December 16, 2016

## Advice 4979-E

(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

## Subject: Pacific Gas and Electric Company's Proposed Default Time-of-Use

 Pilot Design, in Compliance with Decision 15-07-001
## Purpose

This Advice Letter (AL) requests approval of Pacific Gas and Electric Company's (PG\&E's) residential time-of-use (TOU) Default Pilot design in compliance with Decision (D.) 15-07-001 (Decision), Decision on Residential Rate Reform for Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas \& Electric Company and Transition to Time-of-Use Rates.

## Background

On July 3, 2015, the California Public Utilities Commission (Commission or CPUC) issued D.15-07-001 requiring PG\&E, Southern California Edison Company (SCE), and San Diego Gas \& Electric Company (SDG\&E) (collectively the IOUs) to each submit a Tier 3 Advice Letter setting forth its proposal to conduct certain pilot programs and studies of residential TOU electric rate designs (TOU Pilots and Studies). The Decision required the pilot design to include "both opt-in pilots for immediate implementation and default pilots to be implemented in 2018 as permitted by statute." ${ }^{1}$ An Administrative Law Judge Ruling issued on December 29, 2015, clarified that the Default Pilot rate designs are not required to be filed at the same time as the Opt-in Pilots ${ }^{2}$ and that each IOU's Default Pilot design can be filed as a Tier 3 Advice Letter on December 16, 2016.

To support the development of the residential TOU Pilots and Studies, the IOUs were directed to form a multi-stakeholder working group (TOU Working Group), led by Energy Division staff, to address issues regarding the TOU rate design and study as detailed in D.15-07-001. The Decision also directed the TOU Working Group to hire one or more qualified independent consultants to assist with the design and implementation of the

[^0]TOU Pilots and Studies. Through a competitive bidding process, Nexant, Inc. (Nexant) was chosen as the independent consultant to assist the TOU Working Group with the design of the TOU pilots.

Nexant began working on the project on September 18, 2015, first focusing on the Optin Pilot design and then shifting to Default Pilot design. A report describing the agreed upon IOU Default Pilot plans titled Time-of-Use Pricing Default Pilot Plan, Final Report was issued on November 30, 2016 (Nexant Report), which is attached to PG\&E's Default Pilot Proposal as Appendix A. As described in the Nexant Report, as a result of working diligently for several months, the TOU Working Group was able to successfully design three Default Pilot programs, involving clear objectives and several different treatments across the three IOUs. PG\&E's Default Pilot plan, included with this Advice Letter as Attachment 1, builds on the TOU Working Group's efforts as described in the Nexant Report. PG\&E's proposal provides greater detail and more specific implementation parameters than the Nexant Report was able to cover for PG\&E's Default Pilot. In addition, PG\&E's Default TOU Pilot Proposal also comports with and builds upon PG\&E's Marketing, Education and Outreach Advice Letter, filed on November 1, 2016 (PG\&E Advice 4949-E). The bill volatility analysis requested by Energy Division will be provided as a supplement to this advice letter by December 23, 2016.

## Cost

The preliminary estimate of the incremental costs for PG\&E's Default Pilot, over the three-year period from 2017 - 2019, is approximately $\$ 9.9$ million; a year-by-year overview of the estimated costs may be found in Section A of Attachment 1. Actual costs will be tracked in PG\&E's Electric Preliminary Statement Part GS, Residential Rate Reform Memorandum Account (RRRMA). The RRRMA was established in PG\&E's AL 4672-E, ${ }^{3}$ pursuant to Ordering Paragraph 12 of D.15-07-001. The estimated costs presented in Attachment 1 represent a high level estimate based on certain assumptions detailed in its Default Pilot plan. Should any aspect of the scope significantly change, PG\&E will need to refine and update the cost proposal.

## Timing and Implementation

Section A of the attached report contains an implementation schedule. In summary it includes:

- Internal system and business process development: February - March 2017
- Marketing and Customer Notification: December 2017
- Start Default Pilot: March 2018
- Preliminary Default Pilot Results: October 2018

[^1]- End Default TOU Pilot: March 2019
- Final Default Pilot Results: June 2019

It is of the utmost importance that the CPUC issue a resolution approving this pilot proposal as soon as possible, but no later than the Decision Conference on April 27, 2017. Timely approval is essential to enable PG\&E to finish building its systems in time to meet the targeted Default Pilot launch date of March 2018 (which requires customer communication to start in late 2017). Even with an April 2017 final CPUC resolution, PG\&E will need to begin its billing system programming work in February, 2017 to accommodate the targeted launch dates. If the final decision were to include significant changes to the proposed Default TOU rate, that would also jeopardize the proposed launch schedule.

## Protests

Anyone wishing to protest this filing may do so by letter sent via U.S. mail, facsimile or E-mail, no later than January 5, 2017, which is 20 days after the date of this filing. Protests must be submitted to:

CPUC Energy Division<br>ED Tariff Unit<br>505 Van Ness Avenue, $4^{\text {th }}$ Floor<br>San Francisco, California 94102

Facsimile: (415) 703-2200
E-mail: EDTariffUnit@cpuc.ca.gov
Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest shall also be sent to PG\&E either via E-mail or U.S. mail (and by facsimile, if possible) at the address shown below on the same date it is mailed or delivered to the Commission:

Erik Jacobson
Director, Regulatory Relations
c/o Megan Lawson
Pacific Gas and Electric Company
77 Beale Street, Mail Code B10C
P.O. Box 770000

San Francisco, California 94177

Facsimile: (415) 973-1448
E-mail: PGETariffs@pge.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter (General Order 96-B, Section 7.4). The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name, telephone number, postal address, and (where appropriate) e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

## Effective Date

PG\&E respectfully requests that this Tier 3 AL be approved and become effective as of the Commission's April 27, 2017 decision conference.

## Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the parties on the service list for R.12-06-013. Address changes to the General Order 96-B service list should be directed to PG\&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 7032021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter filings can also be accessed electronically at: http://www.pge.com/tariffs/.
/S/
Erik Jacobson
Director, Regulatory Relations
Attachment 1: PG\&E's Default Time-of-Use Pilot Proposal
cc: Service List R.12-06-013

# ADVICE LETTER FILING SUMMARY <br> ENERGY UTILITY 

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)
Company name/CPUC Utility No. Pacific Gas and Electric Company (ID U39 E)


Advice Letter (AL) \#: 4979-E
Tier: $\underline{3}$
Subject of AL: Pacific Gas and Electric Company's Proposed Default Time-of-Use Pilot Design, in Compliance with Decision 15-07-001
Keywords (choose from CPUC listing): Compliance,
AL filing type: $\square$ Monthly $\square$ Quarterly $\square$ Annual $\boxtimes$ One-Time $\square$ Other $\qquad$
If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution \#: D.15-07-001
Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No
Summarize differences between the AL and the prior withdrawn or rejected AL: $\qquad$
Is AL requesting confidential treatment? If so, what information is the utility seeking confidential treatment for: No
Confidential information will be made available to those who have executed a nondisclosure agreement: N/A
Name(s) and contact information of the person(s) who will provide the nondisclosure agreement and access to the confidential information:

Resolution Required? $\begin{array}{r}\text { Yes } \\ \square\end{array}$
Requested effective date: April 27, 2017
No. of tariff sheets: $\mathbf{N} / \mathbf{A}$
Estimated system annual revenue effect (\%): N/A
Estimated system average rate effect (\%): N/A
When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).
Tariff schedules affected: N/A
Service affected and changes proposed: N/A
Pending advice letters that revise the same tariff sheets: N/A
Protests, dispositions, and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

California Public Utilities Commission<br>Energy Division<br>EDTariffUnit<br>505 Van Ness Ave., $4^{\text {th }}$ Flr.<br>San Francisco, CA 94102<br>E-mail: EDTariffUnit@cpuc.ca.gov

Pacific Gas and Electric Company<br>Attn: Erik Jacobson<br>Director, Regulatory Relations<br>c/o Megan Lawson<br>77 Beale Street, Mail Code B10C<br>P.O. Box 770000<br>San Francisco, CA 94177<br>E-mail: PGETariffs@pge.com

Advice 4979-E December 16, 2016

## Attachment 1

## PG\&E Default Time-Of-Use Pilot Proposal

## PACIFIC GAS AND ELECTRIC COMPANY

## DEFAULT TIME-OF-USE PILOT PROPOSAL

IN COMPLIANCE WITH CPUC DECISION 15-07-001
DECEMBER 16, 2016


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# PACIFIC GAS AND ELECTRIC COMPANY DEFAULT TIME-OF-USE PILOT PROPOSAL IN COMPLIANCE WITH CPUC DECISION 15-07-001 

## A. Executive Summary

## 1. Introduction

In this section, Pacific Gas and Electric Company (PG\&E) provides an overview of its proposed residential Default Time-of-Use Pilot (Default Pilot), required by Decision (D.) 15-07-001, $\mathbf{1}$ issued in the Residential Rate Reform Order Instituting Rulemaking proceeding (RROIR). ${ }^{2}$

In D.15-07-001, the California Public Utilities Commission (CPUC or Commission) required each of California's major investor-owned utilities (IOU)—PG\&E, San Diego Gas \& Electric Company (SDG\&E), and Southern California Edison Company (SCE) (the IOUs)—to implement a Default Pilot with the objective of understanding the operational and customer impacts of defaulting customers to a Time-of-Use (TOU) rate. PG\&E's Default Pilot proposal fully complies with D.15-07-001, and related CPUC rulings, the requirements of Public Utilities Code (Pub. Util. Code) Section 745, and is consistent with the approaches agreed to by the TOU Working Group. ${ }^{3}$

PG\&E's Default Pilot will begin in March 2018, which aligns with the California statutory 4 requirement that default TOU cannot begin prior to January 1, 2018.5 Roughly 5 percent of PG\&E's customers will be defaulted to

1 D.15-07-001 ordered each of the IOUs to file a Tier 3 Advice Letter (AL) detailing its pilot design for both Opt-In TOU Pilot and Default Pilot. On December 29, 2015, an Assigned Administrative Law Judge's Ruling (ALJ Ruling) was issued, granting an extension of the due date for the Default Pilot design AL to December 16, 2016. See D.15-07-001, mimeo, p. 166 and December 29, 2015 Administrative Law Judge (ALJ) Ruling.

Rulemaking (R.) 12-06-013.
(ed by the Energy Division and includes a wide range of stakeholders interested in residential rate reform including the Office of Rate Payer Advocates (ORA), the Center for Accessible Technology (CforAT), The Utility Reform Network (TURN), Environmental Defense Fund (EDF), Seimens, and the IOUs.
In Assembly Bill (AB) 327 and Senate Bill 1090 the legislature mandated specific requirements for the CPUC and Electric Corporations in order to default customers to TOU rates. These requirements are set forth in Pub. Util. Code Section 745. (Stats. 2013, Ch. 611 (amended by Stats. 2014, Ch. 625 Effective January 1, 2015.))
See D.15-07-001, mimeo, p. 95.
a TOU rate during a 2-week period in March of 2018. This will enable PG\&E to test operational readiness and customer outreach tactics, in preparation for the full default, which is projected to start in 2019.

PG\&E has been working closely with the TOU Working Group and Nexant, Inc. (Nexant), ${ }^{6}$ on the Default Pilot design. PG\&E would like to compliment and thank the Energy Division, Nexant, and all of the stakeholders in the TOU Working Group for their collaborative efforts during PG\&E's development of its Default Pilot design. This Default Pilot plan incorporates Nexant's November 30, 2016 report, titled Time-of-Use Pricing Default Pilot Plan, Final Report (Nexant Report), attached as Appendix A. PG\&E largely agrees with the Nexant Report and uses this filing to augment the Nexant Report, providing additional PG\&E-specific details, timelines, and estimated costs.

PG\&E's Default Pilot plan assumes and depends on the approval of several key elements, discussed in detail in later sections of this report: (1) the proposed Default Pilot rate; (2) the proposed customer exclusions; (3) the proposed timeline; (4) the proposed evaluation plan; and (5) the proposed Marketing, Education and Outreach (ME\&O) test plan. Should one or more of these assumptions change, there could be significant impacts to approach, timing and/or budget. In addition, there are numerous other factors that could change PG\&E's proposed Default Pilot approach, including: new information from the Opt-In Pilot; related CPUC rulings and decisions (such as the CPUC's Resolution in early 2017 on PG\&E's proposed ME\&O Plan); results of the IOU-led Design Thinking studies requested by the CPUC; information from the Low Income Needs Assessment; or new findings relating to operational feasibility. Due to these dependencies PG\&E reserves the right to amend its proposed Default Pilot proposal through a Supplement to this AL if circumstances or assumptions significantly change. PG\&E also recommends the CPUC's resolution approving this Default Pilot plan build in sufficient flexibility to refine the Default Pilot proposal, as a result of new learnings. As was done in the Opt-In Pilot, this flexibility could be accomplished through continued coordination with Energy Division staff, in consultation with the TOU

[^2]Working Group, where feasible and appropriate. Such flexibility is necessary to allow PG\&E's Default Pilot plan to adapt to changing circumstances, while ensuring proper oversight and adherence to the CPUC's ambitious timelines.

Implementation of PG\&E's Default Pilot is also contingent upon the Commission's issuance of a decision on its assessment of "unreasonable hardship," as required under Pub. Util. Code Sections 745(c)(2) and 745(d). ${ }^{7}$ Under Section 745(c)(2), the CPUC is required to "ensure that any default TOU rate does not cause unreasonable hardship for senior citizens or economically vulnerable customers in hot climate zones." 8 The CPUC's schedule calls for its initial evaluation of unreasonable hardship to be issued by September 2017. A CPUC ruling on this matter by September 2017 is critical in order to have adequate lead time to incorporate any requirements into Default Pilot plans and still launch as expected in March 2018.

## 2. Default Pilot Purpose and Objectives

In order to prepare for the full rollout of default TOU in 2019, the Commission ordered the IOUs to each conduct two pilots: (1) the Opt-In Pilot, which is currently underway; and (2) the Default Pilot. Both pilots are meant to inform each IOU's Rate Design Window (RDW) application, and subsequent proceeding, which is required to be filed by January 1, 2018. Specifically, in D.15-07-001, the CPUC required each IOU to file a 2018 RDW application including: (1) its default TOU proposal (detailing its 2019 default TOU rate and its approach for implementing default TOU); (2) a tiered opt-in TOU rate,

See D.16-09-016, mimeo, p. 14, finding that "the determination of whether default TOU rates would cause unreasonable hardship under [Pub. Util. Code] Section 745(c)(2) should not, and cannot, be made until the data are gathered... That analysis will be done after the data are collected and examined by the parties. The initial evaluation will be done using the Opt-In Pilots and other existing data...." An ALJ Ruling issued September 30, 2016 provides a schedule for this review, which targets the issuance of such a CPUC decision for September 2017.
In D.16-09-016, the CPUC found that there are two possible sources of hardship that can be caused by default TOU rates: (1) economic impacts; and (2) health and safety impacts resulting from reduced air conditioning use. See D.16-09-016, mimeo, p. 14.
utilizing a baseline credit and (3) at the discretion of each IOU, other optional residential rates. 9

The IOU's three Opt-In Pilots focus primarily on testing various rate designs, understanding whether any of these rates could cause "unreasonable hardship" to customers identified in Section 745(c), and assessing whether enabling technologies might provide significant, cost-effective benefits. PG\&E's Opt-In Pilot began on June 1, 2016 with approximately 21,000 customers initially enrolled; it will run through December 31, 2017.

The Default Pilot seeks to "study aspects of TOU that are directly impacted by the self-selection bias inherent in the Opt-In Pilot, 10 to fine-tune customer default education and test system operability prior to full rollout of default TOU."11 Accordingly, and in alignment with the recommendations in the Nexant Report, PG\&E's Default Pilot will focus primarily on:

1) Operational Readiness: This includes optimizing business processes, building and testing Information Technology (IT) and billing systems, and increasing capacity of customer service channels to support a smooth transition to default TOU rates.
2) ME\&O Optimization: Optimization will focus on increasing customer awareness of rate options and engagement while managing costs. This will include testing customer bill impact segmentation, delivery channels, messaging cadence and tactics to enable refinement to support the transition to default TOU rates.

See D.15-07-001, mimeo, pp. 301-302. The decision listed five types of information and supporting documentation in support of the 2018 RDW proposals, but also provided that, in Phase 3 of the RROIR proceeding, the CPUC would further address the specific information and supporting documentation that should be included in the IOUs' 2018 RDW applications.
10 "Selection bias" means the selection of individuals, groups or data for analysis in such a way that proper randomization is not achieved, thereby ensuring that the sample obtained is not representative of the population intended to be analyzed. The potential for "self-selection bias" in the Opt-In Pilot results from its voluntary nature; although the Opt-In Pilot was designed to come as close to simulating default as possible (i.e., by randomly assigning customers to one of three pilot rates or the control group), it does not include customers who nonetheless were unwilling to affirmatively opt-in to TOU through that pilot.
11 See D.15-07-001, mimeo, p. 170.

Additionally, there are three key business objectives for the Default Pilot, which align with the overall default objectives stated in PG\&E's ME\&O proposal recently filed with the CPUC, ${ }^{12}$ which are as follows:

1) Customers have support and easy access to timely, effective information in their transition to, and tenure on, the default TOU rate.
2) Customers understand the rate change and are aware that they have choices during and after the default notification period.
3) Opportunities and improvement plans are identified for operations, business processes, and ME\&O in time to inform the then in-progress 2018 RDW13 proceeding and the implementation of full default in 2019.
These business objectives, which are also in alignment with the statewide objectives listed in the Nexant Report, ${ }^{14}$ form the foundation for PG\&E's Default Pilot plan.

## 3. Summary of Default Pilot Proposal

As noted above, PG\&E's Default Pilot will focus on: (1) testing and building business processes and operational systems; and (2) optimizing ME\&O tactics and cadence. The following is a summary of the Default Pilot design.

## Default Pilot Design

PG\&E proposes to default a random sample of 250,000 eligible residential electric customers, who are currently on its monthly tiered rate $\mathrm{E}-1$ (and its California Alternate Rates for Energy (CARE) counterpart, EL-1), ${ }^{15}$ to PG\&E's proposed new E-TOU-C16 rate described in detail in the Rate Design section. This sample size is necessary to enable sufficient testing of operational systems and multiple ME\&O approaches. Specifically, PG\&E proposes to automatically enroll these customers (i.e., default) onto PG\&E's Default Pilot

12 PG\&E AL 4949-E, filed November 1, 2016.
13 PG\&E is proposing that the Default Pilot begin in March 2018, however the RDW application will be filed by January 1, 2018 and thus the RDW proceeding will already be in progress.
14 Time-of-Use Pricing Default Pilot Plan, Final Report, November 30, 2016, Nexant, p. 1.
15 These two rates ( $\mathrm{E}-1$ and EL-1) are collectively referred to in this proposal as " $\mathrm{E}-1$ ".
16 The new E-TOU-C rate would also have a CARE counterpart called EL-TOU-C (these two rates are collectively referred to in this proposal as "E-TOU-C".) Upon approval of this AL, PG\&E will file a Tier 1 AL to update the tariff book to include the new E-TOU-C and EL-TOU-C rates. PG\&E reserves the right to re-name these rates at a later time.
rate during a 2-week period in March 2018. ${ }^{17}$ By defaulting 250,000 customers over a 2-week period, PG\&E will be simulating the operational impact that would result from defaulting 500,000 customers over a 1-month period, which is PG\&E's conceptual plan for the size of the monthly waves, during the full default roll-out, starting in 2019. The Default Pilot size of 250,000 customers is also close to, but larger than, PG\&E's largest single-month TOU transition, implemented in November of 2012,18 when PG\&E moved 210,000 non-residential customers to mandatory TOU. 19 PG\&E will leverage the Default Pilot to "stress test" its systems, while also focusing on maintaining a high level of customer support and satisfaction.

PG\&E has a total of approximately 4.7 million residential electric customers, and expects to be transitioning approximately 2-3 million eligible customers to default TOU over the next several years. The scale for full default is not yet known because it is dependent on whether or which customers the CPUC may decide to exempt, if it finds default TOU causes "unreasonable hardship."

As a result of the eligibility requirements set forth in Pub. Util. Code Section 745, PG\&E will exclude: (1) customers with less than 12 months of interval data at their current premise; 20 (2) customers on Medical Baseline; 21 (3) customers requesting third-party notification; and (4) customers requiring on-site visits prior to disconnection. 22 If the CPUC identifies additional exclusions at a later date, these would also need to be addressed in PG\&E's Default Pilot. As agreed upon with Energy Division Staff, PG\&E will submit its

17 Customers will be selected for the Default Pilot based on their billing cycle.
See D.11-11-008 (modifying D.10-02-032 and D.08-07-045), approved November 10, 2011 in PG\&E's 2009 RDW Application ((A.) 09-02-002). In D.11-11-008, the CPUC approved a rolling default schedule for Small and Medium Business customers over several years, beginning on November 1, 2012.
19 Mandatory TOU, which the CPUC has required for PG\&E's non-residential customer classes, is not the same as default TOU. Although both involve an automatic enrollment (rather that opting-in to the rate), customers placed on mandatory TOU rates cannot later opt-out, as can be done under default TOU (and indeed, as is required under Pub. Util. Code Section 745). Therefore, the business processes for default TOU are more complicated than for mandatory TOU, making a stress test even more important.
Pub. Util. Code Section 745(c)(4).
Id. Section 745(c)(1), and Section 745(c)(4).
Id. Section 745(c)(1), and Section 745(c)(4).
proposed procedures for handling Pub. Util. Code Section 745(c)(2) exclusions (should they be required by the CPUC) via a supplemental filing, in late Q1 of 2017. An additional statutory requirement, included in PG\&E's Default Pilot design, is to send Rate Comparison (RC) information to customers on TOU rates and provide bill protection to customers defaulted onto TOU rates. ${ }^{23}$

Furthermore, PG\&E is recommending additional customer exclusions, including customers in master-metered properties, customers already on a TOU rate, unbundled customers served by an existing non-participating Community Choice Aggregator (CCA) or who will be served by an emerging CCA, customers on Direct Access, and customers without an advanced meter capable of registering interval usage. Further description of these exclusions can be found in Section B. 3 below.

PG\&E plans to include eligible Net Energy Metering (NEM) customers and unbundled customers served by CCAs, who elect to participate. ${ }^{24}$ Including these customer segments will simulate the anticipated environment during the 2019 default. These elements are described in more detail in subsequent sections.

## Default Pilot Rate Design and Bill Impacts

For its Default Pilot rate, PG\&E proposes to create a new Rate Schedule which will follow the rate design for PG\&E's existing E-TOU-A 25 rate in most aspects, except that E-TOU-C will start with a 4 p.m.-9 p.m. peak period like

23
Marin Clean Energy (MCE) and Sonoma Clean Power (SCP) have both indicated their interest in participating in this Default Pilot, however certain operational details are still being worked out. PG\&E is continuing to coordinate with other existing and future CCAs in advance of the full TOU default in 2019.
25 E-TOU-A was recently approved by the CPUC in D.15-11-013, has a baseline credit, a four-month summer season (June-September), and peak period from 3 p.m.-8 p.m., Monday through Friday (excluding holidays). After December 31, 2019, the peak period hours for E-TOU-A will transition to those of E-TOU-B ( 4 p.m.-9 p.m.).

E-TOU-B. ${ }^{26}$ For the general population this new Rate Schedule would be called Schedule E-TOU-C, and for CARE customers, Schedule EL-TOU-C (collectively referred to as E-TOU-C). The design for E-TOU-C aligns with the rates recently approved by the CPUC in D.15-11-013 (PG\&E's 2015 RDW). Like E-TOU-A, E-TOU-C will have a baseline credit, a 4-month summer season (June-September), and peak period on Monday through Friday (excluding holidays).

Section C below includes bill impact analysis for the target population's default from E-1 to E-TOU-C in 2018 as requested by Energy Division, pursuant to Pub. Util. Code Section 745(d), to aid the Commission's evaluation of "unreasonable hardship." This analysis shows that, overall, 30.9 percent of non-CARE customers would have decreases in their average monthly bills, over the course of the year, by moving from tiered ( $\mathrm{E}-1$ ) rates to a TOU rate with a baseline credit and a 4 p.m.-9 p.m. peak (E-TOU-C), while 68.4 percent would see an increase in bills (the remaining 0.7 percent would see no change). ${ }^{27}$ However, among the 68.4 percent of customers who would see higher bills, 48.1 percent would see average monthly bill increases of just $\$ 5$ or less.

For CARE, the results show that, overall, 58.5 percent of customers would see decreases in their average monthly bills by moving from tiered (EL-1) rates to TOU (EL-TOU-C) rates, while 41.5 percent would see increases (with 0.1 percent seeing no change). Of the 41.5 percent seeing increases, though, 39.5 percent would have increases only up to $\$ 5$.

26 Schedule E-TOU-A resulted from a settlement compromise, such that its peak period from inception in 2016 through December 31, 2019 would be 3 p.m.-8 p.m., shifting to the same 4 p.m. -9 p.m. peak adopted for E-TOU-B. Studies put into evidence in the 2015 RDW by both the ORA and PG\&E showed that-based on then-available data-the peak period (with highest generation marginal costs) was 4 p.m. to 9 p.m. This is consistent with the California Independent System Operator's analysis, presented in the CPUC's TOU Periods Order Instituting Rulemaking (R.15-12-012), which similarly showed that the system net-load peak has already shifted to 4 p.m.-9 p.m., as of 2015. PG\&E's proposed Schedule E-TOU-C does not replace E-TOU-A (which will continue to be available), thus PG\&E continues to support the 2015 RDW settlement. However, this proposal would provide an additional rate option (E-TOU-C) which is targeted to become available to both those $250,000+$ customers selected to receive notification under the Default Pilot starting December 1, 2017, as well as any other customers who might wish to opt-in (as it would be listed on PG\&E's website as an available rate).
27 These percentages do not add to 100.0 percent, due to rounding.

PG\&E has two existing residential TOU rates; E-TOU-A and E-TOU-B, neither of which is appropriate for the Default Pilot. As regards to E-TOU-A, PG\&E shared with the TOU Working Group its interest in leveraging its existing E-TOU-A rate as the Default Pilot rate, as noted in the Nexant Report. However, since that time, PG\&E has decided it is crucial to use 4 p.m.-9 p.m. peak period to better replicate the anticipated experience for full default and to gain customer insights and load shifting research on a peak period which is more cost-based and closer to the expected default TOU rate. It is important that the customer feedback and load shifting research provided by Default Pilot participants be as relevant as possible to full default. Additionally, if E-TOU-A were used without change for the Default Pilot rate, pilot participants would have an initial peak period of 3 p.m. -8 p.m. which would, by the terms of E-TOU-A, only be applicable for a year and three-quarters before they would be automatically shifted to the pre-approved 4 p.m.-9 p.m. peak starting January 1, 2020. This could cause customer confusion and increase the operational burden of this transition.

PG\&E has only one other existing (non-Electric Vehicle) residential TOU rate open to new customers: E-TOU-B. Although E-TOU-B has a peak period from 4 p.m.-9 p.m., Monday through Friday (excluding holidays), it does not include a baseline credit. E-TOU-B also currently has an enrollment cap of 225,000 customers. Since it lacks a baseline credit and has too small of an enrollment cap, E-TOU-B is not a viable Default Pilot rate option. 28

Since the key focus of the Default Pilot is to prepare for the full default TOU implementation in 2019, it means PG\&E should—as closely as possiblereplicate the anticipated environment. While the final default TOU rate the CPUC will approve in PG\&E's 2018 RDW cannot currently be known, what is known today is that better emulation of the anticipated conditions in 2019 can be done by: (1) having the default rate publicly available to all customers; 29

28 The Commission determined in D.15-07-001 that the default TOU rate must have two tiers (with the tiering accomplished via a baseline credit, which E-TOU-A has, but E-TOU-B does not).
29 The Opt-In Pilot leveraged micro-sites for online communications that were not integrated with PG\&E systems or tools, as the purpose of the Opt-In Pilot is to test different rates that may not ultimately be selected.
(2) providing a menu of options ${ }^{30}$ during the default notification period; and (3) allowing customers to continue on the default rate after the conclusion of the Default Pilot.

PG\&E is viewing its Default Pilot as "Phase 0" of the full TOU default—an approach that is supported by the TOU Working Group. As such, it is critical that customers can remain on their rate after completion of the Default Pilot, even as full default is implemented. As "Phase 0" of the full default, PG\&E proposes all decisions made by those defaulted during this Default Pilot should carry forward into the future. This means customers who are automatically enrolled onto E-TOU-C as part of the Default Pilot, will remain on that rate until they move out of PG\&E territory, transfer service, or elect to switch to another available rate. Also, customers who elect not to participate in the Default Pilot will not be subject to future defaults at their current premise. Therefore, at the end of the Default Pilot, participating customers may remain on their Default Pilot rate or select another available rate, but will not be defaulted again in 2019.

## Marketing Education and Outreach

As mentioned above, the Default Pilot design incorporates ME\&O tactics to be tested and optimized, many of which were described in PG\&E's ME\&O Plan, filed on November 1, 2016. The Default Pilot activities will help inform the final customer outreach approach adopted for full default. This Default Pilot design also aligns with ongoing rate education outreach efforts, such as the RC Mailer "test and learn," voluntary TOU acquisition efforts, and other planned rate communications, which were also detailed in the ME\&O filing. These activities will provide insights into the various components of default TOU, which will be needed to ensure a successful full rollout in 2019. In addition, PG\&E's design for the Default Pilot ME\&O leverages and incorporates best practices learned from PG\&E's prior experiences with implementing non-residential mandatory TOU and from other jurisdictions such as the Ontario Energy Board and the Sacramento Municipal Utility District (SMUD).

A menu of options references the availability of multiple rate choices, including the standard tiered rate and TOU rates.

The Default Pilot ME\&O consists of four key stages: (1) customer default notification, which will begin as early as December 2017; (2) welcome communication; (3) summer and winter seasonal support; and (4) end of bill protection period notification. As detailed in the Nexant Report, and Section D. 5 below, the proposed plan involves tests for 13 different combinations, focused on the first two stages, in order to gather results in time to inform the 2019 default implementation. This includes: testing of delivery channels; messaging; granularity of RC information; frequency of notifications; and customer segmentation. There are two customer segments for the test schematic. Segment 1 is comprised of customers who receive paper bills, as well as customers who receive paperless bills and for whom PG\&E does not have an e-mail address. These customers can be reached through Direct Mail (DM) or through on-bill communication (also referred to as a "bill onsert"). Segment 2 is comprised of customers who have elected to receive paperless bills and for whom PG\&E has e-mail addresses. This group can be communicated with via e-mail (EM) and DM.

## Customer Tools and Support

Customer tools and support are particularly critical to achieving PG\&E's objective to ensure the Default Pilot delivers a positive customer experience. This is important because the experience for these 250,000 Default Pilot customers will set the stage for how default TOU is perceived by PG\&E's remaining eligible customers. Key elements of a successful default TOU implementation are customer awareness, understanding, and (ultimately), engagement on rates. To support these elements, PG\&E will be leveragingand in some cases, improving-its existing online tools and contact center resources. In advance of the Default Pilot, PG\&E will be building capacity in these key areas (e.g., customer opt-out or rate change tools) to better support customer needs during and after the default occurs. An important stage of the Default Pilot is the customer notification period, in which customers may select to remain on E-1, switch to another available TOU rate or, if no action is taken or, if E-TOU-C is affirmed, be automatically switched to the default rate. New online and phone-based tools will be made available to support this stage and are detailed below in Section E.

## Information Technology

As mentioned earlier, the Default Pilot will test operational readiness of PG\&E's business processes and systems. In order to effectively test the operationally readiness, PG\&E must automate its processes, such as the default transition, customer selection workflow, bill protection calculation, and customer support. PG\&E will use the results of the Default Pilot to optimize and scale these systems, in support of the full default.

To meet the timeframe established for the Default Pilot, PG\&E will need to finalize business requirements and begin building the key IT systems, such as automated customers selection and bill protection calculation, by February, 2017. While PG\&E will attempt to build these systems with flexibility, changes to the scope—such as a change in rates—or delays in approval of the Default Pilot could have significant impacts in PG\&E's ability to meet the forecasted budget and timeline.

## Customer Research, Measurement, and Evaluation

Another objective of the Default Pilot is to rigorously determine customer response to various treatments. The Default Pilot will include a process evaluation to help identify potential bottlenecks or systems issues that may be encountered when processing these high volume transactions. It will also help PG\&E determine what staffing will be needed for essential services (e.g., the call center) in order to maintain service quality and support customer satisfaction during full default. PG\&E will track and measure data on various operational and ME\&O metrics, throughout the Default Pilot, to help inform the then-ongoing 2018 RDW proceedings. After August 2018, PG\&E proposes to conduct a preliminary assessment of bill and load impacts, to help inform the CPUC's decision making process on the 2018 RDW, with a full analysis delivered after the completion of the Default Pilot. It is possible, based on these preliminary Default Pilot results, that PG\&E may amend its 2018 RDW default TOU proposal.

## 4. Summary of Timeline and Budget

a. Integrated Schedule

A summary of PG\&E's schedule, as currently anticipated, is provided below. Additionally, more detailed schedules, outlining the specific activities, are provided in each of the corresponding sections of this report.

FIGURE 1
PG\&E DEFAULT PILOT TIMELINE


## b. Budget Summary

The building of internal processes and systems and development of ME\&O to support a 13 permutation test, in addition to the smooth default of a quarter of a million customers in early 2018, is a huge and complex undertaking. Accordingly, it is not possible at this early stage, over a year away, to predict with precision, the level of its ultimate, actual costs. There are many unknowns, including, but not limited to: (1) how the CPUC will resolve remaining issues under Pub. Util. Code Section 745; (2) what type
of statewide marketing, if any, takes place; (3) when and what lessons will be learned after data is collected from the Opt-In Pilot; and (4) results from early test and learn ME\&O efforts. The ultimate outcomes of these unknowns could result in cost changes that may increase or decrease any of the elements PG\&E has attempted to forecast in these preliminary budget estimates. PG\&E reserves the right to update this budget, as such unknowns are resolved.

It should also be noted that a start-up effort, such as this one, is likely to have somewhat higher costs, in the early years. As the Default Pilot is "Phase 0" of PG\&E's full default TOU implementation, PG\&E will be building systems that are also expected to be part of supporting full default in 2019. As a result, costs may be higher than a traditional pilot and the efforts to build these systems may experience unforeseen complications as PG\&E works to integrate new functionality with other related systems.

PG\&E's preliminary cost estimate for the Default Pilot activities (2017-2019) totals to $\$ 9,990,418$. As mentioned above, this estimated total cost is based on numerous assumptions about the activities planned for 2017-2019, as set forth in this filing. Should any of those assumptions change or if the CPUC's Resolution were to modify PG\&E's proposal, this preliminary budget estimate would also change. In the table below, PG\&E has included estimates of PG\&E's anticipated labor and contract costs relating to Default Pilot activities that are to be recovered through the 2017 General Rate Case (GRC) Settlement filed on August 3, 2016 (A.15-09-001) 31 and recorded through the memorandum account authorized by Ordering Paragraph (OP) 12 of D.15-07-01. 32 Similarly, costs associated with contact center support, on-going customer research, and marketing effectiveness studies have been included in the estimates and will be recovered in this manner as well.

31 As of the date of filing, the CPUC had not yet issued a final decision in A.15-09-001.
32 The RROIR memorandum account was approved in AL 4672-E, effective July 22, 2015.

TABLE 1
SUMMARY OF PG\&E'S ESTIMATED DEFAULT PILOT COSTS

| Budget Category | 2017 Proposed <br> Budget | 2018 Proposed <br> Budget | 2019 Proposed <br> Budget |
| :--- | ---: | ---: | ---: |
| Default Pilot Design (Section B) | $\$ 33,500$ | $\$ 33,500$ | - |
| Marketing \& Outreach (Section D) | 375,000 | 661,250 | $\$ 351,250$ |
| Customer Support (Section E) | 174,595 | 331,745 | 80,778 |
| IT and Operations (Section F) | $4,875,000$ | - | - |
| Measurement \& Evaluation (Section G) | 115,000 | 830,000 | 140,000 |
| Labor | 880,000 | 880,000 | 228,800 |
| Total Annual Cost | $\$ 6,453,095$ | $\$ 2,986,495$ | $\$ 550,828$ |
| Default Pilot Total Cost | $\$ 9,990,418$ |  |  |

## B. Default Pilot Design

## 1. Introduction

This section provides an overview of the Default Pilot design, including: (1) design and sample size determination; and (2) customer exclusions. PG\&E's Default Pilot has been designed to meet the objectives summarized in Section A above, as well as to satisfy applicable regulatory and statutory requirements.

While the primary objective of the Default Pilot is to operationally prepare for default TOU, there will be a parallel initiative to test the effectiveness of multiple ME\&O strategies. Also, through its staged Measurement and Evaluation (M\&E) plans discussed in Section G below, PG\&E will be positioned to evaluate this Default Pilot so as to identify successes as well as opportunities for improvement that could be used to improve future residential default TOU implementation efforts. PG\&E worked closely with the TOU Working Group to incorporate an overarching research design and a set of ME\&O tests that would accompany the 2018 Default Pilot and inform stakeholders on how best to implement default TOU starting in 2019. As a result, PG\&E agrees with the summary of its proposed Default Pilot design, as presented in the Nexant Report, and incorporates the Nexant Report by reference as part of this AL. 33

To meet the multiple Default Pilot objectives-within the short timeframe leading up to the 2019 default-beginning shortly after the launch of the pilot in Q4 2017, PG\&E will begin quickly generating analysis on Default Pilot
outcomes, including: assessments of operational readiness; effectiveness of ME\&O treatments on customers awareness; and impacts of the TOU default on customer hardship. A detailed schedule of the evaluation deliverables is provided in Section G below.

The Nexant Report lists the full set of Default Pilot objectives, research questions and metrics. ${ }^{34}$ In alignment with the Nexant Report, the key research questions PG\&E plans to address through the proposed Default Pilot design are:

1) How to cost-effectively increase customer awareness and understanding of the default TOU rate;
2) How to cost-effectively minimize attrition from default TOU and maximize engagement for customers placed on TOU rates;
3) What are the call volume, and other operational impacts, as a function of different ME\&O approaches;
4) What are the measured load impacts (including load-shifting behaviors during hot summer peaks), bill impacts, and results on other metrics that could affect the long-term success of residential default TOU; and
5) Augment Opt-In Pilot research to provide key information concerning whether the default TOU rate causes unreasonable hardship for senior citizens or economically vulnerable customers in hot climate zones. The results would enable PG\&E and the other IOUs to make cost-effective decisions about what approach(es) to take for the full rollout of default TOU in 2019, taking into account both ME\&O and ensuring operational success. However-as proposed-in order to reach valid conclusions, it is necessary to employ a proper experimental research design that would enable PG\&E to confidently attribute differential results to the various treatments.

## 2. Design and Sample Size Determination

a. Experimental Design

PG\&E supports the experimental design approach described in the Nexant Report and offers additional details in this proposal. First, PG\&E will randomly-select a pool of default-eligible customers, and randomly assign half of these customers into the Default Pilot. This first step would
facilitate the measurement of load and bill impacts associated with default TOU, while minimizing the risk of biased results. ${ }^{35}$ Second, for those customers assigned to the Default Pilot, PG\&E will randomly-assign the specific ME\&O approach. This second step would enable PG\&E to measure the effectiveness of various ME\&O treatments with confidence that the results are un-biased. Finally, PG\&E will place customers remaining on the Default Pilot rate into test groups to facilitate assessment of welcome communications. The proposed experimental design is summarized in Figure 2.

FIGURE 2
PROPOSED EXPERIMENTAL DESIGN


## b. Random Selection and Assignment

The random selection of customers for participation in the Default Pilot will support the goal of obtaining results and drawing conclusions that can be generalized to the entire population of default-eligible customers. To ensure an accurate representation of PG\&E's overall residential

An alternative approach, that was considered, but rejected, would have been to randomly sample 250,000 customers from the total eligible population, treating all default-eligible customers that were not randomly selected for default as the Control Group. However, the selection of an equal-sized control group from the outset was deemed to be a useful and better way to define a more manageable control population ahead of time, for later use in the analysis.
population, PG\&E will randomly select the customers so they accurately reflect the total eligible population in all observable—and un-observabledimensions.

This random selection will prevent an inaccurate representation of the overall population (e.g., if customers with e-mail addresses were prioritized during recruitment, the percentage of customers with e-mail would be higher than in the overall population, and their behavior on TOU may not accurately reflect the behavior of the overall population).

Once the population is randomly-selected, the random assignment of half of the customers onto the Default Pilot rate will generate equal-sized treatment and control groups-also referred to as a comparison groupthat are, in aggregate, equivalent to each other. The control group, who will remain on E-1—at their discretion ${ }^{36}$ —will not be aware of their identification as part of the comparison population and would serve as the baseline against which the Default Pilot customers will be compared. 37 Per the Working Group's Default Pilot recommendations, PG\&E will employ a type of Randomized Control Trial (RCT) called a Randomized Encouragement Design (RED). This method accounts for the fact that customers can elect not to enroll onto the Default Pilot or to switch rates (opt-out) if they are defaulted. Therefore when estimating differential impacts, it is not appropriate to make a direct comparison between those who choose to remain on the rate and a random selection of customers in a control group. 38

36 Customers in the control group may select to switch to another available rate of their choosing at any time. If a customer switches rates during the Default Pilot, they will be removed from the control group.
37 As noted above, an alternative approach would be to randomly-sample the defaulted customers from the total eligible population, treating the entire remaining population as the control group. However, defining a manageable control group ahead of time will save time and effort during the analysis phase.
38 For an in-depth explanation of the RED methodology, please see Cappers, Peter, Annika Todd, Michael Perry, Bernie Neenan, and Richard Boisvert, "Quantifying the Impacts of Time-based Rates, Enabling Technology, and Other Treatments in Consumer Behavior Studies: Protocols and Guidelines." Lawrence Berkeley National Laboratory, July 2013.

## c. Assignment of Customers to ME\&O Treatments Groups

After careful consideration of various ME\&O tactics, PG\&E has defined a set of notification delivery methods and rate impact presentations that have varying cost and operational implications. These may also have differential effects on customer awareness and understanding. Within the Default Pilot population, PG\&E will randomly assign these ME\&O treatments according to the plan described in the ME\&O section of this AL. The random assignment would ensure that the groups receiving the various ME\&O treatments would be similar in all dimensions beyond the ME\&O treatment they receive. Therefore any observed differences in the way they respond to default TOU-whether it is through an active decision, such as electing not to enroll, or through simple awareness, as measured through a survey—can be attributed to the ME\&O treatment. This will allow PG\&E to understand the impact of these treatments on a range of key metrics like customer awareness, understanding, and attrition.

## d. Sample Size Determination

PG\&E agrees with the sampling plan described in the Nexant Report. Approximately 500,000 customers will be selected from PG\&E's eligible customer population. This list will be screened for operational feasibility and other approved exclusions. The resulting group will also be large enough to allow adequate room for customer attrition due to customers who move or transfer service. 39 From this pool, PG\&E will randomly assign 250,000 customers to the Default Pilot. Assuming that approximately 5 percent of customers elect not to participate, about 237,500 will be automatically-transitioned to the default rate. Given the broader objectives of the pilot, the population will be representative of the future default-eligible population, giving the results high external validity.

The planned size of the Default Pilot population was set, based on operational considerations (i.e., it is the number determined to be necessary to perform an operational test of the impact of the planned full roll-out of default TOU, as discussed in Section A above). By extension,

Approximately 15 percent of PG\&E's residential customers move or transfer service monthly.
the Default Pilot population of approximately 250,000 participants yields more than enough customers for PG\&E to test its proposed ME\&O treatments. For example, PG\&E proposes 13 distinct default notification pathways in its proposed plan. If an approximately equal number of customers are assigned to each notification pathway, slightly more than 19,000 customers would fall into each of the 13 paths. For planning and budgeting purposes, PG\&E currently proposes to implement its Default Pilot with this straightforward distribution of customers across notification pathways. However, if upon further consideration of the ideal customer experience and the costs of each distinct notification option-which are not yet finalized—PG\&E may choose to place more customers into certain notification paths than others, while maintaining the appropriate number per cell for the test.

## 3. Customer Exclusions

This section describes: (1) the statutory exclusions for default TOU under Pub. Util. Code Section 745; and (2) the types of customers that PG\&E proposes to exclude from its Default Pilot for operational, as well as customer experience reasons.

Under Section 745(c)(2), the CPUC is required to "ensure that any default TOU rate does not cause unreasonable hardship for senior citizens or economically vulnerable customers in hot climate zones." 40 By mid-2017, the IOUs and interested parties will provide data from the Opt-In Pilots on: bill impacts; energy burden changes; load-shifting behavior during hot summer days; disconnections; and arrearages. 41 In addition, before the end of Q1 2017, results from an Opt-In Pilot survey conducted by the market research firm Research Into Action (RIA) will be available to further inform the CPUC's initial

In D.16-09-016, the CPUC found that there are two possible sources of hardship that can be caused by default TOU rates: (1) economic impact; and (2) health and safety impacts resulting from reduced air conditioning use. See D.16-09-016, mimeo, p. 14.
41 Per the approach adopted in the CPUC's recent Section 745 Decision (D.16-09-016) and the October 10, 2016, Prehearing Conference, PG\&E, SCE and SDG\&E will serve showings and file legal briefs on key matters related to Section 745 in mid-2017, after Opt-In Pilot data is available.
assessment of "unreasonable hardship," with data addressing potential economic, as well as health and safety impacts of TOU. 42
a. Required Customer Exclusions

Certain customers are legally required to be excluded from default TOU under Pub. Util. Code Section 745. This statute expressly defines four types of residential customers that, by law, are already categorically required to be excluded from the rollout of default TOU, starting on or after January 1, 2018. Specifically, Pub. Util. Code Section 745(c)(1) requires that the following types of customers may not be placed on TOU rates "without their affirmative consent" (i.e., not defaulted):

1) Customers receiving a medical baseline allowance pursuant to Subdivision (c) of Section 739;
2) Customers requesting third-party notification pursuant to Subdivision (c) of Section 779.1; and
3) Customers whom the Commission has ordered cannot be disconnected from service without an in-person visit from a utility representative (D.12-03-054 (March 22, 2012), Decision on Phase II Issues:

Adoption of Practices to Reduce the Number of Gas and Electric Service Disconnections, Order 2 (b) at page 55). 43

42 The RIA survey on potential economic and health and safety impacts was designed at the direction of the TOU Working Group.
43 D.12-03-054 describes the customers who cannot be disconnected without an in-person visit as including: (1) Medical Baseline customers; (2) Life Support customers (who also qualify for Medical Baseline); and (3) a third, broader group, of vulnerable customers, defined as follows (p. 30):
[C]ustomers who certify that they have a serious illness or condition that could become life threatening if service is disconnected. We do not require the customer to produce a physician's statement in support of the certification; i.e., customers may self-certify as to the illness or condition.
D.12-03-054 specifically notes that this group of customers is broader than those who are eligible for Medical Baseline allowances, stating:
...the Medical Baseline designation alone may not be adequate to protect at-risk customers. As CforAT [the Center for Accessible Technology] points out, there are many households containing disabled individuals who are not enrolled in programs such as Medical Baseline because they are unaware of them or because their disability does not cause them to use above-average levels of energy. 'The fact that they are not enrolled in these programs...does not mean that they would not be subject to severe harm if they were disconnected.'

The fourth pre-determined exclusion is set forth in Pub. Util. Code Section 745(c)(4), which prevents any residential customer from being defaulted "until they have been provided with one-year of interval usage data from an advanced meter, and associated customer education." In compliance with the statute, PG\&E plans to exclude customers with less than 12 months of interval data at the time of the selection of the Default Pilot population. Separately, in compliance with Pub. Util. Code Section 745(c)(4), customers who are included in the Default Pilot will receive "associated customer education" in the form of at least one RC and access to additional information online or by phone, 44 as well as, or as part of, the ME\&O information about default TOU that will be provided $90-, 60-$, and 30 -days before they are automatically enrolled onto the Default Pilot rate.

Finally, an additional, as yet un-defined, provision in Section 745(c), allows for the exclusion of "other customers designated by the Commission in its discretion" from being "subject to default TOU rates without their affirmative consent." ${ }^{45}$ The potential categories of customers who could be excluded were mentioned in D.16-09-016. These include potential exclusions relating to Section 745(c)(2) (if necessary to prevent potential "unreasonable hardship" for either some or all senior citizens who reside in hot areas, or some or all "economically vulnerable," CARE/ Family Electric Rate Assistance (FERA)-eligible, customers who reside in hot climate zones.) Additionally, the CPUC must consider whether default TOU causes financial hardship for these same customers residing in hot inland areas or

44 See D.16-09-016, mimeo, pp. 28-30 and pp. 36-37, Finding of Fact 18, and Conclusions of Law 10-12, stating that the rate comparison is "a necessary tool for customers to become educated about rate choices."
45 The Commission has stated, in D.16-09-016 at p. 17, and in the Schedule issued in the ALJ Ruling of September 30, 2016, that it expects to issue a final decision, in or about September 2017, which will include a finding as to whether it will exercise its discretion to assess whether any additional types of customers must be excluded from the Default Pilots after the data from the Opt-In TOU Pilots are collected and examined by the parties, as the basis for arguments to be presented by the parties in mid-2017. (See D.16-09-016, mimeo, pp. 17, FN 33, noting that, "prior to putting any customers on a default TOU pilot rate, the Commission must make sure that there will not be an unreasonable hardship under Section 745(c)(2).") A decision on this issue in the fall of 2017 is necessary because of the lead-time necessary to prepare for the Default Pilot if it is to begin in March 2018, as has been contemplated by the Default TOU Working Group.
in areas with hot summer weather ${ }^{46}$ which results in seasonal bill volatility, per Pub. Util. Code Section 745(d).

Any additional exclusions, such as of CARE/FERA-eligible customers in hot areas, or senior households in hot areas, would require IT system changes to enable additional tracking and data reporting. If the CPUC were to decide to exclude CARE/FERA eligible customers, PG\&E believes it has adequate information available to support a straightforward process for any such exclusion. However, in D.16-09-016, the CPUC found that, because the IOUs do not currently track which of their customers have a senior citizen ( 65 and older) in their household, the IOUs are required to implement a procedure for obtaining and tracking this information in the future. The IOUs were encouraged to work with the TOU Working Group to develop reasonable rules for this process, should seniors be excluded from default TOU. Similarly, the IOUs were to work with the TOU Working Group on a process for identifying customers who are eligible for an in-person visit from a utility representative before they can be disconnected, so they can be excluded from default as required by Section 745(c)(1). The TOU Working Group discussed these processes, but did not have adequate time to reach a final conclusion in time for inclusion in the IOUs' December 16, 2016 Advice Filings. As discussed with and agreed upon by Energy Division Staff—in consultation with the assigned ALJ—the IOUs will each provide detailed implementation plans as a supplemental proposal, targeted to be filed in late Q1 of 2017, in order to allow time for further TOU Working Group discussions after the main Default TOU Pilot AL has been submitted, and after the winter holiday season.
b. Identifying and Tracking Required Customer Exclusions

PG\&E's Default Pilot will exclude the categories of customers who have already been expressly excluded from default TOU by statute. As mentioned above, Pub. Util. Code Section 745(c)(1) sets forth three required categorical exclusions. The following sets forth PG\&E's plan for excluding these three groups who are categorically excluded by law:

46 PG\&E's service territory analysis concluded that "hot climate zones" and "areas with hot summer weather" are the same for PG\&E (i.e., Climate Zones: P, R, S, and W).

1) Medical Baseline: PG\&E has long provided a Medical Baseline Program, pursuant to Pub. Util. Code Section 739(c)(1), which allows eligible customers to receive additional baseline allotments as necessary to cover their additional medically-necessary electrical needs. Identification of such customers is already provided for in PG\&E's Customer Care and Billing (CC\&B) system, which includes a designation for customers who participate in the medical baseline rate program—specifically, a Service Agreement, which is unique to each customer and premise, characteristic type for Medical allotments. During the selection of PG\&E's pool of 500,000 customers to be considered as potential randomly selected participants in its Default Pilot, PG\&E would query its CC\&B data and exclude all customers with a medical baseline designation.
2) Customers Requesting Third-Party Notification: PG\&E has long provided the option for a customer at a specific residence to request to have someone else, such as a third party, receive notification of each delinquent notice (among other things). PG\&E's CC\&B system includes a field identifying those accounts for which the Residential Service Account names at least one Not-Main-Customer on the Account as "Receives Notification." PG\&E notifies the third party of any delinquent payments to ensure that the third party is aware of any pending service interruption. During the selection of PG\&E's pool of 500,000 customers to be considered as potential randomly selected participants in its Default Pilot, PG\&E would query its CC\&B data and exclude all customers with a Third-Party Notification designation.
3) In-Person Utility Visit Required before Disconnection: Since March 22, 2012, pursuant to D.12-03-054, mimeo, OP 2 (b) at page 55 , when any customer becomes subject to disconnection of service, PG\&E provides them with the opportunity to attest that they are eligible for an in-person utility visit before they may be disconnected. Customers on Medical Baseline are automatically included, as well as those non-medical baseline customers who identify themselves as eligible (e.g., on life-support or having another eligible medical condition or customers
who certify that they have a serious illness or condition that could become life threatening if service were disconnected).
Specifically, PG\&E's CC\&B system includes fields that identify the following types of customers who might qualify for an in-person visit by a utility representative before they can be disconnected:

- Customer accounts listing a member of the household with a Medical Flag/Characteristic and/or indicating participation in the Medical Baseline Program;
- Customer accounts flagged as having a member of the household on Life Support/Sensitive Load; and
- Customer accounts listed as having been contacted by PG\&E with a Vulnerable Customer Letter 47 within the last 90 days and/or that have been flagged with a "Vulnerable Customer Extension" Account Alert.

While the tracking for much of the information discussed above is already in place, PG\&E plans to improve and enhance its processes for greater ease in monitoring in advance of the Default Pilot.

Based on discussions with the TOU Working Group, especially input from the CforAT, it was agreed that the 90-day notification sent to potential Default Pilot participants would expressly let them know about their option to participate, if qualified, in any of the following: (1) the medical baseline program; (2) receiving an in-person visit before being disconnected; and/or (3) third-party notification. Customers would be informed that, if they believe they qualify for any of these options, they should call the specified PG\&E toll-free number. If they call by a set date, they would be excluded from the Default Pilot. During this discussion, these excluded customers would be provided the opportunity to affirmatively agree to opt-in to a TOU rate, if they wish.

## c. Operational Customer Exclusions

Per the agreement between the TOU Working Group and Energy Division staff, PG\&E proposes that its Default Pilot participants be selected from those customers on PG\&E's standard monthly tiered E-1 rate (or its

47 Vulnerable customer is a self-certified classification for existing customers who do not qualify for medical baseline, but have a serious illness or condition that could become life threatening if service is disconnected.

CARE counterpart, EL-1) who are eligible for default TOU. The vast majority of PG\&E's residential customers are on Schedules E-1 and EL-1. 48

PG\&E residential electric customers on other rate schedules, such as those already on one of PG\&E's existing opt-in TOU rates ${ }^{49}$ or master-metered premises 50 will not be subject to the Default Pilot. With regard to existing TOU customers, they have already chosen a specific TOU rate, so there is no need to default them to TOU. Master-metered customers will not be included in the Default Pilot because they are billed for the aggregate load at the master meter for the numerous dwellings on-site (behind the master meter). As such, these individual household units (e.g., mobile homes, houseboats or apartments) do not have their own individual meter or PG\&E account, which limits the residents' ability to: understand their own interval usage patterns; receive individualize price signals based thereon; or be able to use the aforementioned information to potentially shift their loads to lower-cost off-peak periods in response to higher price signals during the TOU peak hours.

Further operational exclusions include customers without interval usage data from an advanced meter or without sufficient interval data to perform a rate analysis. This last issue is usually caused by poor connectivity due to location or building material, and can impact PG\&E's ability to properly bill the customer if the missing intervals are during peak periods. Customers with poor quality interval data will be noted, with the goal of improving data quality so that they can become eligible for the full default in 2019.

Because the CPUC does not-by statute-have ratemaking jurisdiction over CCAs, un-bundled electric customers served by a CCA cannot be selected to enroll in the Default Pilot unless their Community Choice

As of October 31, 2016, 93 percent of PG\&E's approximately 4.7 million residential customers are on its standard-tiered monthly rate schedules (E-1 and EL-1).
49 As of November 1, 2016, PG\&E has a total of approximately 184,000 residential customers enrolled on the following existing TOU rates: Schedules E-6, E-TOU-A, and E-TOU-B (and their CARE counterparts).
As of April 28, 2016, PG\&E has a total of approximately 17,500 master-metered residential customers enrolled on the following existing rates Schedules: EM, ES, ESR, and ET (and their CARE counterparts).

Aggregation provider decides to participate, at its discretion. MCE and SCP have agreed to participate in this Default Pilot, in coordination with PG\&E, however, certain operational details are still being worked out. If these CCAs participate in the Default Pilot, eligible customers served by MCE and SCP will be selected in the same manner as other Default Pilot customers and be subject to the same exclusions.

To avoid customer confusion, customers in areas that are in the process of establishing a CCA, or who are known to be planning to join an existing CCA in 2017 or 2018, will be excluded from the Default Pilot. This includes areas known to be served by San Francisco Clean Power, Peninsula Clear Power, and Silicon Valley Clean Power. It will also include the communities in Mendocino County, which are joining SCP in 2017. Additionally, any Direct Access, or PG\&E bundled customers in these regions, will be excluded to avoid the potential for customer confusion.

TABLE 2
DEFAULT PILOT EXCLUSIONS
(THOUSANDS)

| Customer Exclusion Description | Exclusion Reason | Number of Customers ${ }^{\text {(a) }}$ |
| :---: | :---: | :---: |
| Medical Baseline, customers requesting Third-Party Notification, and those that require an in-person utility visit before disconnection. | Section 745(c)(1). | 173 |
| Less than 12 months of interval data. | Section 745(c)(4). | 704 |
| No advanced meter (SmartMeter ${ }^{\text {TM }}$ ). | Section 745(c)(4), customer does not have 12 months of interval data. | 100 |
| Customers on TOU rate. | TOU Working Group recommended that customers already on a TOU rate would be excluded from default TOU. | 184 |
| Participants in the Opt-In Pilot and control group (current or former). | Participants will be encouraged to enroll in TOU rates at the end of the Opt-In Pilot. | 21 |
| Master-metered, vessel or mobile home. | Resident is not the account holder. | 17 |
| Low quality interval reads. | May pose significant operational challenges for billing a customer on a TOU rate. | 90 |
| Non-participating current and planned CCAs and Direct Access customers. | Participation in default TOU is at the discretion of the CCA. To avoid potential confusion and Default Pilot attrition, regions with planned CCA expansion in 2017 or 2018 will also be excluded. | 387 |
| Total Current Exclusions |  | 1,676 |
| Total PG\&E Residential Customers |  | 4,693 |
| Residential Customers Currently Eligible for Default TOU |  | 3,017 |

(a) Estimated based on information gathered in November 2016 in preparation for the AL filing. This information may change slightly in 2018 or based on the selected Default Pilot population.

## d. Additional Customer Outreach

In advance of the Default Pilot, PG\&E plans to perform outreach to customers who may benefit from specific PG\&E offerings such as Medical Baseline Program, Third-Party notification, and the ability to have an in-person visit prior to disconnection, as mentioned in the recent ME\&O filing. This proposal is based on feedback from the TOU Working Group, and specifically the CforAT, who wants to ensure eligible customers are aware of these offerings. While specific tactics are still under development, PG\&E will immediately begin leveraging partnerships
with Community-Based Organizations (CBO) and Community Outreach Contractors to educate partners and customers about these offerings in hopes of increasing knowledge of these services and enrollment for eligible customers in advance of the Default Pilot.

It is also possible the CPUC may order further exclusions, such as: certain senior households; those within a specific energy burden threshold; CARE and/or low income; hard-to-reach; and other special circumstances. 51 Such possible additional exclusions, if any, are being explored and will be determined later in the Pub. Util. Code Section 745 decisions and will be applied to the final outreach plan accordingly. PG\&E will target outreach to customers who qualify for the approved exemptions and provide further plans in its supplemental filing in late Q1 of 2017.

## 4. Detailed Budget

In developing the objectives and design of the Opt-In TOU pilots and the proposed Default TOU pilots, PG\&E and the broader TOU Working Group have benefited from the advisory support of the consulting firm Nexant. PG\&E, SCE, and SDG\&E recommend that Nexant be retained through the end of 2018 to: revise the proposed Default Pilot design-if deemed necessary—based on new information; coordinate future Working Group discussions, as it relates to the Default Pilot; and advise on implementation issues, as necessary.

51 D.16-09-016, approved September 15, 2016, included certain requirements for Pub. Util. Code Section 745 for default TOU rates for residential customers. The decision interpreted and set definitions for many of the terms in Section 745 , such as economically vulnerable customers and senior citizens. However, the decision points out-on page 32-that the remaining Section 745 issues fall into two broad categories, which will likely be addressed in separate decisions. First, operational and technical issues, such as those identified in the Section 745 Matrix, must be resolved. Second, after data has been collected, a decision will be made regarding whether the Section 745(c)(2) requirement to prevent unreasonable hardship caused by default TOU rates has been met.

TABLE 3
DEFAULT PILOT DESIGN BUDGET

| Budget Category | 2017 Proposed <br> Budget | 2018 Proposed <br> Budget | 2019 Proposed <br> Budget |
| :--- | :---: | :---: | :---: |
| Working Group Consultant | $\$ 33,500$ | $\$ 33,500$ | - |
| Total Annual Budget | $\$ 33,500$ | $\$ 33,500$ | - |
| Total Proposed Budget | $\$ 67,000$ |  |  |

## C. Default Pilot Rate Design and Bill Impacts

## 1. Introduction

This section provides an overview of the Default Pilot's rate design and bill impacts, including: (1) a description of Schedule E-TOU-C, the proposed rate for PG\&E’s Default Pilot design; (2) an analysis of bill impacts as a result of defaulting customers onto E-TOU-C from E-1; and (3) estimates of the distribution of customer' electricity burden (i.e., the relationship between a household's annual electric bill and its income) under both E-1 and E-TOU-C (and the CARE versions of these two Schedules, EL-1 and EL-TOU-C). This analysis is the basis for the customer segmentation approach described in the ME\&O description found in Section D.

## 2. Default Pilot TOU Rate Design

For the Default Pilot, PG\&E proposes to use a new two-tiered TOU rate, Schedule E-TOU-C (and its CARE counterpart EL-TOU-C-collectively referred to as E-TOU-C). As shown in Table 4, E-TOU-C is a relatively simple rate for customers to understand, with only two TOU periods—peak- and off-peak—that are defined the same way in both summer (June through September) and winter (all other months). 52 Peak hours for both summer and winter occur only on non-holiday weekdays, 53 during a 5 -hour period between 4 p.m. and 9 p.m. All other hours have reduced off-peak rates.

52 PG\&E's non-tiered TOU rate, Schedule E-TOU-B, is even simpler for customers to understand, but the Commission determined in D.15-07-001 that the default TOU rate must have two tiers (with the tiering accomplished via a baseline credit, which E-TOU-B does not have).
53 Weekdays are defined to exclude holidays. Holidays that fall on weekdays are treated the same as weekend days.

TABLE 4
SCHEDULE E-TOU-C (AND EL-TOU-C) TOU PERIOD DEFINITIONS

| Day Type | Weekdays | Weekends/Holidays |
| :--- | :---: | :---: |
| Summer | 4 p.m. -9 p.m. | N/A |
| Peak | Midnight -4 p.m., <br> 9 p.m. - Midnight | All hours |
| Off-Peak |  |  |
| Winter | 4 p.m. -9 p.m. | N/A |
| Peak | Midnight -4 p.m., <br> 9 p.m. - Midnight | All hours |
| Off-Peak |  |  |

E-TOU-C is a slight variation the rate structure already adopted for PG\&E's existing Schedule E-TOU-A, but offers a more cost-based time period, 4 p.m.-9 p.m. from the start-rather than adding E-TOU-A's complexity of requiring defaulted customers to shift from a 3 p.m. -8 p.m. to a 4 p.m. -9 p.m. peak period relatively soon after being defaulted. The E-TOU-C rate is relatively cost-based, allowing for ease-of-understanding for customers. In recent years, as a result of the influx of renewable wind and solar power, the weekday high-cost hours have steadily moved to later in the day from the old-now-outdated-afternoon peak period hours. 54 In addition, the fact that E-TOU-C's peak hour definitions are the same in both summer and winter, makes them easier for customers to remember, and respond to, by shifting load. Furthermore, like E-TOU-A, the new E-TOU-C rate offers a moderate differential between peak- and off-peak prices. Currently, the summer peak rates on Schedule E-TOU-C are about 5.4 cents per kilowatt-hour (kWh), higher than the summer off-peak rates. While this is slightly in excess of the "mild" initial starting point differential for default TOU rates of 4 cents per kWh

54 PG\&E's initial TOU rate for residential customers, Schedule E-7, had peak hours on weekdays between noon and 6 p.m.; and its successor rate, Schedule E-6, had weekday peak hours from 1 p.m. to 7 p.m. In recognition of the changing cost patterns, where the high-cost hours are now later in the day, the Commission approved, effective in June 2016, the elimination of Schedule E-7, and the closing of Schedule E-6 to new enrollment. While Schedule E-6 is still available on a grandfathered-basis to customers who had taken service prior to the June 2016 closing date, the peak hours on this schedule will also soon be moving to later in the day. The Commission in D.15-11-013 directed that the Schedule E-6 peak hours remain from 1 p.m. to 7 p.m. only through 2020, after which, they will transition to a 4 p.m. to 9 p.m. peak.
recommended by the ORA ${ }^{55}$ —as referenced by the Commission in D. 15-07-00156_it is indicative of the differential likely to eventually be in place after a transition period to allow residential customers to accept and become accustomed to responding to default TOU rates. This differential is also milder than any of the current opt-in Pilot Rates. PG\&E's new Schedule E-TOU-C would also become available on an Opt-In basis to non-Default Pilot customers starting in Q4 of 2017. This new rate will be presented online on PG\&E's website to support the Default Pilot starting when the first notifications go out for the Default Pilot. It would be much more costly, complex and time-consuming for PG\&E to attempt to offer E-TOU-C only to Default Pilot customers, and doing so would not adequately test PG\&E's operational systems.

PG\&E presented its proposal to use the E-TOU-C (and EL-TOU-C) rates for the Default Pilot to Steve George of Nexant, the Energy Division, and a subset of the TOU Working Group and Energy Division; there were no objections.

## 3. Bill Impacts and Section 745(d) Analysis

To get a sense of the bill impacts on customers going from the tiered $\mathrm{E}-1$ rate to the default TOU rate, PG\&E first designed "2018 proxy" rates for Schedules E-1 and E-TOU-C. Due to uncertainty regarding future levels of residential sales (and, importantly, sales by tier) as well as revenue requirements, PG\&E did not attempt to forecast these, but instead based its proxy rate designs on 2017 levels for these variables. However, PG\&E did account for known changes in the rate designs that will be in place in 2018. For example, PG\&E developed its 2018 proxy Schedule E-1 rates using the Glidepath rate ratios for 2018 directed by the Commission in D.15-07-001:57

- Tier 2 rate: Tier 1 rate = 1.313; and
- High Usage Surcharge, formerly known as the Super-User Electric

Surcharge, rate: Tier 1 rate $=2.033$.
The decision also specified that PG\&E's CARE discount be reduced to 35 percent by 2020.58 In compliance with this decision, PG\&E submitted, and

[^3]the Commission approved, AL 4697-E, with a proposed transition of steadily-declining CARE discount percentages to comply with this directive. 59 The approved 2018 CARE discount is 36.0 percent. 60 The 2018 proxy Schedule E-1 and EL-1 rates, which meet these prescribed tier rate ratios and CARE discount percentage, are shown in Table 5.

TABLE 5
PROXY 2018 E-1 TIERED MONTHLY RATES

| 2018 Rates | E1 (Non-CARE) | EL1 (CARE) |
| :--- | :---: | :---: |
| Tier 1 (0-100\% of Baseline Quantity) | $\$ 0.19949$ | $\$ 0.12655$ |
| Tier 2 (100\%-400\% of Baseline Quantity) | $\$ 0.26193$ | $\$ 0.16661$ |
| High Usage (Over 400\% of Baseline Quantity) | $\$ 0.40557$ | $\$ 0.25728$ |

For the proxy 2018 E-TOU-C rate, PG\&E designed rates as it does currently for Schedule E-TOU-A. First, the E-TOU-C rates were designed to be revenue-neutral with the residential class. Second, marginal generation capacity and energy costs used in PG\&E's 2015 RDW proceeding were used to set price differentials between TOU periods. Although total rates were designed to be revenue-neutral with the residential class on an aggregate basis, the rate differentials between TOU periods were based strictly on their marginal generation cost differences. As a result, any usage shift from a higher-cost period to a lower-cost period will not typically cause other customer bills to increase. These proxy 2018 E-TOU-C rates are, like Schedule E-TOU-A, a hybrid rate structure with both tiers and TOU periods. The TOU periods are described in the previous section. There are two tiers of rates for each TOU period, and for each TOU period the tier differentials are tied to the rate differentials on the proxy 2018 tiered $\mathrm{E}-1$ rates. There are two ways that the proxy 2018 E-TOU-C rates can be presented. The first option is to present them as individual rates by tier, as shown in Table 5 .

AL 4697-E was submitted by PG\&E on September 1, 2015 and approved by Energy Division on November 12, 2015.
See AL 4697-E, p. 2.

TABLE 6
PROXY 2018 E-TOU-C RATES (BY TIER)

|  | Summer <br> On-Peak | Summer <br> Off-Peak | Winter <br> On-Peak | Winter <br> Off-Peak |
| :---: | :---: | :---: | :---: | :---: |
| Non-CARE | $\$ 0.25764$ | $\$ 0.20345$ | $\$ 0.20179$ | $\$ 0.18752$ |
| Baseline | $\$ 0.33456$ | $\$ 0.28037$ | $\$ 0.27870$ | $\$ 0.26444$ |
| Over Baseline | $\$ 0.18339$ | $\$ 0.12920$ | $\$ 0.12754$ | $\$ 0.11327$ |
| CARE | $\$ 0.22414$ | $\$ 0.17095$ | $\$ 0.16929$ | $\$ 0.15502$ |

However, since the cent-per-kWh differences between the Tier 1 and 2 rates in Table 5 are the same for all TOU periods, there is a second alternative way to present the proxy 2018 TOU rates, as shown in Table 5. For each TOU period, a single rate is provided, equal to the corresponding Tier 2 rate in Table 5. The Tier 1 rates are not shown in Table 5; however, they can be obtained by simply subtracting the baseline credit from the Tier 1 rate in the table for each TOU period. 61 For both non-CARE and CARE, the baseline credits on the proxy 2018 TOU rates are linked to the corresponding tier differentials on the proxy 2018 tiered rates. 62

61 This presentment, with single rates for each TOU period along with a baseline credit, is how the Schedule E-TOU-A rates are shown in PG\&E's tariff book, and what customers see on their bills. Mathematically, both approaches produce the same customer bill amount.
62 The baseline credits for the proxy 2018 E-TOU-C rates were calculated as sales-weighted averages of (a) the difference between the Tier 2 and Tier 1 rates, and (b) the difference between the High Usage Tier and Tier 1 rates, where the weights are the shares of sales (a) between 100 and 400 percent of baseline, and (b) over 400 percent of baseline. This is consistent with the method PG\&E currently uses to calculate the baseline credits on Schedules E-TOU-A and EL-TOU-A, where they are based on tier differentials on Schedules E-1 and EL-1, respectively.

TABLE 7
PROXY 2018 E-TOU-C RATES (SHOWING BASELINE CREDIT)

|  | Summer <br> On-Peak | Summer <br> Off-Peak | Winter <br> On-Peak | Winter <br> Off-Peak |
| :--- | :---: | :---: | :---: | :---: |
| Non-CARE | $\$ 0.33456$ | $\$ 0.28037$ | $\$ 0.27870$ | $\$ 0.26444$ |
| Rate | $\$(0.07692)$ | $\$(0.07692)$ | $\$(0.07692)$ | $\$(0.07692)$ |
| Baseline Credit | $\$ 0.22514$ | $\$ 0.17095$ | $\$ 0.16929$ | $\$ 0.15502$ |
| CARE | $\$(0.04175)$ | $\$(0.04175)$ | $\$(0.04175)$ | $\$(0.04175)$ |
| Rate |  |  |  |  |

Once these proxy $2018 \mathrm{E}-1$ and E-TOU-C rates were developed, the second step was to calculate monthly bills for residential customers under both tiered and TOU rates, and to see how these bills changed moving from the former to the latter. Non-CARE and CARE bill comparisons were done separately, using the relevant proxy 2018 rates for each group. PG\&E calculated the change in each customer's average monthly bill, both in terms of dollars per month, and in terms of percentage change. Positive changes signify a customer would see an increase in its average monthly bills (i.e., that the customer would be worse off); negative changes signify a decrease (i.e., that the customer would be better off).

It is important to keep in mind that, for each customer, these bill comparisons use the identical historical usage pattern billed out at each of the two rates. In other words, the results show the effect on each customer's bill moving from tiered to TOU rates assuming that the customer does not respond in the slightest by shifting load in order to avoid the higher peak period prices. As such, these results represent an extreme case. In reality, many customers are anticipated to shift load in response to being educated about TOU rates. To the extent customers can and do shift load from peak- to off-peak periods, those who the analysis shows would see bill increases might see smaller increases or even decreases, and those who the analysis shows would see bill decreases would see even larger decreases.

For the bill comparisons, PG\&E used SmartMeter ${ }^{\text {TM }}$ interval load data from its population of residential customers for the 12-month historical period from

January through December 2015.63 To most accurately reflect the anticipated Default Pilot population, this analysis excluded customers who are not eligible for default as a result of Pub. Util. Code Section 745(c)(1) requirements. In total, bills were calculated on the 2018 proxy tiered monthly and E-TOU-C rates for non-CARE and CARE customers. After average monthly bill changes were calculated for each customer, customer frequencies were tabulated in a variety of ways, as summarized in Table 8. These 60 bill comparison tables are presented in Appendix B. The first 30 tables show bill comparisons for nonCARE customers and the next 30 tables show similarly organized comparisons for CARE customers. In each set of comparisons, the first two tables show the overall results—based on the entire year and PG\&E's entire system—in terms of dollar changes and percentage changes. The remaining tables show results for either particular climate zones or particular seasons. The climate zones are defined as follows:

- Cool - Customer in Territories T, V, or Z;
- Moderate - Customer in Territories Q, X, or Y;
- Hot - Customer in Territories P, R, S, or W; $\mathbf{6 4}$ and
- Not Hot - Customers in either Cool or Moderate climate zones as defined above.

The summer season is defined as June through September and the winter season as all other months (October-May).

NEM customers were excluded from the data set, as were FERA customers and customers who took service from either a Direct Access or a Community Choice Aggregation service provider.

TABLE 8
ORGANIZATION OF NON-CARE BILL COMPARISON RESULTS

| Table Order | Type of Bill Change | Annual/Seasonal | System/Climate Zone |
| :---: | :---: | :---: | :---: |
| 1 | Dollars | Annual | System |
| 2 | Percentage | Annual | System |
| 3 | Dollars | Annual | Cool |
| 4 | Percentage | Annual | Cool |
| 5 | Dollars | Annual | Moderate |
| 6 | Percentage | Annual | Moderate |
| 7 | Dollars | Annual | Hot |
| 8 | Percentage | Annual | Hot |
| 9 | Dollars | Annual | Not Hot |
| 10 | Percentage | Annual | Not Hot |
| 11 | Dollars | Winter | System |
| 12 | Percentage | Winter | System |
| 13 | Dollars | Winter | Cool |
| 14 | Percentage | Winter | Cool |
| 15 | Dollars | Winter | Moderate |
| 16 | Percentage | Winter | Moderate |
| 17 | Dollars | Winter | Hot |
| 18 | Percentage | Winter | Hot |
| 19 | Dollars | Winter | Not Hot |
| 20 | Percentage | Winter | Not Hot |
| 21 | Dollars | Summer | System |
| 22 | Percentage | Summer | System |
| 23 | Dollars | Summer | Cool |
| 24 | Percentage | Summer | Cool |
| 25 | Dollars | Summer | Moderate |
| 26 | Percentage | Summer | Moderate |
| 27 | Dollars | Summer | Hot |
| 28 | Percentage | Summer | Hot |
| 29 | Dollars | Summer | Not Hot |
| 30 | Percentage | Summer | Not Hot |
| 31 | Dollars | Annual | System |
| 32 | Percentage | Annual | System |
| 33 | Dollars | Annual | Cool |
| 34 | Percentage | Annual | Cool |
| 35 | Dollars | Annual | Moderate |
| 36 | Percentage | Annual | Moderate |
| 37 | Dollars | Annual | Hot |
| 38 | Percentage | Annual | Hot |
| 39 | Dollars | Annual | Not Hot |
| 40 | Percentage | Annual | Not Hot |
| 41 | Dollars | Winter | System |
| 42 | Percentage | Winter | System |
| 43 | Dollars | Winter | Cool |
| 44 | Percentage | Winter | Cool |
| 45 | Dollars | Winter | Moderate |
| 46 | Percentage | Winter | Moderate |
| 47 | Dollars | Winter | Hot |
| 48 | Percentage | Winter | Hot |
| 49 | Dollars | Winter | Not Hot |

TABLE 8 ORGANIZATION OF NON-CARE BILL COMPARISON RESULTS (CONTINUED)

| Table <br> Order | Type of Bill Change | Annual/Seasonal | System/Climate Zone |
| :---: | :---: | :---: | :---: |
| 50 | Percentage | Winter | Not Hot |
| 51 | Dollars | Summer | System |
| 52 | Percentage | Summer | System |
| 53 | Dollars | Summer | Cool |
| 54 | Percentage | Summer | Cool |
| 55 | Dollars | Summer | Moderate |
| 56 | Percentage | Summer | Moderate |
| 57 | Dollars | Summer | Hot |
| 58 | Percentage | Summer | Hot |
| 59 | Dollars | Summer | Not Hot |
| 60 | Percentage | Summer | Not Hot |

The overall results show that 30.9 percent of non-CARE customers would have decreases in their average monthly bills, over the course of the year, by moving from tiered ( $\mathrm{E}-1$ ) rates to TOU rates with a baseline credit ( $\mathrm{E}-\mathrm{TOU}-\mathrm{C}$ ), while 68.4 percent would see increases in their bills-the remaining 0.7 percent would see no change. 65 A large percentage of the increases and decreases, though, are small in dollar magnitude. For example, among the 30.9 percent of customers who would save on TOU rates, a total of 26.0 percent would see savings of less than $\$ 1$ per month, 2.3 percent would save between $\$ 1$ and $\$ 5$ per month, and 0.5 percent would save between $\$ 5$ and $\$ 10$. Just
2.1 percent of customers would save more than $\$ 10$ per month. Of course, these figures assume no load shifting, and to the extent customers shift load savings will be greater, and the number of customers who are benefiters or neutral would also be greater.

Similarly, among the 68.4 percent of non-CARE customers who would see higher bills, 16.5 percent would see average monthly bill increases of less than $\$ 1$, while another 31.6 percent would see increases between $\$ 1$ and $\$ 5$ or less. These customers, too, could turn bill increases into decreases by shifting their loads. Of the remaining customers seeing bill increases, 15.2 percent would see increases between $\$ 5$ and $\$ 10,5.1$ percent would see increases between $\$ 10$ and $\$ 20$, with only a tiny percentage-less than 0.1 percent-

65 Percentages cited here may not exactly add to 100.0 percent due to rounding.
seeing average monthly bill increases in excess of $\$ 20$. Figure 3 shows the distribution of customers' bill increases or decreases.

FIGURE 3
DISTRIBUTION OF NON-CARE BILL COMPARISONS
(FROM E-1 TO E-TOU-C)


The results for CARE customers follow a similar pattern, with the overwhelming majority of customers seeing only small decreases or increases from moving to TOU rates. A total of 58.5 percent of customers would save on TOU rates, but of this total, 56.9 percent would save less than $\$ 5$ per month, while 1.0 percent would save between $\$ 5$ and $\$ 10$, and 0.5 percent would save more than $\$ 10$. A total of 41.5 percent of customers would see higher bills, with 0.1 percent seeing no change. Among the 41.5 percent who-absent load shifting-would see bill increases, 39.5 percent would see increases of less than $\$ 5,1.9$ percent would see increases between $\$ 5$ and $\$ 10$, and only a very small number of customers (less than 0.01 percent would see increases above $\$ 10$. These results, where the vast majority of the bill changes
(decreases or increases) are clustered around zero, are to be expected, given the Commission's stated desire to introduce default TOU, in beginning, with relatively mild TOU rate differentials—which the CPUC called "TOU-lite" in D.15-07-001. The distribution of CARE customers' bill changes is shown in Figure 4.

FIGURE 4
DISTRIBUTION OF CARE BILL COMPARISONS (FROM EL-1 TO EL-TOU-C)


## 4. Electricity Burden Estimates

The concept of "electricity burden" 66 has been defined as the relationship between a household's annual electric bill and its income, where the electric bill is generally expressed as a percentage of income. As a result of its arrangement with the firm Experian, PG\&E has household income data on a

66 PG\&E defines "electricity burden" as electric bill impacts only, as opposed to combined gas and electric.
subset of the customers for whom bill comparisons were calculated. 67
For each of these customers, PG\&E is able to calculate electricity burden estimates. Each customer has two such estimates: (1) one showing the electricity burden (i.e., percent of household income spent on electricity) under the standard, tiered monthly rates; and (2) one showing the burden under E-TOU-C, PG\&E's proposed Default TOU Pilot rate. The individual customer results were then summarized by assigning customers to categories, depending on their electricity burdens (e.g., 0 to 1 percent, 1 percent to 2 percent, etc.) The resulting customer frequency tables are shown in Tables 9 and 10 for non-CARE and CARE customers, respectively. Each table has two parts. In the top part of each table, the number of customers falling into each electricity burden category are shown for the entire PG\&E system, as well as by climate zone. In the bottom part of each table, customer counts are converted into percentages, showing the percentage of customers (either systemwide or by climate zone) falling into each electricity burden category.

67 Experian's household income data is estimated using several individual and household-level variables. These variables are inputted into Experian's proprietary statistical models to predict income levels for each household unit. When sufficient customer-level data is not available to produce a predicted income level for an individual household, Experian bases its estimated income on the median estimated income in the household's zip+4 area.

TABLE 9
NON-CARE ELECTRICITY BURDENS UNDER PG\&E'S STANDARD TIERED RATE (E-1) VS. E-TOU-C SYSTEMWIDE AND BY CLIMATE ZONE

| Electricity Burden | All |  | Cool |  | Moderate |  | Hot |  | Not Hot |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C |
| 0\% to 1\% | 801,078 | 789,776 | 311,643 | 309,747 | 380,946 | 374,465 | 108,489 | 105,564 | 692,589 | 684,212 |
| 1\% to 2\% | 646,377 | 640,618 | 173,387 | 173,521 | 299,710 | 300,287 | 173,280 | 166,810 | 473,097 | 473,808 |
| 2\% to 3\% | 329,129 | 332,247 | 68,800 | 69,917 | 123,850 | 126,518 | 136,479 | 135,812 | 192,650 | 196,435 |
| 3\% to 4\% | 174,833 | 178,230 | 32,863 | 33,326 | 56,573 | 57,689 | 85,397 | 87,215 | 89,436 | 91,015 |
| 4\% to 5\% | 100,528 | 103,440 | 18,268 | 18,422 | 30,360 | 31,099 | 51,900 | 53,919 | 48,628 | 49,521 |
| 5\% to 6\% | 62,316 | 64,197 | 11,102 | 11,131 | 18,392 | 18,735 | 32,822 | 34,331 | 29,494 | 29,866 |
| 6\% to 7\% | 42,165 | 43,277 | 7,401 | 7,383 | 12,115 | 12,316 | 22,649 | 23,578 | 19,516 | 19,699 |
| 7\% to 8\% | 29,704 | 30,401 | 5,122 | 5,091 | 8,673 | 8,736 | 15,909 | 16,574 | 13,795 | 13,827 |
| 8\% to 9\% | 21,853 | 22,501 | 3,630 | 3,668 | 6,271 | 6,363 | 11,952 | 12,470 | 9,901 | 10,031 |
| 9\% to 10\% | 16,649 | 16,970 | 2,672 | 2,654 | 4,651 | 4,722 | 9,326 | 9,594 | 7,323 | 7,376 |
| 10\% to 15\% | 43,374 | 44,676 | 6,098 | 6,163 | 11,360 | 11,646 | 25,916 | 26,867 | 17,458 | 17,809 |
| Over 15\% | 28,729 | 30,402 | 3,214 | 3,177 | 6,079 | 6,404 | 19,436 | 20,821 | 9,293 | 9,581 |
| TOTAL | 2,296,735 | 2,296,735 | 644,200 | 644,200 | 958,980 | 958,980 | 693,555 | 693,555 | 1,603,180 | 1,603,180 |


| Electricity Burden | All |  | Cool |  | Moderate |  | Hot |  | Not Hot |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C |
| 0\% to 1\% | 35\% | 34\% | 48\% | 48\% | 40\% | 39\% | 16\% | 15\% | 43\% | 43\% |
| 1\% to 2\% | 28\% | 28\% | 27\% | 27\% | 31\% | 31\% | 25\% | 24\% | 30\% | 30\% |
| 2\% to 3\% | 14\% | 14\% | 11\% | 11\% | 13\% | 13\% | 20\% | 20\% | 12\% | 12\% |
| 3\% to 4\% | 8\% | 8\% | 5\% | 5\% | 6\% | 6\% | 12\% | 13\% | 6\% | 6\% |
| 4\% to 5\% | 4\% | 5\% | 3\% | 3\% | 3\% | 3\% | 7\% | 8\% | 3\% | 3\% |
| 5\% to 6\% | 3\% | 3\% | 2\% | 2\% | 2\% | 2\% | 5\% | 5\% | 2\% | 2\% |
| 6\% to 7\% | 2\% | 2\% | 1\% | 1\% | 1\% | 1\% | 3\% | 3\% | 1\% | 1\% |
| 7\% to 8\% | 1\% | 1\% | 1\% | 1\% | 1\% | 1\% | 2\% | 2\% | 1\% | 1\% |
| 8\% to 9\% | 1\% | 1\% | 1\% | 1\% | 1\% | 1\% | 2\% | 2\% | 1\% | 1\% |
| 9\% to 10\% | 1\% | 1\% | 0\% | 0\% | 0\% | 0\% | 1\% | 1\% | 0\% | 0\% |
| 10\% to 15\% | 2\% | 2\% | 1\% | 1\% | 1\% | 1\% | 4\% | 4\% | 1\% | 1\% |
| Over 15\% | 1\% | 1\% | 0\% | 0\% | 1\% | 1\% | 3\% | 3\% | 1\% | 1\% |
| TOTAL | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% |

TABLE 10
CARE ELECTRICITY BURDENS UNDER
PG\&E'S STANDARD TIERED RATE (EL-1) VS. EL-TOU-C SYSTEMWIDE AND BY CLIMATE ZONE

| Electricity Burden | All |  | Cool |  | Moderate |  | Hot |  | Not Hot |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C |
| 0\% to 1\% | 254,160 | 255,580 | 83,847 | 85,354 | 94,866 | 96,217 | 75,447 | 74,009 | 178,713 | 181,571 |
| 1\% to 2\% | 235,422 | 233,388 | 47,755 | 47,496 | 61,118 | 60,779 | 126,549 | 125,113 | 108,873 | 108,275 |
| 2\% to 3\% | 130,678 | 130,607 | 20,472 | 20,200 | 25,411 | 25,205 | 84,795 | 85,202 | 45,883 | 45,405 |
| 3\% to 4\% | 74,682 | 74,969 | 11,093 | 10,903 | 13,467 | 13,332 | 50,122 | 50,734 | 24,560 | 24,235 |
| 4\% to 5\% | 45,940 | 46,123 | 6,658 | 6,485 | 8,071 | 7,896 | 31,211 | 31,742 | 14,729 | 14,381 |
| 5\% to 6\% | 30,731 | 30,713 | 4,259 | 4,123 | 5,268 | 5,184 | 21,204 | 21,406 | 9,527 | 9,307 |
| 6\% to 7\% | 21,905 | 21,804 | 2,910 | 2,806 | 3,523 | 3,358 | 15,472 | 15,640 | 6,433 | 6,164 |
| 7\% to 8\% | 15,782 | 15,836 | 1,887 | 1,799 | 2,371 | 2,336 | 11,524 | 11,701 | 4,258 | 4,135 |
| 8\% to 9\% | 12,020 | 12,006 | 1,416 | 1,401 | 1,569 | 1,532 | 9,035 | 9,073 | 2,985 | 2,933 |
| 9\% to 10\% | 9,303 | 9,285 | 1,053 | 981 | 1,191 | 1,137 | 7,059 | 7,167 | 2,244 | 2,118 |
| 10\% to 15\% | 24,700 | 24,720 | 2,051 | 1,929 | 2,303 | 2,230 | 20,346 | 20,561 | 4,354 | 4,159 |
| Over 15\% | 12,809 | 13,101 | 566 | 490 | 662 | 614 | 11,581 | 11,997 | 1,228 | 1,104 |
| TOTAL | 868,132 | 868,132 | 183,967 | 183,967 | 219,820 | 219,820 | 464,345 | 464,345 | 403,787 | 403,787 |


| Electricity Burden | All |  | Cool |  | Moderate |  | Hot |  | Not Hot |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C | E-1 | E-TOU-C |
| 0\% to 1\% | 29\% | 29\% | 46\% | 46\% | 43\% | 44\% | 16\% | 16\% | 44\% | 45\% |
| 1\% to 2\% | 27\% | 27\% | 26\% | 26\% | 28\% | 28\% | 27\% | 27\% | 27\% | 27\% |
| 2\% to 3\% | 15\% | 15\% | 11\% | 11\% | 12\% | 11\% | 18\% | 18\% | 11\% | 11\% |
| 3\% to 4\% | 9\% | 9\% | 6\% | 6\% | 6\% | 6\% | 11\% | 11\% | 6\% | 6\% |
| 4\% to 5\% | 5\% | 5\% | 4\% | 4\% | 4\% | 4\% | 7\% | 7\% | 4\% | 4\% |
| 5\% to 6\% | 4\% | 4\% | 2\% | 2\% | 2\% | 2\% | 5\% | 5\% | 2\% | 2\% |
| 6\% to 7\% | 3\% | 3\% | 2\% | 2\% | 2\% | 2\% | 3\% | 3\% | 2\% | 2\% |
| 7\% to 8\% | 2\% | 2\% | 1\% | 1\% | 1\% | 1\% | 2\% | 3\% | 1\% | 1\% |
| 8\% to 9\% | 1\% | 1\% | 1\% | 1\% | 1\% | 1\% | 2\% | 2\% | 1\% | 1\% |
| 9\% to 10\% | 1\% | 1\% | 1\% | 1\% | 1\% | 1\% | 2\% | 2\% | 1\% | 1\% |
| 10\% to 15\% | 3\% | 3\% | 1\% | 1\% | 1\% | 1\% | 4\% | 4\% | 1\% | 1\% |
| Over 15\% | 1\% | 2\% | 0\% | 0\% | 0\% | 0\% | 2\% | 3\% | 0\% | 0\% |
| TOTAL | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% | 100\% |

Focusing on the systemwide (i.e., the "All" category) results, Table 9 shows that the distribution of non-CARE customer electricity burdens is quite similar under the E-TOU-C rate as under standard tiered rates. Under either rate, the vast majority of customers-89 percent-have electricity burdens less than 5 percent. About 8 percent of customers under either rate have burdens between 5 and 10 percent. Only 2 percent of customers have electricity burdens between 10 and 15 percent, and just 1 percent of customers have burdens in excess of 15 percent. Looking at the electricity burdens by climate zone shows that these distributions, too, are very similar between E-1 and E-TOU-C. Also, as expected, the electricity burdens skew higher in the Hot areas where summer bills are much higher than elsewhere. Even here, though, 80 percent of customers on E-1 (and 79 percent on E-TOU-C) are less than 5 percent. About 13 percent of E-1 customers (and 14 percent of E-TOU-C customers) have burdens between 5 and 10 percent, with 4 percent of customers having burdens between 10 and 15 percent (on either rate), and just 3 percent of customers with burdens higher than 15 percent (on either rate).

So while the electricity burdens tend to be higher in the Hot climate areas, they are not appreciably higher for E-TOU-C than for E-1.

The distribution of electricity burdens for CARE shown in Table 10 have a similar shape, though as expected, there are slightly lower percentages of customers with lower burdens and slightly higher percentages of customers with higher burdens. But like the non-CARE results, the distributions of electricity burdens are similar, whether the calculation is based on tiered or TOU rates. For CARE, over the entire PG\&E system about 85 percent of customers have electricity burdens less than 5 percent, 10 percent have burdens between 5 and 10 percent, 3 percent have burdens between 10 and 15 percent and just 1 percent have burdens greater than 15 percent. Here, too, the distributions of CARE customers' electricity burdens are virtually identical calculated at EL-TOU-C rates as when calculated under EL-1 rates. Again, it is important to keep in mind that the electricity burdens under TOU rates were calculated assuming no load shifting. If CARE customers can shift load, it might be possible to lessen these burdens somewhat.

## 5. Bill Volatility Analysis

The bill volatility analysis requested by Energy Division will be provided as a supplement to this advice letter by December 23, 2016.

## D. Marketing Education and Outreach

## 1. Introduction

PG\&E's ME\&O plan for the Default Pilot consists of a multi-channel, multi-touch, format variance testing approach to the approximately 250,000 customers expected to be identified for participation. These customers will be divided into 13 different test treatment tracks (with approximately 19,000 customers in each track), to allow for comparison of the relative effectiveness of various marketing approaches on multiple customer segments. Messaging will also likely be varied depending on whether a customer is forecasted to benefit on default TOU or not, or falls into the "neutral" category (described below), but this is not a part of the empirical 13-track test approach.

## 2. Outreach Objectives

The purpose of this section is to describe PG\&E's proposal for outreach to customers chosen for the Default Pilot for both pre-rate change and post-rate
change notification and education. PG\&E's ME\&O goals and objectives for the Default Pilot, which are aligned with its overall goals for ME\&O, are summarized below:

1) Inform residential customers (selected for the Default Pilot) that their rate will be changing and educate them on how and when they must take action if they choose to opt-out;
2) Drive awareness and understanding of the Default Pilot rate and other rate options;
3) Drive awareness and provide call-to-action for customer classes who may qualify for one or more of the default exclusion categories as decided by the CPUC in compliance with Pub. Util. Code Section 745; and
4) Provide ongoing education about the Default Pilot rate plan and actions customers can take to reduce and shift energy to be successful on their new rate.
a. Assumptions

In order for PG\&E to design its proposed Default Pilot ME\&O plan, several assumptions had to be made, including:

- Default Rollout Plan: The Default Pilot will be a one-time, single default of approximately 250,000 customers onto E-TOU-C during a 2 -week period in March 2018, with initial customer communications starting in or around December 2017. The Default Pilot will run until March 2019.
- Target Audience: The customers selected at random for Default Pilot participation will be a close representation of PG\&E's customer base. The Default Pilot participants will not be segmented by zip code which limits PG\&E's ability to leverage digital media and CBOs as part of the Default Pilot test efforts. However, both digital media and CBOs are currently proposed in PG\&E's ME\&O Plan, 68 and will be considered for part of the 2019 default outreach.
- ME\&O Plan: The baseline assumption for the Default Pilot is that PG\&E will be testing elements of its ME\&O proposal filed on November 1, 2016. Any modifications to the ME\&O filing will need

68 See AL 4949-E, "PG\&E’s Residential Rate Reform Marketing, Education and Outreach Plan," filed with the CPUC on November 1, 2016.
to be evaluated to determine if adaptation is necessary for the Default Pilot.
Should one or more of these assumptions change, there could be impacts to approach, timing and budget. As such, PG\&E reserves the rights to modify its approach-while staying true to the Default Pilot objectives-based on new information that arises after this filing.

## 3. Marketing Strategies

PG\&E will implement several key strategies to meet the goals and objectives of the Default Pilot, including:

- Analyze Bill Impacts: Once Default Pilot customers are identified, a bill impact analysis will be conducted and customers will be determined to either be Benefiters, Neutrals, or Non-Benefiters ${ }^{69}$ on the rate (segmentation described in detail below). PG\&E plans to include messaging within the default notifications targeted at a customer's specific bill impact to help indicate how the new rate is likely to affect them based on their prior usage, how they might adjust their usage to be more successful on TOU, and help guide them to an active choice about what rate works best for them. While all customer bill impact segments will fall into each testing category, it is hypothesized that the more negatively-affected customers (Non-Benefiters) will require the three notification track to ensure they are most informed about the rate transition, as detailed in PG\&E's ME\&O plan and similar to what is recommended in the Greenberg Blueprint.
- Provide a RC With Personalized, Actionable Information: PG\&E will highlight what the rate transition means to a customer and their household's energy statements through the customized RC report (in the 90- or 60-day notification). This outreach will provide a call to action for customers to make the most informed decision about the default rate and make an active choice accordingly (even if that means taking no action).

69 (1) Benefiters are defined as customers who will likely save on the Default Pilot TOU rate;
(2) neutrals are defined as customers likely to have negligible bill impacts on the Default Pilot TOU rate; (3) and non-benefiters are defined as customers likely to see bill increases on the Default Pilot TOU rate.

- Leverage Best Practices: PG\&E will use results and learnings from the Opt-In Pilot, on-going rate education campaigns, customer research and other utility best practices such as the Ontario Energy Board and SMUD Smart Pricing Options pilots, for the PG\&E Default Pilot, to help determine the best initial customer messaging approach. PG\&E is leveraging best practices from its non-residential TOU default as well, where direct-to-customer outreach was the primary marketing strategy to drive awareness.
- Test and Learn: Conduct a robust, 13-track outreach testing sequence to help determine optimal channel, message and cadence to achieve PG\&E's marketing objectives while utilizing the most efficient and cost-effective outreach methods.


## 4. Marketing Plans and Tactics

a. Pre-Default Plans and Tactics

PG\&E proposes to utilize direct-to-customer outreach to customers selected for Default Pilot participation. This will allow for a cost-effective, efficient and targeted campaign that will be solely focused on selected customers. The direct-to-customer notifications will begin in advance of the default based on the Default Pilot test design detailed in the Nexant Report. Tactics planned to be tested during the pilot include:

- Direct Mail (DM): Customers will receive notification(s) and other information critical to Default Pilot success via DM. Each customer will receive a minimum of one DM touch, 70 usually at the 60-day period, along with a RC report. Additional DM touches may be received depending on the testing channel track.
- E-Mail (EM): Some customers may also receive one or more e-mails, either in lieu of, or in addition to, DM outreach. Cadence and timing for this channel will be measured as to how it affects default objectives and costs, especially as a replacement for some notification touches. Content of e-mails that compliment, or are in addition to, DM touches

70 This will be done as an on-bill notification for paper billing customers (Segment 1 ) or as a separate collateral piece for paperless customers (Segment 2) and for a subset of the paper billing customers.
will be very similar, accounting only for communication nuance differences within the channel.

- Rate Comparison Report: All customers will receive a 90- or 60-day RC Report in a DM format (individual DM or bill insert). Two versions of the RC report will be tested: annual and seasonal. These two formats will present a customers' projected bill amount based on historic usage information in either an annual or seasonal (by summer/winter) format. This comparison will include a menu of options such as E-1, E-TOU-A, E-TOU-B, and E-TOU-C (or other then-available TOU rates, as applicable) in order to determine which format will help a customer best understand their rate variation over the year. The RC report will also be format tested as a bill insert and in regular DM format. RC reports are currently being tested with some customers and results from that effort will help inform the best approach for the Default Pilot.
- Outbound Calls/Interactive Voice Response (IVR) System: During the final stage of default (last 30 days), customers that have been deemed Non-Benefiters, may be given an outbound call attempt to ensure default awareness. This may be a live call or an IVR recording with response prompts for ease of customer action.


## b. Post Default Communications

## 1) Welcome Communications

A welcome communication will be sent to each Default Pilot participant after their rate has been changed to educate them on the specific details of their new TOU rate plan and to present tips and tools to be successful. PG\&E will produce two versions-as detailed in Figure 7-of the welcome communication to test awareness, understanding and engagement levels, versus production costs. One version will be a basic letter that provides rate details, basic visuals, and tips and tools for rate success. The second version will provide similar rate content but present enhanced graphic design, visuals and layout presentment. For pieces, learnings and best practices from ongoing rate education campaigns, customer research,
and the Opt-In TOU Pilot will be leveraged to develop optimal rate education and tips content.

The welcome communication test approach will also explore how sending different layout versions in channel variation affects customer awareness, understanding and engagement with the rate. A customer will either receive a DM version of one of the welcome communication versions, an EM version, or both.

The welcome communications, similar to other outreach, will be provided in-language with the language preference by customer found in our billing system in English, Spanish, or Chinese and will also feature key messages in large print for increased awareness and understanding of communications content, calls to action, and critical information presentment for visually impaired customers.

## 2) Seasonal Communications

In addition to the tips included in the welcome communications, all customers will receive an additional communication after default to provide seasonally relevant low- and no-cost tips to help them most effectively reduce or shift their energy use to lower cost, off-peak hours of the day.

- Summer: Default Pilot customers will receive a communication in summer of 2018 that reinforces key aspects of the rate and offers specific seasonally-relevant tips during this critical time period of the rate plan.
- Winter: Despite the Default Pilot rate plan's lower prices in winter months, there may still be negatively-impacted customers during this season, though relatively fewer, compared to summer.

Customers that are deemed to be negatively-impacted during winter will receive an in-season communication that: reinforces aspects of the rate; emphasizes the lower rates during the winter; and provides targeted and general tools and tips.

## 3) End-of-Bill Protection Notice

At the end of their first year on the Default Pilot rate, customers will be notified that their one year of bill protection will be ending and details
of how a bill credit will be applied if that is applicable to them. This will be in the form of a DM communication. The exact format of the communication is being explored and may likely include an on-bill message.

## 4) Integrated and Programmatic Marketing Communications

Customers who are participating in the Default Pilot will likely continue to receive other marketing communications if they qualify for participation in other programs or if the communication can help them succeed in their energy management journey independent of specific Default Pilot outreach. These communications may include: the monthly Residential Energy Advisor digital newsletter; SmartRate ${ }^{T M}$; Pool Pump Rebates; Energy Alerts, and other targeted programs and energy solutions. PG\&E will monitor the Default Pilot customer engagement with, and adoption of, these tools and programs.

## 5. Default Pilot ME\&O Testing Approach

As described in the Nexant Report, the proposed plan involves tests for 13 different combinations of delivery channel, messaging, granularity of RC information, frequency of notifications, and customer segments. There are two customer segments of interest:

1) Segment 1 is comprised of customers that receive paper bills as well as paperless billed customers for whom PG\&E does not have an e-mail address (which is a small group). These customers can be reached through DM or through on-bill communication (referred to in the figures below as an "onsert"). Preliminary data indicates that Segment 1 accounts for roughly 64 percent of PG\&E's residential customers.
2) Segment 2 is comprised of customers that have elected to receive paperless bills and for whom PG\&E has e-mail addresses. This group can be communicated with via EM and DM. Preliminary data indicates that Segment 2 accounts for roughly 36 percent of PG\&E's residential customers.

As detailed in the Nexant Report, 71 PG\&E will test multiple customer communication combinations across the two customer segments to determine optimal messaging, cadence, and channel of communications in relation to achieving awareness, understanding and engagement relative to cost. The objective of the tests is to determine how to drive optimal customer awareness of default TOU and determine what post-default communications will be most effective in driving customer's education about, and understanding of, their new rate plan. Tests will include the following:

- Channels: Determine optimal channel(s) to notify customers and present post-default support, including DM, on-bill, and EM.
- Format: Determine which formats are most effective for maximum impact in relation to cost for customer engagement. Formats include varied presentment and content of a RC report, DM letter variation, DM design piece, EM variation, and welcome communications variation (DM and/or EM).
- Messaging: Determine what messages resonate best with customers and are most effective in driving engagement with the default communication, preparing customers with ways to be successful on the TOU rate and encouraging customers to reduce overall energy use, post-default.

A minimum of two message variations will be tested.

- Timing/Cadence: Test the timing and frequency of communications. Cadence tests include 90-, 60-, and 30-day notification variations, RC report variations, and channel, format and message variations within those. PG\&E proposes 13 different combinations for testing the sequence for default notification variations and five tracks for testing the sequence for the welcome communications. The charts below provide detail for the channel, format and timing for each of the 13 test cells:

[^4]FIGURE 5
NOTIFICATION TESTS FOR 13-TRACK (TRACKS 1-6) SEGMENT 1 PAPER BILLING + PAPERLESS BILLING WIO E-MAIL


FIGURE 6
DEFAULT NOTIFICATION TESTS FOR 13-TRACK (TRACKS 7-13) SEGMENT 2 PAPERLESS BILLING CUSTOMERS WITH E-MAIL


FIGURE 7
WELCOME PACKAGE TEST CELLS

a. Explanation of ME\&O Tests:

TABLE 11
SUMMARY OF NOTIFICATIONS PRIOR TO DEFAULT

|  |  | 90-day |  | 60-day |  | 30-day |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Direct Mail | E-Mail | Direct Mail | Onsert | Direct Mail | E-Mail |
|  | A | DM with RC |  | Reminder only (no RC) |  | Reminder |  |
|  | B | DM (no RC) |  |  | RC Onsert | Reminder |  |
|  | C | DM (no RC) |  | RC DM |  | Reminder |  |
|  | D | DM (no RC) |  | RC DM Seasonal |  | Reminder |  |
|  | E | DM (no RC) <br> Alt. message |  | RC DM Alt. message |  | Reminder Alt. message |  |
|  | F |  |  |  | RC Onsert | Reminder |  |
|  | G |  |  | RC DM |  | Reminder |  |
|  |  |  |  |  |  |  |  |
|  | H |  |  | RC DM |  | Reminder |  |
|  | 1 |  |  | RC DM |  |  | Reminder |
|  | J | DM (no RC) |  | RC DM |  | Reminder |  |
|  | K | DM (no RC) |  | RC DM |  |  | Reminder |
|  | L |  | EM (no RC) | RC DM |  | Reminder |  |
|  | M |  | EM (no RC) | RC DM |  |  | Reminder |

Notification tests for: (1) delivery channel; and (2) RC content and timing for customers with paper billing and customers with paperless billing without an e-mail address (Figure 5 above):
A) Customer receives 90-day notification with a RC DM; 60-day reminder DM; 30-day reminder DM
B) Customer receives 90-day DM without a RC; 60-day RC as a bill insert; 30-day reminder DM
C) Customer receives 90-day DM without RC; 60-day RC DM; 30-day reminder DM
D) Customer receives 90-day DM without RC; 60-day seasonal RC DM; 30-day reminder DM
E) Customer receives 90-day DM without RC; 60-day RC DM; 30-day reminder DM; Same as track "C" but with an alternative customer message.
F) Customer receives no 90-day notification; 60-day RC as a bill insert; 30-day reminder DM
G) Customer receives no 90-day notification; 60-day RC DM; 30-day reminder DM

Additional tests for paperless billing customers with an e-mail address
(Figure 6 above):
H) Customer receives no 90-day notification; 60-day RC DM; 30-day reminder DM
I) Customer receives no 90-day notification; 60-day RC DM; 30-day reminder EM
J) Customer receives 90-day DM without RC; 60-day RC DM; 30-day reminder DM
K) Customer receives 90-day DM without RC; 60-day RC DM; 30-day reminder EM
L) Customer receives 90-day EM without RC; 60-day RC DM; 30-day reminder DM
M) Customer receives 90-day EM without RC; 60-day RC DM; 30-day reminder EM

TABLE 12 SUMMARY OF WELCOME COMMUNICATION

|  |  | Welcome Communication |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Form Letter | E-Mail | Design Piece |
|  | A |  | EM |  |
|  | B | DM | EM |  |
|  | C |  | EM | DM |
|  | D | DM |  |  |
|  | E |  |  | DM |

Tests for welcome communication EM population (Figure 7 above):
A) EM only
B) Letter and EM
C) Design piece and EM

Tests for DM only (no e-mail address) population (Figure 7 above):
A) Letter
B) Design piece

## 6. Target Audience and Segmentation

PG\&E plans to default approximately 250,000 randomly selected customers to the Default Pilot rate. These customers will be a close representation of PG\&E's entire customer base so that learnings will be applicable to all customers during the 2019 TOU default. For these selected customers, PG\&E will analyze and review an impact-based segmentation approach where customers will be grouped according to the rate impact on their average summer electric bills, the time when their energy use most often spikes and higher bills and attrition tend to occur. PG\&E currently assumes its impact-based segmentation will consist of (see definitions in Table 13 below):

- Benefiters: Customers who will likely save on the Default Pilot TOU rate;
- Neutrals: Customers likely to have negligible bill impacts (higher or lower) on the Default Pilot TOU rate; and
- Non-Benefiters: Customers likely to see bill increases on the Default Pilot TOU rate.

Assignment of customers into one of these three segments is determined by comparing their average summer E-1 bills given their previous twelve months of usage data against the Default Pilot TOU rate E-TOU-C. This does not take into account any potential behavior change or load shifting behavior, which could increase the benefit associated with a TOU rate.

The table below shows a forecast of the percentage of customers expected to fall into each bill impact category—non-CARE and CARE customers—based on preliminary 2018 E-TOU-C bill impacts analysis for the targeted population. 72 Once the Default Pilot rate has been approved and the final population determined, this analysis will be re-run against the selected Default Pilot customer base, using then-current rate values.

72 The targeted population includes NEM customers and excludes customers without 12 months of interval data and those on Medical Baseline.

TABLE 13 FORECASTED CUSTOMER BILL IMPACTS ON DEFAULT PILOT E-TOU-C ${ }^{(a)}$

| Impact Categories | \% <br> Customers <br> (Annual Avg.) | \# <br> Customers (Annual Avg.) | \% Customers (Summer Avg.) | Customers (Summer Avg.) |
| :---: | :---: | :---: | :---: | :---: |
| Benefiter |  |  |  |  |
| Decrease of $>\$ 10$ or $10 \%$ (non-CARE) | 2.06\% | 3,746 | 1.52\% | 2,764 |
| Decrease of > \$5 or 10\% (CARE) | 1.55\% | 1,056 | 0.20\% | 136 |
| Neutral (+) |  |  |  |  |
| Decrease of \$0-\$10 or 0\%-10\% (nonCARE) | 29.58\% | 53,793 | 1.72\% | 3,128 |
| Decrease of \$0-\$5 or 0\%-10\% (CARE) | 57.00\% | 38,841 | 0.22\% | 150 |
| Neutral (-) |  |  |  |  |
| Increase of \$0-10 or 0\%-10\% (nonCARE) | 63.25\% | 115,025 | 57.89\% | 105,277 |
| Increase of \$0-\$5 or 0\%-10\% (CARE) | 39.54\% | 26,944 | 38.82\% | 26,453 |
| Mild Non-Benefiter |  |  |  |  |
| Increase of \$10-\$20 or 10\%-20\% (nonCARE) | 4.22\% | 7,674 | 22.74\% | 41,354 |
| Increase of \$5-\$10 or 10\%-20\% (CARE) | 1.92\% | 1,308 | 27.56\% | 18,780 |
| Non-Benefiter |  |  |  |  |
| Increase of > \$20 or 20\% (non-CARE) | 0.02\% | 36 | 16.12\% | 29,315 |
| Increase of $>\$ 10$ or 20\% (CARE) | 0.00\% | 0 | 15.32\% | 10,439 |

(a) This data analysis is based on population averages and was performed on December 12, 2016.

Upon further analysis, PG\&E has determined that Non-Benefiters may be further segmented into two micro segments: (1) Mild Non-Benefiters; and (2) Non-Benefiters as described in Table 13 above. PG\&E is considering adding an outbound telephone call to Non-Benefiters-across all test cellswith the largest financial impacts within the last 30 days prior to default to ensure they have received the default notification and to address any questions.

The Benefiter/Neutral/Non-Benefiter segmentation (plus the subdivision of Non-Benefiters) may be factored into message selection to serve as a guide as customers decide what is the most appropriate action for them to consider taking after receiving default notification (i.e., stay through the default transition, evaluate load shifting opportunities, or select a rate they find more preferable).

PG\&E will test this approach during pre-outreach customer messaging research. The results will help inform PG\&E's final messaging approach.

Persona cluster-based segmented messaging was considered for inclusion as a part of this Default Pilot. Due to the nature of the notification as well as the messaging hierarchy for the planned communications, it was determined that layering persona cluster-based additional segmented messaging on top of already-critical messaging priorities combined with a complicated 13-test track would not be prudent.

## a. Customer Segmentation Measurement

Within each of these various test cells, sub-segments of populations that are statistically significant will be identified and measured for variations within the test cells for awareness levels, response rates, call volume, etc. Customer segments are expected to include: CARE, non-CARE, and sub-segments of each by bill impact (Benefiters, Neutrals, and Non-Benefiters). PG\&E will also use its demographic data to gain further insights into the behaviors and patterns using the Default Pilot evaluation data.

## 7. Messaging

PG\&E will use best practices from the Opt-In Pilot, SMUD's Pilot, and PG\&E's non-residential default combined with additional research to develop optimal outreach for this Default Pilot group of customers. For the default communications, the presumed primary and secondary messages are:

- Primary message direction: Notify customer of the changing rate, what it is, how it may impact them; provide actions they can take (calls to action) to make an active choice about their rate (website link; contact phone number; take no action) and availability of bill protection.
- Secondary message direction: Provide additional segmented messaging to address bill impact and targeted tools and solutions that may include Energy Alerts and Balanced Payment Plans (BPP). Messaging based on impacts may include:
- Benefiters/Neutrals:
- General Awareness: A change is coming, basic default detail, review your rate options and choose the best rate for you; and
- Awareness/Education: Your new rate is coming in 30 days. See how you can be most successful on this new rate.
- Non-Benefiters:
- Driving Awareness and Building Urgency: TOU details, this change could impact your bills, review your rate options and choose the best rate for you, potentially consider choosing another rate; and
- Awareness/Education: Your new rate is coming in 30 days. Take action before the deadline or see how you can take advantage of this new rate.


## a. Welcome Communications Message Testing

For welcome communications, messages will vary based on the format the customer receives as there are varying space and design opportunities that may be utilized. All pieces regardless of the design utilized, will include:

- Education about default rate;
- Emphasize peak times in summer and lower costs overall during other eight months per year;
- Outline opportunities to shift and/or reduce usage during peak times and how to leverage lower cost periods; and
- Offer general (non-targeted) seasonal, energy efficiency and shifting and reduction solutions.


## b. BPP Message Testing

As described in the Nexant Report, PG\&E will also test the promotion of the BPP, also known as Budget Billing, to a subset of customers who are participating in the Default Pilot.

PG\&E will test offering BPP to a portion of customers who are participating in the Default Pilot. The Nexant Report73 presented the opinion that half of customers in the Default Pilot should be marketed this program option. While many customers do benefit from this program, there are some groups of customers that have been found to not succeed on the program due to their payment history-a customer is removed from the program after two missed payments. Timing of sign-up also can play a

73 Time-of-Use Pricing Default Pilot Plan, Final Report, Nexant Report, p. 34.
factor in length of program participation. Customers who sign up closer to summer and winter months tend to stay on the program longer than those that sign up during spring and fall seasons; in light of this, PG\&E will market the program during the summer seasonal outreach. PG\&E will also test a small segment of all customers—as the Nexant Report suggests—but not expose every customer on the pilot to the program to not overly-market it to those customers who might not find it beneficial. This approach will still allow PG\&E to measure results across all customer segments.

## 8. Customers Rate Change Options:

Customers will be given a menu of rate options-E-TOU-A, E-TOU-B, E-TOU-C, and E-1-if they take no action, they will automatically be placed on E-TOU-C. Customers will be able to make these choices by taking one of the following actions:

1) Visit Website: A page on pge.com for customers to self-serve their selection choice while viewing their RC and other rate information.
2) IVR: When calling to make a rate choice, customers can choose a self-service option via IVR if they have made their decision and want to quickly take action without speaking with a Customer Service Representative (CSR).
3) Live Call: If a customer has questions or wants to discuss the rate change or make a rate selection, they can contact the call center and speak with a live CSR.
If a customer elects not to participate in the Default Pilot, they will be encouraged to visit their online account to become educated about their other options, see their personalized best rate recommendation and select the rate they would like to be on. In outreach, customers will be provided with call center information. PG\&E knows some customers prefer to speak to a CSR when it comes to understanding and selecting their best rate. The call center will be able to offer the same RC information as the customer would see in their online account and can help to facilitate the most appropriate rate choice (encouraging an available TOU rate). All of these paths will help customers make an informed and active choice to default, elect not to participate or choose another TOU rate.

## 9. PG\&E Website

The primary website objective is to provide customers with easy access to information that promotes education, understanding and engagement with residential rates, rate options, and energy management tips and tools. An increasing number of PG\&E customers are using digital channels as their preferred source to obtain information about their energy use. The website will continue to support customers during their participation in the Default Pilot.

The website will provide rate information, links to relevant programs, and tips for energy management and shifting usage away from peak times. As noted in the Greenberg Blueprint, $\mathbf{7 4}$ it is important to have the detailed information available for those that want it instead of trying to burden paper communications with extraneous details.

Customers seeking information on rate options can receive general guidance on front-facing pages of pge.com. If they already have created or decided to enroll in an online account, they can receive more personalized rate guidance. For customers who create an online account, PG\&E provides a more robust selection of personalized information, after login, through which they can compare rates and see projected savings for various rate options based on their past usage. As a part of pre- and post-default communications, all customers will be encouraged to visit, sign-up, and engage with, Your Account-PG\&E logged-in website-to find their best rate, tools and tips on how to best reduce and shift energy.

## 10. Sharing Results

As PG\&E measures and monitors customer responses for each of these test tracks, results will be shared with the TOU and ME\&O Working Groups to discuss outcomes and implications to current ME\&O plans for the 2019 default.

## 11. Detailed Timeline and Budget

PG\&E's budget estimates for ME\&O are based on a combination of preliminary and exploratory vendor quotes and prior costs of similar work. The figures, in Table 15 below, represent PG\&E's best current estimate for the

74 RROIR MEO Blueprint: Integrated Marketing, Measurement, and Alignment Strategic Action Plan for Residential Rate Reform and TOU_V2, Greenberg, Inc., August 19, 2016, p. 66.
expected cost to carry out the proposed scope of work. Changes to the proposed scope may affect estimated budget requirements.

TABLE 14
DEFAULT PILOT OUTREACH SCHEDULE

| Description | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2017 | 2017 | 2018 | 2018 | 2018 | 2018 | 2019 |  |
| Potential Exclusion Outreach | X |  |  |  |  |  |  |
| Certification Outreach | X |  |  |  |  |  |  |
| Default Pilot Notifications |  | X |  |  |  |  |  |
| Welcome Communication |  |  | X |  |  |  |  |
| Summer Seasonal Outreach |  |  |  | X |  |  |  |
| Winter Seasonal Outreach |  |  |  |  |  | X |  |
| End of Bill Protection Notice |  |  |  |  |  |  | X |

TABLE 15
PG\&E'S ESTIMATED DEFAULT PILOT COSTS FOR ME\&O

| Budget Category | 2017 Proposed <br> Budget | 2018 Proposed <br> Budget | 2019 Proposed <br> Budget |
| :--- | ---: | ---: | ---: |
| Communications Development | $\$ 250,000$ | $\$ 250,000$ | - |
| 90-day Notification (DM and/or EM) | 125,000 | - | - |
| 60-day Notification (DM Only) | - | $\$ 125,000$ | - |
| On-bill Annual or Seasonal RC | - | 8,750 | - |
| DM piece Annual or Seasonal RC | - | 43,750 | - |
| 30-day Notification (DM and/or EM) | - | 125,000 | - |
| Outbound calling (if needed) | - | 125,000 | - |
| Post-Default Welcome Communication | - | 96,250 | - |
| Summer Seasonal Education | - | 112,500 | - |
| Winter Seasonal Education | - | 25,000 | - |
| End of Bill Protection Notice | - | - | 101,250 |
| Total Annual Budget | $\$ 375,000$ | $\$ 911,250$ | $\$ 101,250$ |
| Total Proposed Budget | $\$ 1,387,500$ |  |  |

## E. Customer Tools and Support

## 1. Introduction

This section provides an overview of the tools and support available to customers who are selected to participate in PG\&E's Default Pilot, including:
(1) the Default Pilot customer experience for non-NEM, NEM, and CCA customers; (2) online tools available to Default Pilot customers; and (3) contact center support available to Default Pilot customers.

## 2. Customer Experience

PG\&E is dedicated to providing a Default Pilot that is not only well-thought-out, but also delivers a high-quality customer experience. This is extremely important, not just because 250,000 customers will be included, but also because it will set the stage for how Default TOU is perceived by the remaining customers, moving forward to full roll-out in 2019. PG\&E will use tools such as Customer Journey Mapping 75 to define and optimize the customer experience before the Default Pilot as part of PG\&E's implementation preparation. PG\&E will also use ongoing customer feedback and information gathered through its research efforts to constantly evolve processes and resources to further aid customers. There are several customer groups that warrant specific considerations during this process: NEM customers and unbundled CCA customers.
a. Net Energy Metering Customers

As previously mentioned, a subset of eligible NEM customers currently on E-1 or EL-1 will be included in the Default Pilot. Customers who are on a NEM rate experience interactions with electricity and their energy statements differently than non-NEM customers. Indeed, because of the complexities of NEM rates (e.g., their annual true-up), PG\&E maintains a dedicated NEM call-in number, staffed by a group of CSRs who are NEM experts. Similarly, with default TOU, it is important to provide a customized experience that helps the NEM Default Pilot customers understand the

75 Customer journey mapping is a tool that can be leveraged to document and improve the customer experience. The journey map is in the form of a diagram that illustrates the steps a customer(s) goes through in engaging with a company, whether it is: a product, an online experience, a retail experience, a service, or any combination.
nuances of being on a TOU rate. To do this, PG\&E will coordinate with its internal Distributed Generation Team to optimize the Default Pilot experience for NEM customers, and to gain the necessary operational system learnings from the Default Pilot to prepare for the full roll-out of default TOU in 2019. Consistent with PG\&E's typical business practice for IT projects, PG\&E plans to build and test Default Pilot processes (e.g., enrollment process and bill protection calculation) for non-NEM customers prior to expanding the rollout to NEM customers. This ensures that the process for standard E-1 customers is rolled out successfully before expanding the processes to incorporate NEM customer requirements, which are more complex.

## b. CCA Customers

The CPUC does not have jurisdiction over CCA rate making, and as a result, there is uncertainty as to whether some or all CCAs will default their customers on TOU and whether their rates will exactly mirror the IOU's TOU rates. Currently, the only time-variant portion of PG\&E's residential TOU rates is found in the generation component which for CCA customers is set by each individual CCA. Further, each CCA will likely have different generation rates under the same PG\&E tariff. With the increasing number of customers served by CCAs, if any CCA does not default customers to TOU and/or mirror the IOU's TOU rates, it could undermine the state of California's policy goals and create customer confusion from statewide marketing. If CCA customers are included in the Default Pilot, or full default, PG\&E will need to work through the messaging, versioning, and coordination complexities with numerous CCAs. This complexity is compounded, given the difference in generation rates for each CCA.

Two CCAs in PG\&E's service territory have signaled their interest in participating in the Default Pilot: MCE and SCP. Including these two CCAs in the Default Pilot will allow PG\&E to gain operational experience for the many additional functional tasks involved to make the transition to default TOU as smooth and successful as possible for PG\&E's CCA customers. PG\&E, MCE and SCP have been, and will continue to, coordinate closely to work through the various implementation challenges associated with automatic enrollment of unbundled customers onto a TOU rate. Customer
messaging will need to be customized to ensure they have the relevant information to make a rate choice and to reduce confusion. At this point PG\&E has identified three critical elements unique to defaulting CCA customers: (1) modeling of generation rates specific to their CCA; (2) inclusion of CCA logo and reference to the specific CCA in customer communications; and (3) process for bill protection. PG\&E will continue to work closely with SCP and MCE to attempt to address elements specific to CCAs and prepare for the Default Pilot.

## 3. Online Tools

## a. Existing Functionality

PG\&E's Your Account online customer portal currently has several features that help customers understand and manage their energy usage, rate plan, and bills. These tools are available to customers on TOU rate plans, and will be made available for the proposed Default Pilot rate:

- Online Rate Enrollment: This product helps simplify the rate enrollment process by offering online rate enrollment, an alternative to calling to enroll in a rate. By visiting pge.com/myrate, customers can view descriptions of, and enroll in, eligible residential rate plans, including rate add-ons such as, SmartRate and Solar Choice.
- Online RC and What-If tools: PG\&E's online RC tool helps customers understand which rates are most beneficial. The RC tool calculates hypothetical bills on each of the available rates, using that customer's prior 12 months of usage data. PG\&E will provide online RCs for Default Pilot customers as it does for other customers. After a customer completes the RC they can also use the What-lf tool to refine their results. Through the What-If tool, customers gain a deeper-level of understanding about how they might perform on the available rates if they were to make future changes in their usage patterns. Since these actions would modify the usage pattern from their prior 12 months of actual billing data, the What-If tool will modify their initial results provided by the RC. Customers who use the What-If tool are presented with various behavioral questions (e.g., "Can you reduce usage all the time?" and "Can you shift usage during certain times during the day?").

Upon answering these questions, recommended actions appear to help the customer understand how they can lower their energy usage and costs. The What-If tool further demonstrates how taking actions would likely impact performance on their best rate. Finally, the What-If tool takes into account customer behavior-from the responses to the behavioral questions-to present hypothetical bill impacts.

- Compare My Bills: This product provides customers with additional insight into changes in their bill amount by providing bill comparisons for gas and electric charges. Customers are presented with the primary reasons why their current monthly bill differs from the prior month's bill. Customers can also choose to compare a monthly bill with a bill from the same period in the previous year. The top reasons for differences in monthly bills include changes in pricing, variations in weather, and changes in season. If a customer's total bill has changed for rate-related reasons, an applicable rate-related insight appears. Some examples of rate-related insights presented within this section of Your Energy on pge.com include:
- Time-of-Day Insight: For TOU customers-including the Default Pilot participants-the Time-of-Day Insight compares TOU charges by time-of-day periods (i.e., peak, off-peak, and partial-peak, if applicable) on the customer's current bill to the customer's previous bill.
- SmartRate Insight: For TOU customers who are also enrolled in SmartRate, this tool displays SmartRate charges and credits, as compared to the previous bill.
- Bill Forecasts: This product helps customers by creating a no surprises billing experience. PG\&E's Bill Forecasts provides customers with an estimated projection of the expected bill (both gas and electric), based on their usage patterns in the bill cycle thus far. Providing a bill forecast helps customers better predict the cost of their bill and take necessary steps to manage their bill. In conjunction with the Bill Forecast tool, energy management tips are provided as a way to help manage the bill.
- Energy Alerts (Bill Forecast Alert): This product also helps create a no surprises billing experience for customers. Customers who sign-up for

Energy Alerts can set a unique monthly bill notification amount, using a dollar amount threshold for electricity and gas charges. If a customer's bill is estimated to exceed the threshold, the customer will receive an Energy Alert via their channel of choice-EM, text or phone call. By receiving these notifications prior to exceeding the threshold amount, customers are given an opportunity to adjust their energy usage.

## 4. Customer Contact Center Support

## a. Customer Support

Customer Support includes responding to customer calls and EMs regarding the Default Pilot. PG\&E Customer Contact Operations (CCO) will provide customer support throughout the stages of the Default Pilot, described below, during which customers may have different types of questions or concerns they want to discuss with PG\&E.

The first stage is the customer notification period when PG\&E is sending notification to customers 90 - (for most customers), 60 - and 30 -days before the start of the automatic enrollment on the Default Pilot rate in March 2018. The second stage is the post-default enrollment period, when Default Pilot customers will receive welcome communications. During this early stage on the default TOU rate, customers may see changes to their bills, such that they may seek to take further action, including calling the customer contact center or checking online. After the default, PG\&E plans to have a similar approach with customers who are defaulted as it would with other customers who are currently on a TOU rate, however, CSRs will be able to recognize customers who are part of the Default Pilot, as the identification functionality will be built into PG\&E's IT tracking system.

PG\&E budget forecast includes costs related to supporting customer contacts, including calls and EMs, related to its Default Pilot. Most of these costs are expected to be incurred in late 2017 and early to mid-2018, during the notification and launch phases, with additional lower-volume during summer 2018. To arrive at this forecast PG\&E assumed that 5 percent76 of customers who receive the initial notification letter will take action and
contact PG\&E's Contact Center (either with questions or to elect not to participate) or go online for support. PG\&E also expects that a higher proportion of Non-Benefiters may be inclined to take some action (requesting additional information or electing not to participate) even though there are provisions such as bill protection. It is estimated that another 5 percent of customers will contact PG\&E after the default and receipt of the Welcome Communication or first bill to take action or ask questions.

PG\&E's cost estimates detailed below are based on PG\&E's cost-per-call forecast of $\$ 13.77$ for years 2017-2019. The contact volume forecast is broken into four sections as follows:

1) Initial Notification (December 2017-March 2018): For the purpose of forecasting, PG\&E assumed that 5 percent of the 250,000 Default Pilot customers might contact PG\&E prior to the default in March. This assumption results in 12,500 contacts to PG\&E during the three-month period from December 2017 through March of 2018.
a) $250,000 \times 5 \% \times \$ 13.77=\$ 172,125$
2) Post-Default (April 2018-June 2018): For the purpose of forecasting, PG\&E assumed that close to five percent of the people who are sent notifications might elect not to participate in the default TOU rate after being defaulted. Of the remaining 237,500 customers, 5 percent are assumed to likely contact PG\&E during the months after default, in response to welcome communications or changes in their billing rate.
a) 237,500 customers $\times 5 \% \times \$ 13.77=\$ 163,519$
3) Ongoing and Seasonal Support (June 2018-March 2019): For the purpose of forecasting, PG\&E assumed that 10 percent of customers might elect not to participate during the notification period, post default period, or during the summer. Of the remaining 225,625 customers, 2 percent 77 are likely to contact PG\&E in response to seasonal messaging, or to change their rate. This assumption results in 4,513 contacts from June 2018 through March 2019.
a) 225,625 customers $\times 2 \% \times \$ 13.77=\$ 62,137$

A 2 percent response rate is the typical call volume for rate marketing.
4) Bill Protection Outreach Support (March-April 2019): For the purpose of forecasting, PG\&E assumed that 2 percent of the remaining customers might elect to contact PG\&E in response to the end of bill protection period notification communication. This assumption results in a total estimate of 4,513 contacts from March-April 2019.
a) 225,625 customers $\times 2 \% \times \$ 13.77=\$ 62,137$

## b. Employee Training

PG\&E forecasts $\$ 127,200$ in costs for the following employee training related to the Pilot.

1) Training Facilitation: The 2017 forecasted hourly rate for instructor-led training is $\$ 67.64$. PG\&E assumed that approximately 800 CCO employees, including Supervisors and CSRs, will receive 150 minutes of instructor-led training. The content for this training will include general rates education, RC rate mailer and rate change tools. It will also include Default Pilot specific process-related information such as how to identify a Default Pilot customer and how to handle these types of contacts. The cost estimates also include 15 minutes of instructor preparation time per session.
a) Awareness Training: 40 sessions $\times 2.75$ hours $\times \$ 67.64=\$ 7,440$
2) Employee Training: The 2017 forecasted hourly rate for CCO is $\$ 49.90$. Using these assumptions, the employee training costs are forecasted as follows:
a) Awareness Training: 800 employees $\times 2.5$ hours $\times \$ 49.90=$ \$99,800
3) Web-Based Training: PG\&E also assumed that supplemental web-based training and communication will be delivered to CCO employees throughout the Default Pilot. Based on the 2017 forecasted hourly rate for CCO of $\$ 49.90$, the training costs are forecasted as follows:
a) Supplemental training: 800 employees $\times 0.5$ hours $\times \$ 49.90=$ \$19,960

## c. Customers Who Elect Not to Participate

Customers who elect not to participate (or opt-out) during the notification period will be removed from the list of customers who will be defaulted (also referred to as being "automatically enrolled"), in March of 2018, and will stop receiving default notifications. These customers will have specific designations in PG\&E's systems to allow future tracking, both for the purposes of customer research during the Default Pilot (to learn why they opted-out), and so that they will be excluded from the full rollout of default TOU.

After the automatic enrollment onto E-TOU-C in March 2018, Default Pilot customers may elect to end enrollment in the Default Pilot (switch rates), and might contact the PG\&E contact center to do so. CSRs will be trained to encourage the customer to remain on the TOU rate, including reminding them that they are covered by one-year of bill protection. If the customer still wishes to un-enroll from E-TOU-C, the CSR will talk with them about other available rates (E-1, E-TOU-A, E-TOU-B, Electric Vehicle (EV) rates, etc.) and help them decide on the best rate based on their RC analysis and individual situation. Whether the customer un-enrolls by phone or online, their bill protection period will end as of the date of their next bill after they un-enroll, and if applicable, a credit will be issued on a subsequent bill. These customers, as well as those electing not to participate during the notification period, will be excluded from the default in 2019.

## d. Complaints and Escalation

PG\&E has an existing escalation process which will be leveraged during the Default Pilot. The call center has two levels of service representatives: (1) CSRs; and (2) Senior Service Representatives (SSR). SSRs are typically more experienced than CSRs, and as a result, handle escalated calls and EMs. As necessary, CSRs use a one-click speed dial transfer to help resolve customer's issues as quickly as possible. SSRs can also consult with or transfer calls to their Supervisors to resolve any potential issues.

## e. IVR Process for rate change

PG\&E already has an existing self-service IVR process built for customers to change their rates without speaking to an operator. This process will be modified and be available during Default Pilot to help customers make a rate change decision as well.

## 5. Detailed Budget

PG\&E's estimated costs for its CCO team to support customer enrollment and inquiries related to the Default Pilot are presented below in Table 16.

TABLE 16
PG\&E'S ESTIMATED DEFAULT PILOT COSTS FOR CUSTOMER SUPPORT

| Budget Category | 2017 Proposed <br> Budget | 2018 Proposed <br> Budget | 2019 Proposed <br> Budget |
| :--- | :---: | :---: | :---: |
| Call Center Support | $\$ 57,375$ | $\$ 321,765$ | $\$ 80,778$ |
| Training Facilitation | 7,440 | - | - |
| Employee Training | 99,800 | - | - |
| Web-based Training | 9,980 | 9,980 | - |
| Total Annual Budget | $\$ 174,595$ | $\$ 331,745$ | $\$ 80,778$ |
| Total Proposed Budget | $\$ 587,118$ |  |  |

## F. Information Technology

## 1. Introduction

This section describes the IT enhancements that must occur in order to implement the Default Pilot. Since PG\&E considers the Default Pilot "Phase 0" of the full default, it is critical that PG\&E optimize and build scalable systems. PG\&E's Default Pilot aims to test and identify the ideal IT systems to support the full default in order to minimize manual processes and prevent full-scale build out of extraneous or unnecessary systems.

In this section, PG\&E details its current plan for various system upgrades and processes, notwithstanding: results from the Opt-In Pilot; additional exclusions for Pub. Util. Code Section 745; and internal discussions, which may provide insights that alter the final approach. PG\&E plans to make enhancements to PG\&E's IT infrastructure in order to: implement a new TOU rate, implement the default process flow, and provide bill protection to
customers. In order to complete all IT processes in time to support the beginning of Default Pilot notifications in December 2017-for Default Pilot customer enrollment in March 2018—PG\&E must finalize requirements by the end of February 2017. As such, PG\&E will move forward with the project, based on the assumptions listed in the Default Pilot plan; however, timely notification of any issues, and ultimately the final CPUC decision approving its Default Pilot plan by April 27, 2017, is crucial to timely execution.

## a. New E-TOU-C Rate

To support the use of E-TOU-C in the Default Pilot, PG\&E must make numerous systems changes, including necessary structural and logic programming changes to its core billing system. Required system modifications including the following:

- Implement the new E-TOU-C and EL-TOU-C rates for all customers through changes to systems such as to the billing system and PGE.com website;
- Energy Statement (bill) modifications and updates;
- Update Interfaces to and from dependent and related systems (such as Revenue Reporting System) to recognize the new E-TOU-C and EL-TOU-C rates; and
- Update all downstream applications to support the new E-TOU-C rates (e.g., Enrollment and Customer Engagement Tools).

Any major billing system modifications by PG\&E represent a significant undertaking, with myriad interdependencies. PG\&E's billing system is an integral part of PG\&E's overall IT infrastructure and customer relations tools. PG\&E must do extensive testing to ensure the new rates are computed properly, bills are printed correctly, and dependent applications can integrate appropriately with system records, to ensure a positive customer experience.

## b. Default Process

In order to automate the default process for 250,000 residential customers onto the Default Pilot, PG\&E must make structural and logic programming changes to its core billing system. PG\&E will develop a default workflow process in its core billing system, which will be integrated
with other systems and processes to enable automation. The default workflow will support pre-default transition, default, and post-transition default processes.

Prior to defaulting customers, new IT functionality will be built to identify and track different groups of customers. Specifically, the new functionality will identify and track eligible customers for default, ineligible customers, and customers who actively opt-out of the default. New functionality will be built to perform several validations to identify customers who are eligible for default, based on the criteria described in Section B. 3 and other operational characteristics (e.g., whether customer sufficient data exists to perform a RC analysis). A database of the eligible customers will be created and integrated with targeted marketing and outreach efforts.

Prior to default, enhancements must be made to enable customer opt-outs through PG\&E's Your Account—PG\&E's online web portal for customers—and IVR systems. Your Account enhancements will include a new opt-out feature for customers to use. Additionally, at any time during the Default Pilot, customers may opt-out of E-TOU-C and enroll on another rate. The defaulting workflow must recognize this customer choice and not default the customer again in 2019. These enhancements will be integrated with PG\&E's existing enrollment tools to better support customers who may decide to enroll in a rate that better fits their lifestyle (i.e., if customers un-enrolling from the Default Pilot are interested in enrolling in another TOU rate plan, the enrollment process is presented subsequently).

During the Default Pilot, PG\&E will need to transition up to 250,000 customers to a new rate (E-TOU-C). Given that the high volume of customers will need to be transitioned to a new rate, a new process will be designed to automatically transition customers in order to minimize manual rate enrollments. This process will select customers from the database of eligible customers, which will be a smaller scale of the process PG\&E plans to use for full default in 2019.

PG\&E will also explore possible enhancements to the Energy Statement to support additional messaging. For example, a possible enhancement may include on-bill messaging 90-, $60-$, and 30 days prior
to default, which would engage customers when they are already thinking about their utilities while also helping to reduce mailing costs.

Upon completion of defaulting customers to this pilot, PG\&E will evaluate opportunities for continuous improvement and prepare processes for the full default. All steps of the pre-default and default processdiscussed above-will include new tracking and reporting requirements to support evaluation and lessons learned.

## c. Bill Protection

Pursuant to Pub. Util. Code Section 745(c)(4), "a customer shall not be subject to a default TOU rate schedule unless that residential customer has been provided with no less than one year of bill protection during which the total amount paid by the residential customer for electric services shall not exceed the amount that would have been payable by the residential customer under that customer's previous rate schedule." ${ }^{78}$ In order to provide bill protection to defaulted customers, PG\&E must develop a new process to determine each participating customer's bill impacts on the default TOU rate, and to apply a bill credit if they paid more on TOU. Specifically, an algorithm must be developed to automatically calculate each customer's bill impact on E-TOU-C as compared to their prior, $\mathrm{E}-1$ rate. For every customer who would have performed better on E-1, a bill credit would need to be issued at the end of the bill protection period. The algorithm will take into account various changes that can occur, such as: (1) customer closure of this account; (2) transfer of service to a different location; (3) rate changes; (4) transitioning to or from a CCA;79 and (5) enrollment or de-enrollment in NEM. If any of these events occur, such a participant will be removed from the Default Pilot and the bill protection period will end. Note that PG\&E is not proposing to remove customers from the Default Pilot if they become ineligible under Pub. Util. Section 745(c)(1). Customers who join these programs or offerings will be given the option to stay on their TOU rate or switch to another available rate.

78 See D.15-07-001, mimeo, p. 318.
79 Transitioning to or from a CCA will result in a rate change, because doing so moves the customer back to schedule E-1.

In practice, providing bill protection requires the billing system—unlike the Opt-In Pilot-to perform two bill calculations for each customer in the same bill cycle (e.g., one bill calculation on E-TOU-C and one on E-1). PG\&E's customer billing workflow has a limited time to complete the daily billing process, without bill protection for customers defaulted onto TOU rates. The Default Pilot will test the impact of adding bill protection calculations to the billing workflow. This will be a key learning to identify whether any adjustments (e.g., adding additional servers) are necessary in order to prevent consequential impacts of providing bill protection in advance of full default.

Customers who are placed onto the Default Pilot rate will be afforded the benefit of bill protection for up to 12 months as mandated by Pub. Util. Code Section 745. Bill protection would revise the amount collected in rates such that the customer does not pay more than they would have paid on Schedule E-1. Where bill protection is applied, the adjustments to revenue will be captured and allocated directly to the residential class.

## d. RC Report

PG\&E proposes to send RC reports to Default Pilot customers once per year. Specifically, customers receiving notification in advance of the Default Pilot will receive a RC and related customer education during the pre-Pilot timeframe. In addition, Default Pilot customers will receive one more RC during the pendency of the Pilot. This proposal is consistent with the default TOU provisions in Pub. Util. Code Section 745(c)(5). The timing of the RC reports to be provided to participating customers during the Default Pilot's operations is still being evaluated. However, it will important to wait for the customer to have sufficient time on the TOU rate so as to document any savings due to load shifting the customer may have done in response to TOU price signals once they become accustomed to the Default Pilot TOU rate.

## 2. Billing Operations

In order for any customer to be defaulted to a TOU rate, they must be on interval billing, 80 based on the sum of interval usage. Currently, transition to interval billing occurs on an individual-account-basis when a customer elects a voluntary TOU rate or a critical peak pricing option. The automated process to transition Default Pilot customers to interval billing will begin at least 120 days prior to the Default Pilot launch date and take approximately four weeks to complete. Customers will be transitioned in waves over a span of several consecutive weeks, with a forecasted exception rate of 1 percent that will require manual processing. The Default Pilot interval billing transition process will be part of a larger effort to prepare for full default in 2019 by beginning the conversion of most customers-who are not currently interval billed-to interval billing in late 2017. Default Pilot customers will be prioritized in this process.

Customers who elect not to participate in the Default Pilot will require processing automation and updates in PG\&E's billing system, also known as CC\&B (Customer Care and Billing) to track all customer categories such as, "elect not to participate," "ineligible," 81 "eligible," and "defaulted." Additional upgrades to the existing customer rate enrollment tools_planned for 2017—will be required to process requests, to enable customer self-servicing and minimize manual intervention.

## 3. Detailed Timeline and Budget

PG\&E has numerous inter-related IT systems that support the day-to-day gas and electric service operations and PG\&E's interaction with its customers. While PG\&E has upgraded its systems over the years to enhance system flexibility to adapt to a changing market and regulatory environment, whenever new requirements arise that affect one or more of PG\&E's IT systems, PG\&E must carefully manage the system changes to avoid potentially serious system errors or failures. The Default Pilot will require new IT functionality (i.e., bill protection and customer assignment workflow) and as such will need careful planning and execution.

Interval billing is distinct and different from availability of interval data. All customers eligible for the Default Pilot will have at least 12 months of interval data available.
For example, a customer becomes an exclusion due to Pub. Util. Code Section 745(c) between the time the customer was notified and when the default occurs.

PG\&E is currently scoping detailed IT requirements to support the Default Pilot. In order to meet the overall Default Pilot timelines, detailed IT requirements must be finalized by February of 2017. If the final approval of this AL alters the Default Pilot design or the rate design, the overall timelines, including the default date, may be impacted.

An initial, high-level cost estimate for IT system changes and enhancements is provided below. To prepare this cost estimate, PG\&E determined the IT systems changes and enhancements necessary to default customers to TOU, taking into account discussions from the TOU Working Group. Any changes to the scope of the requirements may impact the estimate costs.

TABLE 17
PG\&E'S ESTIMATED DEFAULT PILOT COSTS FOR IT

| Budget Category | 2017 Proposed <br> Budget | 2018 Proposed <br> Budget | 2019 Proposed <br> Budget |
| :--- | :---: | :---: | :---: |
| Building New Rate | $\$ 325,000$ | - | - |
| Default Process | $2,400,000$ | - | - |
| Billing Upgrades | $1,300,000$ | - | - |
| Workflow Management | 50,000 | - | - |
| CCA Rate Modeling | 800,000 | - | - |
| Total Annual Budget | $\$ 4,875,000$ | - | - |
| Total Estimate IT costs | $\$ 4,875,000$ |  | - |

## G. Customer Research and Measurement and Evaluation

## 1. Introduction

This section details the customer research as well as M\&E proposals for the Default Pilot and expands upon the details provided in the Nexant Report. The key focus of the customer research is to inform development of PG\&E's implementation plans for full default in 2019, to be filed as part of its 2018 RDW application, due by January 1, 2018.

## 2. Customer Research Approach

PG\&E's proposed measurement approach is designed to fully-support the specific objectives of the Default Pilot around optimized communications and operational readiness. PG\&E will monitor customer rate adoption behavior by
evaluating: ongoing call center volume; the number of customers who elect not to participate or select an alternative rate; load impacts; and bill impacts. PG\&E will also measure customer awareness, understanding, engagement and satisfaction around the TOU default rate. These measures will provide the information necessary to evaluate the most effective and efficient notification pathway, as well as provide direction for operational adjustments that impact customer experience. PG\&E will also be monitoring the population of customers who have been defaulted to a TOU rate, and may be experiencing hardship as a result of the rate. 82

For ME\&O PG\&E's research efforts will be focused on evaluating the following areas: (1) awareness; (2) understanding; and (3) engagement:

1) Awareness
a) Customer awareness of default
b) Customer awareness of rate details
c) Customer awareness of rate choice
d) Customer awareness of PG\&E tips and tools to support their TOU experience
2) Understanding
a) Communications optimization to ensure messages are clear and engaging
b) Customer understanding of how to control their bill by shifting and reducing energy use away from peak times
3) Engagement
a) Customer ability to participate in and comply with the rate and maintain bill stability
b) Customer satisfaction
c) Customer opt-out rates
d) Customer evaluation of "fairness" of the rate

82 The Opt-In Pilot tracking research conducted by RIA was specifically designed to measure the hardship that may be caused by the TOU rate. As part of its analysis of the data collected in that study (field dates October 2016 and July 2017) PG\&E will look for the specific questions that are the most reliable indicators of hardship. These will be included in PG\&E's survey questionnaire for the Default Pilot. Opt-out rates, the opt-out survey conducted by the customer care team at time of opt out, and rate satisfaction measures will also provide indicators of hardship caused by the TOU rate.
e) Customer interactions with PG\&E to support their TOU experience (i.e., call center, website)

TABLE 18
PROPOSED DEFAULT PILOT RESEARCH DELIVERABLES

| Task | Goal | Method | Frequency | Timing |
| :--- | :--- | :--- | :--- | :--- |
| Communication <br> Development | Optimize <br> communications for <br> engagement, clarity <br> and impact | Online qualitative <br> and quantitative <br> evaluation | Four rounds of <br> research | March 2017-March <br> 2018 |
| Quantitative ME\&O <br> and Experience <br> Survey Tracking | Ongoing evaluation <br> of customer <br> awareness, actions <br> taken, barriers, bill <br> impact, satisfaction | Tracking Study <br> (N=5200) per wave | Two waves of the <br> tracking study <br> among Default <br> Customers <br> (Assuming ME\&O <br> wave three tracking <br> as benchmark) | April 2018 and <br> October 2018. <br> (Benchmark October <br> 2017 - covered by <br> existing ME\&O <br> budget) |
| Qualitative ME\&O <br> and Experience <br> Evaluation | Context around <br> specific tracking <br> study findings | Online qualitative <br> study | Two rounds of <br> research | April 2018-November <br> 2018 |
| ME\&O <br> Effectiveness <br> Analysis | Measure impacts of <br> varying ME\&O <br> treatments | Statistical analysis, <br> survey responses, <br> attrition rates, call <br> center volume, etc. | Quarterly | At end of each quarter <br> starting in Q1 2018 |
| Process Evaluation | Optimize <br> operational <br> processes across <br> the organization | Combination of <br> stakeholder <br> interviews and <br> internal process <br> review | One Time <br> Evaluation | Statistical analysis <br> of load and billing <br> data |
| Three evaluations |  |  |  |  |

(a) PG\&E proposed this same approach to optimizing communications in the PG\&E Residential Rate Reform Marketing Education and Outreach Plan in AL 4949, filed on November 1, 2016, p. 130.

## a. Communications Effectiveness

PG\&E believes it is critical to ensure the notification, welcome and seasonal communications materials are clear and engaging. To that end, PG\&E will review marketing materials as they are in development with a group of customers who reflect the population of eligible customers. Using online quantitative methods and smaller group qualitative approaches,

PG\&E will expose the materials under consideration to gather the insights to optimize the effectiveness of the outreach in terms of language used, clarity, relevance and tonal appropriateness.

PG\&E will invite a reflective sample of customers from its Customer Voice panel—a community of 15,000 residential customers who have agreed to participate in surveys-to participate in both an online survey and a follow-up small group online discussion. Prior to each marketing outreach period, PG\&E will conduct creative development research with customers who reflect the population of Default Pilot customers on its customer voice panel.

TABLE 19
COMMUNICATIONS DEVELOPMENT RESEARCH APPROACH

| Marketing Message | Survey | Online <br> Discussion |
| :--- | :---: | :---: |
| Notification (90/60/30) | $\mathrm{N}-500$ | $\mathrm{~N}=15$ |
| RC (Annual/Seasonal) | $\mathrm{N}-500$ | $\mathrm{~N}=15$ |
| Welcome Communication | $\mathrm{N}-500$ | $\mathrm{~N}=15$ |
| Seasonal Tips | $\mathrm{N}-500$ | $\mathrm{~N}=15$ |

In the proposed quantitative investigation, PG\&E will present the sample of customers with a mock-up of the materials in development, asking them a series of questions to evaluate:

- Message clarity, relevance and engagement;
- Language used, is it: clear, understandable, and familiar; tonally correct;
- Visual engagement of the communications; and
- Likelihood to open and read.

PG\&E plans to follow up with an online discussion, in the form of an interactive bulletin board—similar to a blog with the opportunity for participants to see others' comments, react, and engage. PG\&E will further explore the nuances of the information gathered in the quantitative communications evaluation. While the content of the bulletin board will be directly influenced by the outcome of the quantitative findings, one could imagine that the online qualitative research may further explore:

- Reasons for engagement or lack of engagement with the communications;
- Suggestions for adjusting language for clarity and familiarity;
- Suggestions for gaining attention to read the communications; and
- Other opportunities for enhancing communications effectiveness.
b. Quantitative ME\&O and Experience Tracking

The Default Pilot is considered to be "Phase 0" of the full default. As such, PG\&E wants to ensure that it is using a consistent measurement tool across all stages of the TOU migration. The metrics outlined in the ME\&O Tracking survey 83 will provide the framework for the survey instrument PG\&E will use to measure the impact of the notification pathways. The instrument has been designed to be flexible and evaluate the evolving awareness, understanding and engagement of customers across a broad spectrum of TOU adoption.

PG\&E will survey a representative number of customers in each of the 13 notification pathways-discussed as part of PG\&E's ME\&O plan in Section $D$ above-to evaluate the relative impact of the pathway on awareness, satisfaction and engagement on the TOU rate. PG\&E will also follow the rigorous sampling plan recommended by Nexant. 84 Through this approach, PG\&E will evaluate customer awareness, understanding, engagement and experience in each of the 13 notification pathways. With this approach, PG\&E can ensure the ability to measure the Default Pilot population against the general population and evaluate the success of the TOU Default Pilot communications impact.

83 See PG\&Es Residential Rate Reform Marketing, Education and Outreach Plan, AL 4949 filed on November 1, 2016, Draft Goal Metrics 1-96, pp. 126-127.
84 Following Dilman's sampling theory, PG\&E will sample 500 customers in each of the 13 notification pathways, resulting in at least $\mathrm{N}=250$ completed surveys in each pathway. While this method of surveying is more expensive, it ensures that a representative sample of customers provides feedback using the survey. This same sampling approach was used for the recent RIA survey, conducted among Opt-In Pilot participants.

The evaluation metrics for this survey are aligned with the metrics outlined in the ME\&O filing. ${ }^{85}$ The specific metrics that will be the barometer for success are:

1) Customers are aware that there are rate plans that may help them mitigate energy expenditures;
2) Customers know where to go to get more information about how to manage their energy use;
3) Customers understand how energy use can impact bills;
4) Customers understand the benefits of lowering their energy use;
5) Customers are aware of the rebates, energy efficiency programs, and tips offered by their utility that can help them manage their energy bill;
6) Customers feel they were provided useful information explaining their bills;
7) Customers are aware of TOU;
8) Customers are aware of rate choices; and
9) Customer have an optimal experience.

PG\&E plans to evaluate the Default Pilot experience during two-survey waves (April and October 2018) and will compare these results to a baseline survey which will be established during the ME\&O tracking Wave 3 survey in September, 2017.86 The survey waves dedicated to Default Pilot participants will be conducted among a representative sample of default customers in each of the 13 notification pathways. For each notification pathway, 250 surveys will be completed—aiming for a 50 percent response rate in each cell, to ensure representation of the population, thereby providing confidence in the results.

## c. Evaluating Unreasonable Hardship

As mentioned in the Nexant Report, 87 the focus of the quantitative survey research conducted during the Opt-In Pilot ${ }^{88}$ was on assessing the

85 See PG\&Es Residential Rate Reform Marketing, Education and Outreach Plan AL 4949, filed with the Commission on November 1, 2016.
86 See PG\&E's Residential Rate Reform Marketing, Education and Outreach Plan, filed with the Commission on October 1, 2016. AL 4949-E.
See Nexant's Default Pilot Design Final Report, p. 7, Section 2.1.
88
See Research Into Action "Opt-In TOU Pilot Survey Research Plan," dated July 7, 2016.
"degree of hardship caused by TOU rates relative to tiered rates and identifying key population segments most affected by the rate change." Given this objective, the survey content was primarily geared towards measuring "hardship" from many angles-financial, emotional, physicallimiting the ability to assess other important metrics related to experience and communications effectiveness.

The Opt-In Pilot survey's emphasis on hardship, combined with the Opt-In Pilot's rigorous experimental design, makes it particularly well-suited to measure the extent to which certain customers may experience unreasonable hardship due to a TOU rate, as required under Pub. Util. Code Section 745(c)(2). Since PG\&E's Opt-In Pilot randomly assigned customers to one of three experimental TOU rates and the standard E-1 rate, any statistically significant differences in perceived hardshipas indicated in survey responses-can be confidently attributed to the rate assignment (as opposed to some other set of confounding factors). Additionally, the Opt-In Pilot's inclusion of two surveys, with the second survey fielded after a full year of the Pilot's start, will help determine whether customers feel that TOU rates' lower winter season costs offset the higher summer season costs. Therefore, the results of the Opt-In Pilot survey will provide stakeholders with valuable information that is directly relevant to the Pub. Util. Code Section 745 determination on whether specific customer segments would suffer unreasonable hardship if they were defaulted to TOU.

However, stakeholders have also expressed a need to collect hardship data from the Default Pilot, should specific customer groups be included, to inform this determination as well. As stated below, PG\&E proposes to facilitate this process by generating both load and bill impacts from the start of the Default Pilot to the end of August 2017. However, as discussed in the Nexant Report, there are several challenges associated with measuring hardship from surveys of the Default Pilot population. Customers from the Default Pilot's control population, who will not be aware of their status as control customers, may be significantly disinclined to respond to surveys. Conversely, customers from the treatment population, who will be defaulted onto TOU—potentially without their prior knowledge or consent to
participate—may only be motivated to respond if they were particularly affected by their placement onto TOU. If these selection effects are not effectively mitigated, observed differences in survey responses between treatment and control may in fact be attributable to factors other than the rate itself. Another challenge is that the Default Pilot rate results are needed by early Q4 2018 if they are to be considered by the CPUC as part of the 2018 RDW proceeding, however only preliminary results will be available as the Default Pilot will still be in process. The RDW resolution is currently targeted to be decided by the end of 2018 in order to allow adequate time to prepare for the full rollout of default TOU in 2019.

Despite these challenges, PG\&E will support the CPUC in evaluating data and making its findings available on whether any customers suffer unreasonable hardship from being defaulted to TOU, and, if so, taking appropriate action before the full launch of default TOU. As PG\&E notes above, surveys will be administered with the goal of obtaining high response rates to mitigate response bias. While PG\&E does not plan to survey control customers, PG\&E does plan to include questions about hardship in its survey to treatment customers. The specific questions will be informed by learnings from the Opt-In Pilot and assessments of what questions tend to be the strongest determinants of hardship on TOU.

## d. Qualitative ME\&O and Experience Evaluation

PG\&E believes it is important to keep a finger on the pulse of the experience that customers are having with the Default Pilot TOU rate, particularly at the time shortly after they are defaulted, as well as after the first hot summer on the Default Pilot rate. Therefore, PG\&E plans to engage a group of customers in an online discussion where they can provide their feedback at these two junctures.

These online sessions will be designed to provide context for the data PG\&E will be gathering during its quantitative evaluation. These online sessions will explore the specific experiences customers are having as they transition to TOU (e.g., how they are thinking and feeling about their new rate; if the rate details are clear; and what, if anything, they will need to be successful in adopting the new rate). It will also be important to evaluate the impact on their satisfaction with PG\&E as a result of this rate change.

## e. Additional Related Research

There are two studies currently underway that may inform or impact PG\&E's Default Pilot operations and ME\&O development:
(1) User-Centered Design Thinking Study; and (2) Opt-In Pilot Study.

1) User-Centered Design Thinking Study: This study, which is being conducted at the request of the CPUC, is being facilitated separately by each of the three IOUs under the direction of Energy Division. The objective is to explore rate preferences in a more customer centric manner and to find opportunities that might help overcome barriers to acceptance of a TOU rate. More specifically, the goal of this research is to explore how to encourage customers to shift their electricity use away from peak times and reduce their overall electricity consumption to mitigate energy waste in their household. PG\&E has partnered with a behavior design firm, engagedIN, who will conduct a series of user-centered design workshops in early 2017. These workshops are intended to illuminate and illustrate the customer needs, attitudes and drivers around using and managing energy in their household, including understanding the role of rate structure to impact behavior change. In particular, PG\&E plans to field three customer idea-generation workshops in early January 2017 among specific groups of customers, previously-approved by the Energy Division. The Commission was looking to include a wide-range of customer types in this exploratory effort. PG\&E has agreed to explore three different groups-one in each of the three markets, as described in Table 20 below.

TABLE 20
DESIGN THINKING STUDY SEGMENTS

| Market | Target Customer | PG\&E Personas |
| :--- | :--- | :--- |
| Fresno | Low income, minority <br> customers | Living for Today, Beyond their <br> Means, Heart and Home |
| Fremont | Middle income customers <br> (no CARE) | Gadget Family, Way Wired, <br> Stable Living |
| Sunnyvale | Energy engaged customers <br> (EV owners, NEM and Solar <br> Choice Customers, My <br> Energy Account) | Style Seekers, <br> Eco Active Go-getters |

A mix of customer ages, household size (presence of children), homeowner/renter and ethnicities will be included in these sessions. This research will attempt to provide insight on whether or not customers will accept a "vanilla TOU Rate" (one-size-fits-all) or if other rate options are necessary to explore. It will also provide specific customer-generated ideas on how PG\&E can help customers engage with the TOU rate structure to successfully shift or reduce their energy consumption away from peak periods. Following the customer workshops, engagedIN will facilitate a working session with a cross-functional team at PG\&E to bring the customers ideas to practice via rate design (if warranted) or additional support strategies and tactics. This research will be complete in mid-February 2017, with results provided to the Energy Division and TOU Working Group by March 2017.
2) Opt-In Pilot Study: Survey research is already underway for the Opt-In Pilot. Results, expected to be available from RIA in Q1 and Q3 2016, may impact several elements of PG\&E's Default Pilot proposal, operations and ME\&O, including:
a) Understanding whether TOU rates cause unreasonable hardship;
b) Clarifying which of the opt-in rates cause customer hardship;
c) Defining which specific types of customers are most impacted by any unreasonable hardship caused by the Opt-In Pilot's TOU rates; and
d) Defining the key predictors of unreasonable hardship (defining questions that could be included in the Default Pilot tracking to identify customers who might experience unreasonable hardship as a result of TOU rates).

## 3. ME\&O Effectiveness Analysis

The following section describes the insights that will be obtained from the proposed experimental design and ME\&O treatments, as well as the method by which they will be evaluated. In addition, PG\&E proposes how these evaluations should be timed and sequenced in order to meet the tight timelines leading up to the full rollout of default TOU, starting in 2019.

As described in the preceding Experimental Design and ME\&O sections, PG\&E's proposed Default Pilot design offers a unique opportunity to test the effect of varying ME\&O strategies on customer awareness, understanding, and engagement. These findings will help inform how PG\&E can cost-effectively raise customer awareness, understanding and engagement during the default of the broader TOU-eligible residential population starting in 2019.

PG\&E proposes to measure the impact of the ME\&O approaches on the following outcomes:

- Customer attrition from TOU—as measured by customers who elect not to participate;
- Customer confusion or dissatisfaction-as measured by call center interactions and surveys;
- Customer awareness-as measured by survey data; and
- Customer satisfaction-as measured by survey data.

Given the need to obtain results quickly to inform the 2019 default planning process and PG\&E's 2018 RDW proceeding, PG\&E will analyze impacts promptly and report on them at regular intervals. In the schedule described in Table 21 below, PG\&E proposes to generate reports on a quarterly basis, starting in the first quarter of 2018 and extending through to the first quarter of 2019. The report submitted at the end of Q1 2018 would report on customer responses to the first wave of default notifications. The report submitted at the end of Q2 2018 would provide an update on participant activity through the actual default, incorporating initial findings from the first ME\&O survey. The Q3 2018 report would provide interim summer 2018 results, and the Q4 2018 report would provide final summer 2018 results. The final report, expected to be submitted in Q1 2019, would incorporate results from the second ME\&O survey. PG\&E will collect the data and perform the analysis internally, reporting out to the TOU Working Group.

## 4. Load and Bill Impacts

PG\&E proposes to also estimate the load and bill impacts attributable to the Default Pilot rate. The proposed experimental design would allow PG\&E to estimate impacts with a high degree of confidence in the validity of the results. More specifically, the proposed RCT would dramatically minimize the likelihood
of biased results (i.e., results that inaccurately attribute behavior change to the rate as opposed to other factors such as self-selection onto the rate).

The load and bill impacts analysis would serve several purposes. First, the results would inform stakeholders about the extent to which the TOU price signals are, as envisioned, motivating customers to change their electric usage behavior. While many utilities have investigated this topic before, the outcomes are sensitive to the nature of both the customer population and the nature of the rate. Given PG\&E's proposal to randomly sample from its population of default TOU-eligible customers, the impacts estimated from the 2018 default population would be more indicative of what can be expected from the broader PG\&E residential population in 2019, and beyond. 89 This knowledge can then feed into long-term load forecasts to inform resource planning and inform future residential rate design. Additionally, the analysis could provide insights into whether the behavioral response differs by customer segment and as a function of different ME\&O approaches. These results could guide how PG\&E and the other IOUs could adopt more cost-effective strategies.

Members of the TOU Working Group have also expressed interest in using the load and bill impacts to make inferences about whether TOU rates cause unreasonable hardship relative to PG\&E's standard rate. In order to provide this data in a timely fashion, PG\&E proposes to generate a first set of load and bill impacts by November 2018, covering customers' performance on TOU from the time of default through the end of August 2018. However, while PG\&E will provide these load impacts, PG\&E believes the findings will be of limited value in assessing the impact of TOU rates on unreasonable hardship. 90 A group of customers may respond to a TOU rate by shifting their load to off-peak hours; however, that says little about whether that behavior change mitigated a potential hardship, or actually caused hardship on its own. Conversely, a group of customers may not change their usage in response to a TOU rate, but it would not necessarily follow that therefore TOU rates cause unreasonable hardship.

89 However the impact may still be different if the default TOU rate approved by the CPUC in PG\&E's 2018 RDW differs from the rate that PG\&E uses for its 2018 Default Pilot.

90 See Nexant Opt-In Pilot Design Report, p. 42, which documents the shortcomings of load impacts for purposes of measuring unreasonable hardship.

Bill impacts, which will help quantify the financial impact of a customers' transition to TOU, would provide a better indication of unreasonable hardship than load impacts. However, the bill impacts will be limited to only the summer months, so the impacts should not be extrapolated to the entire year as they would not account for the lower prices in effect during the non-summer months.

Once the preliminary results of the Default Pilot are available, stakeholders may want to determine whether the relative impacts for Default Pilot participants appear to be similar in magnitude to the relative impacts on the Opt-In Pilot's TOU rates, or different. PG\&E suggests that stakeholders should not make any prior assumptions about how the impacts from the Default Pilot may compare or contrast to the impacts from the Opt-In Pilot. There are several differences between the two pilots that may, in turn, lead to different results. First, customers in the Opt-In Pilot needed to proactively volunteer to join the pilot, while customers in the Default Pilot will not. This difference in recruiting methods may lead to different populations of enrolled customers. Moreover, variations that have nothing to do with the Default Pilot design, such as differences in weather conditions in 2018 compared to the prior two years, can also lead to unexpected outcomes. These disparities may make it difficult to explain the precise cause of differences between the Opt-In Pilot and Default Pilot results.

However, this is not an uncommon challenge in economic research. As with TOU rates, many other interventions ranging from minimum wage increases to changes to marginal tax rates are not binary either, and they are studied under various experimental or quasi-experimental design conditions. Researchers generally deal with this by performing meta-analyses, or assessing a body of research as a whole, carefully accounting for differences in each study to reach general conclusions about an intervention. Between the three IOUs, findings will be generated from six separate pilots. The findings from all six pilots may lead to similar conclusions, but to the extent that they do not, PG\&E plans to work with the TOU Working Group to try and understand the underlying cause of any discrepancies that arise.

For example, comparing the results from the three Opt-In Pilots to the three Default Pilots, may reveal that customers in the former group all experience a magnitude of bill impacts that are significantly different from that of
the latter group. It may therefore lead to the conclusion that these differences could be explained by the nature of the recruitment approach and the resulting customer mixes. Similarly, assessing results as a function of peak to off-peak ratios may reveal that a higher peak to off-peak ratio is associated with a specific type of bill impact. These types of analyses can be performed once the data is available. And because the results from the Opt-In Pilot will be available far in advance of the Default Pilot results, integrating insights from the Default Pilot can be done relatively quickly. PG\&E does not recommend defining the precise approach and the form of this analysis until there is some indication of the extent to which discrepancies across the pilots do exist; however PG\&E will work with the TOU Working Group on performing such analyses within the required time constraints as the need arises.

While PG\&E plans to provide initial load and bill impacts on an accelerated timeline in order to meet regulatory needs, a fuller accounting of customers' behavior on TOU will also be provided at a later date. PG\&E proposes to report load and bill impacts through the Demand Response Measurement and Evaluation Committee's annual April 1 filings, which provide estimated load impacts of all of the three IOUs' demand response-related rates and programs. The results would adhere to the protocols adopted in D.08-04-050, Decision Adopting Protocols for Estimating Demand Response Load Impacts. Under this proposal, load and bill impacts will be reported on April 1, 2019 and on April 1, 2020.91

## 5. Process Evaluation

Given the primary Default Pilot goal of achieving operational readiness for the full default starting in 2019, PG\&E proposes to conduct a process evaluation to rigorously evaluate the Default Pilot's operational successes and areas for improvement.

A process evaluation focuses on a review of the administration of the program to identify ways to better meet participation objectives and improve the cost-effectiveness of the program. A process evaluation could be used to evaluate the way the program is being delivered and provide recommendations

91 Since these evaluations are performed by calendar year, the April 2019 report would not provide an entire year's worth of load and bill impacts from the default pilot.
on how the key features of the delivery could better meet the goals of the program while also being cost-effective.

As noted in the Nexant Report, operational readiness can be assessed through careful tracking of key metrics of interest, such as volume of rate changes by communication channel, processing time for rate changes relative to target, and volume of billing exceptions. As noted in its proposed timeline, PG\&E will be reporting on key metrics such as these in its quarterly reports. But while these metrics will provide valuable insights, they will be somewhat limited in explaining the underlying causes and identifying the associated process improvements that may significantly improve the customer experience. For example, a metrics report may reveal that call volumes are high upon the first wave of default notifications. A process evaluation may be more useful in methodically determining whether the call volumes can be minimized through improved customer access to information, or whether the solution lies in improved call routing, or some other process improvement.

The scope of the process evaluation would be focused on topics that can yield the most constructive feedback on features of program delivery and their impacts on operations relative to their impact on the customer experience. The scope should be limited to researchable issues that can be addressed within the timeframe and with available data. Potential data to be collected or assessed includes:

- Review of similar programs and any related studies;
- Interviews with implementation staff and managers;
- Interviews with other stakeholders, including policy makers;
- Interviews or surveys with participants and non-participants-this could be coordinated with ME\&O survey data collection;
- Focus groups-this could be coordinated with ME\&O customer research;
- Review of program related material and tools; and
- Observations of operations and review of procedures and workflow.

PG\&E proposes to select a qualified evaluator for the process evaluation by the end of Q3 2017. This timing would allow PG\&E and its consultant to begin planning and early data collection as PG\&E prepares for the default in Q4 2017. The bulk of the data collection would occur during the first half of 2018, with the goal of preparing a final report by the beginning of Q4 2018.

## 6. Detailed Timeline and Budget

PG\&E's budget estimates for Customer Research and M\&E are based on a combination of preliminary and exploratory vendor quotes and prior costs of similar work.

The Quantitative ME\&O and Experience Survey Tracking task includes the estimated incentive costs to ensure the targeted response rate.
The Communications Development, Qualitative ME\&O and Experience Survey Tracking, ME\&O Effectiveness Analysis, Load Impacts Analysis, and Process Evaluation are based on estimated labor hours and approximate billing rates.

The amounts below represent PG\&E's best current estimate for the expected cost to carry out the proposed scope of work. Changes to the proposed scope may affect estimated budget requirements.

TABLE 21
DEFAULT PILOT OUTREACH SCHEDULE

| Description | Q1 <br> 2017 | Q2 <br> 2017 | Q3 <br> 2017 | Q4 <br> 2017 | Q1 <br> 2018 | Q2 <br> 2018 | Q3 <br> 2018 | Q4 <br> 2018 | Q1 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Communication Development | X | X | X | X | X |  |  |  |  |
| Quantitative ME\&O and <br> Experience Survey Tracking |  |  |  | X |  | X |  | X |  |
| Qualitative ME\&O and <br> Experience Evaluation |  |  |  |  |  | X |  |  |  |
| ME\&O Effectiveness Analysis |  |  |  |  | X | X | X | X | X |
| Process Evaluation |  |  |  |  | X | X | X | X | X |
| Load and Bill Impacts <br> Evaluation |  |  |  |  |  |  |  | X |  |

TABLE 22
CUSTOMER RESEARCH, M\&E BUDGET ESTIMATE

| Budget Category | 2017 Proposed Budget | 2018 Proposed Budget | 2019 Proposed Budget |
| :---: | :---: | :---: | :---: |
| Communication Development | \$45,000 | \$15,000 | - |
| Quantitative ME\&O and Experience Survey Tracking ${ }^{\text {(a) }}$ | 20,000 | 480,000 | - |
| Qualitative ME\&O and Experience Evaluation ${ }^{\text {(b) }}$ | - | 150,000 | - |
| ME\&O Effectiveness Analysis ${ }^{(\text {b }}$ | - | 50,000 | \$25,000 |
| Load and Bill Impacts Analysis | - | 50,000 | 100,000 |
| Process Evaluation | 50,000 | 85,000 | 15,000 |
| Total Annual Budget | \$115,000 | \$830,000 | \$140,000 |
| Total Proposed Budget | \$1,085,000 |  |  |

(a) Oversample and evaluation of the TOU Default customers (omitting any excluded customers).
(b) Assumes 6 groups and 30 Bulletin Board participants.

## H. Conclusion

PG\&E believes its proposed framework and design for the Default Pilot is the most appropriate means for setting the stage for a successful full-scale rollout of default TOU in 2019. PG\&E plans to achieve this by using the Default Pilot to ensure that its business processes and operational systems are functional, and its ME\&O efforts are optimized. PG\&E's Default Pilot proposal aims to provide useful results in time for the IOUs to develop their default TOU implementation plans and to be presented in testimony supporting PG\&E's 2018 RDW application, to be filed with the CPUC by January 1, 2018. 92

PG\&E has shown, in this proposal, why its Default Pilot plan is reasonable and should be promptly adopted to achieve the objectives for the overall default TOU initiative, which the CPUC has targeted for 2019. A timely approval is essential to enable PG\&E to start building its systems in order to meet the targeted Default Pilot launch date of March, 2018—which requires customer communication to start in

92 Analysis and development of testimony supporting PG\&E's residential default TOU rate proposal must begin by September 2017 in order to meet the Commission's deadline of January 1, 2018. The Default Pilot has been designed to provide interim results by September 2018 for that reason. Any slippage of the overall pilot schedule will jeopardize PG\&E's ability to meet the January 1, 2018 deadline envisioned in D.15-07-001 for filing its residential default TOU program proposal.
late 2017. Before the first customer communications can go out, the rate must be fully operational, including on-line on pge.com and through the customer service center. To ensure adequate lead-time, PG\&E must respectfully, and insistently request that the Commission approve this Advice Letter request by no later than its Decision Conference, on April 27, 2017. Given the minimum requirements for lead time for systems development, testing, and communications preparation, a final CPUC decision received any later than April 27, 2017 would jeopardize PG\&E's planned March 1, 2018 Default Pilot start date.

Additionally, a timely Commission's Decision on the exclusions associated with Pub. Util. Code Section 745(c)(2) is essential to a successful implementation of PG\&E's March 2018 Default Pilot. While some exclusions are already enumerated in Pub. Util. Code Section 745, and have already been planned for in this AL, others remain open, and at the Commission's discretion. PG\&E acknowledges the complexity and importance of this issue, and will be filing a Supplemental AL, per the direction of Energy Division, in late Q1 of 2017, setting forth a contingency plan in case the CPUC should find in its planned ruling later in 2017, that additional customers should be excluded (e.g., if unreasonable hardship is found under Section 745(c)(2), and no other means appears to be available to mitigate that hardship, the CPUC might perhaps exclude some or all senior citizens in hot areas, or some or all CARE/FERA customers in hot areas). If so, however, it is crucial for PG\&E to know of such incremental customer exclusions by August 2017, to allow adequate lead-time for outreach to impacted customers, and to prepare the final Default Pilot participant lists which is necessary before any early notifications can go out. PG\&E is committed to continuing to coordinate with the TOU Working Group in early 2017 to develop reasonable processes that could be leveraged, should the CPUC exclusions apply.

PG\&E would, once again, like to express our sincerest thanks to the CPUC's Energy Division, Nexant, and the interested parties who have tirelessly worked together in a professional and collaborative manner-through the TOU Working Group-to help PG\&E develop this Default TOU Pilot plan. PG\&E appreciates that the window for a timely CPUC final decision on this proposal is relatively narrow, and thanks the Energy Division, and other interested parties for taking all reasonable steps to support a timely final CPUC decision on this AL no later than April 27, 2017 to support Default Pilot launch as planned in March 2018.

# PACIFIC GAS AND ELECTRIC COMPANY APPENDIX A 

TIME-OF-USE PRICING DEFAULT PILOT PLAN (NEXANT REPORT)


# Time-of-Use Pricing Default Pilot Plan 

## Final Report

November 30, 2016

Prepared for<br>TOU Pilot Design Working Group

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## 1 Executive Summary

California Public Utilities Commission (CPUC or the Commission) Decision 15-07-001 (D.15-07-001), dated July 3, 2015, ${ }^{1}$ requires Pacific Gas and Electric Company (PG\&E), Southern California Edison Company (SCE), and San Diego Gas \& Electric Company (SDG\&E)—collectively the Investor-Owned Utilities (IOUs)—to (a) conduct certain "pilot" programs and studies of residential Time-of-Use (TOU) electric rate designs (TOU Pilots and Studies) beginning the summer of 2016; and (b) to file applications no later than January 1, 2018 proposing default TOU rates for residential electric customers. A Working Group of stakeholders (the TOU Working Group) was formed in August 2015 to develop recommendations for these TOU Pilots and Studies.

Although the purpose of the pilots is to inform the implementation of default TOU pricing for all residential customers in 2019, utilities are prohibited from defaulting any residential customer onto any TOU rate prior to January 2018. As such, the initial focus of the TOU Working Group was the development of opt-in pilots for implementation in 2016. The interim evaluation of these pilots is currently underway.

Work on default pilots to be implemented in 2018 began in June 2016. This report summarizes the recommendations developed through the TOU Working Group process for design of the default pilots. Each IOU will use these recommendations as input to the pilot designs presented in the Advice Filings requesting CPUC approval that will be submitted to the Commission no later than December 16, 2016.

### 1.1 Pilot Objectives and Evaluation Metrics

A primary objective of the default pilots is to assess operational readiness for full default. Each IOU will stress test its business processes and capabilities to support a large volume of rate changes over a relatively short time period. Key systems include the call center, systems and processes that enable customers to easily select alternate time-varying rates or opt out of default TOU, software to support rate changes, new billing system requirements, first year bill protection, exception processing, databases and tracking and monitoring systems needed to ensure compliance with all regulatory requirements that might be associated with default enrollment (e.g., the potential exclusion of economically vulnerable customers, who can be hard to identify a priori, and the exclusion of customers with fewer than 12 months of usage at the same location).

Collectively, the IOUs propose to send default notifications to roughly 700,000 customers in order to assess operational readiness through tracking and monitoring of transactions and problems that arise during the notification and enrollment periods and in conjunction with the initial bills that are sent out for enrolled customers. The complete list of operational performance metrics will be determined closer to pilot launch but is likely to include:

[^5]- Opt-out/rate change volume and the timing of rate change requests relative to the timing of default notification communications;
- Volume of rate changes by communication channel (e.g., the number that come in via the call center, that are done online, and that are submitted via business reply card if that option is made available, etc.);
- Processing time for rate changes;
- Percent of rate change requests that are processed by the targeted change date (e.g., next billing cycle after request);
- Volume of billing exceptions and the labor hours required to address them; and
- Call volume by type of call (e.g., opt-out request, inquiries about what is happening, etc.).

Another key objective of the default pilots is to determine how best to maximize, at reasonable cost, customer awareness of the fact that they will be defaulted onto a new rate unless they opt out, and to inform customers about the options they have if they want to opt out to the otherwise applicable tariff (OAT) or choose a TOU rate that is different from the default rate. A closely related objective is determining cost-effective ways of educating customers about how to manage their energy use and control costs under TOU rates and to provide tools for managing seasonal bill volatility in order to retain customers on TOU rates over time. These objectives will be met by testing a wide array of marketing, education and outreach (ME\&O) options that vary with respect to communication channel, content, frequency and other factors. ME\&O options will be tested at various stages, including default notification, the delivery of welcome information and ongoing seasonal support. Key metrics for evaluating these objectives include:

- Opt-out rates from the default TOU rate (separately tracking customer churn and proactive rate changes) prior to and after enrollment at various points in time (e.g., monthly, quarterly, etc.);
- The percent of customers that choose the rate option with the lowest projected structural bill amount (based on the structural rate comparisons (RCs) that will be provided to each customer);
- Customer awareness that they will be or have been (depending on timing of the awareness survey) defaulted onto a TOU rate;
- Customer satisfaction;
- Other customer perceptions concerning issues such as fairness;
- Usage behavior or changes in usage behavior reported in surveys;
- Feedback on the various treatments and changes to the treatments that might be of interest to consumers (e.g., would prefer seasonal RCs over monthly RCs); and
- Load impacts by rate period.

The first two metrics will be determined by tracking opt-out rates prior to and following enrollment on the default rate and comparing the choices made to the "best rate" choice based on the structural bill analysis (or rate comparisons) that will be done for each customer. Assessments for the next five metrics will be based on survey data and a randomized control trial design (RCT) for the treatments. Awareness is one of the most important metrics for
assessing the relative effectiveness of different treatments in the proposed pilots and for putting other key metrics, such as opt-out rates, into the proper perspective. A low opt-out rate can result from two very different factors. One is that customers who stayed on the default rate proactively chose to do so while the other is low awareness that a tariff change had been made or what the options are if a customer is unhappy with the new rate. Understanding which of these factors is the primary cause of any observed opt-out rates is critical to developing sound policies and implementation plans. Awareness can only be assessed through a survey of the participant population.

Load and bill impacts will be estimated for each of the TOU rates being tested. The impact of other selected treatments, such as level payment plans, on load reductions and bills will also be examined. The sample sizes for these pilots are being set primarily based on the need to assess operational readiness and, collectively, will involve as many as 600,000 customers across the three IOUs. These large samples will allow for estimation of load and bill impacts for a wide variety of customer segments.

### 1.2 Pilot Treatments

Table 1-1 summarizes the treatments that will be tested at each IOU and collectively across the three IOUs. Five tariffs will be examined, which differ with respect to the length and timing of the peak period, the number of rate periods, and the length of the summer season. SCE and SDG\&E will test two different tariffs. At SCE, the rate with the shorter peak period will have higher peak-to-off-peak price differentials compared with the tariff with the longer peak period, which will allow for a determination of customer preferences for this tradeoff.

A wide variety of default notification options will be examined across the three IOUs in order to determine how best to maximize customer awareness at reasonable cost. Tests vary with respect to the number of communication touches sent to each customer, the timing of each communication, communication channels (e.g., email, or EM, direct mail, or DM, and on-bill, or "onsert"), the number of alternative rates included in rate comparison information provided to each customer, and the granularity of the rate comparison information (e.g., annual, seasonal or monthly). Alternative messaging will be examined by PG\&E and SCE.

Several different treatments will be tested for the communication of welcome information that will be sent to each customer shortly after enrollment, including different format/content and communication channels. Tests of ongoing communication will include enhanced encouragement to enroll in existing level pay plans, which help customers smooth out variability in bills due to variation in usage and prices across months and seasons. These tests will allow for a determination of the impact of level pay plans on both opt-out rates and load reductions. Different messaging strategies will be examined at SCE and SDG\&E, with details yet to be determined. SDG\&E plans to test the impact of messaging tailored to customer segments, including psychographic personas, versus a more generic strategy. Finally, SDG\&E will examine whether an educational campaign to encourage households that have central air conditioning and programmable thermostats (PTs) to use these existing devices reduces peakperiod electricity use.

Table 1-1: Default Pilot Treatments

| Treatment | PG\&E | SCE | SDG\&E |
| :---: | :---: | :---: | :---: |
| Tariffs |  |  |  |
| \# of tariffs tested | 1 | 2 | 2 |
| Peak period | 3-8 PM | Rate 1: 4-9 PM <br> Rate 2: 5-8 PM | Both: 4-9 PM |
| \# of weekday rate periods | 2 | Summer: 2 periods Winter: 3 periods | Rate 1: 3 <br> Rate 2: 2 |
| Summer season | Jun 1 - Sept 30 | June 1 - Sept 30 | May 1 - Oct 31 |
| \% of pilot customers defaulted onto each rate | 100\% | Rate 1: 50\% <br> Rate 2: 50\% | Rate 1: ~80\% <br> Rate 2: ~20\% |
| Default notification |  |  |  |
| \# of customers receiving default notifications | ~250,000 | $\sim 400,000$ | 125,000 to 150,000 |
| \# of notifications | 3 for some most vs 2 for some | 3 for all | 3 for all |
| Notification timing | 90/60/30 days for most 60/30 days for some | 90/60/30 days for all | 6 months $^{2} / 60$ days/15-30 days for all |
| Communication channel | DM vs On-bill for 60 day notification for paper billing customers <br> DM vs EM for 90 and 30-day notifications for paperless billing, DM only for 60 day notification | No side-by-side tests <br> All customers will receive DM notifications | DM+EM vs DM only vs EM only for email customers <br> DM only for DM customers |
| Rate comparison granularity | Annual vs seasonal | Monthly vs seasonal | Annual vs seasonal vs monthly |
| Timing of rate comparison information | 90 vs 60 days | 60 days and 30 days for everyone | 60 days only |
| \# of rate comparisons included in default notification | Default rate and one other TOU rate relative to OAT | At a minimum, the default rate and one other TOU rate relative to OAT | Two comparisons to be tested: Rate 1 and Rate 2 relative to the OAT in one test and the above plus a CPP rate relative to the OAT in the other test |
| \# of message alternatives | 2 | 2 | 1 |

[^6]| Treatment | PG\&E | SCE | SDG\&E |
| :--- | :--- | :--- | :--- |
| Welcome Information | Form letter vs design <br> piece vs email for EM <br> customers <br> Form letter vs design <br> piece for DM customers | High touch vs low touch <br> for multiple after-care <br> communications <br> including welcome <br> package | Welcome information <br> only vs welcome <br> information + energy <br> efficiency device (e.g., <br> LED, power strip, etc.) |
| Cormat/content | EM only vs EM+DM for <br> email population | See above | EM vs DM for EM <br> customers |
| Post Welcome <br> Package <br> Communication | Enhanced <br> encouragement for <br> random sample drawn <br> from entire participant <br> population | Enhanced <br> encouragement for <br> segments impacted by <br> bill volatility | Enhanced <br> encouragement for <br> random sample drawn <br> from entire participant <br> population |
| Level pay plan | No testing planned after <br> the welcome <br> communication | No testing planned <br> during pilot | Message tailored to <br> personas/other <br> segments vs non- <br> tailored |
| Message | None | High touch vs low touch <br> for multiple after-care <br> communications | Education campaign for <br> CAC households to use <br> programmable <br> thermostats to <br> shift/reduce loads |
| Other |  |  |  |

## 2 Introduction and Objectives

California Public Utilities Commission (CPUC or the Commission) Decision 15-07-001 (D.15-07-001), dated July 3, 2015, ${ }^{3}$ requires Pacific Gas and Electric Company (PG\&E), Southern California Edison Company (SCE), and San Diego Gas \& Electric Company (SDG\&E)—collectively the Investor-Owned Utilities (IOUs)—to (a) conduct certain "pilot" programs and studies of residential Time-of-Use (TOU) electric rate designs (TOU Pilots and Studies) beginning the summer of 2016; and (b) file applications no later than January 1, 2018 proposing default TOU rates for residential electric customers.

To support the TOU Pilots and Studies, the IOUs were directed to form a working group (TOU Working Group) to address issues regarding the TOU rate design and study as detailed in D.15-07-001. The Decision also directed the TOU Working Group to select one of the IOUs to hire one or more qualified independent consultants to assist with the design and implementation of the TOU Pilots and Studies. SCE was chosen as the IOU to solicit bids from qualified consultants and to act as the contracting agent for the independent consultant.

With assistance and direction from the CPUC's Energy Division, the TOU Working Group was formed and held its first meeting on August 25, 2015 to begin work designing pilots to be implemented in 2016. Membership in the TOU Working Group has evolved since that time. Appendix A contains the names and affiliations of TOU Working Group members who actively participated in the design of the default pilots summarized in this report.

Following a competitive bidding process, the TOU Working Group chose Nexant, Inc. (Nexant) as the independent consultant to assist with design of the TOU pilots. Nexant began work on the project on September 18, 2015. The Nexant Project manager was Dr. Stephen George, a Senior Vice President at Nexant with 40 years of industry experience, all of it involving the study of consumer behavior in response to utility and regulatory demand side initiatives. Dr. George is a recognized expert on time-based pricing and experimental design. He was one of the chief architects and evaluators of California's well-known Statewide Pricing Pilot and was also the chief evaluator of SMUD's well-known Smart Pricing Options pilot.

The initial focus of the TOU Working Group was the development of opt-in pilots for implementation in 2016. Although the purpose of the TOU pilots and studies is to inform the implementation of default TOU pricing for all residential customers in 2019, utilities are prohibited from defaulting any residential customer onto any TOU rate prior to January 2018. As such, it was not possible to conduct default TOU pricing pilots in 2016 and 2017. The opt-in pilot design process and recommendations are documented in a December 17, 2015 Nexant report entitled "Time-of-Use Pricing Opt-in Pilot Plan." ${ }^{4}$ An update on opt-in pilot implementation and

[^7]plans for evaluating the pilots can be found in California Statewide Opt-in Time-of-Use Pricing Pilot Evaluation (October 5, 2016). ${ }^{5}$

Once the opt-in pilots were approved and implementation was well underway, the TOU Working Group reconvened to begin the process of designing default pilots to be implemented in 2018. This effort was also facilitated by Dr. George and Nexant. The first default pilot design meeting was held on June 9, 2016. Additional in-person meetings were held on July 12, August 24 and September 22. A TOU Working Group conference call was held on October 12. This report summarizes the pilot recommendations arising from the WG process. Each IOU will use these recommendations as input to the pilot designs presented in the Advice Filings requesting CPUC approval that will be submitted to the Commission no later than December 16, 2016.

### 2.1 Pilot Objectives

Pilot design must be driven by a clear understanding of objectives. The opt-in pilots that are currently in the field focused primarily on testing multiple TOU rate options and technologies that could potentially influence demand response under time-varying rates. Each IOU is testing its own set of three different TOU tariffs (or treatments). The experimental treatments in the optin pilots will provide valuable insights regarding potential load and bill impacts under different rate options. These pilots are specifically designed to provide key information concerning whether TOU rates cause unreasonable hardship for senior citizens or economically vulnerable customers in hot climate zones. ${ }^{6}$ Results from the opt-in pilots will be used, in part, to inform default rate design and to assist the CPUC in deciding whether any senior citizens or economically vulnerable customers in hot climate zones should be excluded from default enrollment in 2019.

The primary focus of the default pilots summarized in this report is different. A key objective of the default pilots is to assess operational readiness for full default. Each IOU will stress test its business processes and capabilities to support a large volume of rate changes over a relatively short time period. Key systems include the call center, systems and processes that enable customers to easily select alternate time-varying rates or opt out of default TOU, software to support rate changes, new billing system requirements, first year bill protection, exception processing, databases, and tracking and monitoring systems needed to ensure compliance with all regulatory requirements that might be associated with default enrollment (e.g., the potential exclusion of economically vulnerable customers, who can be hard to identify a priori, and the exclusion of customers with fewer than 12 months of usage at the same location).

Another key objective of the default pilots is to determine how best to maximize, at reasonable cost, customer awareness of the fact that they will be defaulted onto a new rate unless they opt out, and to inform customers about the options they have if they want to opt out to the otherwise applicable tariff (OAT) or choose a TOU rate that is different from the default rate. A closely related objective is determining cost-effective ways of educating customers about how to

[^8]manage their energy use and control costs under TOU rates and to provide tools for managing seasonal bill volatility in order to retain customers on TOU rates over time. These objectives will be met by testing a wide array of marketing, education and outreach (ME\&O) options that vary with respect to communication channel, content, frequency and other factors. ME\&O options will be tested at various stages, including default notification, the delivery of welcome information and ongoing seasonal support. As seen in Sections 4 through 6, which lay out the proposed plans for each IOU, a large number of default notification options will be tested. This significant focus on default notification is driven, in part, by the fact that key insights from these tests will be available in time to influence what the IOUs will do for default notification during full roll out in 2019.

Although evaluating load and bill impacts for default rates is not the primary focus of the default pilots, these metrics are still important and will be estimated for the default pilot rates and for some of the other treatments that may influence these measures.

The default pilots are not being designed to assess unreasonable hardship among senior citizens and economically vulnerable customers in hot climate zones to the same extent as with the opt-in pilots. One reason is that these groups may be excluded from the default pilots. Hardship is a major focus of the opt-in pilots and will be assessed in part through two major survey waves of participants from all three IOUs. Information from the opt-in pilots is intended to inform the CPUC's initial Section 745 decision about whether or not senior citizens and economically vulnerable customers in hot climate zones should be excluded from default enrollment, including enrollment in the default pilots. As such, if the Commission's initial decision in mid-2017 is that some or all of the people in either of these two large customer groups must be excluded from default TOU, they would not be part of the default pilot population and therefore could not be studied.

However, if the Commission's initial Section 745 determination is that some or all of these customers can be included in the default TOU pilots, information from the pilots could be used as input to help the CPUC make a timely reassessment before its final decision on whether unreasonable hardship exists for seniors or CARE/FERA-eligible customers in hot climate zones (under Section 745(c)(2)). ${ }^{7}$ For example, estimates of bill and load impacts for selected customer segments (with segments developed using data from the commercial databases available at each IOU rather than from survey data) could be produced and compared with bill and load impacts from the opt-in pilots (using control group customers for reference loads and reference bill distributions) to determine whether there are significant differences that might influence the interpretation of hardship information from the opt-in pilots.

Given the primary objectives of the default pilots, the TOU WG agreed that the surveys for the default pilot would not need to be as extensive as the well designed, but costly, surveys used in the opt-in pilots to address hardship. If hardship questions were incorporated into the default

[^9]surveys that are currently planned, there would be concern about the validity of the findings unless the survey plan was modified. In the proposed default pilot design, there is no need to survey control customers to compare their behavior to the treatment groups, but such surveys would be useful to determine whether TOU rates cause unreasonable hardship. However, unlike in the opt-in pilots where participants were randomly assigned to treatment and control conditions after enrolling in the pilot and all groups were paid attractive incentives to respond to the survey, control group customers in this default setting won't even know that they are technically participating in the pilots. Surveying control customers in order to compare their answers to hardship-related questions to answers from customers on TOU rates would raise a concern about response bias, since customers in the control group may respond to surveys at different rates and potentially for different reasons from those who are on the default rates. Expanding the survey to include control customers would significantly increase pilot costs.

Finally, even if surveys were conducted to assess unreasonable hardship in the context of the default pilots, in order to provide information in time to influence decisions about exclusions that might be applied for default enrollment in 2019, the assessments of unreasonable hardship would only be based on summer data in 2018, not a full year's worth of data. Assessing unreasonable hardship based on summer months may be misleading because what most customers experience over the course of a full year is different from their experience over the summer months. This timing issue also applies to estimates of bill and load impacts.

These concerns about the utility of surveys and the validity of data collected from such surveys regarding hardship pertain to the information that can or cannot be collected under the parameters that the TOU Working Group have been given. They are not intended to address the policy decisions that must be made by the Commission after the pilots are completed. While there is widespread agreement that the most comprehensive assessment of whether or not TOU rates create unreasonable hardship will come from the opt-in pilot surveys that were developed specifically for that purpose, it is also understood that relevant information from the default pilots may be used to inform the Commission's final Section 745 decision. The IOUs plan to include more discussion of how each of their default pilot plans should address these important issues in their December 16, 2016 Advice Letters.

It should be noted that the default pilots' ME\&O tests will be large enough to examine how different customer segments react to default TOU. If senior citizens and economically vulnerable customers in hot climate zones are included in the default pilot and identified through the ME\&O surveys, useful information may be obtained concerning how best to communicate with these customer groups and their reactions to default TOU. In addition, the detailed analysis conducted on unreasonable hardship in the opt-in pilots, which will be available in mid-2017, can be used to inform the evaluation of the ME\&O survey responses.

Another research objective that could be explored through the default pilots concerns enabling technology. The opt-in pilots have included several technology treatments and are expected to provide useful information on this important topic. As will be seen in Sections 4 through 6, none of the IOUs have included technology treatments in their default pilot plans.

During the default pilot planning, the TOU Working Group had several discussions about whether to include tests of the impact of enabling technology on load impacts, customer retention and other potential metrics. Some stakeholders felt strongly that enabling technology should also be included in the default pilots. Indeed, the Environmental Defense Fund (EDF) commented that "the provision of technology should be treated with robust experimental design to measure how technologies (and other) mitigation strategies predict bill impact mitigation and customer satisfaction." Siemens indicated that "in a tech-enabled world where so much of our daily activities is automated; it would be an aberration to take a non-tech approach to energy consumers. At the very least, an app should be made available to all participants to study uptake and response (among the users)."

While it is understood that the impact of technology on demand response, customer retention and other metrics for customers on TOU rates is an important issue, there are several reasons why the IOUs decided not to explicitly test new technologies in the default pilots, a decision with which Nexant agrees. One is that the complexities inherent in deploying technology assessments as part of the pilots could cause a delayed launch of the default pilots that, in turn, could jeopardize the CPUC's 2019 target for a full launch of default TOU. A second reason is that useful insights regarding the impact of and interest in new technologies, such as smart thermostats, will be obtained through the opt-in pilots. Third, each utility has and continues to conduct numerous other pilots of such technologies, some of which will run concurrently with the default pilots in 2018. While most of these technology pilots are not being done in conjunction with TOU pricing, they provide useful insights concerning load impacts and customer engagement with technology that may be partially transferrable to a default TOU setting. Finally, and very importantly, there will be ample opportunity to examine the impact of technologies for TOU customers after default rates are fully deployed. Unlike tests focused on default notification, for example, which must be done prior to full default, technology tests can be done after full default occurs. Furthermore, technology will continue to evolve and, as such, will demand testing on an ongoing basis regardless of any findings that might be produced in a one-year, default pilot. For all of these reasons, rigorous technology tests have not been included in the default pilots summarized in Sections 4 through 6.

Nevertheless, technology may be offered to pilot customers in conjunction with existing or planned utility programs. Indeed, if the AB 793 programs recently filed by the IOUs for implementation in 2017 are extended into 2018, Nexant sees no reason to exclude TOU customers from participation in these and similar offerings as long as they are offered equally to treatment and control customers.

### 2.2 Report Organization

The remainder of this report is organized as follows. Section 3 contains an overview of the numerous treatments that will be implemented across the three pilots and a summary of issues that were discussed during the WG process and how each issue will be addressed in the pilots. Sections 4 through 6 summarize the pilot plans for PG\&E, SCE and SDG\&E, respectively.

## 3 Pilot Treatments and Key Issues in Pilot Design

The prior section summarized the primary objectives for the default pilots that are described in detail in Sections 4 through 6. This section provides a high level summary of the pilot treatments that will be deployed to address the objectives outlined in Section 2, the metrics that will be used to determine the relative effectiveness of the various treatments, and a variety of technical and practical issues that must be addressed.

### 3.1 Pilot Treatments

The treatments that will be tested across the three default pilots comprise several different TOU rates and numerous ME\&O options for default notification, welcome information and ongoing education and outreach. The impact of a level pay plan as a means of reducing bill volatility across rate seasons will also be examined. These treatments are summarized briefly below and in more detail in Sections 4 through 6.

### 3.1.1 Rate Treatments

As indicated in Section 2, testing different TOU rate options was a key focus of the opt-in pilots but is not the primary focus of the default pilots. As such, PG\&E plans to default all customers onto a single TOU rate-its approved ETOU-A rate-which is currently available to all residential customers on an opt-in basis. This tariff has a four-month summer season (June 1 through September 30), two rate periods during weekdays, with the peak period from 3 PM to 8 PM throughout the year, and a baseline credit. ${ }^{8}$ Using this already-approved rate during the default pilot has significant advantages because it is already programmed into PG\&E's billing system, including for both net energy metered (NEM) customers and Community Choice Aggregator (CCA) customers. Since NEM and CCA customers will be included in PG\&E's default pilots, using E-TOU-A reduces lead time and simplifies interactions with CCAs and their customers.

SCE plans to test two different default rates. Each proposed tariff has two rate periods on weekdays in summer and three rate periods in winter. One tariff has a five-hour peak period on weekdays in the summer (June 1 through September 30) from 4 PM to 9 PM and the other has a three-hour peak period from 5 PM to 8 PM. On weekends, the same peak periods apply but the peak-period price is less than on weekdays. In winter, the peak period is the same as in summer and prices during the peak period will be lower than in the summer. The off-peak period is from 9 PM to 8 AM for both tariffs and the shoulder period is comprised of the remaining hours. The specific prices in each rate period are still being developed but it is expected that the tariff with the shorter peak period will have higher peak-to-off-peak price ratios than the other tariff. Both of these tariffs will include a baseline credit and will have more modest structural bill impacts than the TOU rates tested by SCE in the opt-in pilots. As discussed further in Section 5, SCE currently plans to default about half of its default pilot sample onto each rate option. Observing opt-out rates for the two tariffs for two randomly selected customer samples will

[^10]provide all three IOUs and interested parties with very useful insights into customer preferences for shorter peak periods in return for higher price differentials. Estimating average load impacts for each rate and combining that data with observed attrition will determine which tariff produces the greater aggregate impacts over selected hours.

SCE had initially proposed to develop three TOU rates to test in its default pilot, and further initially suggested it would like to default customers onto the best rate option for them based on a comparison of bills under each tariff using pre-enrollment interval data. If the best rate were the OAT, customers would be enrolled on the best TOU rate option unless they opted out. This approach to default enrollment would have maximized the number of structural benefiters compared with an approach that defaults all customers onto a single TOU rate. However, doing so would also generate the greatest amount of lost revenue compared with the single default rate alternative. The Office of Ratepayer Advocates (ORA) objected to this proposal. In addition, ORA objected to SCE's initially-proposed rates because two of the three rates did not include a baseline credit and included higher fixed charges than the OAT, which would be in conflict with the requirements for default TOU laid out in D.15.07.001. In response to these objections, SCE decided to test the two rates outlined above and, as indicated, to default half the test population onto one rate and the other half onto the other rate.

SDG\&E also plans to test two different rate options that are structurally the same as the two tariffs tested by SDG\&E in the TOU opt-in pilots. The majority of customers will be defaulted onto a TOU rate that is more cost-based than the other rate, with higher peak-to-off-peak price differentials. This tariff will have three rate periods with the peak period running from 4 PM to 9 PM and the partial peak period running from 6 AM to 4 PM and from 9 PM to Midnight on weekdays. A smaller group of customers will be defaulted onto a two-period rate with somewhat milder peak-to-off-peak price differentials. The second rate will have the same peak period as the first. For both rates, the summer period spans six months, from May 1 through October 31. The TOU periods are the same all year.

### 3.1.2 Default Notification Treatments

Each utility will test multiple notification treatment options in order to understand the impact of different notification approaches on pre-enrollment opt-out rates, customer awareness, call center activity and notification costs. The objective of these various tests is to optimize the notification approach for full roll out of default TOU targeted for 2019. An optimized approach would be one that maximizes awareness of the rate change at reasonable cost. This definition of optimum contrasts with an alternative possible definition, which would be to minimize opt-out rates at reasonable cost. The reason the latter cannot be the primary objective is that the best way to minimize opt-outs at the lowest cost would be not to notify anyone at all. Obviously, doing so would not be appropriate. By the same token, it may not be appropriate or sound policy to set a target of a very high or even $100 \%$ awareness level without regard to costs, since achieving that level of awareness would likely only be possible at a very high cost per enrolled customer. By obtaining data on the relative effectiveness and costs of multiple notification options, the IOUs and interested stakeholders will be able to develop communication strategies for default notification based on sound empirical data rather than on qualitative research or assumptions about what is and is not effective in this context.

Notification options vary along several dimensions. One important dimension is the communication channel. All customers can be reached by direct mail (DM) and roughly half of the customers at all three utilities can be reached via email (EM). A third option is "on bill" communication. DM is the most costly channel but may be the most effective in maximizing awareness. EM is probably the lowest cost option but may be the least effective. On-bill communication may be somewhere in between the other two and probably closer in cost to EM but may or may not be as effective. All three options are being explored in various combinations at PG\&E and SDG\&E. SCE plans to use DM only for all customers.

Another dimension of the notification communication is the content and format of the rate comparisons (RCs) that must be provided to each default customer. By rate comparison, we mean information on the difference in bills calculated using the default TOU tariff, the OAT and possibly other available TOU tariffs based on pre-enrollment usage data. Collectively, the three utilities will test three variations in the number of tariffs that are incorporated into the rate comparison information (one, two or three rates relative to the OAT), and the granularity of the rate comparisons (average monthly bill impacts for the year, for the summer and winter rate periods, or monthly).

A third dimension of the default communication is the number of notifications sent and the timing of those notifications. Some customers will receive three notifications (at 90/60/30 days prior to enrollment for PG\&E and SCE and at 6 months, 60 days and 30 or 15 days for SDG\&E) and others will receive just two notifications (at 60 and 30 days).

Finally, default notification tests will be done for multiple messaging strategies at PG\&E and SCE. The specific content and nature of the messages will be determined at a later date. The baseline messaging will take as a starting point the strategies outlined in the ME\&O plans for full default roll out that were recently filed by each IOU. ${ }^{9}$ These plans were developed in parallel with planning for the default pilots and were based in part on work done by the ME\&O Working Group. The ME\&O Working Group also worked with an outside consultancy, Greenberg, Inc. (Greenberg), which produced high-level recommendations relating to both statewide and local campaigns, which were used as input to the IOUs' development of the individual plans they filed with the CPUC via Advice Letters dated November 1, 2016. ${ }^{10}$ Each utility also plans to conduct focus groups and perhaps other qualitative research leading up to the launch of the default pilot to refine their proposed messaging strategies.

The ME\&O Working Group report suggested structuring the messaging and notification strategies around segments defined by the magnitude of the structural benefits or non-benefits associated with moving to the TOU default rate, with a goal of ensuring that nearly all customers who experience large structural increases in their bills are aware of the impending rate change and are provided with sufficient information concerning the impact of that change and the other choices available to them. Indeed, the Greenberg report suggested defining as many as five different levels of non-benefiters and increasing the amount and frequency of information

[^11]provided with increases in the magnitude of structural non-benefits. However, after estimating the distribution of bill impacts associated with the proposed default pilot rates, it became apparent that there were many fewer annual non-benefiters, and very few extreme nonbenefiters, compared to what was assumed when these initial strategies were developed. This analysis also revealed that the number of non-benefiters increases significantly when the analysis is based only on summer usage rather than on usage for the entire year. This analysis raises questions about whether M\&EO strategies for default notification should vary across segments defined around structural benefits and non-benefits and, if so, whether the segments should be structured around just summer bill impacts or around annual bill impacts. These issues remain open at this time and each IOU's December 16, 2016 proposal may take a different path in this regard. As seen in Sections 4 through 6, the default notification test plan currently does not emphasize ex ante segmentation; rather the test plan involves large sample sizes for each rate treatment, so that ex post analysis of how impacts vary across customer segments structured around bill impacts can be done.

### 3.1.3 Welcome Information Treatments

Welcome information will be provided to each customer shortly after they begin to take service on their default pilot rate. The content of such information will be determined by the IOUs at a later date. The intent of this information is to ensure that customers: understand that they are now on a new rate, are knowledgeable about the structure of the rate, and have information about how to manage their energy use and costs on the new rate. Welcome packages may also highlight that customers' bills will vary across months and seasons, perhaps more so than under their prior, monthly tiered tariff. As a result, the packet will highlight information and tools that are available to help manage bill volatility. In addition, customers will be reminded that they will receive bill protection for the first year on the default TOU tariff, which means that if their bills are higher than they would have been under the OAT, they will receive a rebate at the end of the year (or sooner if they opt-out before the end of a year).

The primary welcome package treatments being tested across the three IOUs include variation in delivery channels (e.g., direct mail and/or email) and formats (e.g., a standard business letter versus a brochure or similar format). Another treatment will test the impact of providing an energy efficiency device (e.g., an LED, a smart plug, etc.) along with the welcome information. Comparison of results from these variations will provide useful insights into what approaches work best to increase readership, understanding, awareness and satisfaction.

### 3.1.4 Post Enrollment Education and Outreach

Education and outreach will not end with the information provided in the welcome packages sent to participants shortly after they are enrolled on their default TOU pilot rate. Information designed to help customers reduce their bills under TOU rates and tools to help manage bill volatility across months and seasons will continue to be offered after the initial transition to default TOU. Variations in post enrollment education and outreach will be examined through the default pilots.

Collectively, the three IOUs will examine the impact of four different types of post enrollment education and outreach. One potentially useful tool for managing variation in bills across months
and seasons is the existing level pay plans (LPP) ${ }^{11}$ offered by the IOUs. Significant variation in electricity usage occurs across seasons due in large part to summer air conditioning loads and the tiered pricing structure that has been a key structural component of California's electricity tariffs since at least the 1970s. As such, each IOU offers a program that allows customers to pay the same amount each month based on historical average usage, with adjustments to these payments (referred to as "true up adjustments") depending on the magnitude of differences between historical and current usage. Across the three IOUs, roughly 400,000 residential customers are already on level pay plans today.

Under TOU rates, the variation in residential bills across seasons may increase and most customers may see higher bills during summer months and lower bills during non-summer months compared with their bills on the OAT. As such, many more customers on TOU rates may benefit from participating in an LPP program and increased participation could reduce optout rates during summer months. However, there is concern that seeing constant bills each month could hide or diminish the price signals that are inherent in TOU rates and that are hoped will drive changes in consumer behavior, such as reducing peak period usage. The likely customer response to more accurate time-of-day price signals is one of the key reasons for implementing default TOU pricing in the first place. In order to test whether there might be greater interest in LPP for customers on TOU rates, as well as to estimate the impact of LPP on opt-out rates (especially during the summer) and demand response, each IOU will develop an enhanced encouragement campaign for LPP that will be offered to some default pilot customers and not to others.

Another after-care treatment that will be examined through the default pilots is an educational campaign designed to encourage the use of existing technology that is widespread among California households that have central air conditioning-the programmable thermostat (PT). While there is much focus and interest in smart thermostats (which have not yet become widely adopted, but are starting to gain penetration in the residential population), almost 70\% of current households with central air conditioning in California ${ }^{12}$ already have a programmable thermostat that allows them to vary the temperature setting across the hours of the day. ${ }^{13}$ This existing technology could be used to adjust thermostat settings during peak periods and help reduce bills for customers on TOU rates. Whether many customers would think to do so, go to the trouble of doing so, or know how to do so, is unknown. To determine this, SDG\&E plans to offer an educational campaign focused on helping participants use their existing PTs to better manage their energy costs. In order to measure the impact of this campaign, SDG\&E will offer the educational campaign to a random sample of TOU participants and not offer it to others.

[^12]A third after-care treatment that will be examined is variation in the quantity and type of information provided. To this end, SCE will develop what they describe as "high touch" and "low touch" after care strategies and assess the impact of those alternatives on customer retention, customer satisfaction, understanding of rates and how to reduce bills under TOU rates and perhaps other relevant metrics. The specific content and frequency of communications for the high and low touch strategies will be determined at a later date.

The final after-care treatment that will be examined through the default pilots concerns whether messaging tailored to psychographic personas or other segmentation characteristics is more effective than a generic messaging strategy. This treatment will be tested at SDG\&E by offering the tailored strategy for after care communications to a random sample of customers and the generic strategy to another random sample and comparing evaluation metrics such as customer satisfaction, understanding of rates, etc. across the treatment populations.

### 3.2 Evaluation Metrics and Methods

The purpose of these pilots is to rigorously determine how the various treatments influence key outcomes of interest. This section summarizes the outcomes, or metrics, of interest and describes the basic approach to gathering and analyzing data that will produce these metrics.

As indicated in Section 2, the overarching objective of these pilots is to assess each IOUs capabilities and readiness to support full scale implementation of default TOU pricing in 2019. While the time period over which all residential customers will be transitioned to default TOU pricing is currently unknown, as discussed below in Section 3.5, it is safe to say that under most scenarios, the number of transactions that each IOU will need to process in a relatively short time period exceeds anything that the IOUs have had to manage in the past. The pilots will help each IOU to identify potential bottlenecks or systems issues they may encounter when processing these high volume transactions and to determine what staffing will be needed for essential services (e.g., the call center) in order to maintain service quality and support customer satisfaction when default TOU is rolled-out to millions of residential customers statewide.

Operational readiness will largely be assessed through tracking and monitoring of transactions and problems that arise during the notification and enrollment periods and in conjunction with the initial bills that are sent out for enrolled customers. The complete list of operational performance metrics will be determined closer to pilot launch but is likely to include:

- Opt-out/rate change volume and the timing of rate change requests relative to the timing of default notification communications;
- Volume of rate changes by communication channel (e.g., the number that come in via the call center, that are done online, and that are submitted via business reply card if that option is made available, etc.);
- Processing time for rate changes;
- Percent of rate change requests that are processed by the targeted change date (e.g., next billing cycle after request);
- Volume of billing exceptions and the labor hours required to address them; and
- Call volume by type of call (e.g., opt-out request, inquiries about what is happening, etc.).

All but one of the metrics listed above are primarily of interest for the overall pilot, not for individual treatment conditions. The one exception is call volume. While total call volume is very important, it will also be necessary to monitor variation in call volume across selected test cells, since call volume might vary with the nature of information provided in the default notifications (e.g., could be higher for monthly rate comparisons because of the confusion factor than for annual or seasonal rate comparisons or lower for email notifications that provide a link to a self-service website for opting out compared to direct mail that might drive up call volume to process rate changes, etc.).

Key metrics for evaluating the other primary objectives include:

- Opt-out rates from the default TOU rate (separately tracking customer churn and proactive rate changes) prior to and after enrollment at various points in time (e.g. monthly, quarterly, etc.);
- The percent of customers that choose the rate option with the lowest projected structural bill amount (based on the structural rate comparisons that are provided or conducted for each customer);
- Customer awareness that they will be or have been (depending on timing of the awareness survey) defaulted onto a TOU rate;
- Customer satisfaction;
- Other customer perceptions concerning issues such as fairness;
- Usage behavior or changes in usage behavior reported in surveys;
- Feedback on the various treatments and changes to the treatments that might be of interest to consumers (e.g., would prefer seasonal RCs over monthly RCs); and
- Load impacts by rate period.

The first two metrics will be determined by tracking opt-out rates prior to and following enrollment on the default rate and comparing the choices made to the "best rate" choice based on the structural bill analysis (or rate comparisons) that will be done for each customer. It should be noted that no judgment is being made here about whether the best outcome from a policy perspective is to have more customers stay on the default TOU rate even if their bills would be lower on the OAT or on some other tariff, based on their historical usage. The key point is that it is important to track choices in this manner so that policy makers and other stakeholders can have useful information to guide future policy.

Assessments for the next five metrics will be based on survey data and a randomized control trial design (RCT) for the treatments. As discussed in detail in Sections 4 through 6, the majority of treatments summarized in Section 3.1 will be applied to random samples of customers and differences in the outcome metrics between two test cells will be calculated. For example, one random sample might be notified three times (at 90, 60 and 30 day intervals) and another random sample might be notified twice (at 60 and 30 day intervals). Given the RCT design, any difference in opt-out rates, awareness or other metrics between these two groups can be
attributed to the difference in the treatment which, in this example, is a difference in the number of touches. In the following sections of the report, we delineate in detail the specific research questions that the pilots will answer and the numerous two-way comparisons across test cells that will be done to answer those questions.

Awareness is one of the most important metrics for assessing the relative effectiveness of different treatments in the proposed pilots and for putting other key metrics, such as opt-out rates, into the proper perspective. A low opt-out rate, which some consider to be a desirable outcome for default TOU, could be caused by two very different factors, one favorable and the other not. The favorable explanation for a low opt-out rate is that all those who stay on the rate consciously choose to do so. The alternative, unfavorable explanation for a low opt-out rate is that few people were aware that their rate had changed. In order to determine how much of the observed opt-out rate is caused by each of the above factors, it is necessary to know how many participants were aware that their rate had changed and that they could opt-out to an alternative rate. In other words, it requires determining awareness among the population of customers who stay on the default rate (awareness can be assumed for those who choose to opt out). This can only be known through a survey of the participant population.

When conducting surveys in conjunction with experiments such as those that will be implemented, it is imperative that rigorous, scientific survey methods be applied. ${ }^{14}$ Low response rates and differential response across treatment groups can completely invalidate any findings that are obtained from surveys and undercut the rigorous RCT design of the pilots. Information obtained from surveys with response rates in the single digits, or even ones much below $50 \%$, is highly likely to be biased and unrepresentative of the study population as a whole. If response rates differ significantly across treatment options that are being compared, this could produce misleading information and lead to erroneous conclusions. For example, if the objective is to assess how awareness differs across two notification strategies and if, for example, aware customers are more likely to respond to surveys than unaware customers, any observed difference in awareness across the two treatments could be due, at least in part, to differential response bias across the treatment groups. For purposes of evaluating the numerous treatments in these pilots, it is imperative that each IOU employ scientific survey research methods designed to maximize response rates and minimize response bias. Simple survey methods that often produce response rates of $5 \%$ or $10 \%$ are not acceptable for these purposes. Nexant strongly recommends that each IOU request funding that will support use of these more expensive but essential survey methods.

Load impacts will be estimated based on a randomized encouragement design (RED) and analysis. An RED is similar to an RCT in terms of the ability to produce impacts that are internally valid. Internal validity means that the only explanation for a difference between the treatment and control groups is the treatment itself or random chance. With an RED design, the study sample is randomly divided into two groups. One group is offered the treatment and the other is not. Among those offered the treatment, some will take it and others will not. With an RED, impacts for those who accept the treatment offer are estimated through a two-step

[^13] Mode Surveys: The Tailored Design Method. Fourth Edition, 2014 by Wiley Press
process. In the first step, the difference in the outcome variable of interest is calculated by taking the difference in the variable for the treatment and control groups, where the treatment group includes both those who accept the treatment and those who decline it. This estimate is called the intention-to-treat (ITT) impact. In the second analysis step, the ITT estimate is divided by the percent of the encouraged (or treatment) group who take up the offer. This value represents the impact for those who took the treatment. ${ }^{15} \mathrm{~A}$ conceptual overview of the RED design and analysis for estimating load impacts is shown in Figure 3-1.

Figure 3-1: Design and Analysis Schematic for an RED Experiment


An RED will be used not only to estimate load impacts for each TOU rate included in the pilots, but also to determine various outcome metrics for the LPP-enhanced encouragement treatment, including whether LPP programs increase retention and/or change the average load impact on the rate as some hypothesize they might. Differences in opt-out rates, customer satisfaction and load impacts will be estimated using an RED analysis for the encouraged and non-encouraged LPP groups. An RED analysis will also be used to determine if load impacts differ for customers who receive education about using their programmable thermostats (PTs) to manage their energy use in SDG\&E's after-care PT education campaign.

[^14]
### 3.3 Sampling

The sampling strategies for the proposed pilots are driven by several factors. In the opt-in TOU pilots, the overall sample size for each IOU was based on a bottoms-up assessment of the required sample sizes for each treatment and customer segment of interest, the type of evaluation metric of interest, and the desired level of statistical precision for each metric. Each sample point was costly to acquire given the participation incentives offered for the "pay-to-play" experimental design that was used in the opt-in pilots so it was very important to optimize the sample based on rigorous power analysis and a complex sampling strategy and recruitment plan focused on ensuring that there was sufficient participation by segments of interest. The total cost for the opt-in pilots was driven to a large degree by the size of the sample.

For the default pilots, sample points are much less costly to acquire and the overall sample size for each utility is driven by the need to stress test the operational systems that will be used for the system wide roll out of default pricing in 2019. Each IOU was asked to indicate how large the number of default pilot participants would need to be in order to assess operational readiness. PG\&E and SCE indicated that sending default notifications to roughly 250,000 to 300,000 customers would be sufficient and SDG\&E indicated that sending notifications to between 125,000 and 150,000 customers would be sufficient (in light of its smaller residential population). Shortly before this report was completed, SCE decided that it would send notifications to roughly 400,000 customers over roughly a two week period. PG\&E and SDG\&E plan to send out all notifications over a one or two-week period to simulate the rate at which customers may need to be defaulted each month for the full rollout of default TOU starting in 2019.

While the overall sample size is based on the requirement to assess operational readiness as summarized above, the sample size for each treatment group is based in large part on a top down allocation of the total sample to the treatment test cells. For example, if there were 20 notification treatment test cells and 250,000 customers were to be notified in order to test operational readiness, a simple sampling plan would be to divide the notification treatments equally across the sample population so that each treatment would be offered to a randomly selected group of 12,500 customers. With sample sizes this large for each test cell, it will be possible to determine outcomes for metrics of interest that are available for all customers (such as opt-out rates and whether or not a customer contacts the call center), with a very high degree of precision, even for small customer segments of interest. As indicated in the opt-in pilot design report ${ }^{16}$ (see Section 3.3.3 of the opt-in pilot design report), detecting differences in binary variables of this type with reasonable statistical precision only requires 100 or 200 sample points.

Where a bottoms-up sampling plan is needed is in determining how many surveys must be done for each test cell in order to estimate differences in awareness, customer satisfaction and other survey-based metrics across treatments. For the opt-in pilots, a minimum sample size of 250 was used for survey-based metrics and the same minimum sample size for completed surveys is recommended here. However, this does not necessarily mean that

[^15]only 250 completed surveys will be adequate for each test cell. The required sample size for each test cell will need to be set based on consideration of the size and number of customer segments for which there is interest in estimating survey-based metrics. For example, if there is interest in knowing how the level of awareness differs for CARE customers and non-CARE customers for a specific treatment, the required number of completed surveys would be closer to 600 , assuming that roughly $40 \%$ of the population was CARE customers. If the survey response rate was $50 \%$, this would require sending out 1,200 surveys for each test cell of interest.

In the TOU WG meetings focused on producing the default pilot plans, there was minimal discussion concerning the extent to which key evaluation metrics are needed for selected customer segments. Nexant recommends that each IOU take into consideration the number and size of customer segments of interest, and set the size of its survey plan and budget accordingly while factoring in the expected survey response rate.

The large sample sizes that will be employed in the default pilots will support estimation of load impacts and differences in load impacts across treatments with a very high degree of statistical precision, although load impacts are not very relevant metrics for many of the test cells. For example, there is no intent to determine whether load impacts might vary across the numerous samples of customers who enroll based on the different default notification test cells. Load impacts will be estimated for the enrolled population as a whole for each of the five rate options being tested across the three IOUs, for the enhanced LPP encouragement groups at each IOU, and for the PT education group at SDG\&E, at a minimum. There may be interest in seeing how load impacts for each rate or for the LPP or PT encouraged groups vary across customer segments or climate regions within one or more of these test groups. For example, there could be interest in knowing whether the load impact for structural benefiters was different from the load impact for non-benefiters or knowing how load impacts for CARE and non-CARE customers differ.

Load impacts for these and other segments that can be identified using pretreatment, nonsurvey data can all be determined using the two-step RED analysis described above by first segmenting both the treatment and control groups (where the treatment group includes those who opt-out) according to segment characteristics. The number and size of the customer segments of interest for load impact analysis should be considered when deciding how large the sample size should be for the default pilot control group that will be used for impact estimation. The most conservative approach in this regard would be to treat the entire population of eligible customers who are not given default notifications as the control group. However, this population is far larger than necessary to estimate any impacts of interest with precision. Another approach that offers significant flexibility to estimate impacts for almost any segment of interest identified after the fact would be to draw a random sample for the control group equal in size to the sample drawn for the treatment group. In this instance, that would mean choosing a sample of 250,000 customers for the control group in PG\&E's service territory, for example. With this approach, if there was interest in knowing what load impacts are for large structural benefiters who might only comprise $2 \%$ of the overall population, for example, there would be enough sample points in both the treatment and control groups to
estimate load impacts for this small group with reasonable precision. If, on the other hand, the smallest customer segment of interest comprised $20 \%$ of the default population (or 50,000 customers in this example), it would be possible to support this analysis using a smaller control group, even if the opt-out rate for this segment was high. ${ }^{17}$

Nexant recommends that each IOU initially draw a control group sample equal in size to the sample that will receive notification offers (e.g., roughly 400,000 customers for SCE, 250,000 for PG\&E and between 125,000 and 150,000 customers for SDG\&E). This is recommended for two reasons. First, the opt-out rate by customer segment will not be known until after pilot customers have actually been enrolled on their default rates (and will change over time). Second, there has been little discussion in the TOU WG regarding the customer segments for which load impacts may be of interest. Once the initial opt-out rates are known, and after deciding which segments are of interest for load impact estimation and knowing how large these segments are, the initial control group could be reduced in size through random selection among the original sample, taking into consideration the desired level of precision for the segments of interest.

### 3.4 Inclusions and Exclusions

This subsection summarizes the customer groups that will be excluded from participation in the default pilots, and the reasons for those exclusions, as well as specific segments of interest that will be included.

Pub. Util. Code Section 745(c)(1) excludes certain customers from being defaulted onto TOU rates without their affirmative consent. Customers expressly excluded from ever being defaulted onto TOU rates are those: (1) who receive a medical baseline allowance, (2) who have requested third party notification pursuant to subdivision (c) of Section 779.1, and (3) those that the Commission has ordered cannot be disconnected from service without an inperson visit from a utility representative (D. 12-03-054, March 22, 2012). These groups will be excluded from the default pilots.

As to the latter group, the cited CPUC decision (D.12-03-054) indicates that the vulnerable customer group that cannot be disconnected without an in-person visit includes Medical Baseline customers, Life Support Customers, and a broader group defined as follows (p. 30): "customers who certify that they have a serious illness or condition that could become life threatening if service is disconnected. We do not require the customer to produce a physician's statement in support of the certification; i.e., customers may self-certify as to the illness or condition." The decision goes on to further analyze this group and specifically notes that it is broader than the group of customers eligible for medical baseline, stating "the medical baseline designation alone may not be adequate to protect at-risk customers." This latter point recognizes that there are many households containing individuals who are not enrolled

[^16]in programs such as medical baseline even though they might qualify or because they do not use above-average amounts of electricity.

IOU databases identify customers with medical baseline allowances, those that require third party notification, and those that have previously been determined to require an in-person visit prior to disconnection. These accounts will be excluded from the pilots because they are not subject to default TOU. During TOU Working Group meetings, the Center for Accessible Technology expressed concerns that there might be households that include disabled individuals that are not enrolled in medical baseline programs or that may include individuals who have not previously been identified but who would be subject to an in-person visit prior to disconnection. As such, language was included in the recruitment materials for the opt-in pilots asking participants to self-certify at the time of enrollment into the pilot that losing power due to nonpayment would not put their health or safety at risk. Similar language could be included in the notification communications for the default pilots.

Pub. Util. Code Section 745 also allows the CPUC to potentially exclude other customer groups from default enrollment on TOU rates. Specifically, Section 745(c)(2) provides that "the commission shall ensure that any time-of-use rate schedule does not cause unreasonable hardship for senior citizens or economically vulnerable customers in hot climate zones." The CPUC has set forth a process by which it will make a determination on this issue, based in part on results from the opt-in pilots. Issuance of such a decision has been targeted for September 2017. A recent CPUC decision (D.16-09-016) has defined "senior citizens" as any household that has one or more individuals who are 65 years or older and has defined "economically vulnerable" customers as not just those currently enrolled in CARE or FERA programs but also those that are eligible for enrollment but not yet enrolled. How these segments will be identified, if it is determined they need to be excluded from default enrollment for hot climate zones, is yet to be determined. A subgroup of TOU Working Group members was formed to work on practical procedures for implementing these exclusions if the Commission decides that is appropriate. Given the current uncertainty about what the Commission will rule with regard to 745(c)(2), the IOUs will need to wait until the third or fourth quarter of 2017 to finalize the list of exclusions from the pilots and to draw samples for default notification in early 2018.

Another group that will be excluded from default enrollment is customers with fewer than 12 months of usage data. This exclusion is based on Pub. Util. Code Section 745(c)(4), which states that "a residential customer shall not be subject to a default time-of-use rate schedule unless that residential customer has been provided with not less than one year of interval usage data from an advanced meter and associated customer education..." Given the relatively high customer turnover rate (perhaps 20\% per year), this screening criterion will reduce the default population significantly.

For purposes of the default pilots, the TOU Working Group also decided that customers who are currently on a TOU rate (including those on rates that may be closed to future enrollment) will be excluded from being defaulted onto one of the pilot rates. An exception to exclusion of customers on TOU rates is those who participate in the Peak Time Rebate programs at SCE and SDG\&E. These customers will be included in the default sample. Also included are the roughly 150,000 customers on PG\&E's SmartRate critical peak pricing rider. Customers who
participate in the IOUs' demand response programs (e.g., PG\&E's SmartAC program, SCE's Save Power Days program and SDG\&E's Summer Saver program), will also be included in the default pilots, as will NEM customers (except those already on TOU rates).

An important and growing customer segment consists of households that are served through Community Choice Aggregation (CCA). Two of the largest CCAs in the state-Marin Clean Energy (MCE) and Sonoma Clear Power (SCP)—currently serve more than 380,000 customers in PG\&E's service territory and the number of communities they serve is growing. Other CCAs that may form between now and the end of 2018 could, along with MCE and SCP, serve perhaps as many as 750,000 of PG\&E's customers. There has been much less action thus far on CCA formation in Southern California, with the City of Lancaster, serving 45,000 customers, being the only CCA currently operating in the SCE's service territory. There are no CCAs in SDG\&E's service territory.

CCAs are not subject to Commission ratemaking jurisdiction and, as such, are not required to default customers onto TOU rates starting in 2019. Similarly, they are not required to participate in the default pilots. However, MCE and SCP have an interest in implementing default TOU rates for their customers and have agreed in concept to participate in PG\&E's default pricing pilot (subject to approval by each of these CCA's Board of Directors). Representatives from these two CCAs have been meeting with PG\&E and Energy Division representatives to work out the details of their participation. The fact that PG\&E's proposed default pilot rate is its current E-TOU-A tariff facilitates participation by these CCAs, as MCE/SCP already serve some customers on this tariff and, as such, the tariff based on MCE/SCP supply costs has already been programmed into PG\&E's billing system. (PG\&E bills on behalf of all of the CCAs operating within its service territory.) Even though CCAs are not subject to the requirements of Pub. Util. Code Section 745, representatives from MCE/SCP have also agreed in concept to abide by the same exclusions to which PG\&E will adhere for its default pilot. Assuming that CCA Boards approve, PG\&E plans to select MCE/SCP customers at random in the same manner as non-CCA customers and plans to include them in the test cells in proportion to their percentage representation among PG\&E's default population.

Other existing or planned CCAs in PG\&E's service territory that have not agreed to participate in the default pilots include CleanPowerSF, Peninsula Clean Energy, Silicon Valley Clean Energy, Redwood Coast Energy Authority and East Bay Community Energy. Their customers will be excluded from the pilot. A key uncertainty is whether new CCAs will form or existing ones will attract more customers between now and when the default pilot is launched. If a new, large CCA formed after customers were already enrolled on the default rates in 2018, and that CCA decided that their customers would not continue on the default tariffs, this could significantly undercut the number of customers that remained on the TOU rates and potentially compromise (and certainly complicate) impact estimation. Given this, there was a general consensus among TOU Working Group members that customers should be excluded from pilot participation if there was a reasonable likelihood that the city where they live might become a CCA during the pilot. Which cities will be put on this list of exclusions due to the risk that they will become CCAs during the pilot will be determined at a later date closer to pilot launch so that there will be greater clarity on the likelihood that a CCA will be formed during the relevant time frame.

### 3.5 Timing

There was significant discussion during the TOU Working Group meetings concerning the time period over which default enrollment should occur and the implications of that timing for how the default pilots should be conducted. The starting position of Energy Division and some other stakeholders was that all customers should be defaulted in a very short time period in 2019, perhaps even within a single billing cycle. This came to be called the "big bang" approach. The starting position of at least one of the IOUs was that there should be a much slower roll out of default pricing that might span three or four years. Energy Division, ORA and UCAN argued strongly that such a long phase-in period would very likely be rejected by the Commission.

Energy Division asked each IOU to submit a list of risks and concerns they would have if a big bang schedule was set. While the phase-in period for full default is still to be determined, there was reasonable consensus among the IOUs that they could successfully implement default pricing for all residential customers over a period of 12 to 16 months. There was broad consensus that regardless of the final decision on default enrollment, most if not all customers in the 2018 pilots would need to be defaulted over a one or two week period in order to stress test systems for operational readiness.

A related issue is the timing of default notification and enrollment. There was general consensus among TOU Working Group participants that customers whose bills are likely to increase during summer months (which is almost everyone) should not be enrolled on TOU rates just prior to or during the summer period. Given this, if full roll out were to be done over a 12 month period, there would likely be a pause for the 4 summer months for PG\&E and SCE, and the 6 summer months for SDG\&E, to avoid defaulting most customers in the summer. This means that many more customers would need to be defaulted during each of the remaining months. For this reason, one IOU suggested a 16 month timeline-so that summer default could be avoided.

Another factor influencing the timing of the default pilots and when full roll out might begin is concern about sending out default notifications during the winter holiday season for fear that fewer customers will pay attention during this period of increased mail traffic and general holiday distraction. This concern argues against defaulting customers in January since doing so would mean that the important 60- and 30-day notifications and rate comparisons would occur in November and December. In light of the above considerations, there was general consensus that the target for enrollment on default rates in the pilot should be the March 2018 billing cycle. This would allow the 60-and 30-day notification materials to be sent in January and February. However, a March launch schedule means that the 90-day initial notifications would occur during the December holiday season. However, Nexant and the TOU Working Group concluded that delaying enrollment until April in order for the initial notifications to occur in January rather than December presented a worse problem, as this would push enrollment too close to the start of the summer period (especially for SDG\&E whose summer season starts on May 1 rather than the June 1 start date for summer rate periods in the PG\&E and SCE tariffs).

### 3.6 Bill Protection

Pub. Util. C Section 745(c)(4) requires that customers defaulted onto TOU rates receive bill protection for the first year. During this period, the total amount paid by residential customers for
electric service cannot exceed the amount that would have been paid under the customer's previous rate schedule. This means that shortly after the end of the 12 month bill protection period, the IOUs will calculate each customer's bill based on interval usage and their prior tariff and compare that value with what the customer actually paid over the prior 12 months. If their actual bill was higher than the bill calculated using their original rate schedule, the IOU would issue a credit equal to the difference in bill amounts.

A question not addressed by Section 745 is whether bill protection should be paid if a customer switches off the default rate prior to the end of the 12 month period or drops off the rate because they move. In decision (D.16-09-016, mimeo p. 38, Ordering Paragraph 5), the Commission ruled that bill protection payments should be made to customers who drop off the rate to enroll on a different rate as well as to customers who leave the default rate to relocate or terminate service.

## 4 Final Default Pilot Plan for PG\&E

This section summarizes the proposed pilot plan for PG\&E. The primary objectives of PG\&E's pilot include:

- Testing operational readiness of all key business processes and systems at sufficient scale to ensure that PG\&E is ready for full scale default in 2019;
- Testing operations and coordination with MCE and SCP to inform CCA involvement in full default starting in 2019;
- Identifying a cost-effective communications plan by measuring how key outcome metrics vary across different ME\&O options for default notification, welcome communications, and ongoing education and outreach. Key metrics include customer rate choices (e.g., elect not to participate in the default pilot and take service on $\mathrm{E}-1$ instead, elect service on PG\&E's opt-in TOU rate, E-TOU-B, or remain on the default pilot rate, E-TOU-A), call center activity, customer awareness, customer satisfaction and perhaps other customer perceptions such as fairness;
- Determining load impacts by rate period for the default rate for selected customer segments and climate regions; and
- Determining the impact of selected customer options, such as a level pay plan (PG\&E's Budget Billing Program), on opt-out rates and load impacts.

To meet these objectives, PG\&E will send default notifications to approximately 250,000 customers in March 2018. PG\&E will test a single default rate, the current E-TOUA rate. This tariff has two rate periods during weekdays, with the peak period from 3 to 8 PM throughout the year. Using this approved rate during the default pilot has significant advantages since it is already programmed into PG\&E's billing system, including for both NEM and CCA customers.

Under E-TOU-A, the vast majority of customers would see relatively modest bill impacts annually, with almost $80 \%$ of customers seeing impacts between $\pm \$ 5$ per month over the course of a year based on pretreatment usage. ${ }^{18}$ However, many more customers will see larger summer bill impacts. Specifically, focusing solely on the 4 months of PG\&E's summer season when peak rates are higher than in winter, roughly $60 \%$ of customers would see bill impacts greater than $\$ 5$ per month and almost all of the remaining $40 \%$ would see bill impacts between $\pm \$ 5$. This difference between summer and annual bill impacts highlights the importance of not defaulting customers shortly before or during the summer, as well as testing information and tools that may reduce opt-outs during the summer and help customers manage the higher summer bills.

PG\&E currently plans to include, assuming their continued interest, CCA customers from Marin Clean Energy (MCE) and Sonoma Clean Power (SCP) in the default pilots. While the details of CCA participation are still being worked out, the current plan is to include MCE/SCP customers in proportion to their share of PG\&E's population. Put another way, MCE/SCP customers will not be oversampled. Based on current information, this means there would likely be between

[^17]15,000 and 20,000 MCE/SCP customers defaulted onto TOU pricing in 2018. In addition, MCE/SCP customers will be subject to the same screening criteria as PG\&E's customers, which include screening out customers that have fewer than 12 months of interval usage data at the same location as well any constraints imposed under PU Code Section 745 as delineated above in Section 3.4. As also described in Section 3.4, customers located in cities that have a planned CCA development or expansion prior to completion of the default pilot, will also be excluded from participation to avoid customer confusion.

The remainder of this section summarizes the treatments that are proposed by PG\&E for default notification, welcome information, and ongoing communication. Enhanced encouragement for PG\&E's Budget Billing Program (BBP) will also be tested for a subset of default customers to estimate its potential impact on opt-out rates and load impacts. Yet to be determined is whether to provide enhanced encouragement for Budget Billing at the time of notification, in conjunction with the welcome information, as part of ongoing communication leading up to the summer period, or at multiple points along the way.

### 4.1 Tests for Default Notification

Figures 4-1 and 4-2 illustrate PG\&E's test plan for default notification. The proposed plan involves tests for 13 different combinations of delivery channel, messaging, granularity of rate comparison (RC) information, frequency of notifications, and customer segments. There are two customer segments of interest. Segment 1 is comprised of customers that receive paper bills as well as paperless billed customers for whom PG\&E does not have an email address (which is a small group). These customers can be reached through direct mail or through on-bill communication (referred to in the figure as an "onsert"). Segment 2 is comprised of customers that have elected to receive paperless bills and for whom PG\&E has email addresses. This group can be communicated with via email and direct mail. Preliminary data on the above segments indicates that Segment 1 accounts for roughly $64 \%$ of PG\&E's residential customers and Segment 2 accounts for roughly $36 \%$ of PG\&E's customers.

While the number of test cells (13) shown in the figures is large, it does not represent the full factorial design that would test every combination of relevant variables and customer segments. Nexant believes that the specific combinations proposed here will provide a robust outcome database that can be used to develop a cost-effective notification scheme for maximizing awareness at reasonable cost during full scale deployment of default pricing. This plan will also allow PG\&E to properly staff its call centers and size its business support systems for full default. PG\&E's significant focus on testing different notification options is driven, in part, by the fact that results from these tests will be available in time to influence what will be done in 2019 when full default occurs.

Figure 4-1: Notification Tests for Segment 1 Paper Billing + Paperless Billing wlo Email


Figure 4-2: Default Notification Tests for Segment 2 Paperless Billing Customers with Email


In Figure 4-1, tests A through E involve communicating with Segment 1 customers up to 3 times, at 90,60 and 30 day intervals, prior to default enrollment. In test $A$, the initial communication at 90 days prior to default includes the rate comparisons that show bill differences associated with being on the default rate and on the non-time varying rate. In tests $B, C$ and $D$, the rate comparisons are provided 60 days prior to enrollment. The difference between tests $B$ and $C$ is that one provides the rate comparisons through a direct mail
communication and the other provides the comparisons on customers' bills (for paper billing customers). Test D has rate comparisons that show how bills differ under the TOU rate and the available alternatives for the summer and winter months in addition to annually. All of the other test cells in PG\&E's proposed pilot plan to provide rate comparisons for the entire year rather than seasonally. A comparison of opt-out rates between tests C and D, both prior to enrollment and over time, will determine whether the seasonal granularity increases or decreases customer attrition. One possible outcome is that opt-out rates prior to enrollment might be higher with the more granular data as some customers may focus on the higher summer bills, but attrition over time may be lower since customers may also focus on the lower bills in the winter months that lie ahead.

Tests $F$ and $G$ differ from each other in the same way that tests $B$ and $C$ differ, in that one provides rate comparisons on customers' bills while the other uses DM communication. The difference between tests F and G, and B and C, is that the latter two tests include a 90-day DM communication while the former two tests do not.

Test E will involve a different messaging strategy as compared with all the other tests, with the specifics of that difference to be determined through qualitative research that will be completed prior to pilot implementation. Metrics for tests $C$ and $E$ can be compared to determine the impact of differences in messaging.

Figure 4-2, above, shows the planned tests to be conducted for the paperless billing population for whom PG\&E has email addresses. Default notification communications for this customer segment can be provided through DM and EM. A concern that on-bill communications for paperless billed customers could be much less effective than either DM or EM led to a decision not to test it. The communication that includes rate comparisons is provided at 60 days using DM in all tests as PG\&E does not believe it is appropriate to deliver this important information through email only. Across the tests, the 90-day notification varies between EM and DM delivery as it also does for the 30-day notification. A comparison of opt-out rates and awareness for this set of tests will show how these important metrics vary between higher and lower cost communication combinations, which will allow PG\&E to develop a cost-effective communication strategy that maximizes awareness at reasonable cost.

In earlier versions of PG\&E's potential default pilot plan, PG\&E had suggested segmenting customers based on annual and or summer bill impacts and applying different notification strategies across segments, including variation in the number of touches and messaging. In PG\&E's final plan, summarized here, large enough random samples will be drawn for each test cell to allow for post treatment segmentation and for determining how different segments react to the same set of tests. As such, ex ante segmentation and variation in communications across segments is not planned for the default pilots

As discussed in Section 3.3, the proposed sampling strategy for notification tests can be quite simple. While PG\&E may revise the sampling plan closer to pilot launch, one approach would involve a top-down, equal allocation of the default sample to proposed tests. In this instance, given that paperless billing customers comprise roughly $36 \%$ the population, the six test cells for this group (tests H through M) would be allocated across roughly 90,000 customers (250,000
$x 0.36$ ), so each test cell would have roughly 15,000 sample points. Each of the 7 tests done for the Segment 1 population would have almost 23,000 sample points. These samples would support an assessment of how key metrics vary across treatments for a large number of customer segments, even those that might equal only a few percent of the overall population, as long as these segments can be identified from existing data that is available on all customers (e.g., segments defined by the magnitude of structural bill impacts, segments that can be identified from PG\&E's commercial databases such as Experian data, etc.).

Of course, as discussed in Section 3.2, some of the most important metrics of interest, such as customer awareness, understanding, satisfaction and other perceptions, must be obtained through surveys. PG\&E will develop a survey strategy and budget based on careful consideration of the number and size of customer segments for which awareness and other survey-based metrics will be needed and assumptions about expected survey response rates. As discussed in Section 3.2, Nexant strongly recommends using scientific research methods that obtain higher response rates and minimize response bias. While much more costly than more standard survey methods, these scientific methods are essential to obtaining valid results for key metrics such as awareness.

Table 4-1 provides a summary of the research questions that can be addressed for default notification given the pilot plan shown in Figures 4-1 and 4-2 along with the specific comparisons that will address key questions. Each two-way comparison is intended to isolate the research variable of interest across test cells. As indicated above, the pilot plan is not comprised of a full factorial design of all treatment variables and customer segments of interest. Rather, it is a carefully chosen set of tests that will, in some cases, require extrapolating from one customer segment to another to answer questions of interest. For example, the relative difference in opt-out rates and call volume between annual and seasonal rate comparisons provided at 60 days in tests $C$ and $D$ can logically be applied to the opt-out rates for the annual rate comparison provided at 90 days to predict what the opt-out rate would likely be if the 90-day rate comparison includes both seasonal and annual comparisons rather than just annual comparisons.

Table 4-1: Research Questions and Assessment Methods for Evaluation of Notification Options

| Research Question | How Addressed |
| :--- | :--- |
| Does 90-day notification <br> (in addition to 60- and 30-day <br> notifications) materially impact <br> opt-out rates and customer <br> awareness? | Compare opt-out rates for tests B and F, C and G, H and J and I <br> and K |
| How does the communication <br> channel for rate comparisons <br> (RCs) and notifications affect <br> awareness and active choice? | Compare awareness and opt-out rates for tests B and C, F and G, <br> H and I, J and K and L and M |


| Research Question | How Addressed |
| :--- | :--- |
| Does providing seasonal + annual <br> RCs rather just annual RCs <br> materially impact opt-out rates and <br> call volume? | Compare opt-out rates and call volume for tests C and D. The <br> relative impact between these two tests can be applied to the <br> impact in tests A and G to predict the impact based on seasonal <br> rather than the annual comparisons in tests A and G. |
| Does Message 1 materially <br> impact opt-out rates or customer <br> satisfaction compared with <br> Message 2? | Compare opt-out rates and customer satisfaction for tests C and E. |

### 4.2 Tests for Welcome Package Communication

PG\&E plans to test three different formats for the welcome information. The exact content and format of each will be determined based on market research. At a high level, the three options are a designed collateral piece, a form letter and an email. There are two customer segments of interest that differ with respect to the available channels for welcome information communication. One, referred to here as the DM population, can only be communicated with via direct mail while the other, the EM population, can be reached via both email and direct mail. Note that these segments differ from the ones used for the notification tests, which were structured around whether or not notifications could be provided on paper bills. As depicted in Figure 4-3, the email population would get either an email only communication (test cell A) or both a hard copy and email communication (test cells B and C) whereas the DM population would get only direct mail. .

Figure 4-3: Welcome Package Test Cells


Sample sizes for each group above can be equally distributed across all default EM and DM customers or could vary in size across treatments, with smaller test cells used for the more expensive options in order to manage costs. The overall population of test subjects is unknown at this time because it will be a function of how many customers elect not to participate or change rates prior to receiving the welcome packages. For example, if $20 \%$ of customers are not placed on the default rate, the overall sample size for these welcome package tests would be 200,000. Another complicating factor in developing a sampling strategy for these tests is whether opt-out rates for the EM and DM populations are significantly different due to differences in the communication channels tested for each group, which could impact
awareness, or due to differences in the underlying behavior of EM and DM customers, which may differ demographically.

These current uncertainties will be significantly reduced before samples are drawn for the six test groups shown in Figure 4-3. ${ }^{19}$ Based on what is known at the time, PG\&E can decide whether to split the EM and DM populations evenly across the tests done within each customer segment or, for example, draw smaller samples for the design piece delivered via direct mail in order to keep costs down (as designed pieces are more expensive to deliver). Another possibility would be to select a smaller sample for the email only test cell over concern that email only may not be as effective in educating customers. In addition to cost or effectiveness, another important consideration in setting the minimum sample sizes for any of the tests depicted in Figure 4-3 is the number of surveys that will be obtained from each test cell for assessing outcome metrics such as reported behavior changes, customer satisfaction and perhaps others.

Table 4-2 summarizes the research questions that will be addressed for the welcome package tests. As shown, the outcomes of interest for the welcome package include, but may not be limited to, opt-out rates over time, customer satisfaction and other perceptions such as fairness, knowledge of the rates, and changes in customer behavior. Behavior change could be assessed through surveys or by comparing the load impacts for customers that get the different materials. Either way, the estimated impacts would result from a combination of the welcome package, the notification materials, and the ongoing seasonal support (discussed next). However, the relative impact of the welcome package materials can be estimated using the above test cells as the various notification options and seasonal support will be randomly distributed across each welcome package test cell.

## Table 4-2: Research Questions and Assessment Methods for Evaluation of Welcome Package Options

| Research Question | How Addressed |
| :--- | :--- |
| Does the format of the welcome <br> communication impact customer <br> awareness, understanding (e.g. <br> rate knowledge), satisfaction, <br> active choice or call volume? | Compare outcome metrics for tests A and B, A and C, B and C, D <br> and E. |
| Does the welcome package <br> delivery channel impact metrics of <br> interest? | The proposed design does not completely isolate this variable since <br> tests A and B, for example, both include a common channel (email) <br> but B also has a form letter and multiple touches. Tests B and D, for <br> example, include a different number of touches but also have <br> differences in the populations, which may respond differently to the <br> same tests. In other words, differences in channel, the number of <br> touches and the population could all influence observed differences <br> in relevant metrics across tests B and D. |

[^18]
### 4.3 Post Enrollment Education and Outreach

PG\&E is not planning to use its default pilot to empirically test variation in ongoing communications and seasonal support. Instead, PG\&E plans to conduct market research and to rely on findings from existing outreach efforts and the opt-in pilots to guide the content and frequency of communication that will be provided on an ongoing basis. Such communications may be tailored to specific customer segments such as benefiters and nonbenefiters or personas. PG\&E's decision not to test variation in ongoing communication is due, in part, to the fact that any insights gained from such tests would not likely be available in time to significantly influence the initial strategies PG\&E would include in its full default TOU proposal to be filed by January 1, 2018 in the 2018 RDW application required by D.15-07-001. ${ }^{20}$ Also, tests of the impact of variation in ongoing communication on post-enrollment opt-out rates, customer behavior, customer satisfaction, and other relevant metrics can be done through side-by-side tests of various options after full default occurs. As such, there is less need to focus on such tests within the context of the 2018 default pilots.

An exception to this general rule concerns PG\&E's Budget Billing Program (BBP). BBP is a level pay plan that smooths out bill amounts across months in order to help manage monthly bill volatility. This program is currently available to PG\&E customers who want to reduce the bill volatility that currently exists due to variation in usage across seasons and also due to the inherent variability in bills resulting from the increasing block tariffs that exist in California. As indicated by the IOUs' recent initial analyses of bill volatility under TOU rates, the variation in bills across months and seasons may be greater under TOU pricing than under standard tariffs, and most customers will be non-benefiters during summer months. As such, there is concern that many customers who could have lower bills across a year might opt out during the summer period when bills are higher for almost everyone. BBP may be a useful tool for reducing opt-out rates caused by higher summer bills. On the other hand, there is concern that BBP could mask TOU price signals and reduce load shifting during peak periods. As such, it is important to determine not only the impact of BBP on opt-out rates but also the impact on load impacts.

In order to evaluate the impact of BBP on opt-out rates and load impacts, PG\&E will conduct a randomized encourage design (RED) experiment with BBP by deploying enhanced encouragement for a sample of customers (e.g., the "encouraged group") who will be defaulted onto TOU rates. There will be two "non-encouraged" groups of interest. One is the sample of customers defaulted onto TOU rates who do not receive the enhanced encouragement; the other is the TOU control group, which, as discussed earlier, will be drawn for purposes of estimating load impacts for TOU rates. Both of the "non-encouraged" groups will receive PG\&E's normal promotional materials for BBP, while PG\&E will market BBP more strongly to the "encouraged" group.

[^19]What the enhanced encouragement will consist of, and to whom it will be applied, are yet to be determined. Initially, PG\&E had envisioned offering the enhanced encouragement only to a subset of customers that were felt to be highly likely to benefit from BBP based on a combination of prior experience with the BBP program, and the assumption that only customers with a large amount of bill volatility are likely to be interested in BBP. In response, Nexant argued that PG\&E should consider offering it to a sample from the full population through this rigorous RED design so that good empirical data can be obtained on who is and who is not interested within the context of default TOU rates. PG\&E has agreed to offer BPP to a full cross section of customers but may oversample customers that they believe are more likely to benefit based on prior experience or on an a priori assessment of bill impacts.

Also under discussion is when, and how often, to offer the enhanced encouragement. There are several options. One is to do it in conjunction with the default notification communication. Another is to include it in the welcome package materials, and a third is to market it in conjunction with the initial seasonal support communications that will be sent to help consumers prepare for higher bills during summer months. Of course, a truly aggressive campaign could include enhanced encouragement at all three communication junctures. Relevant considerations for deciding how to proceed include not wanting to overload customers with too much information at any one point in time (which could risk key information getting lost among the noise), wanting to give customers all relevant information before they enroll on the rate (which would argue for including it in the notification communication), and timing it to focus on the primary problem it would help address (which would argue for including it in the seasonal tips leading up to the summer period). Currently, PG\&E is leaning toward including such encouragement in the welcome communication. Nexant has suggested that at least some level of information about BBP should be included in all three communications (i.e., notification, welcome package, and seasonal support). Nexant recommends that the primary push for BBP be provided in the initial pre-summer seasonal support communication (after the welcome package). Nexant believes that discussion of BBP in this communication is likely to be more impactful for customers who may experience higher summer bills under TOU than they have previously experienced. It could also remind customers that their bills are likely to be lower in the winter, and give them tips about how to reduce these higher bills by adjusting their thermostats and tips for how to manage the higher bills through enrollment in BBP. PG\&E is considering Nexant's recommendations, and is in the process of determining the encouragement approach it will propose in its default Pilot advice filing on December 16, 2016.

## 5 Final Default Pilot Plan for SCE

This section provides an overview of the proposed TOU default pilot plan for SCE. The primary objectives of SCE's pilot are as follows:

- Test operational readiness for all key business processes and systems at sufficient scale to ensure that SCE is ready for full scale default in 2019;
- Determine how key outcome metrics vary across different ME\&O options for default notification and for post-default communications. Key metrics of interest include opt-out rates, call center activity, customer awareness, customer satisfaction, and perhaps other customer perceptions such as fairness;
- Determine load impacts by rate period for the default rates being tested for selected customer segments and climate regions; and
- Determine the impact of selected customer options, such as a level payment plan (LPP), on opt-out rates and load impacts. ${ }^{21}$

To meet these objectives, SCE will send default notifications to approximately 300,000 customers in March 2018. SCE plans to test two different default rates. Each proposed tariff has two rate periods on weekdays in summer and three rate periods in winter. One tariff has a fivehour peak period on weekdays in the summer (June 1 through September 30) from 4 PM to 9 PM and the other has a three-hour peak period from 5 PM to 8 PM. On weekends, the same peak periods apply but the peak-period price is less than on weekdays. In winter, the peak period is the same as in summer and prices are lower during the peak period than in the summer. The off-peak period is from 9 PM to 8 AM for both tariffs and the shoulder period is comprised of the remaining hours. The specific prices in each rate period are still being developed but it is expected that the tariff with the shorter peak period will have higher peak-to-off-peak price ratios than the other. Both of these tariffs will include a baseline credit and will have more modest structural bill impacts than the TOU rates tested by SCE in the opt-in pilots. SCE currently plans to default about half of its default pilot sample onto each rate option. Observing opt-out rates for the two tariffs for two randomly selected customer samples will provide all three IOUs and interested parties with very useful insights into customer preferences for shorter peak periods in return for higher price differentials. Estimating average load impacts for each rate and combining that data with observed attrition will determine which tariff produces the greater aggregate impacts over selected hours.

Unlike for PG\&E, SCE does not plan to include CCA customers in the default pilots. SCE had preliminary conversations with the only current CCA in its service territory, Lancaster Clean Energy (LCE), which has about 45,000 residential customers. LCE is hesitant to modify generation charges to align with SCE's pilot TOU rate schedules. Both SCE and LCE plan to closely monitor results and operational issues associated with inclusion of MCE and SCP in PG\&E's pilots in order to prepare for full default in 2019.

[^20]While estimating load impacts is not the primary goal of the pilots, estimates of how loads and bills change in response to the TOU rates will be developed using RED analysis as discussed in prior sections. This will require pulling a random sample of customers of roughly equal size to the default sample and utilizing loads from these customers as the reference load for the encouraged group. In addition to testing opt-out rates and load impacts for the two rate options summarized earlier, SCE will test the impact of different education and outreach efforts on opt-out rates, call volume, customer satisfaction, and other metrics. SCE has divided the treatments that will be assessed into two categories; pre-default tests and post-default tests. Pre-default tests are associated with different default notification options and post-default tests focus on after-care communication and customer tools such as LPP.

### 5.1 Pre-default Tests

Unlike PG\&E's plan, which focuses significant attention on default notification communication channels and frequency, SCE's pilot tests will focus primarily on message testing and how seasonal or monthly rate comparison information impact opt-out rates, call volume, and other performance metrics for each of the two rate options that will be included in the pilots. All SCE customers will receive default notifications at 90, 60, and 30 days prior to enrollment to educate and inform them about the planned default, the potential impact on them, and the options available to them. SCE may tailor the content or message used in these communications to selected customer segments, such as structural benefiters and non-benefiters, but does not plan to test the impact of tailored messaging on opt-out rates or other metrics for these segments.

Figure 5-1 shows the pre-default tests that SCE will conduct. As seen, for each rate option, SCE will provide monthly (plus annual) rate comparisons between the TOU rates and the otherwise applicable tariff for one group of customers and will provide seasonal (plus annual) comparisons for another group. For each group, two different messages will be tested. The specific nature of the two messages will be determined at a later date. One possibility is that one message will focus on the savings potential associated with shifting usage to off-peak periods when prices are lower while the other will focus on avoiding higher bills by reducing usage during the peak period. Figure 5-2 provides examples of the difference in messaging that might be tested. This example is meant to be illustrative only and not necessarily what SCE will test. SCE will conduct pre-pilot research to explore different options that may be tested empirically during the pilot.

Figure 5-1: Pre-default Pilot Tests for SCE


Figure 5-2: Illustrative Example of Different Message Types


The sample sizes that will be employed for each of the eight test cells depicted in Figure 5-1 are to be determined. The simplest strategy would be to divide the 400,000 customers that will receive default notifications evenly across the rate options, rate comparison tests, and messaging tests, so that each of the 8 test cells will include roughly 50,000 customers. These are very robust sample sizes that would allow for assessing differences across tests for many customer segments based on ex post analysis. As discussed in Section 3.3, robust statistical tests for binary variables like customer acceptance or call volume can be obtained with only a couple hundred sample points. As such, samples of 50,000 are sufficient to support comparisons across customer segments within each test cell that might comprise only a few percent of the default population.

As discussed in Section 3.3, an important consideration that will impact pilot costs is the size of the survey samples that will be used to assess important performance metrics such as customer awareness. Survey sample sizes are a function of the number of test cells, the number of customer sub-segments for which outcome metrics will be determined, and expected response rates. SCE will develop a survey strategy and budget based on careful consideration of the number and size of customer segments for which awareness and other survey-based metrics will be needed and assumptions about expected survey response rates. As discussed in Section 3.2, Nexant strongly recommends using scientific research methods that obtain higher response rates and minimize response bias. While much more costly than more standard survey methods, these scientific methods are essential to obtaining valid results for key metrics such as awareness.

Table 5-1 summarizes the research questions that can be answered using the pre-default test plan shown in Figure 5-1 and the comparisons that will be made to address these questions.

Table 5-1: Research Questions and Assessment Methods for Evaluation of Pre-default Tests

| Research Question | How Addressed |
| :---: | :---: |
| Do opt-out rates vary across default rate options? | Compare the average opt-out rate for test cells 1 through 4 with the average for test cells 5 through 8 . Comparisons could also be made at the test cell level (e.g., compare tests 1 with 5,2 with 6 , and so on. |
| Do opt-out rates and call volume vary between notifications that include seasonal bill impact estimates (plus annual) and notifications that show monthly bill impacts? | Compare average metric values for test cells 1 and 2 with the average values for 3 and 4 , and the average for tests 5 and 6 with 7 and 8. |
| Do opt-out rates vary with differences in the messaging contained in the notification communications? | Compare opt out rates for tests 1 and 2,3 and 4,5 and 6 and 7 and 8 , plus the average of $1,3,5$ and 7 with the average of $2,4,6$ and 8 . |
| What is the level of awareness associated with SCE's pre-default communications? | This question must be addressed through surveys as discussed above. There is little reason to believe that the level of awareness will vary across the treatments shown in Figure 5-1 because customers are getting the same number of notifications through the same channels in all cases. However, there may be interest in knowing how awareness varies across customer segments such as CARE and non-CARE for example. Since there is no reason to believe that awareness would vary across the eight test cells in Figure 5-1. As such, if, say, 250 surveys are completed for each test cell in order to test other issues that might vary across test cells, such as perceptions of fairness or perceptions about the appropriateness of monthly versus seasonal testing, there would be a total of 2,000 surveys completed for the 8 test cells combined. These responses could be pooled to examine how awareness varies for CARE and non-CARE customers and perhaps other customer segments of interest. |
| How do load impacts vary across rate options? | Load impacts by rate period will be estimated using an RED analysis for each rate option. The large sample sizes for each rate will allow for statistically robust estimation of load impacts for numerous customer segments such as benefiters, neutrals and non-benefiters, CARE and non-CARE, various income segments (using the Axciom data available on all participants), climate regions and others. |

### 5.2 Post-default Testing

SCEs pilot plan for post-default communications will compare relevant metrics for two communication strategies characterized as high touch and low touch. It will also assess opt-out rates and load impacts associated with enhanced encouragement for participation in SCE's LPP program. Figure 5-3 shows the proposed pilot plan for testing these communication strategies and customer tools.

Figure 5-3: Post Default Tests


What constitutes high and low touch and the content of the various communications are to be determined at a later date. The specific content of each strategy and the number of touches employed may vary by customer segment (e.g., may be different for extreme non-benefiters, non-benefiters, neutrals, and benefiters or for other customer segments) but SCE does not plan to empirically test different strategies within these segments. The high and low touch communication strategies will be randomly assigned to the enrolled customer population so it will be possible to determine how different sub-segments respond to a high and low touch strategy.

Opt-out rates and load impacts for customers who opt into the LPP program will be determined using an RED analysis in which some customers will receive enhanced encouragement to enroll in the LPP program and others will not. If enrollment into the LPP program is quite low for the targeted population, it may not be possible to estimate load impacts with reasonable precision using an RED analysis. In this case, a control group can be developed using statistical matching with customers chosen from the non-encouraged population. An important difference in what PG\&E will test for is its Balanced Budget program, which is similar to SCE's LPP, is that PG\&E will apply enhanced encouragement to a full cross section of the enrolled population whereas SCE plans to apply enhanced encouragement to a targeted group of customers that SCE determines a priori are more likely to benefit from LPP. The specific targeting scheme is to
be determined but may, for example, target low income consumers with above average bill volatility (what is described in Figure 5-3 as "impacted" customers).

Relevant metrics for the post-default tests include customer retention, enrollment rates into LPP (and perhaps other tools that can help customers manage bills), customer satisfaction and perhaps other perceptions gathered through surveys and load impacts. An important research question is whether retention and load impacts vary with enrollment in LPP. Load impacts might also be expected to vary between high and low touch communication strategies and certainly across the two rate options.

## Table 5-2: Research Questions and Assessment Methods for Evaluation of Post-default Tests

| Research Question | How Addressed |
| :--- | :--- |
| Do opt-out rates/retention vary <br> between high and low touch after <br> care communication strategies? | Compare opt-out rates/retention at selected times (e.g., after <br> summer, after a full year) for tests 2 23 (properly weighted if equal <br> samples were not used) with tests $5+6$ and for tests $8+9$ with <br> $11+12$. |
| Do load impacts vary between high <br> and low touch communication <br> strategies? | Compare load impacts for the same test pairs as described earlier. |
| Do opt-out rates/retention vary <br> between customers who do and <br> don't enroll on a LPP? | Compare outcome metrics for tests 1 with 2, 4 with 5, 7 with 8 and <br> 10 with 11. |
| Do load impacts vary between <br> customers who do and don't enroll <br> on a LPP? | Use a RED analysis to estimate load impacts for enrolled <br> customers who received enhanced encouragement and enrolled <br> customers who do not receive enhanced encouragement. |
| Do opt-out rates/retention differ <br> between two rate options? | Compare outcome metrics for tests $2+3$ with $7+8$ and for 5+6 with <br> $11+12$. |
| Do load impacts vary across rate <br> options? | Compare load impacts for customers from tests 2+3 and $7+8$ and <br> for tests 5+6 with 11+12. |

## 6 Final Default Pilot Plan for SDG\&E

This section provides an overview of the proposed TOU default pilot plan for SDG\&E.
The primary objectives of SDG\&E's pilot are similar to those of SCE and PG\&E, namely to:

- Test operational readiness of all key business processes and systems at sufficient scale to ensure that SDG\&E is ready for full scale default in 2019;
- Determine how key outcome metrics vary across different ME\&O options for default notification and for post-default communications. Key metrics of interest include opt-out rates, call center activity, customer awareness, customer satisfaction, and perhaps other customer perceptions such as fairness;
- Determine load impacts by rate period for the default rates being tested for selected customer segments; and
- Determine the impact of selected customer options, such as a level payment plan (LPP), on opt-out rates and load impacts.

Key elements of SDG\&E's pilot plan that differ from PG\&E's and SCE's plans are:

- SDG\&E's default notification treatments include side-by-side tests of annual, seasonal, and monthly rate comparisons for selected customer segments. This contrasts with PG\&E, which is testing annual and seasonal RCs, and SCE, which is testing seasonal and monthly comparisons. The three-way test done by SDG\&E will be helpful in extrapolating results at PG\&E and SCE to the RC test that is not included in their plans.
- SDG\&E is testing two different sets of rate comparisons. One will show the difference in customer's bills between the default rate and two other rates-the OAT and an alternative TOU rate. The second will show comparisons between the above three tariffs as well as a fourth time-varying tariff that includes a critical peak pricing overlay.
- SDG\&E will test an educational campaign that targets central air conditioning (CAC) owners and focuses on getting enrolled customers who have programmable thermostats to program them to reduce peak period usage.
- SDG\&E will also test whether providing a low cost energy efficiency device in conjunction with sending welcome package information increases customer satisfaction, awareness or knowledge of welcome package content.
- Finally, SDG\&E plans to test a targeted messaging plan focused on variation in messaging across psychographic personas compared with non-targeted messaging for ongoing education and communication after customers enroll on the rate.

To meet these objectives, SDG\&E is will send out default notifications to 125,000 to 150,000 residential customers with the goal of enrolling at least 100,000 onto the default rates. Assuming timely decisions by the Commission regarding approval of the pilots, rates and Section 745 issues, the initial notifications will be sent as early as October 2017. The primary default notification containing rate comparisons and other information will occur in January 2018, 60 days prior to enrollment based on bill cycle in March. An enrollment reminder will be sent 15 to 30 days prior to enrollment.

SDG\&E will test two default tariffs that are structurally the same as the two tariffs being tested in the TOU opt-in pilots. The majority of customers will be defaulted onto a TOU rate (referred to
as Rate 1) that is more cost based, with higher peak-to-off-peak price differentials than the other rate. This tariff has three rate periods with the peak period from 4 to 9 PM and the partial peak period running from 6 AM to 4 PM and from 9 PM to midnight on weekdays. A smaller group of customers will be defaulted onto a two-period rate with somewhat milder peak-to-off-peak price differentials (referred to as Rate 2). The peak period for Rate 2 is the same as for Rate 1. For both rates, the summer period spans six months, from May 1 through October 31, and the TOU rate periods are the same all year.

Figures 6-1 and 6-2 show the bill impacts going from SDG\&E's glide-path, non-time varying rate for 2018 and Rate 1 based on usage for a full year and usage for the summer period, respectively. As seen, most customers would see very modest bill impacts based on their usage pattern before going on the TOU rate. Based on annual usage, almost $90 \%$ of customers would see an average bill increase or decrease of less than $\$ 5$ per month. Only about $7 \%$ of customers would see bill decreases of more than $\$ 5$ per month and only $3 \%$ would see bill increases exceeding $\$ 5$ per month. Virtually no one would see an annual bill increase averaging more than $\$ 10$ per month.

Figure 6-1: Rate 1 Average Annual Bill Impacts (Negative Values Depict Bill Decreases)

|  | Customers | \% of Total |
| :---: | :---: | :---: |
| -\$100+ | 5571 | 1\% |
| -\$100 to -\$50 | 5825 | 1\% |
| -\$50 to -\$20 | 12742 | 1\% |
| -\$20 to -\$10 | 16331 | 2\% |
| -\$10 to -\$5 | 32908 | 3\% |
| -\$5 to -\$2 | 113323 | 11\% |
| -\$2 to -\$1 | 147788 | 14\% |
| -\$1 to \$0 | 286843 | 27\% |
| \$0 to \$1 | 198968 | 19\% |
| \$1 to \$2 | 91270 | 9\% |
| \$2 to \$5 | 105459 | 10\% |
| \$5 to \$10 | 35604 | 3\% |
| \$10 to \$20 | 4586 | 0\% |
| \$20 to \$50 | 84 | 0\% |
| \$50 to \$100 | 0 | 0\% |
| \$100+ | 0 | 0\% |
| Total | 1,057,302 | 100\% |



Figure 6-2: Rate 1 Average Summer Bill Impacts (Negative Values Depict Bill Decreases)


As seen in Figure 6-2, bill impacts during the six-month summer period are somewhat greater than annual impacts but still relatively modest. During the summer period, roughly $75 \%$ of defaulted customers would see bill impacts between $\pm \$ 5,13 \%$ would see bill decreases greater than $\$ 5$ per month and $11 \%$ would see bill increases exceeding $\$ 5$ per month.

While estimating load impacts is not the primary goal of the pilots, determining how loads and bills change in response to the TOU rate will be done using an RED analysis as explained in prior sections.

The remainder of this section summarizes the tests that SDG\&E plans to conduct and the research design that will be used to determine the impact of each test. The discussion is organized around three stages of communication and tests: default notification; welcome information; and ongoing education and communication.

### 6.1 Tests for Default Notification

Figure 6-3 shows the proposed set of tests that SDG\&E plans to conduct for default notification. All of these tests will occur at roughly 60 days prior to default enrollment. As mentioned earlier, SDG\&E plans to send an initial notification to customers about 6 months prior to the more detailed notification and information that will be provided 60 days prior to enrollment. There will also be a reminder sent 15 to 30 days before default enrollment. The 6-month notification would need to occur around October 2017. Given the regulatory schedule for approval of the pilots and tariffs and resolution of the 745 issues, this 6-month notification may necessarily be very generic and provide very few, if any, details about the rates. Indeed, depending on when the 745 issues are resolved, this preliminary notification might need to be pushed off because whether or not certain groups of customers can be defaulted may not be resolved in time to finalize the sample for the preliminary notification. If decisions are delayed significantly, the 6month notification may be closer to the 90-day notification that SCE and PG\&E plan to employ.

Figure 6-3: Default 60-day Notification Test Plan


The tests summarized in Figure 6-3 comprise variations across communication channel (email, or EM, and direct mail, or DM), rate (Rates 1 and 2), and the amount of information included in the rate comparisons that will be provided along with default notification. The rate comparison information varies with respect to the number of tariffs for which information is provided and the granularity of the bill impact estimates (e.g., annual, seasonal or monthly). Note that the seasonal (summer and winter average values) and monthly rate comparisons also include annual comparisons.

In an initial pilot design shared with the TOU Working Group, SDG\&E had planned to segment the pilot sample into structural benefiter, neutral and non-benefiter groups and to test some variation in default notification across those segments. After conducting the rate comparisons shown in Figures 6-1 and 6-2, it became apparent that the vast majority of customers would be in the neutral category, even during the summer months, and that the number of benefiters and non-benefiters is relatively small. As such, SDG\&E decided not to segment customers a priori but, instead, to apply the same notification strategy for all customers and then determine whether there is any variation in key metrics, such as opt-out rates or call volume, across segments for each test.

The pilot plan shown in Figure 6-3 does not test all permutations and combinations of the variables being tested across both the EM and DM populations. The combinations chosen for testing were selected based on their deemed importance in terms of cost drivers for default implementation or because one set of tests for a specific customer segment is more likely than not to be valid for the other segment, at least in a relative sense. For example, we do
not believe it is necessary to test the seasonal rate comparisons that include information on three rates versus four rates using direct mail for the EM population because the relative values between these two options using direct mail for the DM population can be applied to the single test for 3 rate options for the EM population. That is, the relative difference in performance metrics for test cells I and J in Figure 6-3 could be applied to the value for test cell $B$ to estimate impacts for the 4 rate comparison using DM for the EM population. On the other hand, it may not be appropriate to extrapolate the relative differences across 3 and 4 rate comparisons, or across annual, monthly and seasonal rate comparisons, from the use of direct mail for the DM population to the use of EM only for the EM population since it may be easier for EM and DM customers to process a large volume of information in hard copy than through email. That is, it is not necessarily valid to extrapolate from test $\mathrm{H}, \mathrm{I}, \mathrm{J}$ and K to the EM population when the same information is communicated via email only. As such, test cells $\mathrm{C}, \mathrm{D}, \mathrm{E}$ and F were incorporated into the test plan.

As with PG\&E and SCE, the sampling plan that SDG\&E will use for default notification will be finalized closer to pilot launch. For planning purposes, SDG\&E is currently assuming that the 60 -day default notifications depicted in Figure $6-3$ will go out to 120,000 customers. ${ }^{22}$ SDG\&E estimates that they currently have email addresses for roughly half of their residential population. As such, a random sample of the enrolled population would result in the sample being about evenly split between EM and DM customers in Figure 6-3. Thus, there would be about 60,000 EM and DM customers in the sample of 120,000 customers that it is assumed will receive the 60-day default notifications, in this example. SDG\&E currently proposes to include 10,000 customers in each of the two Rate 2 test cells (G and L), leaving 50,000 EM and DM customers each to distribute across the remaining test cells. With 6 additional test cells for the EM population and 4 for the DM population, there would be roughly 8,333 customers in each of the Rate 1 EM tests (A through F) and 12,500 in each of the Rate 1 DM tests. These sample sizes are large enough to allow for a determination of how opt-out rates, call volume, and other metrics that are available on all customers vary across many different customer segments, such as benefiters, neutrals and non-benefiters, customer personas, climate region, CARE and nonCARE status, and others.

As discussed in the PG\&E and SCE sections, a key metric that must be assessed through surveys is customer awareness. The number of surveys sent for each test cell and the response rate will determine the extent to which SDG\&E will be able to determine if there are differential levels of awareness across the notification test cells for selected subpopulations, such as CARE/non-CARE, benefiters/non-benefiters, etc. While it would not be necessary or costeffective to survey all participants, Nexant recommends conducting enough surveys to determine how awareness varies across test cells and key customer segments. While opt-out rates are a key metric, as discussed in Section 3, it is critical that these pilots support identification of two types of customers who stay on the pilot rates-those who do so because they make a choice to stay, and those who do so because they don't know that that their rate was changed. Awareness surveys are the only means of making this critical distinction.
${ }^{22}$ As discussed above, initial notifications may go out as early as 6 months prior to enrollment to between 125,000 and 150,000 customers.

Table 6-1 summarizes the research questions that can be addressed with the proposed pilot plan and the comparisons that will be made to address those questions.

## Table 6-1: Research Questions and Assessment Methods for Evaluation of Default Notification Tests

| Research Question | How Addressed |
| :--- | :--- |
| For EM customers, how do opt-out <br> rates, call volume and awareness <br> vary with communication channel <br> and frequency? | Compare opt out rates, call volume and awareness (measured <br> through surveys) for test A with B, A with D, and B with D. |
| How do opt-out rates, call volume <br> and awareness vary with respect <br> to the granularity of rate <br> comparisons provided? | Compare relevant metrics for tests C with D, C with F, D with F, H <br> with I, H with K and I with K. If SDG\&E wishes to estimate values <br> for the performance metrics for EM customers based on DM or <br> DM+EM communication, the differences between tests H, I and K <br> can be applied to the outcomes for tests A and B. |
| How do relevant metrics compare <br> between default notifications that <br> include 3 rate comparisons versus <br> 4 rate comparisons. | Compare outcomes for tests D and E and for tests I and J. |
| How do opt-out rates compare for <br> Rate 1 and Rate 2. | Compare opt-out rates for tests A and G and I and L. |
| How do load impacts vary between <br> Rate 1 and Rate 2. | Estimate load impacts using a RED analysis for test cell A plus test <br> cell I (properly weighted) with load impacts for test cells G plus L. <br> The RED analysis will use a randomly selected control group of <br> customers not enrolled on the TOU rates to estimate reference <br> loads. |

### 6.2 Tests for Welcome Package Communication

The welcome package information provided to customers shortly after enrollment will, among other things, help educate customers about the tariffs that will be in effect and provide them with tips about how to manage their energy costs under TOU rates. It might also act to increase overall awareness by providing another, and perhaps more substantial, packet of information to customers who might have missed prior communications and, therefore, might not be aware until the welcome package arrives that they have been defaulted onto a new rate. The welcome package can also be used to highlight future communications that consumers can expect.

The specific content of the welcome package material will be developed through market research and perhaps, in part, based on insights gained through the opt-in pilots. Currently, SDG\&E does not plan to empirically test different information content. SDG\&E will test delivery channel (EM and DM) for EM customers and also whether or not providing a low cost energy efficiency device (e.g., an LED light bulb) increases readership of the welcome material, increases awareness, improves customer education about rates and actions they can take, or increases customer satisfaction. The test plan for welcome materials is shown in Figure 6-4. As seen, there are six test cells that vary with respect to delivery channel and whether or not an EE device is provided along with the welcome materials. With regard to test cell $F$, while it is
obvious that an EE device cannot be delivered via email, SDG\&E will include a link in the email welcome package that customers can use to request their free EE device after answering a few simple questions.

Figure 6-4: Welcome Package Test Plan


The overall number of enrolled customers expected to receive welcome packages is targeted to be around 100,000 as discussed above. There is significant variation in the cost of the different test cells shown in Figure 6-4, with tests $B, D$ and $F$, which include the EE component, being much more costly than the other test cells. As such, SDG\&E plans to keep these test cells as small as possible. The current plan is to set the sample size for cells $B$ and $D$ at 1,000 each and to set test cell $F$ at 2,000 since not all customers that are offered the device in this test will request it. Given this, there would be about 49,000 DM customers that would get the welcome information via direct mail (test cell A) and 47,000 EM customers that would be split between test cells $C$ and $E$ (or 23,500 in each cell.

Table 6-2 summarizes the relevant research questions and the comparisons that will be made to address the questions.

## Table 6-2: Research Questions and Assessment Methods for Evaluation of Welcome Package Tests

| Research Question | How Addressed |
| :--- | :--- |
| Does the inclusion of an EE device <br> in conjunction with welcome <br> package information materially <br> influence opt-out rates over time, <br> customer satisfaction, customer <br> awareness, customer behavior (as <br> reported in surveys), etc.? | Compare relevant metrics for test cells A with B, C with D, and E <br> with F. |
| What is the impact of EM only <br> communication of welcome <br> package information on the above <br> metrics? | Compare relevant metrics for test cell C with E and D with F. |

### 6.3 Post Enrollment Education and Outreach

Following enrollment and delivery of welcome packages to enrolled customers, SDG\&E plans to test several types of information and tools designed to encourage customer retention and to spur greater load impacts for customers who remain enrolled on the rates. Three primary treatments will be tested in the post enrollment phase:

- An educational campaign designed to encourage the use of existing technology, namely programmable thermostats, for managing energy use and bills among households with central air conditioning (CAC);
- An educational and messaging campaign that will compare tailored messaging based around SDG\&E's recently developed personas (and perhaps other segmentation variables such as whether customers are summer benefiters, non-benefiters or neutrals) with a campaign that does not provide tailored messages or content across segments; and
- A level pay plan that will reduce bill volatility across months.

Figure 6-5 summarizes the proposed plan for testing these three treatments independently and also shows the sampling plan for each test cell based on an assumed enrollment of 100,000 customers minus the 20,000 customers who will be enrolled on Rate 2 . The treatments shown in Figure 6-5 will only apply to Rate 1 customers.

Figure 6-5: Test Plan for Post Enrollment Communication and Tools (Rate 1 Customers Only)


The PT test applies only to owners of CAC and, ultimately only to those who own PTs, which survey data suggests is perhaps $70 \%$ of CAC owners in California. ${ }^{23}$ CAC saturation in SDG\&E's service territory is roughly $50 \%$ of residential customers. This information underlies the assumed split between CAC and non-CAC households in the enrolled population shown in Figure 6-5. ${ }^{24}$ CAC households will be targeted based on models that SDG\&E has that identify households with a high probability of having CAC based on analysis of interval data. However, given that these algorithms are not perfect, a share of households in test cells $A$ and $B$ will not be "eligible" for the treatment because they do not have CAC or because they don't have a PT. The incremental load impact from providing PT education can be obtained by simply using loads from test cell $B$ as the reference load for test cell $A$. The full load impact for test cells $A$ and $B$ can be obtained by using a subset of the default population control group selected using the same CAC algorithms as will be used to target customers for test cells $A$ and $B$.

A portion of the CAC and non-CAC population will be combined into a single sample that will then be split randomly into two groups for testing the impact of LPP on opt-out rates and load

[^21]impacts. One group will receive enhanced encouragement to enroll on the LPP program while the other will receive SDG\&E's standard encouragement for this program (that is, whatever marketing or communications that all residential customers receive). This standard encouragement will also be provided to the default population control group. Opt-out rates over the summer and fall periods will be compared for test cells $C$ and $D$ to determine the impact of LPP on customer retention. The impact of LPP on peak period reductions or changes in usage in other rate periods can be obtained by using test cell $D$ loads as reference loads for group $C$. Total load impacts for each group can be obtained by using the default pilot control group as reference loads for cells C and D (after adjusting for population weights for the CAC and nonCAC households in cells $C$ and $D$ relative to their presence in the control group population).

The final tests shown in Figure 6-5 pertain to tailored versus generic messaging. As discussed above, messages and content for group E will be tailored to personas and perhaps other customer characteristics such as structural benefits or non-benefits whereas messages and content for group F will be more generic. Relevant metrics include opt-out rates, customer satisfaction, changes in usage behavior (gathered through survey data) and load impacts.

## Appendix A TOU Working Group Members

Below is a list of TOU Working Group members who actively participated in the default pilot design process.

| NAME | ORGANIZATION |
| :--- | :--- |
| Cathy Yap | Barkovich and Yap |
| Melissa Kasnitz | Center for Accessible Technology (CforAT) |
| David Lowrey | Comverge |
| Neha Bazaj | Energy Division |
| Paul Phillips | Energy Division |
| Jamie Fine | Environmental Defense Fund |
| CC Song | Marin Clean Energy |
| Jeremy Waen | Marin Clean Energy |
| Justin Kudo | Marin Clean Energy |
| Merrian Borgeson | Natural Resources Defense Council |
| Aaron Berndt | Nest |
| Aimee Savage | Nexant |
| Stephen George | Nexant |
| Ben Gutierrez | ORA |
| Dexter Khoury | ORA |
| Gregory Heiden | ORA |
| Lee Whei Tan | ORA |
| Andrew Lee | PG\&E |
| Barbara Wingate | PG\&E |
| Catherine Buckley | PG\&E |
| Dennis Keane | PG\&E |
| Erika Wasmund | PG\&E |
| Erin Boyd | PG\&E |
| Gail Slocum | PG\&E |
| Joanne O'Neil | PG\&E |
| Laveera Rebello | PG\&E |
| Lori Leiva | PG\&E |
| Maril Pitcock | PG\&E |
| Michelle Purcell | PG\&E |
| Susan McNicoll | PG\&E |
| Andre Ramirez | SCE |
| Brandi Anderson | SCE |
| Brian Kopec | SCE |
| Eva Molnar | SCE |
| Fadia Khoury | SCE |
|  |  |


| NAME | ORGANIZATION |
| :--- | :--- |
| Kiphan Kan | SCE |
| Lisa Foulds | SCE |
| Michelle Rodriguez | SCE |
| Miriam Fischlein | SCE |
| Paul Kasick | SCE |
| Prapti Gautam | SCE |
| Richard Song | SCE |
| Amy Jauert | SDG\&E |
| Chris Bender | SDG\&E |
| Cyndee Fang | SDG\&E |
| Dana Santana | SDG\&E |
| Leslie Willoughby | SDG\&E |
| Monica Wiggins | SDG\&E |
| Robb Henderson | SDG\&E |
| Sabrina Butler | SDG\&E |
| Bonnie Datta | Siemens |
| Chris King | Siemens |
| Nathan Kinsey | Sonoma Clean Power |
| Erica Torgerson | Sonoma Clean Power |
| David Croyle | Utility Consumer Action Network (UCAN) |
| Don Kelly | Utility Consumer Action Network (UCAN) |

# PACIFIC GAS AND ELECTRIC COMPANY APPENDIX B <br> <br> BILL COMPARISON AND ELECTRICITY BURDEN TABLES FOR <br> <br> BILL COMPARISON AND ELECTRICITY BURDEN TABLES FOR CARE/NON-CARE CUSTOMERS 

 CARE/NON-CARE CUSTOMERS}

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | $\begin{aligned} & \text { Cust Count } \\ & =\text { Num of } \\ & \text { months / } 12 \end{aligned}$ | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | Monthly Bill ETOUC 2018 | $\$$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 11,092 | 0.47\% | 0.47\% | 3,545 | \$1,235.63 | \$948.61 | (\$287.02) | -23.23\% |
| 2 Decrease of \$75 to \$100 | 3,477 | 0.15\% | 0.62\% | 2,005 | \$614.22 | \$527.68 | (\$86.55) | -14.09\% |
| 3 Decrease of \$50 to \$75 | 5,660 | 0.24\% | 0.86\% | 1,779 | \$527.44 | \$466.05 | (\$61.39) | -11.64\% |
| 4 Decrease of \$40 to \$50 | 3,484 | 0.15\% | 1.00\% | 1,644 | \$473.61 | \$428.88 | (\$44.73) | -9.45\% |
| 5 Decrease of \$30 to \$40 | 4,851 | 0.21\% | 1.21\% | 1,544 | \$436.30 | \$401.52 | (\$34.77) | -7.97\% |
| 6 Decrease of \$20 to \$30 | 7,352 | 0.31\% | 1.52\% | 1,440 | \$397.31 | \$372.66 | (\$24.65) | -6.20\% |
| 7 Decrease of \$15 to \$20 | 5,290 | 0.22\% | 1.75\% | 1,340 | \$362.62 | \$345.30 | (\$17.33) | -4.78\% |
| 8 Decrease of \$10 to \$15 | 7,412 | 0.31\% | 2.06\% | 1,256 | \$334.15 | \$321.84 | (\$12.31) | -3.69\% |
| 9 Decrease of \$5 to \$10 | 12,744 | 0.54\% | 2.60\% | 1,112 | \$287.83 | \$280.53 | (\$7.30) | -2.54\% |
| 10 Decrease of \$2 to \$5 | 15,999 | 0.68\% | 3.28\% | 912 | \$224.82 | \$221.66 | (\$3.16) | -1.41\% |
| 11 Decrease of \$1 to \$2 | 38,336 | 1.62\% | 4.90\% | 468 | \$102.62 | \$101.30 | (\$1.32) | -1.29\% |
| 12 Decrease of \$0 to \$1 | 614,481 | 26.03\% | 30.93\% | 220 | \$45.60 | \$45.25 | (\$0.34) | -0.76\% |
| 13 No Change | 16,805 | 0.71\% | 31.64\% | 9 | \$10.19 | \$10.19 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 390,419 | 16.54\% | 48.17\% | 314 | \$67.09 | \$67.51 | \$0.42 | 0.63\% |
| 15 Increase of \$1 to \$2 | 249,575 | 10.57\% | 58.75\% | 437 | \$96.30 | \$97.78 | \$1.48 | 1.54\% |
| 17 Increase of \$2 to \$5 | 495,571 | 20.99\% | 79.74\% | 571 | \$130.02 | \$133.36 | \$3.34 | 2.57\% |
| 18 Increase of \$5 to \$10 | 357,654 | 15.15\% | 94.88\% | 782 | \$182.92 | \$189.97 | \$7.05 | 3.86\% |
| 19 Increase of \$10 to \$15 | 99,681 | 4.22\% | 99.11\% | 1,041 | \$248.08 | \$260.07 | \$11.98 | 4.83\% |
| 20 Increase of \$15 to \$20 | 20,498 | 0.87\% | 99.97\% | 1,265 | \$305.26 | \$321.74 | \$16.48 | 5.40\% |
| 21 Increase of \$20 to \$30 | 587 | 0.02\% | 100.00\% | 1,695 | \$406.89 | \$428.43 | \$21.54 | 5.29\% |
| 22 Increase of \$30 to \$40 | 17 | 0.00\% | 100.00\% | 3,398 | \$812.54 | \$845.38 | \$32.84 | 4.04\% |
| 23 Increase of \$40 to \$50 | 1 | 0.00\% | 100.00\% | 3,906 | \$888.61 | \$929.50 | \$40.90 | 4.60\% |
|  | 2,360,986 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:ALL NEM/non-NEM:non-NEM

|  | Cust Count = Num of months / 12 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | $\begin{aligned} & \text { CUM } \\ & \% \text { of } \end{aligned}$ Cust | Avg <br> Monthly kwh for the range | Monthly Bill E1 2018 | $\begin{aligned} & \text { Monthly } \\ & \text { Bill } \\ & \text { ETOUC } 2018 \end{aligned}$ | \$ <br> Change <br> Between <br> Proposed and Currrent | $\begin{gathered} \text { Avg } \\ \text { \% } \\ \text { Change } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 130 | 0.01\% | 0.01\% | 13,542 | \$5,332.00 | \$3,685.21 | (\$1,646.80) | -30.89\% |
| 2 Decrease of 20\% to 30\% | 6,278 | 0.27\% | 0.27\% | 4,032 | \$1,449.99 | \$1,082.81 | (\$367.18) | -25.32\% |
| 3 Decrease of 15\% to 20\% | 5,871 | 0.25\% | 0.52\% | 2,230 | \$713.99 | \$589.56 | (\$124.44) | -17.43\% |
| 4 Decrease of 10\% to 15\% | 9,441 | 0.40\% | 0.92\% | 1,767 | \$528.15 | \$462.75 | (\$65.40) | -12.38\% |
| 5 Decrease of 7.5\% to 10\% | 7,039 | 0.30\% | 1.22\% | 1,524 | \$434.02 | \$396.26 | (\$37.76) | -8.70\% |
| 6 Decrease of 5\% to 7.5\% | 10,725 | 0.45\% | 1.67\% | 1,336 | \$365.95 | \$343.31 | (\$22.64) | -6.19\% |
| 7 Decrease of 2.5\% to 5\% | 33,643 | 1.42\% | 3.10\% | 685 | \$176.07 | \$169.74 | (\$6.33) | -3.60\% |
| 8 Decrease of 0\% to 2.5\% | 657,051 | 27.83\% | 30.93\% | 265 | \$56.69 | \$56.18 | (\$0.51) | -0.91\% |
| 9 No Change | 16,805 | 0.71\% | 31.64\% | 9 | \$10.19 | \$10.19 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 846,155 | 35.84\% | 67.48\% | 452 | \$101.10 | \$102.54 | \$1.44 | 1.42\% |
| 11 Increase of 2.5\% to 5\% | 642,541 | 27.21\% | 94.69\% | 684 | \$158.51 | \$164.27 | \$5.76 | 3.64\% |
| 12 Increase of 5\% to 7.5\% | 124,413 | 5.27\% | 99.96\% | 819 | \$191.49 | \$202.20 | \$10.70 | 5.59\% |
| 13 Increase of 7.5\% to 10\% | 857 | 0.04\% | 100.00\% | 517 | \$118.05 | \$127.44 | \$9.39 | 7.96\% |
| 14 Increase of $10 \%$ to $15 \%$ | 37 | 0.00\% | 100.00\% | 252 | \$57.71 | \$64.11 | \$6.41 | 11.10\% |
|  | 2,360,986 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:COOL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 12 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { ETOUC } 2018 \end{gathered}$ | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 3,511 | 0.53\% | 0.53\% | 3,376 | \$1,215.73 | \$904.76 | (\$310.97) | -25.58\% |
| 2 Decrease of \$75 to \$100 | 950 | 0.14\% | 0.68\% | 1,632 | \$514.57 | \$428.37 | (\$86.20) | -16.75\% |
| 3 Decrease of \$50 to \$75 | 1,555 | 0.24\% | 0.91\% | 1,427 | \$433.48 | \$372.50 | (\$60.98) | -14.07\% |
| 4 Decrease of \$40 to \$50 | 932 | 0.14\% | 1.05\% | 1,299 | \$382.23 | \$337.62 | (\$44.61) | -11.67\% |
| 5 Decrease of \$30 to \$40 | 1,418 | 0.21\% | 1.27\% | 1,213 | \$349.05 | \$314.26 | (\$34.79) | -9.97\% |
| 6 Decrease of \$20 to \$30 | 2,157 | 0.33\% | 1.59\% | 1,127 | \$314.91 | \$290.26 | (\$24.65) | -7.83\% |
| 7 Decrease of \$15 to \$20 | 1,584 | 0.24\% | 1.83\% | 1,036 | \$282.88 | \$265.51 | (\$17.37) | -6.14\% |
| 8 Decrease of \$10 to \$15 | 2,373 | 0.36\% | 2.19\% | 975 | \$260.02 | \$247.70 | (\$12.32) | -4.74\% |
| 9 Decrease of \$5 to \$10 | 4,979 | 0.75\% | 2.95\% | 854 | \$216.37 | \$209.09 | (\$7.27) | -3.36\% |
| 10 Decrease of \$2 to \$5 | 4,942 | 0.75\% | 3.70\% | 749 | \$186.90 | \$183.57 | (\$3.34) | -1.78\% |
| 11 Decrease of \$1 to \$2 | 9,361 | 1.42\% | 5.11\% | 396 | \$88.78 | \$87.49 | (\$1.29) | -1.45\% |
| 12 Decrease of \$0 to \$1 | 269,086 | 40.76\% | 45.87\% | 183 | \$37.70 | \$37.38 | (\$0.32) | -0.85\% |
| 13 No Change | 5,604 | 0.85\% | 46.72\% | 12 | \$10.17 | \$10.17 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 130,174 | 19.72\% | 66.44\% | 280 | \$61.20 | \$61.61 | \$0.41 | 0.67\% |
| 15 Increase of \$1 to \$2 | 80,066 | 12.13\% | 78.56\% | 401 | \$90.96 | \$92.43 | \$1.47 | 1.62\% |
| 17 Increase of \$2 to \$5 | 122,253 | 18.52\% | 97.08\% | 539 | \$127.18 | \$130.37 | \$3.19 | 2.51\% |
| 18 Increase of \$5 to \$10 | 19,258 | 2.92\% | 100.00\% | 727 | \$176.08 | \$181.83 | \$5.75 | 3.27\% |
| 19 Increase of \$10 to \$15 | 13 | 0.00\% | 100.00\% | 1,847 | \$438.06 | \$450.24 | \$12.18 | 2.78\% |
| 20 Increase of \$15 to \$20 | 1 | 0.00\% | 100.00\% | 3,215 | \$759.45 | \$779.16 | \$19.71 | 2.59\% |
| 21 Increase of \$20 to \$30 | 4 | 0.00\% | 100.00\% | 3,361 | \$817.79 | \$840.20 | \$22.41 | 2.74\% |
|  | 660,220 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:COOL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 12 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly $\begin{gathered} \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | Monthly Bill ETOUC 2018 | Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 82 | 0.01\% | 0.01\% | 10,696 | \$4,195.18 | \$2,909.74 | (\$1,285.44) | -30.64\% |
| 2 Decrease of 20\% to 30\% | 2,765 | 0.42\% | 0.43\% | 3,471 | \$1,258.08 | \$931.03 | (\$327.05) | -26.00\% |
| 3 Decrease of 15\% to 20\% | 1,992 | 0.30\% | 0.73\% | 1,667 | \$531.03 | \$438.07 | (\$92.97) | -17.51\% |
| 4 Decrease of 10\% to 15\% | 2,961 | 0.45\% | 1.18\% | 1,309 | \$388.26 | \$340.13 | (\$48.14) | -12.40\% |
| 5 Decrease of 7.5\% to 10\% | 2,225 | 0.34\% | 1.52\% | 1,110 | \$313.06 | \$285.90 | (\$27.16) | -8.68\% |
| 6 Decrease of 5\% to 7.5\% | 3,757 | 0.57\% | 2.09\% | 943 | \$251.64 | \$236.11 | (\$15.53) | -6.17\% |
| 7 Decrease of 2.5\% to 5\% | 11,958 | 1.81\% | 3.90\% | 501 | \$124.84 | \$120.36 | (\$4.48) | -3.59\% |
| 8 Decrease of 0\% to 2.5\% | 277,106 | 41.97\% | 45.87\% | 202 | \$42.72 | \$42.32 | (\$0.40) | -0.94\% |
| 9 No Change | 5,604 | 0.85\% | 46.72\% | 12 | \$10.17 | \$10.17 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 265,919 | 40.28\% | 87.00\% | 377 | \$85.38 | \$86.60 | \$1.23 | 1.44\% |
| 11 Increase of 2.5\% to 5\% | 85,498 | 12.95\% | 99.95\% | 565 | \$134.18 | \$138.22 | \$4.04 | 3.01\% |
| 12 Increase of 5\% to 7.5\% | 331 | 0.05\% | 100.00\% | 286 | \$67.93 | \$71.75 | \$3.82 | 5.62\% |
| 13 Increase of 7.5\% to 10\% | 20 | 0.00\% | 100.00\% | 198 | \$50.56 | \$54.62 | \$4.06 | 8.02\% |
| 14 Increase of 10\% to 15\% | 2 | 0.00\% | 100.00\% | 155 | \$36.28 | \$40.46 | \$4.18 | 11.52\% |
|  | 660,220 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | $\begin{aligned} & \text { Cust Count } \\ & =\text { Num of } \\ & \text { months / } 12 \end{aligned}$ | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | Monthly Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 4,784 | 0.49\% | 0.49\% | 3,474 | \$1,208.38 | \$930.22 | (\$278.16) | -23.02\% |
| 2 Decrease of \$75 to \$100 | 1,596 | 0.16\% | 0.65\% | 1,987 | \$610.08 | \$523.33 | (\$86.75) | -14.22\% |
| 3 Decrease of \$50 to \$75 | 2,653 | 0.27\% | 0.92\% | 1,779 | \$528.04 | \$466.54 | (\$61.50) | -11.65\% |
| 4 Decrease of \$40 to \$50 | 1,620 | 0.16\% | 1.08\% | 1,630 | \$470.43 | \$425.62 | (\$44.81) | -9.53\% |
| 5 Decrease of \$30 to \$40 | 2,163 | 0.22\% | 1.30\% | 1,550 | \$438.43 | \$403.71 | (\$34.72) | -7.92\% |
| 6 Decrease of \$20 to \$30 | 3,305 | 0.34\% | 1.64\% | 1,450 | \$400.50 | \$375.82 | (\$24.68) | -6.16\% |
| 7 Decrease of \$15 to \$20 | 2,315 | 0.24\% | 1.88\% | 1,357 | \$367.38 | \$350.07 | (\$17.30) | -4.71\% |
| 8 Decrease of \$10 to \$15 | 3,156 | 0.32\% | 2.20\% | 1,279 | \$341.12 | \$328.81 | (\$12.31) | -3.61\% |
| 9 Decrease of \$5 to \$10 | 4,907 | 0.50\% | 2.70\% | 1,185 | \$309.94 | \$302.63 | (\$7.31) | -2.36\% |
| 10 Decrease of \$2 to \$5 | 5,670 | 0.58\% | 3.27\% | 1,002 | \$252.59 | \$249.35 | (\$3.24) | -1.28\% |
| 11 Decrease of \$1 to \$2 | 15,630 | 1.59\% | 4.86\% | 438 | \$97.13 | \$95.85 | (\$1.29) | -1.33\% |
| 12 Decrease of \$0 to \$1 | 266,416 | 27.11\% | 31.98\% | 242 | \$49.80 | \$49.44 | (\$0.36) | -0.73\% |
| 13 No Change | 4,107 | 0.42\% | 32.40\% | 12 | \$10.40 | \$10.40 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 173,766 | 17.68\% | 50.08\% | 331 | \$70.60 | \$71.02 | \$0.42 | 0.60\% |
| 15 Increase of \$1 to \$2 | 111,315 | 11.33\% | 61.41\% | 448 | \$98.84 | \$100.32 | \$1.48 | 1.50\% |
| 17 Increase of \$2 to \$5 | 222,093 | 22.60\% | 84.01\% | 576 | \$132.02 | \$135.36 | \$3.34 | 2.53\% |
| 18 Increase of \$5 to \$10 | 147,782 | 15.04\% | 99.05\% | 780 | \$185.65 | \$192.59 | \$6.94 | 3.74\% |
| 19 Increase of \$10 to \$15 | 9,264 | 0.94\% | 100.00\% | 925 | \$223.71 | \$234.43 | \$10.72 | 4.79\% |
| 20 Increase of \$15 to \$20 | 20 | 0.00\% | 100.00\% | 1,739 | \$416.36 | \$432.66 | \$16.30 | 3.91\% |
| 21 Increase of \$20 to \$30 | 11 | 0.00\% | 100.00\% | 2,507 | \$595.48 | \$617.65 | \$22.17 | 3.72\% |
|  | 982,572 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:MODERATE NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | $\begin{aligned} & \text { Cust Count } \\ & =\text { Num of } \\ & \text { months / } 12 \end{aligned}$ | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly $\begin{gathered} \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | Monthly Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 39 | 0.00\% | 0.00\% | 19,498 | \$7,722.31 | \$5,310.38 | $(\$ 2,411.93)$ | -31.23\% |
| 2 Decrease of 20\% to 30\% | 2,428 | 0.25\% | 0.25\% | 4,206 | \$1,509.52 | \$1,130.73 | (\$378.80) | -25.09\% |
| 3 Decrease of 15\% to 20\% | 2,662 | 0.27\% | 0.52\% | 2,311 | \$741.25 | \$612.09 | (\$129.15) | -17.42\% |
| 4 Decrease of 10\% to 15\% | 4,281 | 0.44\% | 0.96\% | 1,818 | \$544.36 | \$476.97 | (\$67.39) | -12.38\% |
| 5 Decrease of 7.5\% to 10\% | 3,089 | 0.31\% | 1.27\% | 1,554 | \$443.54 | \$404.88 | (\$38.66) | -8.72\% |
| 6 Decrease of 5\% to 7.5\% | 4,484 | 0.46\% | 1.73\% | 1,416 | \$390.82 | \$366.63 | (\$24.18) | -6.19\% |
| 7 Decrease of 2.5\% to 5\% | 13,276 | 1.35\% | 3.08\% | 721 | \$186.96 | \$180.24 | (\$6.72) | -3.59\% |
| 8 Decrease of 0\% to 2.5\% | 283,955 | 28.90\% | 31.98\% | 280 | \$59.80 | \$59.28 | (\$0.52) | -0.87\% |
| 9 No Change | 4,107 | 0.42\% | 32.40\% | 12 | \$10.40 | \$10.40 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 386,864 | 39.37\% | 71.77\% | 458 | \$102.25 | \$103.70 | \$1.44 | 1.41\% |
| 11 Increase of 2.5\% to 5\% | 259,969 | 26.46\% | 98.23\% | 657 | \$153.47 | \$158.86 | \$5.39 | 3.51\% |
| 12 Increase of 5\% to 7.5\% | 17,330 | 1.76\% | 99.99\% | 654 | \$153.11 | \$161.41 | \$8.30 | 5.42\% |
| 13 Increase of 7.5\% to 10\% | 85 | 0.01\% | 100.00\% | 313 | \$71.90 | \$77.71 | \$5.81 | 8.08\% |
| 14 Increase of 10\% to 15\% | 3 | 0.00\% | 100.00\% | 224 | \$53.20 | \$59.14 | \$5.94 | 11.17\% |
|  | 982,572 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:HOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 12 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { ETOUC } 2018 \end{gathered}$ | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 2,797 | 0.39\% | 0.39\% | 3,879 | \$1,307.22 | \$1,035.13 | (\$272.09) | -20.81\% |
| 2 Decrease of \$75 to \$100 | 930 | 0.13\% | 0.52\% | 2,419 | \$723.07 | \$636.53 | (\$86.54) | -11.97\% |
| 3 Decrease of \$50 to \$75 | 1,452 | 0.20\% | 0.72\% | 2,156 | \$626.96 | \$565.34 | (\$61.62) | -9.83\% |
| 4 Decrease of \$40 to \$50 | 932 | 0.13\% | 0.85\% | 2,014 | \$570.45 | \$525.72 | (\$44.73) | -7.84\% |
| 5 Decrease of \$30 to \$40 | 1,270 | 0.18\% | 1.03\% | 1,904 | \$530.05 | \$495.21 | (\$34.84) | -6.57\% |
| 6 Decrease of \$20 to \$30 | 1,891 | 0.26\% | 1.29\% | 1,780 | \$485.69 | \$461.09 | (\$24.60) | -5.07\% |
| 7 Decrease of \$15 to \$20 | 1,392 | 0.19\% | 1.48\% | 1,659 | \$445.47 | \$428.14 | (\$17.33) | -3.89\% |
| 8 Decrease of \$10 to \$15 | 1,883 | 0.26\% | 1.75\% | 1,571 | \$415.90 | \$403.59 | (\$12.31) | -2.96\% |
| 9 Decrease of \$5 to \$10 | 2,858 | 0.40\% | 2.15\% | 1,439 | \$374.37 | \$367.04 | (\$7.33) | -1.96\% |
| 10 Decrease of \$2 to \$5 | 5,387 | 0.75\% | 2.90\% | 967 | \$230.39 | \$227.48 | (\$2.91) | -1.26\% |
| 11 Decrease of \$1 to \$2 | 13,346 | 1.86\% | 4.75\% | 555 | \$118.75 | \$117.37 | (\$1.38) | -1.16\% |
| 12 Decrease of \$0 to \$1 | 78,980 | 11.00\% | 15.75\% | 278 | \$58.29 | \$57.93 | (\$0.36) | -0.62\% |
| 13 No Change | 7,094 | 0.99\% | 16.74\% | 6 | \$10.08 | \$10.08 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 86,479 | 12.04\% | 28.78\% | 328 | \$68.90 | \$69.33 | \$0.43 | 0.62\% |
| 15 Increase of \$1 to \$2 | 58,194 | 8.10\% | 36.88\% | 464 | \$98.79 | \$100.28 | \$1.49 | 1.51\% |
| 17 Increase of \$2 to \$5 | 151,225 | 21.06\% | 57.94\% | 589 | \$129.37 | \$132.84 | \$3.47 | 2.68\% |
| 18 Increase of \$5 to \$10 | 190,614 | 26.54\% | 84.48\% | 790 | \$181.48 | \$188.76 | \$7.27 | 4.01\% |
| 19 Increase of \$10 to \$15 | 90,404 | 12.59\% | 97.07\% | 1,053 | \$250.56 | \$262.67 | \$12.11 | 4.83\% |
| 20 Increase of \$15 to \$20 | 20,477 | 2.85\% | 99.92\% | 1,264 | \$305.13 | \$321.61 | \$16.48 | 5.40\% |
| 21 Increase of \$20 to \$30 | 572 | 0.08\% | 100.00\% | 1,667 | \$400.39 | \$421.91 | \$21.52 | 5.37\% |
| 22 Increase of \$30 to \$40 | 17 | 0.00\% | 100.00\% | 3,398 | \$812.54 | \$845.38 | \$32.84 | 4.04\% |
| 23 Increase of \$40 to \$50 | 1 | 0.00\% | 100.00\% | 3,906 | \$888.61 | \$929.50 | \$40.90 | 4.60\% |
|  | 718,194 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:HOT NEM/non-NEM:non-NEM

|  | Cust Count = Num of months / 12 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Bill E1 2018 | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { ETOUC } 2018 \end{gathered}$ | \$ <br> Change <br> Between <br> Proposed and Current | $\begin{gathered} \text { Avg } \\ \text { \% } \\ \text { Change } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 9 | 0.00\% | 0.00\% | 13,643 | \$5,321.88 | \$3,701.59 | (\$1,620.29) | -30.45\% |
| 2 Decrease of $20 \%$ to $30 \%$ | 1,084 | 0.15\% | 0.15\% | 5,075 | \$1,806.25 | \$1,362.70 | (\$443.55) | -24.56\% |
| 3 Decrease of 15\% to 20\% | 1,217 | 0.17\% | 0.32\% | 2,973 | \$953.88 | \$788.25 | (\$165.63) | -17.36\% |
| 4 Decrease of 10\% to 15\% | 2,200 | 0.31\% | 0.63\% | 2,282 | \$684.84 | \$600.08 | (\$84.75) | -12.38\% |
| 5 Decrease of $7.5 \%$ to $10 \%$ | 1,725 | 0.24\% | 0.87\% | 2,005 | \$572.98 | \$523.17 | (\$49.81) | -8.69\% |
| 6 Decrease of 5\% to 7.5\% | 2,485 | 0.35\% | 1.21\% | 1,786 | \$493.93 | \$463.32 | (\$30.61) | -6.20\% |
| 7 Decrease of 2.5\% to 5\% | 8,409 | 1.17\% | 2.38\% | 888 | \$231.72 | \$223.37 | (\$8.35) | -3.61\% |
| 8 Decrease of 0\% to 2.5\% | 95,990 | 13.37\% | 15.75\% | 398 | \$87.81 | \$86.99 | (\$0.82) | -0.93\% |
| 9 No Change | 7,094 | 0.99\% | 16.74\% | 6 | \$10.08 | \$10.08 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 193,372 | 26.92\% | 43.66\% | 546 | \$120.42 | \$122.13 | \$1.71 | 1.42\% |
| $11 \mathrm{Increase} \mathrm{of} \mathrm{2.5} \mathrm{\%} \mathrm{to} \mathrm{5} \mathrm{\%}$ | 297,074 | 41.36\% | 85.03\% | 742 | \$169.92 | \$176.50 | \$6.58 | 3.87\% |
| $12 \mathrm{Increase} \mathrm{of} \mathrm{5} \mathrm{\%} \mathrm{to} \mathrm{7.5} \mathrm{\%}$ | 106,752 | 14.86\% | 99.89\% | 847 | \$198.11 | \$209.22 | \$11.11 | 5.61\% |
| 13 Increase of 7.5\% to 10\% | 752 | 0.10\% | 100.00\% | 549 | \$125.05 | \$134.99 | \$9.94 | 7.95\% |
| 14 Increase of 10\% to 15\% | 32 | 0.00\% | 100.00\% | 260 | \$59.46 | \$66.05 | \$6.59 | 11.08\% |
|  | 718,194 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 12 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { ETOUC } 2018 \end{gathered}$ | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 8,295 | 0.50\% | 0.50\% | 3,433 | \$1,211.49 | \$919.44 | (\$292.05) | -24.11\% |
| 2 Decrease of \$75 to \$100 | 2,546 | 0.15\% | 0.66\% | 1,854 | \$574.45 | \$487.91 | (\$86.55) | -15.07\% |
| 3 Decrease of \$50 to \$75 | 4,208 | 0.26\% | 0.92\% | 1,649 | \$493.10 | \$431.79 | (\$61.31) | -12.43\% |
| 4 Decrease of \$40 to \$50 | 2,551 | 0.16\% | 1.07\% | 1,509 | \$438.22 | \$393.48 | (\$44.74) | -10.21\% |
| 5 Decrease of \$30 to \$40 | 3,581 | 0.22\% | 1.29\% | 1,417 | \$403.04 | \$368.29 | (\$34.75) | -8.62\% |
| 6 Decrease of \$20 to \$30 | 5,461 | 0.33\% | 1.62\% | 1,322 | \$366.70 | \$342.03 | (\$24.67) | -6.73\% |
| 7 Decrease of \$15 to \$20 | 3,898 | 0.24\% | 1.86\% | 1,226 | \$333.05 | \$315.72 | (\$17.33) | -5.20\% |
| 8 Decrease of \$10 to \$15 | 5,529 | 0.34\% | 2.20\% | 1,148 | \$306.31 | \$294.00 | (\$12.31) | -4.02\% |
| 9 Decrease of \$5 to \$10 | 9,886 | 0.60\% | 2.80\% | 1,018 | \$262.81 | \$255.52 | (\$7.29) | -2.77\% |
| 10 Decrease of \$2 to \$5 | 10,612 | 0.65\% | 3.44\% | 885 | \$222.00 | \$218.71 | (\$3.29) | -1.48\% |
| 11 Decrease of \$1 to \$2 | 24,990 | 1.52\% | 4.96\% | 422 | \$94.01 | \$92.72 | (\$1.29) | -1.37\% |
| 12 Decrease of \$0 to \$1 | 535,502 | 32.60\% | 37.56\% | 212 | \$43.72 | \$43.38 | (\$0.34) | -0.78\% |
| 13 No Change | 9,711 | 0.59\% | 38.15\% | 12 | \$10.27 | \$10.27 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 303,940 | 18.50\% | 56.65\% | 310 | \$66.57 | \$66.99 | \$0.42 | 0.63\% |
| 15 Increase of \$1 to \$2 | 191,381 | 11.65\% | 68.30\% | 428 | \$95.54 | \$97.02 | \$1.48 | 1.55\% |
| 17 Increase of \$2 to \$5 | 344,346 | 20.96\% | 89.27\% | 563 | \$130.31 | \$133.59 | \$3.29 | 2.52\% |
| 18 Increase of \$5 to \$10 | 167,041 | 10.17\% | 99.43\% | 773 | \$184.55 | \$191.35 | \$6.80 | 3.69\% |
| 19 Increase of \$10 to \$15 | 9,277 | 0.56\% | 100.00\% | 926 | \$224.01 | \$234.73 | \$10.73 | 4.79\% |
| 20 Increase of \$15 to \$20 | 21 | 0.00\% | 100.00\% | 1,809 | \$432.70 | \$449.16 | \$16.46 | 3.80\% |
| 21 Increase of \$20 to \$30 | 15 | 0.00\% | 100.00\% | 2,735 | \$654.76 | \$677.00 | \$22.23 | 3.40\% |
|  | 1,642,792 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:ALL Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 12 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly $\begin{gathered} \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | Monthly Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg \% Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 121 | 0.01\% | 0.01\% | 13,535 | \$5,332.75 | \$3,683.99 | (\$1,648.76) | -30.92\% |
| 2 Decrease of 20\% to 30\% | 5,194 | 0.32\% | 0.32\% | 3,814 | \$1,375.64 | \$1,024.40 | (\$351.25) | -25.53\% |
| 3 Decrease of 15\% to 20\% | 4,654 | 0.28\% | 0.61\% | 2,036 | \$651.27 | \$537.61 | (\$113.67) | -17.45\% |
| 4 Decrease of 10\% to 15\% | 7,241 | 0.44\% | 1.05\% | 1,610 | \$480.54 | \$421.02 | (\$59.52) | -12.39\% |
| 5 Decrease of 7.5\% to 10\% | 5,314 | 0.32\% | 1.37\% | 1,368 | \$388.92 | \$355.07 | (\$33.85) | -8.70\% |
| 6 Decrease of 5\% to 7.5\% | 8,241 | 0.50\% | 1.87\% | 1,200 | \$327.36 | \$307.12 | (\$20.24) | -6.18\% |
| 7 Decrease of 2.5\% to 5\% | 25,234 | 1.54\% | 3.41\% | 617 | \$157.52 | \$151.86 | (\$5.66) | -3.59\% |
| 8 Decrease of 0\% to 2.5\% | 561,061 | 34.15\% | 37.56\% | 242 | \$51.37 | \$50.91 | (\$0.46) | -0.90\% |
| 9 No Change | 9,711 | 0.59\% | 38.15\% | 12 | \$10.27 | \$10.27 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 652,783 | 39.74\% | 77.89\% | 425 | \$95.38 | \$96.73 | \$1.36 | 1.42\% |
| 11 Increase of 2.5\% to 5\% | 345,467 | 21.03\% | 98.92\% | 634 | \$148.70 | \$153.76 | \$5.06 | 3.40\% |
| 12 Increase of 5\% to 7.5\% | 17,661 | 1.08\% | 99.99\% | 647 | \$151.52 | \$159.74 | \$8.22 | 5.42\% |
| 13 Increase of 7.5\% to 10\% | 105 | 0.01\% | 100.00\% | 291 | \$67.84 | \$73.31 | \$5.47 | 8.07\% |
| 14 Increase of 10\% to 15\% | 5 | 0.00\% | 100.00\% | 196 | \$46.38 | \$51.62 | \$5.23 | 11.28\% |
|  | 1,642,792 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter Bill E1 2018 | Monthly Winter Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 12,180 | 0.52\% | 0.52\% | 3,324 | \$1,156.90 | \$870.20 | (\$286.70) | -24.78\% |
| 2 Decrease of \$75 to \$100 | 3,916 | 0.17\% | 0.69\% | 1,834 | \$557.37 | \$470.86 | (\$86.51) | -15.52\% |
| 3 Decrease of \$50 to \$75 | 6,705 | 0.29\% | 0.97\% | 1,627 | \$476.62 | \$415.35 | (\$61.27) | -12.86\% |
| 4 Decrease of \$40 to \$50 | 4,293 | 0.18\% | 1.15\% | 1,492 | \$423.71 | \$378.99 | (\$44.72) | -10.56\% |
| 5 Decrease of \$30 to \$40 | 6,359 | 0.27\% | 1.42\% | 1,395 | \$387.56 | \$352.88 | (\$34.68) | -8.95\% |
| 6 Decrease of \$20 to \$30 | 10,042 | 0.43\% | 1.85\% | 1,296 | \$350.40 | \$325.85 | (\$24.54) | -7.00\% |
| 7 Decrease of \$15 to \$20 | 8,675 | 0.37\% | 2.22\% | 1,174 | \$306.60 | \$289.32 | (\$17.28) | -5.64\% |
| 8 Decrease of \$10 to \$15 | 12,985 | 0.55\% | 2.77\% | 1,122 | \$287.57 | \$275.30 | (\$12.27) | -4.27\% |
| 9 Decrease of \$5 to \$10 | 61,825 | 2.63\% | 5.41\% | 897 | \$204.01 | \$197.62 | (\$6.39) | -3.13\% |
| 10 Decrease of \$2 to \$5 | 550,834 | 23.46\% | 28.86\% | 424 | \$91.29 | \$88.67 | (\$2.62) | -2.87\% |
| 11 Decrease of \$1 to \$2 | 911,381 | 38.81\% | 67.67\% | 343 | \$75.31 | \$73.80 | (\$1.52) | -2.02\% |
| 12 Decrease of \$0 to \$1 | 484,867 | 20.65\% | 88.32\% | 446 | \$103.97 | \$103.40 | (\$0.57) | -0.55\% |
| 13 No Change | 26,136 | 1.11\% | 89.44\% | 13 | \$10.43 | \$10.43 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 170,938 | 7.28\% | 96.71\% | 717 | \$172.57 | \$172.98 | \$0.41 | 0.24\% |
| 15 Increase of \$1 to \$2 | 58,076 | 2.47\% | 99.19\% | 869 | \$211.99 | \$213.39 | \$1.40 | 0.66\% |
| 17 Increase of \$2 to \$5 | 19,006 | 0.81\% | 100.00\% | 983 | \$243.29 | \$245.89 | \$2.60 | 1.07\% |
| 18 Increase of \$5 to \$10 | 71 | 0.00\% | 100.00\% | 1,664 | \$414.14 | \$419.74 | \$5.59 | 1.35\% |
|  | 2,348,290 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1 2018 | Monthly Winter Bill ETOUC 2018 | $\$$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 776 | 0.03\% | 0.03\% | 8,334 | \$3,226.17 | \$2,217.98 | (\$1,008.18) | -31.25\% |
| 2 Decrease of 20\% to 30\% | 7,578 | 0.32\% | 0.36\% | 3,268 | \$1,147.05 | \$856.50 | (\$290.55) | -25.33\% |
| 3 Decrease of 15\% to 20\% | 7,281 | 0.31\% | 0.67\% | 1,949 | \$608.04 | \$501.99 | (\$106.04) | -17.44\% |
| 4 Decrease of 10\% to 15\% | 12,347 | 0.53\% | 1.19\% | 1,523 | \$441.26 | \$386.66 | (\$54.60) | -12.37\% |
| 5 Decrease of 7.5\% to 10\% | 10,687 | 0.46\% | 1.65\% | 1,282 | \$350.98 | \$320.46 | (\$30.52) | -8.70\% |
| 6 Decrease of 5\% to 7.5\% | 24,791 | 1.06\% | 2.70\% | 814 | \$210.75 | \$197.89 | (\$12.86) | -6.10\% |
| 7 Decrease of 2.5\% to 5\% | 1,032,618 | 43.97\% | 46.68\% | 293 | \$61.84 | \$59.57 | (\$2.27) | -3.67\% |
| 8 Decrease of 0\% to 2.5\% | 977,986 | 41.65\% | 88.32\% | 541 | \$124.45 | \$123.13 | (\$1.32) | -1.06\% |
| 9 No Change | 26,136 | 1.11\% | 89.44\% | 13 | \$10.43 | \$10.43 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 248,053 | 10.56\% | 100.00\% | 773 | \$187.31 | \$188.12 | \$0.81 | 0.43\% |
| 11 Increase of 2.5\% to 5\% | 38 | 0.00\% | 100.00\% | 116 | \$40.21 | \$41.51 | \$1.30 | 3.23\% |
|  | 2,348,290 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:COOL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1 2018 | Monthly Winter Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 3,873 | 0.59\% | 0.59\% | 3,258 | \$1,165.34 | \$854.45 | (\$310.89) | -26.68\% |
| 2 Decrease of \$75 to \$100 | 1,069 | 0.16\% | 0.75\% | 1,598 | \$496.31 | \$409.97 | (\$86.35) | -17.40\% |
| 3 Decrease of \$50 to \$75 | 1,848 | 0.28\% | 1.03\% | 1,403 | \$418.90 | \$357.77 | (\$61.13) | -14.59\% |
| 4 Decrease of \$40 to \$50 | 1,192 | 0.18\% | 1.22\% | 1,274 | \$368.02 | \$323.22 | (\$44.79) | -12.17\% |
| 5 Decrease of \$30 to \$40 | 1,868 | 0.28\% | 1.50\% | 1,194 | \$336.25 | \$301.56 | (\$34.69) | -10.32\% |
| 6 Decrease of \$20 to \$30 | 2,868 | 0.44\% | 1.94\% | 1,100 | \$300.46 | \$275.92 | (\$24.54) | -8.17\% |
| 7 Decrease of \$15 to \$20 | 3,143 | 0.48\% | 2.42\% | 984 | \$251.99 | \$234.77 | (\$17.22) | -6.83\% |
| 8 Decrease of \$10 to \$15 | 3,925 | 0.60\% | 3.01\% | 916 | \$235.47 | \$223.14 | (\$12.33) | -5.24\% |
| 9 Decrease of \$5 to \$10 | 7,619 | 1.16\% | 4.17\% | 828 | \$206.64 | \$199.51 | (\$7.12) | -3.45\% |
| 10 Decrease of \$2 to \$5 | 67,198 | 10.23\% | 14.41\% | 414 | \$90.98 | \$88.34 | (\$2.64) | -2.90\% |
| 11 Decrease of \$1 to \$2 | 321,575 | 48.97\% | 63.38\% | 266 | \$57.15 | \$55.68 | (\$1.47) | -2.57\% |
| 12 Decrease of \$0 to \$1 | 176,576 | 26.89\% | 90.27\% | 330 | \$76.24 | \$75.65 | (\$0.59) | -0.78\% |
| 13 No Change | 9,169 | 1.40\% | 91.66\% | 15 | \$10.40 | \$10.40 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 45,048 | 6.86\% | 98.52\% | 602 | \$144.82 | \$145.20 | \$0.38 | 0.26\% |
| 15 Increase of \$1 to \$2 | 8,963 | 1.36\% | 99.89\% | 753 | \$183.50 | \$184.84 | \$1.34 | 0.73\% |
| 17 Increase of \$2 to \$5 | 746 | 0.11\% | 100.00\% | 891 | \$218.32 | \$220.64 | \$2.32 | 1.06\% |
|  | 656,680 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:COOL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 8 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1 2018 | Monthly Winter Bill ETOUC 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 420 | 0.06\% | 0.06\% | 7,137 | \$2,757.82 | \$1,898.23 | (\$859.59) | -31.17\% |
| 2 Decrease of 20\% to 30\% | 2,984 | 0.45\% | 0.52\% | 2,880 | \$1,016.35 | \$753.56 | (\$262.79) | -25.86\% |
| 3 Decrease of 15\% to 20\% | 2,314 | 0.35\% | 0.87\% | 1,576 | \$489.12 | \$403.72 | (\$85.39) | -17.46\% |
| 4 Decrease of 10\% to 15\% | 4,111 | 0.63\% | 1.50\% | 1,197 | \$341.83 | \$299.79 | (\$42.05) | -12.30\% |
| 5 Decrease of 7.5\% to 10\% | 3,914 | 0.60\% | 2.09\% | 994 | \$264.78 | \$241.74 | (\$23.04) | -8.70\% |
| 6 Decrease of 5\% to 7.5\% | 8,363 | 1.27\% | 3.37\% | 653 | \$165.86 | \$155.73 | (\$10.12) | -6.10\% |
| 7 Decrease of 2.5\% to 5\% | 320,185 | 48.76\% | 52.12\% | 220 | \$46.24 | \$44.51 | (\$1.73) | -3.73\% |
| 8 Decrease of 0\% to 2.5\% | 250,462 | 38.14\% | 90.27\% | 434 | \$99.94 | \$98.88 | (\$1.06) | -1.06\% |
| 9 No Change | 9,169 | 1.40\% | 91.66\% | 15 | \$10.40 | \$10.40 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 54,751 | 8.34\% | 100.00\% | 631 | \$152.16 | \$152.73 | \$0.56 | 0.37\% |
| 11 Increase of 2.5\% to 5\% | 7 | 0.00\% | 100.00\% | 198 | \$55.72 | \$57.57 | \$1.85 | 3.32\% |
|  | 656,680 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1 2018 | Monthly Winter Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 5,097 | 0.52\% | 0.52\% | 3,311 | \$1,148.52 | \$867.79 | (\$280.73) | -24.44\% |
| 2 Decrease of \$75 to \$100 | 1,697 | 0.17\% | 0.70\% | 1,866 | \$566.24 | \$479.81 | (\$86.42) | -15.26\% |
| 3 Decrease of \$50 to \$75 | 2,888 | 0.30\% | 0.99\% | 1,666 | \$487.52 | \$426.04 | (\$61.48) | -12.61\% |
| 4 Decrease of \$40 to \$50 | 1,786 | 0.18\% | 1.17\% | 1,535 | \$435.12 | \$390.43 | (\$44.70) | -10.27\% |
| 5 Decrease of \$30 to \$40 | 2,549 | 0.26\% | 1.43\% | 1,441 | \$400.11 | \$365.43 | (\$34.68) | -8.67\% |
| 6 Decrease of \$20 to \$30 | 4,000 | 0.41\% | 1.84\% | 1,341 | \$362.68 | \$338.09 | (\$24.60) | -6.78\% |
| 7 Decrease of \$15 to \$20 | 2,927 | 0.30\% | 2.14\% | 1,242 | \$328.44 | \$311.11 | (\$17.33) | -5.28\% |
| 8 Decrease of \$10 to \$15 | 4,614 | 0.47\% | 2.62\% | 1,174 | \$304.19 | \$291.88 | (\$12.31) | -4.05\% |
| 9 Decrease of \$5 to \$10 | 13,144 | 1.34\% | 3.96\% | 966 | \$232.24 | \$225.52 | (\$6.72) | -2.89\% |
| 10 Decrease of \$2 to \$5 | 267,500 | 27.37\% | 31.33\% | 379 | \$80.83 | \$78.36 | (\$2.47) | -3.05\% |
| 11 Decrease of \$1 to \$2 | 384,332 | 39.32\% | 70.66\% | 365 | \$80.17 | \$78.62 | (\$1.55) | -1.94\% |
| 12 Decrease of \$0 to \$1 | 178,640 | 18.28\% | 88.93\% | 502 | \$117.04 | \$116.47 | (\$0.57) | -0.49\% |
| 13 No Change | 6,616 | 0.68\% | 89.61\% | 15 | \$10.56 | \$10.56 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 68,818 | 7.04\% | 96.65\% | 745 | \$179.06 | \$179.48 | \$0.42 | 0.24\% |
| 15 Increase of \$1 to \$2 | 25,240 | 2.58\% | 99.24\% | 872 | \$212.58 | \$213.99 | \$1.41 | 0.66\% |
| 17 Increase of \$2 to \$5 | 7,470 | 0.76\% | 100.00\% | 953 | \$234.88 | \$237.41 | \$2.53 | 1.08\% |
| 18 Increase of \$5 to \$10 | 6 | 0.00\% | 100.00\% | 1,214 | \$300.80 | \$306.31 | \$5.51 | 1.83\% |
|  | 977,326 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER
Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 8 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter $\begin{gathered} \text { Bill } \\ \text { E1 } 2018 \end{gathered}$ | Monthly Winter Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg \% Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 247 | 0.03\% | 0.03\% | 9,971 | \$3,882.55 | \$2,661.13 | (\$1,221.42) | -31.46\% |
| 2 Decrease of 20\% to 30\% | 2,926 | 0.30\% | 0.32\% | 3,416 | \$1,197.33 | \$896.50 | (\$300.84) | -25.13\% |
| 3 Decrease of 15\% to 20\% | 3,054 | 0.31\% | 0.64\% | 2,051 | \$641.71 | \$529.64 | (\$112.07) | -17.46\% |
| 4 Decrease of 10\% to 15\% | 4,844 | 0.50\% | 1.13\% | 1,643 | \$478.96 | \$419.46 | (\$59.50) | -12.42\% |
| 5 Decrease of 7.5\% to 10\% | 3,903 | 0.40\% | 1.53\% | 1,402 | \$388.31 | \$354.55 | (\$33.76) | -8.69\% |
| 6 Decrease of 5\% to 7.5\% | 9,193 | 0.94\% | 2.47\% | 852 | \$222.34 | \$208.75 | (\$13.59) | -6.11\% |
| 7 Decrease of 2.5\% to 5\% | 428,522 | 43.85\% | 46.32\% | 290 | \$61.07 | \$58.84 | (\$2.23) | -3.66\% |
| 8 Decrease of 0\% to 2.5\% | 416,486 | 42.61\% | 88.93\% | 541 | \$124.26 | \$122.95 | (\$1.32) | -1.06\% |
| 9 No Change | 6,616 | 0.68\% | 89.61\% | 15 | \$10.56 | \$10.56 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 101,527 | 10.39\% | 100.00\% | 792 | \$191.51 | \$192.34 | \$0.82 | 0.43\% |
| 11 Increase of 2.5\% to 5\% | 6 | 0.00\% | 100.00\% | 178 | \$54.55 | \$56.17 | \$1.62 | 2.97\% |
|  | 977,326 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:HOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1 2018 | Monthly <br> Winter Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 3,210 | 0.45\% | 0.45\% | 3,425 | \$1,160.02 | \$893.02 | (\$267.01) | -23.02\% |
| 2 Decrease of \$75 to \$100 | 1,151 | 0.16\% | 0.61\% | 2,006 | \$601.00 | \$514.22 | (\$86.78) | -14.44\% |
| 3 Decrease of \$50 to \$75 | 1,969 | 0.28\% | 0.89\% | 1,778 | \$514.80 | \$453.70 | (\$61.11) | -11.87\% |
| 4 Decrease of \$40 to \$50 | 1,315 | 0.18\% | 1.07\% | 1,631 | \$458.69 | \$413.98 | (\$44.70) | -9.75\% |
| 5 Decrease of \$30 to \$40 | 1,942 | 0.27\% | 1.34\% | 1,526 | \$420.43 | \$385.76 | (\$34.67) | -8.25\% |
| 6 Decrease of \$20 to \$30 | 3,174 | 0.44\% | 1.79\% | 1,415 | \$380.04 | \$355.56 | (\$24.48) | -6.44\% |
| 7 Decrease of \$15 to \$20 | 2,605 | 0.36\% | 2.15\% | 1,328 | \$347.95 | \$330.64 | (\$17.31) | -4.98\% |
| 8 Decrease of \$10 to \$15 | 4,446 | 0.62\% | 2.77\% | 1,248 | \$316.30 | \$304.13 | (\$12.18) | -3.85\% |
| 9 Decrease of \$5 to \$10 | 41,061 | 5.75\% | 8.52\% | 888 | \$194.49 | \$188.33 | (\$6.16) | -3.16\% |
| 10 Decrease of \$2 to \$5 | 216,135 | 30.26\% | 38.78\% | 483 | \$104.34 | \$101.54 | (\$2.80) | -2.68\% |
| 11 Decrease of \$1 to \$2 | 205,474 | 28.77\% | 67.55\% | 424 | \$94.66 | \$93.14 | (\$1.53) | -1.61\% |
| 12 Decrease of \$0 to \$1 | 129,651 | 18.15\% | 85.70\% | 527 | \$123.71 | \$123.18 | (\$0.54) | -0.44\% |
| 13 No Change | 10,351 | 1.45\% | 87.15\% | 10 | \$10.37 | \$10.37 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 57,072 | 7.99\% | 95.14\% | 774 | \$186.64 | \$187.07 | \$0.42 | 0.23\% |
| 15 Increase of \$1 to \$2 | 23,873 | 3.34\% | 98.48\% | 908 | \$222.07 | \$223.49 | \$1.42 | 0.64\% |
| 17 Increase of \$2 to \$5 | 10,790 | 1.51\% | 99.99\% | 1,011 | \$250.84 | \$253.51 | \$2.67 | 1.06\% |
| 18 Increase of \$5 to \$10 | 65 | 0.01\% | 100.00\% | 1,706 | \$424.61 | \$430.21 | \$5.60 | 1.32\% |
|  | 714,284 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:HOT NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 8 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter <br> Bill <br> E1 2018 | Monthly Winter Bill ETOUC 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 108 | 0.02\% | 0.02\% | 9,241 | \$3,544.10 | \$2,446.43 | (\$1,097.67) | -30.97\% |
| 2 Decrease of 20\% to 30\% | 1,667 | 0.23\% | 0.25\% | 3,704 | \$1,292.77 | \$970.60 | (\$322.17) | -24.92\% |
| 3 Decrease of 15\% to 20\% | 1,913 | 0.27\% | 0.52\% | 2,238 | \$698.12 | \$576.72 | (\$121.40) | -17.39\% |
| 4 Decrease of 10\% to 15\% | 3,392 | 0.47\% | 0.99\% | 1,746 | \$507.93 | \$445.12 | (\$62.81) | -12.37\% |
| 5 Decrease of 7.5\% to 10\% | 2,870 | 0.40\% | 1.39\% | 1,510 | \$417.77 | \$381.45 | (\$36.31) | -8.69\% |
| 6 Decrease of 5\% to 7.5\% | 7,235 | 1.01\% | 2.41\% | 953 | \$247.93 | \$232.82 | (\$15.11) | -6.09\% |
| 7 Decrease of 2.5\% to 5\% | 283,911 | 39.75\% | 42.15\% | 381 | \$80.59 | \$77.66 | (\$2.94) | -3.64\% |
| 8 Decrease of 0\% to 2.5\% | 311,038 | 43.55\% | 85.70\% | 626 | \$144.43 | \$142.91 | (\$1.52) | -1.05\% |
| 9 No Change | 10,351 | 1.45\% | 87.15\% | 10 | \$10.37 | \$10.37 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 91,775 | 12.85\% | 100.00\% | 838 | \$203.62 | \$204.57 | \$0.95 | 0.47\% |
| 11 Increase of 2.5\% to 5\% | 25 | 0.00\% | 100.00\% | 79 | \$32.44 | \$33.51 | \$1.07 | 3.29\% |
|  | 714,284 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1 2018 | Monthly Winter Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 8,970 | 0.55\% | 0.55\% | 3,288 | \$1,155.78 | \$862.03 | (\$293.75) | -25.42\% |
| 2 Decrease of \$75 to \$100 | 2,766 | 0.17\% | 0.72\% | 1,763 | \$539.22 | \$452.83 | (\$86.39) | -16.02\% |
| 3 Decrease of \$50 to \$75 | 4,736 | 0.29\% | 1.01\% | 1,564 | \$460.75 | \$399.41 | (\$61.34) | -13.31\% |
| 4 Decrease of \$40 to \$50 | 2,978 | 0.18\% | 1.19\% | 1,430 | \$408.27 | \$363.53 | (\$44.73) | -10.96\% |
| 5 Decrease of \$30 to \$40 | 4,417 | 0.27\% | 1.46\% | 1,337 | \$373.11 | \$338.43 | (\$34.68) | -9.30\% |
| 6 Decrease of \$20 to \$30 | 6,869 | 0.42\% | 1.88\% | 1,241 | \$336.70 | \$312.13 | (\$24.57) | -7.30\% |
| 7 Decrease of \$15 to \$20 | 6,070 | 0.37\% | 2.25\% | 1,108 | \$288.86 | \$271.58 | (\$17.27) | -5.98\% |
| 8 Decrease of \$10 to \$15 | 8,539 | 0.52\% | 2.78\% | 1,055 | \$272.60 | \$260.28 | (\$12.32) | -4.52\% |
| 9 Decrease of \$5 to \$10 | 20,763 | 1.27\% | 4.05\% | 916 | \$222.84 | \$215.98 | (\$6.87) | -3.08\% |
| 10 Decrease of \$2 to \$5 | 334,698 | 20.48\% | 24.53\% | 386 | \$82.86 | \$80.36 | (\$2.50) | -3.02\% |
| 11 Decrease of \$1 to \$2 | 705,907 | 43.20\% | 67.73\% | 320 | \$69.68 | \$68.17 | (\$1.52) | -2.17\% |
| 12 Decrease of \$0 to \$1 | 355,216 | 21.74\% | 89.47\% | 416 | \$96.76 | \$96.18 | (\$0.58) | -0.60\% |
| 13 No Change | 15,785 | 0.97\% | 90.44\% | 15 | \$10.46 | \$10.46 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 113,866 | 6.97\% | 97.40\% | 689 | \$165.51 | \$165.92 | \$0.40 | 0.24\% |
| 15 Increase of \$1 to \$2 | 34,203 | 2.09\% | 99.50\% | 841 | \$204.96 | \$206.35 | \$1.39 | 0.68\% |
| 17 Increase of \$2 to \$5 | 8,216 | 0.50\% | 100.00\% | 948 | \$233.38 | \$235.89 | \$2.51 | 1.07\% |
| 18 Increase of \$5 to \$10 | 6 | 0.00\% | 100.00\% | 1,214 | \$300.80 | \$306.31 | \$5.51 | 1.83\% |
|  | 1,634,006 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:WINTER Climate:NOTHOT NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 8 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter <br> Bill <br> E1 2018 | Monthly <br> Winter Bill ETOUC 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 668 | 0.04\% | 0.04\% | 8,187 | \$3,174.59 | \$2,180.93 | (\$993.67) | -31.30\% |
| 2 Decrease of 20\% to 30\% | 5,911 | 0.36\% | 0.40\% | 3,145 | \$1,105.95 | \$824.32 | (\$281.63) | -25.46\% |
| 3 Decrease of 15\% to 20\% | 5,368 | 0.33\% | 0.73\% | 1,846 | \$575.94 | \$475.37 | (\$100.57) | -17.46\% |
| 4 Decrease of 10\% to 15\% | 8,955 | 0.55\% | 1.28\% | 1,438 | \$416.01 | \$364.52 | (\$51.49) | -12.38\% |
| 5 Decrease of 7.5\% to 10\% | 7,817 | 0.48\% | 1.76\% | 1,198 | \$326.45 | \$298.06 | (\$28.39) | -8.70\% |
| 6 Decrease of 5\% to 7.5\% | 17,556 | 1.07\% | 2.83\% | 757 | \$195.44 | \$183.50 | (\$11.94) | -6.11\% |
| 7 Decrease of 2.5\% to 5\% | 748,707 | 45.82\% | 48.65\% | 260 | \$54.73 | \$52.71 | (\$2.02) | -3.68\% |
| 8 Decrease of 0\% to 2.5\% | 666,948 | 40.82\% | 89.47\% | 501 | \$115.13 | \$113.91 | (\$1.22) | -1.06\% |
| 9 No Change | 15,785 | 0.97\% | 90.44\% | 15 | \$10.46 | \$10.46 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 156,278 | 9.56\% | 100.00\% | 736 | \$177.73 | \$178.46 | \$0.73 | 0.41\% |
| 11 Increase of 2.5\% to 5\% | 13 | 0.00\% | 100.00\% | 189 | \$55.18 | \$56.93 | \$1.74 | 3.16\% |
|  | 1,634,006 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly Summer Bill ETOUC 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 10,606 | 0.44\% | 0.44\% | 3,963 | \$1,380.24 | \$1,102.23 | (\$278.02) | -20.14\% |
| 2 Decrease of \$75 to \$100 | 3,104 | 0.13\% | 0.57\% | 2,346 | \$730.34 | \$643.46 | (\$86.87) | -11.90\% |
| 3 Decrease of \$50 to \$75 | 4,942 | 0.21\% | 0.78\% | 2,094 | \$633.95 | \$572.58 | (\$61.37) | -9.68\% |
| 4 Decrease of \$40 to \$50 | 2,893 | 0.12\% | 0.90\% | 1,941 | \$573.97 | \$529.27 | (\$44.69) | -7.79\% |
| 5 Decrease of \$30 to \$40 | 3,601 | 0.15\% | 1.05\% | 1,834 | \$533.97 | \$499.20 | (\$34.77) | -6.51\% |
| 6 Decrease of \$20 to \$30 | 4,858 | 0.20\% | 1.26\% | 1,702 | \$487.15 | \$462.37 | (\$24.77) | -5.09\% |
| 7 Decrease of \$15 to \$20 | 2,952 | 0.12\% | 1.38\% | 1,628 | \$459.01 | \$441.60 | (\$17.41) | -3.79\% |
| 8 Decrease of \$10 to \$15 | 3,472 | 0.15\% | 1.53\% | 1,570 | \$437.31 | \$424.86 | (\$12.45) | -2.85\% |
| 9 Decrease of \$5 to \$10 | 4,154 | 0.17\% | 1.70\% | 1,496 | \$411.81 | \$404.39 | (\$7.42) | -1.80\% |
| 10 Decrease of \$2 to \$5 | 2,903 | 0.12\% | 1.82\% | 1,448 | \$394.12 | \$390.65 | (\$3.47) | -0.88\% |
| 11 Decrease of \$1 to \$2 | 1,116 | 0.05\% | 1.87\% | 1,405 | \$380.64 | \$379.16 | (\$1.49) | -0.39\% |
| 12 Decrease of \$0 to \$1 | 9,321 | 0.39\% | 2.26\% | 186 | \$54.19 | \$54.12 | (\$0.07) | -0.12\% |
| 13 No Change | 23,602 | 0.99\% | 3.25\% | 11 | \$9.81 | \$9.81 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 99,796 | 4.18\% | 7.43\% | 82 | \$18.62 | \$19.18 | \$0.56 | 3.01\% |
| 15 Increase of \$1 to \$2 | 212,411 | 8.90\% | 16.33\% | 146 | \$29.48 | \$31.01 | \$1.52 | 5.16\% |
| 17 Increase of \$2 to \$5 | 534,682 | 22.41\% | 38.74\% | 261 | \$53.37 | \$56.73 | \$3.36 | 6.30\% |
| 18 Increase of \$5 to \$10 | 534,476 | 22.40\% | 61.13\% | 435 | \$94.52 | \$101.80 | \$7.28 | 7.70\% |
| 19 Increase of \$10 to \$15 | 329,913 | 13.82\% | 74.96\% | 629 | \$142.07 | \$154.38 | \$12.32 | 8.67\% |
| 20 Increase of \$15 to \$20 | 212,843 | 8.92\% | 83.88\% | 810 | \$185.56 | \$202.88 | \$17.32 | 9.33\% |
| 21 Increase of \$20 to \$30 | 247,960 | 10.39\% | 94.27\% | 1,050 | \$244.16 | \$268.48 | \$24.32 | 9.96\% |
| 22 Increase of \$30 to \$40 | 93,042 | 3.90\% | 98.17\% | 1,419 | \$334.98 | \$369.30 | \$34.32 | 10.24\% |
| 23 Increase of \$40 to \$50 | 36,633 | 1.54\% | 99.70\% | 1,758 | \$421.11 | \$465.06 | \$43.95 | 10.44\% |
| 24 Increase of \$50 to \$75 | 6,995 | 0.29\% | 100.00\% | 2,084 | \$502.32 | \$556.08 | \$53.75 | 10.70\% |
| 25 Increase of \$75 to \$100 | 92 | 0.00\% | 100.00\% | 3,646 | \$866.13 | \$950.16 | \$84.03 | 9.70\% |
| 26 Increase of More Than \$100 | 8 | 0.00\% | 100.00\% | 4,857 | \$1,132.37 | \$1,244.39 | \$112.02 | 9.89\% |
|  | 2,386,377 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 4 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 3,978 | 0.17\% | 0.17\% | 5,322 | \$1,960.47 | \$1,491.35 | (\$469.12) | -23.93\% |
| 3 Decrease of 15\% to 20\% | 4,701 | 0.20\% | 0.36\% | 2,946 | \$987.20 | \$814.93 | (\$172.27) | -17.45\% |
| 4 Decrease of 10\% to 15\% | 7,589 | 0.32\% | 0.68\% | 2,269 | \$711.14 | \$622.89 | (\$88.25) | -12.41\% |
| 5 Decrease of 7.5\% to 10\% | 5,361 | 0.22\% | 0.91\% | 1,993 | \$596.18 | \$544.10 | (\$52.08) | -8.74\% |
| 6 Decrease of 5\% to 7.5\% | 6,514 | 0.27\% | 1.18\% | 1,827 | \$530.36 | \$497.42 | (\$32.94) | -6.21\% |
| 7 Decrease of 2.5\% to 5\% | 7,916 | 0.33\% | 1.51\% | 1,710 | \$481.75 | \$463.73 | (\$18.02) | -3.74\% |
| 8 Decrease of 0\% to 2.5\% | 17,864 | 0.75\% | 2.26\% | 882 | \$243.32 | \$240.40 | (\$2.93) | -1.20\% |
| 9 No Change | 23,602 | 0.99\% | 3.25\% | 11 | \$9.81 | \$9.81 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 38,869 | 1.63\% | 4.88\% | 514 | \$137.50 | \$139.24 | \$1.74 | 1.26\% |
| 11 Increase of 2.5\% to 5\% | 128,816 | 5.40\% | 10.28\% | 341 | \$79.06 | \$82.24 | \$3.18 | 4.02\% |
| 12 Increase of 5\% to 7.5\% | 770,210 | 32.28\% | 42.55\% | 306 | \$65.02 | \$69.25 | \$4.22 | 6.50\% |
| 13 Increase of 7.5\% to 10\% | 936,451 | 39.24\% | 81.79\% | 595 | \$134.05 | \$145.91 | \$11.87 | 8.85\% |
| 14 Increase of 10\% to 15\% | 434,188 | 18.19\% | 99.99\% | 934 | \$214.44 | \$237.91 | \$23.47 | 10.94\% |
| 15 Increase of 15\% to 20\% | 313 | 0.01\% | 100.00\% | 443 | \$95.65 | \$111.00 | \$15.35 | 16.04\% |
| 16 Increase of 20\% to 30\% | 5 | 0.00\% | 100.00\% | 279 | \$57.12 | \$69.17 | \$12.05 | 21.11\% |
|  | 2,386,377 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:COOL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly Summer Bill ETOUC 2018 | $\$$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 3,077 | 0.46\% | 0.46\% | 3,610 | \$1,314.45 | \$1,009.71 | (\$304.74) | -23.18\% |
| 2 Decrease of \$75 to \$100 | 719 | 0.11\% | 0.57\% | 1,740 | \$565.90 | \$478.91 | (\$86.99) | -15.37\% |
| 3 Decrease of \$50 to \$75 | 1,181 | 0.18\% | 0.75\% | 1,502 | \$474.23 | \$413.12 | (\$61.11) | -12.89\% |
| 4 Decrease of \$40 to \$50 | 743 | 0.11\% | 0.86\% | 1,368 | \$418.62 | \$373.97 | (\$44.65) | -10.66\% |
| 5 Decrease of \$30 to \$40 | 965 | 0.14\% | 1.00\% | 1,276 | \$383.08 | \$348.36 | (\$34.72) | -9.06\% |
| 6 Decrease of \$20 to \$30 | 1,414 | 0.21\% | 1.21\% | 1,179 | \$345.94 | \$321.12 | (\$24.82) | -7.17\% |
| 7 Decrease of \$15 to \$20 | 914 | 0.14\% | 1.35\% | 1,117 | \$320.72 | \$303.34 | (\$17.39) | -5.42\% |
| 8 Decrease of \$10 to \$15 | 1,122 | 0.17\% | 1.52\% | 1,069 | \$301.90 | \$289.52 | (\$12.38) | -4.10\% |
| 9 Decrease of \$5 to \$10 | 1,389 | 0.21\% | 1.73\% | 1,018 | \$282.77 | \$275.34 | (\$7.44) | -2.63\% |
| 10 Decrease of \$2 to \$5 | 961 | 0.14\% | 1.87\% | 979 | \$267.44 | \$263.99 | (\$3.45) | -1.29\% |
| 11 Decrease of \$1 to \$2 | 416 | 0.06\% | 1.93\% | 957 | \$259.38 | \$257.90 | (\$1.48) | -0.57\% |
| 12 Decrease of \$0 to \$1 | 3,772 | 0.57\% | 2.50\% | 126 | \$37.80 | \$37.74 | (\$0.06) | -0.16\% |
| 13 No Change | 8,115 | 1.22\% | 3.71\% | 14 | \$9.80 | \$9.80 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 50,489 | 7.57\% | 11.28\% | 74 | \$16.29 | \$16.90 | \$0.61 | 3.72\% |
| 15 Increase of \$1 to \$2 | 121,463 | 18.20\% | 29.48\% | 137 | \$27.44 | \$28.95 | \$1.51 | 5.51\% |
| 17 Increase of \$2 to \$5 | 202,788 | 30.39\% | 59.87\% | 236 | \$49.25 | \$52.53 | \$3.28 | 6.66\% |
| 18 Increase of \$5 to \$10 | 176,619 | 26.47\% | 86.34\% | 389 | \$88.59 | \$95.77 | \$7.18 | 8.11\% |
| 19 Increase of \$10 to \$15 | 73,160 | 10.96\% | 97.30\% | 582 | \$138.64 | \$150.74 | \$12.10 | 8.73\% |
| 20 Increase of \$15 to \$20 | 17,453 | 2.62\% | 99.92\% | 730 | \$176.98 | \$193.43 | \$16.45 | 9.30\% |
| 21 Increase of \$20 to \$30 | 497 | 0.07\% | 99.99\% | 925 | \$220.97 | \$242.68 | \$21.71 | 9.82\% |
| 22 Increase of \$30 to \$40 | 27 | 0.00\% | 100.00\% | 1,803 | \$417.17 | \$451.41 | \$34.24 | 8.21\% |
| 23 Increase of \$40 to \$50 | 8 | 0.00\% | 100.00\% | 2,171 | \$497.53 | \$540.63 | \$43.10 | 8.66\% |
| 24 Increase of \$50 to \$75 | 5 | 0.00\% | 100.00\% | 2,599 | \$627.03 | \$686.65 | \$59.62 | 9.51\% |
| 25 Increase of \$75 to \$100 | 1 | 0.00\% | 100.00\% | 6,035 | \$1,486.65 | \$1,564.37 | \$77.73 | 5.23\% |
|  | 667,299 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:COOL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 4 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 2,010 | 0.30\% | 0.30\% | 4,372 | \$1,622.62 | \$1,226.43 | (\$396.19) | -24.42\% |
| 3 Decrease of 15\% to 20\% | 1,572 | 0.24\% | 0.54\% | 2,004 | \$671.45 | \$553.65 | (\$117.80) | -17.54\% |
| 4 Decrease of 10\% to 15\% | 2,139 | 0.32\% | 0.86\% | 1,471 | \$461.02 | \$403.62 | (\$57.40) | -12.45\% |
| 5 Decrease of 7.5\% to 10\% | 1,451 | 0.22\% | 1.07\% | 1,267 | \$378.68 | \$345.64 | (\$33.04) | -8.73\% |
| 6 Decrease of 5\% to 7.5\% | 1,705 | 0.26\% | 1.33\% | 1,150 | \$333.40 | \$312.58 | (\$20.81) | -6.24\% |
| 7 Decrease of 2.5\% to 5\% | 2,056 | 0.31\% | 1.64\% | 1,060 | \$298.31 | \$287.14 | (\$11.17) | -3.74\% |
| 8 Decrease of 0\% to 2.5\% | 5,740 | 0.86\% | 2.50\% | 424 | \$118.36 | \$117.00 | (\$1.36) | -1.15\% |
| 9 No Change | 8,115 | 1.22\% | 3.71\% | 14 | \$9.80 | \$9.80 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 13,764 | 2.06\% | 5.78\% | 226 | \$61.31 | \$62.05 | \$0.74 | 1.20\% |
| 11 Increase of 2.5\% to 5\% | 46,632 | 6.99\% | 12.77\% | 197 | \$43.98 | \$45.81 | \$1.83 | 4.16\% |
| 12 Increase of 5\% to 7.5\% | 291,903 | 43.74\% | 56.51\% | 208 | \$43.80 | \$46.64 | \$2.83 | 6.46\% |
| 13 Increase of 7.5\% to 10\% | 274,618 | 41.15\% | 97.66\% | 408 | \$93.39 | \$101.47 | \$8.08 | 8.65\% |
| 14 Increase of 10\% to 15\% | 15,573 | 2.33\% | 100.00\% | 501 | \$117.03 | \$129.33 | \$12.30 | 10.51\% |
| 15 Increase of 15\% to 20\% | 20 | 0.00\% | 100.00\% | 293 | \$64.36 | \$75.14 | \$10.78 | 16.75\% |
|  | 667,299 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:MODERATE NEM/non-NEM:non-NEM

| Bill Impact <br> Range(\$) | Cust Count = Num of months / 4 | \% Of Cust | $\begin{aligned} & \text { CUM } \\ & \% \text { of } \end{aligned}$ Cust | Avg <br> Monthly kwh for the range | Monthly <br> Summer <br> Bill <br> E1 2018 | Monthly Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | $\begin{gathered} \text { Avg } \\ \text { \% } \\ \text { Change } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 4,835 | 0.49\% | 0.49\% | 3,754 | \$1,308.81 | \$1,043.93 | (\$264.88) | -20.24\% |
| 2 Decrease of \$ 75 to \$100 | 1,645 | 0.17\% | 0.65\% | 2,232 | \$698.84 | \$612.06 | (\$86.79) | -12.42\% |
| 3 Decrease of \$50 to \$ 75 | 2,673 | 0.27\% | 0.92\% | 2,006 | \$610.18 | \$548.79 | (\$61.39) | -10.06\% |
| 4 Decrease of \$40 to \$50 | 1,505 | 0.15\% | 1.07\% | 1,859 | \$551.70 | \$506.98 | (\$44.72) | -8.11\% |
| 5 Decrease of \$30 to \$ 40 | 1,872 | 0.19\% | 1.26\% | 1,774 | \$517.74 | \$482.96 | (\$34.78) | -6.72\% |
| 6 Decrease of \$ 20 to \$ 30 | 2,547 | 0.26\% | 1.52\% | 1,680 | \$481.33 | \$456.55 | (\$24.78) | -5.15\% |
| 7 Decrease of \$15 to \$20 | 1,501 | 0.15\% | 1.67\% | 1,617 | \$456.22 | \$438.78 | (\$17.44) | -3.82\% |
| 8 Decrease of \$10 to \$15 | 1,730 | 0.17\% | 1.84\% | 1,571 | \$437.95 | \$425.47 | (\$12.48) | -2.85\% |
| 9 Decrease of \$5 to \$10 | 2,089 | 0.21\% | 2.05\% | 1,519 | \$417.64 | \$410.24 | (\$7.40) | -1.77\% |
| 10 Decrease of \$2 to \$5 | 1,483 | 0.15\% | 2.20\% | 1,474 | \$401.10 | \$397.61 | (\$3.49) | -0.87\% |
| 11 Decrease of \$1 to \$2 | 524 | 0.05\% | 2.26\% | 1,457 | \$394.50 | \$393.01 | (\$1.49) | -0.38\% |
| 12 Decrease of \$0 to \$1 | 2,798 | 0.28\% | 2.54\% | 279 | \$78.90 | \$78.80 | (\$0.10) | -0.12\% |
| 13 No Change | 5,917 | 0.60\% | 3.13\% | 13 | \$9.82 | \$9.82 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 28,743 | 2.89\% | 6.03\% | 94 | \$21.65 | \$22.21 | \$0.56 | 2.57\% |
| 15 Increase of \$ 1 to \$2 | 69,408 | 6.99\% | 13.02\% | 154 | \$31.27 | \$32.82 | \$1.55 | 4.95\% |
| 17 Increase of \$2 to \$5 | 259,713 | 26.15\% | 39.17\% | 266 | \$53.80 | \$57.17 | \$3.37 | 6.27\% |
| 18 Increase of \$5 to \$10 | 249,630 | 25.14\% | 64.31\% | 437 | \$94.74 | \$102.06 | \$7.32 | 7.73\% |
| 19 Increase of \$10 to \$15 | 159,188 | 16.03\% | 80.34\% | 614 | \$140.22 | \$152.52 | \$12.31 | 8.78\% |
| 20 Increase of \$15 to \$20 | 99,502 | 10.02\% | 90.36\% | 788 | \$185.19 | \$202.51 | \$17.32 | 9.35\% |
| 21 Increase of \$20 to \$30 | 91,424 | 9.21\% | 99.56\% | 989 | \$236.78 | \$260.52 | \$23.74 | 10.03\% |
| 22 Increase of \$30 to \$40 | 4,223 | 0.43\% | 99.99\% | 1,136 | \$274.19 | \$305.77 | \$31.58 | 11.52\% |
| 23 Increase of \$40 to \$50 | 78 | 0.01\% | 100.00\% | 2,026 | \$470.61 | \$514.35 | \$43.74 | 9.29\% |
| 24 Increase of \$50 to \$75 | 34 | 0.00\% | 100.00\% | 2,531 | \$608.50 | \$666.48 | \$57.98 | 9.53\% |
| 25 Increase of \$75 to \$100 | 2 | 0.00\% | 100.00\% | 3,655 | \$852.14 | \$934.47 | \$82.32 | 9.66\% |
|  | 993,065 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:MODERATE NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 4 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly <br> Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 1,492 | 0.15\% | 0.15\% | 5,841 | \$2,146.70 | \$1,634.90 | (\$511.80) | -23.84\% |
| 3 Decrease of 15\% to 20\% | 2,324 | 0.23\% | 0.38\% | 2,962 | \$992.19 | \$819.42 | (\$172.78) | -17.41\% |
| 4 Decrease of 10\% to 15\% | 4,028 | 0.41\% | 0.79\% | 2,221 | \$696.08 | \$609.52 | (\$86.56) | -12.43\% |
| 5 Decrease of 7.5\% to 10\% | 2,779 | 0.28\% | 1.07\% | 1,906 | \$569.94 | \$520.05 | (\$49.88) | -8.75\% |
| 6 Decrease of 5\% to 7.5\% | 3,391 | 0.34\% | 1.41\% | 1,746 | \$506.75 | \$475.20 | (\$31.55) | -6.23\% |
| 7 Decrease of 2.5\% to 5\% | 4,015 | 0.40\% | 1.82\% | 1,615 | \$455.03 | \$438.00 | (\$17.04) | -3.74\% |
| 8 Decrease of 0\% to 2.5\% | 7,173 | 0.72\% | 2.54\% | 1,030 | \$283.00 | \$279.54 | (\$3.46) | -1.22\% |
| 9 No Change | 5,917 | 0.60\% | 3.13\% | 13 | \$9.82 | \$9.82 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 13,288 | 1.34\% | 4.47\% | 637 | \$170.18 | \$172.34 | \$2.15 | 1.26\% |
| 11 Increase of 2.5\% to 5\% | 48,619 | 4.90\% | 9.37\% | 348 | \$81.45 | \$84.70 | \$3.25 | 3.99\% |
| 12 Increase of 5\% to 7.5\% | 344,169 | 34.66\% | 44.02\% | 310 | \$65.53 | \$69.81 | \$4.28 | 6.53\% |
| 13 Increase of 7.5\% to 10\% | 402,926 | 40.57\% | 84.60\% | 548 | \$123.51 | \$134.35 | \$10.83 | 8.77\% |
| 14 Increase of 10\% to 15\% | 152,730 | 15.38\% | 99.98\% | 721 | \$166.74 | \$185.01 | \$18.27 | 10.96\% |
| 15 Increase of 15\% to 20\% | 208 | 0.02\% | 100.00\% | 413 | \$88.91 | \$103.34 | \$14.43 | 16.23\% |
| 16 Increase of 20\% to 30\% | 5 | 0.00\% | 100.00\% | 279 | \$57.12 | \$69.17 | \$12.05 | 21.11\% |
|  | 993,065 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:HOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 2,693 | 0.37\% | 0.37\% | 4,739 | \$1,583.68 | \$1,312.60 | (\$271.08) | -17.12\% |
| 2 Decrease of \$75 to \$100 | 741 | 0.10\% | 0.47\% | 3,188 | \$959.76 | \$872.81 | (\$86.95) | -9.06\% |
| 3 Decrease of \$50 to \$75 | 1,089 | 0.15\% | 0.62\% | 2,949 | \$865.58 | \$803.98 | (\$61.60) | -7.12\% |
| 4 Decrease of \$40 to \$50 | 645 | 0.09\% | 0.71\% | 2,795 | \$805.07 | \$760.38 | (\$44.69) | -5.55\% |
| 5 Decrease of \$30 to \$40 | 764 | 0.11\% | 0.82\% | 2,686 | \$764.33 | \$729.52 | (\$34.81) | -4.55\% |
| 6 Decrease of \$20 to \$30 | 896 | 0.12\% | 0.94\% | 2,588 | \$726.55 | \$701.87 | (\$24.68) | -3.40\% |
| 7 Decrease of \$15 to \$20 | 538 | 0.07\% | 1.01\% | 2,527 | \$701.82 | \$684.43 | (\$17.39) | -2.48\% |
| 8 Decrease of \$10 to \$15 | 620 | 0.09\% | 1.10\% | 2,473 | \$680.66 | \$668.15 | (\$12.51) | -1.84\% |
| 9 Decrease of \$5 to \$10 | 676 | 0.09\% | 1.19\% | 2,412 | \$658.95 | \$651.50 | (\$7.45) | -1.13\% |
| 10 Decrease of \$2 to \$5 | 459 | 0.06\% | 1.26\% | 2,345 | \$637.02 | \$633.57 | (\$3.45) | -0.54\% |
| 11 Decrease of \$1 to \$2 | 176 | 0.02\% | 1.28\% | 2,315 | \$626.43 | \$624.94 | (\$1.49) | -0.24\% |
| 12 Decrease of \$0 to \$1 | 2,751 | 0.38\% | 1.66\% | 173 | \$51.52 | \$51.48 | (\$0.04) | -0.08\% |
| 13 No Change | 9,570 | 1.32\% | 2.98\% | 8 | \$9.81 | \$9.81 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 20,564 | 2.83\% | 5.81\% | 83 | \$20.07 | \$20.53 | \$0.45 | 2.26\% |
| 15 Increase of \$1 to \$2 | 21,539 | 2.97\% | 8.78\% | 170 | \$35.29 | \$36.78 | \$1.49 | 4.23\% |
| 17 Increase of \$2 to \$5 | 72,181 | 9.94\% | 18.72\% | 313 | \$63.37 | \$66.94 | \$3.57 | 5.63\% |
| 18 Increase of \$5 to \$10 | 108,228 | 14.91\% | 33.63\% | 505 | \$103.70 | \$111.06 | \$7.36 | 7.10\% |
| 19 Increase of \$10 to \$15 | 97,565 | 13.44\% | 47.06\% | 689 | \$147.65 | \$160.15 | \$12.50 | 8.47\% |
| 20 Increase of \$15 to \$20 | 95,888 | 13.21\% | 60.27\% | 846 | \$187.50 | \$204.98 | \$17.48 | 9.32\% |
| 21 Increase of \$20 to \$30 | 156,038 | 21.49\% | 81.76\% | 1,086 | \$248.57 | \$273.23 | \$24.67 | 9.92\% |
| 22 Increase of \$30 to \$40 | 88,792 | 12.23\% | 93.99\% | 1,433 | \$337.85 | \$372.29 | \$34.45 | 10.20\% |
| 23 Increase of \$40 to \$50 | 36,547 | 5.03\% | 99.03\% | 1,758 | \$420.98 | \$464.94 | \$43.96 | 10.44\% |
| 24 Increase of \$50 to \$75 | 6,956 | 0.96\% | 99.99\% | 2,081 | \$501.71 | \$555.44 | \$53.73 | 10.71\% |
| 25 Increase of \$75 to \$100 | 89 | 0.01\% | 100.00\% | 3,619 | \$859.36 | \$943.51 | \$84.14 | 9.79\% |
| 26 Increase of More Than \$100 | 8 | 0.00\% | 100.00\% | 4,857 | \$1,132.37 | \$1,244.39 | \$112.02 | 9.89\% |
|  | 726,013 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:HOT NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 4 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly <br> Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 476 | 0.07\% | 0.07\% | 7,710 | \$2,804.18 | \$2,160.73 | (\$643.45) | -22.95\% |
| 3 Decrease of 15\% to 20\% | 805 | 0.11\% | 0.18\% | 4,741 | \$1,589.42 | \$1,312.23 | (\$277.20) | -17.44\% |
| 4 Decrease of 10\% to 15\% | 1,422 | 0.20\% | 0.37\% | 3,608 | \$1,130.20 | \$990.71 | (\$139.49) | -12.34\% |
| 5 Decrease of 7.5\% to 10\% | 1,132 | 0.16\% | 0.53\% | 3,137 | \$939.32 | \$857.44 | (\$81.88) | -8.72\% |
| 6 Decrease of 5\% to 7.5\% | 1,418 | 0.20\% | 0.72\% | 2,837 | \$823.78 | \$772.93 | (\$50.86) | -6.17\% |
| 7 Decrease of 2.5\% to 5\% | 1,844 | 0.25\% | 0.98\% | 2,641 | \$744.41 | \$716.62 | (\$27.78) | -3.73\% |
| 8 Decrease of 0\% to 2.5\% | 4,950 | 0.68\% | 1.66\% | 1,198 | \$330.74 | \$326.77 | (\$3.97) | -1.20\% |
| 9 No Change | 9,570 | 1.32\% | 2.98\% | 8 | \$9.81 | \$9.81 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 11,816 | 1.63\% | 4.61\% | 709 | \$189.49 | \$191.93 | \$2.43 | 1.28\% |
| 11 Increase of 2.5\% to 5\% | 33,565 | 4.62\% | 9.23\% | 532 | \$124.35 | \$129.30 | \$4.94 | 3.98\% |
| 12 Increase of 5\% to 7.5\% | 134,138 | 18.48\% | 27.70\% | 510 | \$109.90 | \$117.01 | \$7.12 | 6.47\% |
| 13 Increase of 7.5\% to 10\% | 258,907 | 35.66\% | 63.37\% | 867 | \$193.57 | \$211.06 | \$17.49 | 9.03\% |
| 14 Increase of 10\% to 15\% | 265,885 | 36.62\% | 99.99\% | 1,082 | \$247.55 | \$274.66 | \$27.11 | 10.95\% |
| 15 Increase of 15\% to 20\% | 84 | 0.01\% | 100.00\% | 554 | \$119.93 | \$138.65 | \$18.71 | 15.60\% |
|  | 726,013 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly <br> Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 7,913 | 0.48\% | 0.48\% | 3,698 | \$1,311.00 | \$1,030.62 | (\$280.38) | -21.39\% |
| 2 Decrease of \$75 to \$100 | 2,364 | 0.14\% | 0.62\% | 2,082 | \$658.43 | \$571.58 | (\$86.85) | -13.19\% |
| 3 Decrease of \$50 to \$75 | 3,854 | 0.23\% | 0.85\% | 1,852 | \$568.52 | \$507.21 | (\$61.30) | -10.78\% |
| 4 Decrease of \$40 to \$50 | 2,248 | 0.14\% | 0.99\% | 1,697 | \$507.71 | \$463.01 | (\$44.69) | -8.80\% |
| 5 Decrease of \$30 to \$40 | 2,837 | 0.17\% | 1.16\% | 1,605 | \$471.93 | \$437.17 | (\$34.76) | -7.37\% |
| 6 Decrease of \$20 to \$30 | 3,962 | 0.24\% | 1.40\% | 1,501 | \$432.99 | \$408.20 | (\$24.80) | -5.73\% |
| 7 Decrease of \$15 to \$20 | 2,415 | 0.15\% | 1.54\% | 1,428 | \$404.94 | \$387.52 | (\$17.42) | -4.30\% |
| 8 Decrease of \$10 to \$15 | 2,853 | 0.17\% | 1.71\% | 1,374 | \$384.43 | \$371.99 | (\$12.44) | -3.24\% |
| 9 Decrease of \$5 to \$10 | 3,478 | 0.21\% | 1.92\% | 1,319 | \$363.78 | \$356.37 | (\$7.41) | -2.04\% |
| 10 Decrease of \$2 to \$5 | 2,444 | 0.15\% | 2.07\% | 1,279 | \$348.53 | \$345.05 | (\$3.47) | -1.00\% |
| 11 Decrease of \$1 to \$2 | 940 | 0.06\% | 2.13\% | 1,235 | \$334.66 | \$333.18 | (\$1.49) | -0.44\% |
| 12 Decrease of \$0 to \$1 | 6,570 | 0.40\% | 2.52\% | 191 | \$55.31 | \$55.23 | (\$0.08) | -0.14\% |
| 13 No Change | 14,031 | 0.85\% | 3.37\% | 14 | \$9.81 | \$9.81 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 79,232 | 4.77\% | 8.14\% | 81 | \$18.24 | \$18.82 | \$0.59 | 3.22\% |
| 15 Increase of \$1 to \$2 | 190,872 | 11.50\% | 19.63\% | 143 | \$28.83 | \$30.35 | \$1.53 | 5.29\% |
| 17 Increase of \$2 to \$5 | 462,501 | 27.86\% | 47.49\% | 253 | \$51.81 | \$55.14 | \$3.33 | 6.43\% |
| 18 Increase of \$5 to \$10 | 426,249 | 25.67\% | 73.16\% | 417 | \$92.19 | \$99.45 | \$7.26 | 7.88\% |
| 19 Increase of \$10 to \$15 | 232,348 | 13.99\% | 87.16\% | 604 | \$139.72 | \$151.96 | \$12.24 | 8.76\% |
| 20 Increase of \$15 to \$20 | 116,955 | 7.04\% | 94.20\% | 780 | \$183.97 | \$201.15 | \$17.19 | 9.34\% |
| 21 Increase of \$20 to \$30 | 91,922 | 5.54\% | 99.74\% | 989 | \$236.69 | \$260.42 | \$23.73 | 10.03\% |
| 22 Increase of \$30 to \$40 | 4,250 | 0.26\% | 99.99\% | 1,141 | \$275.11 | \$306.71 | \$31.60 | 11.49\% |
| 23 Increase of \$40 to \$50 | 86 | 0.01\% | 100.00\% | 2,040 | \$473.13 | \$516.81 | \$43.68 | 9.23\% |
| 24 Increase of \$50 to \$75 | 39 | 0.00\% | 100.00\% | 2,539 | \$610.87 | \$669.07 | \$58.19 | 9.53\% |
| 25 Increase of \$75 to \$100 | 3 | 0.00\% | 100.00\% | 4,450 | \$1,063.98 | \$1,144.77 | \$80.79 | 7.59\% |
|  | 1,660,364 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1 Comparison: E1 2018 vs. ETOUC 2018 Season:SUMMER Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1 2018 | Monthly <br> Summer Bill ETOUC 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 3,502 | 0.21\% | 0.21\% | 4,998 | \$1,845.89 | \$1,400.45 | (\$445.44) | -24.13\% |
| 3 Decrease of 15\% to 20\% | 3,896 | 0.23\% | 0.45\% | 2,576 | \$862.79 | \$712.20 | (\$150.60) | -17.45\% |
| 4 Decrease of 10\% to 15\% | 6,168 | 0.37\% | 0.82\% | 1,961 | \$614.54 | \$538.10 | (\$76.44) | -12.44\% |
| 5 Decrease of 7.5\% to 10\% | 4,229 | 0.25\% | 1.07\% | 1,686 | \$504.33 | \$460.22 | (\$44.11) | -8.75\% |
| 6 Decrease of 5\% to 7.5\% | 5,097 | 0.31\% | 1.38\% | 1,546 | \$448.74 | \$420.78 | (\$27.96) | -6.23\% |
| 7 Decrease of 2.5\% to 5\% | 6,071 | 0.37\% | 1.74\% | 1,427 | \$401.95 | \$386.90 | (\$15.05) | -3.74\% |
| 8 Decrease of 0\% to 2.5\% | 12,914 | 0.78\% | 2.52\% | 761 | \$209.82 | \$207.29 | (\$2.53) | -1.20\% |
| 9 No Change | 14,031 | 0.85\% | 3.37\% | 14 | \$9.81 | \$9.81 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 27,052 | 1.63\% | 5.00\% | 428 | \$114.79 | \$116.22 | \$1.43 | 1.25\% |
| 11 Increase of 2.5\% to 5\% | 95,251 | 5.74\% | 10.73\% | 274 | \$63.10 | \$65.66 | \$2.56 | 4.05\% |
| 12 Increase of 5\% to 7.5\% | 636,072 | 38.31\% | 49.04\% | 263 | \$55.56 | \$59.17 | \$3.61 | 6.51\% |
| 13 Increase of $7.5 \%$ to $10 \%$ | 677,544 | 40.81\% | 89.85\% | 491 | \$111.30 | \$121.02 | \$9.72 | 8.73\% |
| 14 Increase of 10\% to 15\% | 168,303 | 10.14\% | 99.99\% | 700 | \$162.14 | \$179.86 | \$17.72 | 10.93\% |
| 15 Increase of 15\% to 20\% | 229 | 0.01\% | 100.00\% | 402 | \$86.73 | \$100.84 | \$14.11 | 16.27\% |
| 16 Increase of 20\% to 30\% | 5 | 0.00\% | 100.00\% | 279 | \$57.12 | \$69.17 | \$12.05 | 21.11\% |
|  | 1,660,364 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:ALL NEM/non-NEM:non-NEM

| Bill Impact Range(\$) <br> Range(\$) | Cust Count = Num of months / 12 | \% Of Cust | $\begin{aligned} & \text { CUM } \\ & \% \text { of } \end{aligned}$ Cust | Avg <br> Monthly kwh for the range | Monthly Bill E1L 2018 | Monthly Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | $\begin{gathered} \text { Avg } \\ \text { \% } \\ \text { Change } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 238 | 0.03\% | 0.03\% | 3,710 | \$817.29 | \$598.14 | (\$219.15) | -26.81\% |
| 2 Decrease of \$ 75 to \$100 | 102 | 0.01\% | 0.04\% | 2,233 | \$441.39 | \$355.52 | (\$85.86) | -19.45\% |
| 3 Decrease of \$50 to \$75 | 229 | 0.03\% | 0.06\% | 2,035 | \$382.60 | \$322.12 | (\$60.49) | -15.81\% |
| 4 Decrease of \$40 to \$ $\$ 50$ | 166 | 0.02\% | 0.08\% | 1,836 | \$333.69 | \$288.91 | (\$44.78) | -13.42\% |
| 5 Decrease of \$ 30 to \$ 40 | 324 | 0.04\% | 0.12\% | 1,675 | \$296.81 | \$262.28 | (\$34.53) | -11.63\% |
| 6 Decrease of \$ 20 to \$ 30 | 792 | 0.09\% | 0.21\% | 1,528 | \$261.80 | \$237.65 | (\$24.15) | -9.22\% |
| 7 Decrease of \$15 to \$20 | 809 | 0.09\% | 0.30\% | 1,369 | \$227.24 | \$210.05 | (\$17.19) | -7.57\% |
| 8 Decrease of \$10 to \$15 | 1,915 | 0.22\% | 0.52\% | 1,245 | \$200.12 | \$188.07 | (\$12.05) | -6.02\% |
| 9 Decrease of \$5 to \$10 | 9,021 | 1.02\% | 1.54\% | 1,068 | \$161.50 | \$154.78 | (\$6.72) | -4.16\% |
| 10 Decrease of \$2 to \$5 | 49,962 | 5.65\% | 7.18\% | 734 | \$105.61 | \$102.70 | (\$2.91) | -2.76\% |
| 11 Decrease of \$1 to \$2 | 130,363 | 14.73\% | 21.92\% | 481 | \$67.87 | \$66.50 | (\$1.38) | -2.03\% |
| 12 Decrease of \$0 to \$1 | 323,277 | 36.54\% | 58.46\% | 333 | \$45.54 | \$45.03 | (\$0.52) | -1.13\% |
| 13 No Change | 675 | 0.08\% | 58.53\% | 19 | \$6.92 | \$6.92 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 123,720 | 13.98\% | 72.51\% | 457 | \$63.25 | \$63.70 | \$0.45 | 0.71\% |
| 15 Increase of \$1 to \$2 | 84,659 | 9.57\% | 82.08\% | 576 | \$81.03 | \$82.51 | \$1.48 | 1.83\% |
| 17 Increase of \$2 to \$5 | 141,500 | 15.99\% | 98.08\% | 725 | \$104.93 | \$108.10 | \$3.18 | 3.03\% |
| 18 Increase of \$5 to \$10 | 17,011 | 1.92\% | 100.00\% | 900 | \$133.39 | \$139.21 | \$5.83 | 4.37\% |
| 19 Increase of \$10 to \$15 | 12 | 0.00\% | 100.00\% | 1,239 | \$182.24 | \$193.28 | \$11.04 | 6.06\% |
|  | 884,775 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:ALL NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 12 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | ```Monthly Bill ETOUCL }201``` | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 48 | 0.01\% | 0.01\% | 5,290 | \$1,259.27 | \$854.60 | (\$404.67) | -32.14\% |
| 2 Decrease of 20\% to 30\% | 264 | 0.03\% | 0.04\% | 2,627 | \$558.78 | \$420.83 | (\$137.95) | -24.69\% |
| 3 Decrease of 15\% to 20\% | 322 | 0.04\% | 0.07\% | 1,777 | \$339.10 | \$280.32 | (\$58.78) | -17.33\% |
| 4 Decrease of 10\% to 15\% | 1,020 | 0.12\% | 0.19\% | 1,316 | \$231.44 | \$203.43 | (\$28.01) | -12.10\% |
| 5 Decrease of 7.5\% to 10\% | 1,735 | 0.20\% | 0.38\% | 1,046 | \$171.95 | \$157.20 | (\$14.75) | -8.58\% |
| 6 Decrease of 5\% to 7.5\% | 10,572 | 1.19\% | 1.58\% | 567 | \$84.88 | \$79.87 | (\$5.02) | -5.91\% |
| 7 Decrease of 2.5\% to 5\% | 135,041 | 15.26\% | 16.84\% | 375 | \$51.75 | \$50.02 | (\$1.73) | -3.33\% |
| 8 Decrease of 0\% to 2.5\% | 368,195 | 41.61\% | 58.46\% | 442 | \$61.98 | \$61.20 | (\$0.78) | -1.26\% |
| 9 No Change | 675 | 0.08\% | 58.53\% | 19 | \$6.92 | \$6.92 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 213,597 | 24.14\% | 82.67\% | 606 | \$86.41 | \$87.52 | \$1.11 | 1.29\% |
| 11 Increase of 2.5\% to 5\% | 133,447 | 15.08\% | 97.76\% | 629 | \$89.84 | \$92.94 | \$3.10 | 3.45\% |
| 12 Increase of 5\% to 7.5\% | 18,583 | 2.10\% | 99.86\% | 501 | \$69.89 | \$73.88 | \$3.99 | 5.71\% |
| 13 Increase of 7.5\% to 10\% | 1,187 | 0.13\% | 99.99\% | 353 | \$47.90 | \$51.82 | \$3.92 | 8.19\% |
| 14 Increase of 10\% to 15\% | 88 | 0.01\% | 100.00\% | 273 | \$36.50 | \$40.48 | \$3.97 | 10.88\% |
| 15 Increase of 15\% to 20\% | 1 | 0.00\% | 100.00\% | 334 | \$44.93 | \$52.32 | \$7.40 | 16.47\% |
|  | 884,775 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:COOL NEM/non-NEM:non-NEM

| Bill |
| :---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Impact |
| Range(\$) |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:COOL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | $\begin{aligned} & \text { Cust Count } \\ & =\text { Num of } \\ & \text { months / } 12 \end{aligned}$ | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly $\begin{gathered} \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | ```Monthly Bill ETOUCL 2018``` | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 30 | 0.02\% | 0.02\% | 5,282 | \$1,266.57 | \$856.04 | (\$410.52) | -32.41\% |
| 2 Decrease of 20\% to 30\% | 96 | 0.05\% | 0.07\% | 1,917 | \$405.21 | \$304.30 | (\$100.91) | -24.90\% |
| 3 Decrease of 15\% to 20\% | 100 | 0.05\% | 0.12\% | 1,248 | \$233.64 | \$193.88 | (\$39.76) | -17.02\% |
| 4 Decrease of 10\% to 15\% | 385 | 0.21\% | 0.33\% | 966 | \$167.20 | \$147.05 | (\$20.16) | -12.06\% |
| 5 Decrease of 7.5\% to 10\% | 731 | 0.39\% | 0.72\% | 755 | \$118.94 | \$108.77 | (\$10.17) | -8.55\% |
| 6 Decrease of 5\% to 7.5\% | 4,103 | 2.20\% | 2.92\% | 455 | \$67.23 | \$63.24 | (\$3.99) | -5.93\% |
| 7 Decrease of 2.5\% to 5\% | 55,475 | 29.70\% | 32.61\% | 277 | \$38.15 | \$36.89 | (\$1.26) | -3.31\% |
| 8 Decrease of 0\% to 2.5\% | 120,357 | 64.44\% | 97.05\% | 337 | \$47.87 | \$47.17 | (\$0.70) | -1.46\% |
| 9 No Change | 199 | 0.11\% | 97.16\% | 14 | \$6.01 | \$6.01 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 5,117 | 2.74\% | 99.90\% | 309 | \$43.98 | \$44.21 | \$0.23 | 0.52\% |
| 11 Increase of 2.5\% to 5\% | 185 | 0.10\% | 99.99\% | 148 | \$21.01 | \$21.67 | \$0.66 | 3.14\% |
| 12 Increase of 5\% to 7.5\% | 10 | 0.01\% | 100.00\% | 116 | \$18.06 | \$19.12 | \$1.07 | 5.91\% |
|  | 186,787 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 12 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | ```Monthly Bill ETOUCL 2018``` | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 56 | 0.03\% | 0.03\% | 3,120 | \$679.36 | \$501.76 | (\$177.60) | -26.14\% |
| 2 Decrease of \$75 to \$100 | 34 | 0.02\% | 0.04\% | 2,092 | \$418.57 | \$332.02 | (\$86.55) | -20.68\% |
| 3 Decrease of \$50 to \$75 | 57 | 0.03\% | 0.07\% | 1,858 | \$352.68 | \$292.22 | (\$60.46) | -17.14\% |
| 4 Decrease of \$40 to \$50 | 44 | 0.02\% | 0.09\% | 1,667 | \$306.72 | \$261.83 | (\$44.89) | -14.64\% |
| 5 Decrease of \$30 to \$40 | 77 | 0.03\% | 0.12\% | 1,569 | \$280.56 | \$246.16 | (\$34.39) | -12.26\% |
| 6 Decrease of \$20 to \$30 | 178 | 0.08\% | 0.20\% | 1,429 | \$245.67 | \$221.33 | (\$24.34) | -9.91\% |
| 7 Decrease of \$15 to \$20 | 190 | 0.09\% | 0.29\% | 1,246 | \$208.16 | \$191.05 | (\$17.11) | -8.22\% |
| 8 Decrease of \$10 to \$15 | 472 | 0.21\% | 0.50\% | 1,155 | \$187.25 | \$175.27 | (\$11.98) | -6.40\% |
| 9 Decrease of \$5 to \$10 | 2,243 | 1.01\% | 1.50\% | 990 | \$152.05 | \$145.36 | (\$6.69) | -4.40\% |
| 10 Decrease of \$2 to \$5 | 16,695 | 7.49\% | 8.99\% | 672 | \$97.74 | \$94.93 | (\$2.81) | -2.88\% |
| 11 Decrease of \$1 to \$2 | 54,310 | 24.35\% | 33.34\% | 466 | \$65.62 | \$64.24 | (\$1.37) | -2.09\% |
| 12 Decrease of \$0 to \$1 | 113,848 | 51.05\% | 84.39\% | 328 | \$44.73 | \$44.19 | (\$0.54) | -1.21\% |
| 13 No Change | 93 | 0.04\% | 84.43\% | 40 | \$9.68 | \$9.68 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 24,428 | 10.95\% | 95.39\% | 427 | \$60.13 | \$60.51 | \$0.38 | 0.63\% |
| 15 Increase of \$1 to \$2 | 7,217 | 3.24\% | 98.62\% | 548 | \$79.48 | \$80.89 | \$1.41 | 1.77\% |
| 17 Increase of \$2 to \$5 | 3,053 | 1.37\% | 99.99\% | 630 | \$92.81 | \$95.47 | \$2.66 | 2.87\% |
| 18 Increase of \$5 to \$10 | 16 | 0.01\% | 100.00\% | 638 | \$92.68 | \$98.22 | \$5.53 | 5.97\% |
|  | 223,011 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | $\begin{aligned} & \text { Cust Count } \\ & =\text { Num of } \\ & \text { months / } 12 \end{aligned}$ | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | Monthly Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 8 | 0.00\% | 0.00\% | 4,206 | \$987.77 | \$679.40 | (\$308.37) | -31.22\% |
| 2 Decrease of 20\% to 30\% | 73 | 0.03\% | 0.04\% | 2,465 | \$521.65 | \$393.96 | (\$127.69) | -24.48\% |
| 3 Decrease of 15\% to 20\% | 93 | 0.04\% | 0.08\% | 1,728 | \$329.53 | \$271.78 | (\$57.74) | -17.52\% |
| 4 Decrease of 10\% to 15\% | 248 | 0.11\% | 0.19\% | 1,314 | \$230.92 | \$203.23 | (\$27.69) | -11.99\% |
| 5 Decrease of 7.5\% to 10\% | 361 | 0.16\% | 0.35\% | 1,095 | \$181.74 | \$166.14 | (\$15.60) | -8.58\% |
| 6 Decrease of 5\% to 7.5\% | 3,359 | 1.51\% | 1.86\% | 511 | \$75.61 | \$71.20 | (\$4.41) | -5.84\% |
| 7 Decrease of 2.5\% to 5\% | 50,147 | 22.49\% | 24.34\% | 360 | \$49.38 | \$47.75 | (\$1.63) | -3.30\% |
| 8 Decrease of 0\% to 2.5\% | 133,916 | 60.05\% | 84.39\% | 425 | \$59.58 | \$58.79 | (\$0.79) | -1.33\% |
| 9 No Change | 93 | 0.04\% | 84.43\% | 40 | \$9.68 | \$9.68 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 30,240 | 13.56\% | 97.99\% | 478 | \$68.23 | \$68.85 | \$0.62 | 0.91\% |
| 11 Increase of 2.5\% to 5\% | 4,147 | 1.86\% | 99.85\% | 426 | \$60.29 | \$62.24 | \$1.95 | 3.23\% |
| 12 Increase of 5\% to 7.5\% | 306 | 0.14\% | 99.99\% | 315 | \$43.93 | \$46.45 | \$2.52 | 5.74\% |
| 13 Increase of 7.5\% to 10\% | 22 | 0.01\% | 100.00\% | 222 | \$31.03 | \$33.59 | \$2.55 | 8.23\% |
|  | 223,011 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:HOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 12 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | Monthly Bill ETOUCL 2018 | $\$$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 109 | 0.02\% | 0.02\% | 4,033 | \$868.09 | \$651.11 | (\$216.98) | -25.00\% |
| 2 Decrease of \$75 to \$100 | 50 | 0.01\% | 0.03\% | 2,490 | \$483.03 | \$397.71 | (\$85.32) | -17.66\% |
| 3 Decrease of \$50 to \$75 | 124 | 0.03\% | 0.06\% | 2,278 | \$422.50 | \$362.35 | (\$60.15) | -14.24\% |
| 4 Decrease of \$40 to \$50 | 94 | 0.02\% | 0.08\% | 2,051 | \$367.74 | \$323.54 | (\$44.21) | -12.02\% |
| 5 Decrease of \$30 to \$40 | 176 | 0.04\% | 0.12\% | 1,866 | \$327.23 | \$292.72 | (\$34.51) | -10.55\% |
| 6 Decrease of \$20 to \$30 | 421 | 0.09\% | 0.20\% | 1,733 | \$294.92 | \$270.91 | (\$24.01) | -8.14\% |
| 7 Decrease of \$15 to \$20 | 447 | 0.09\% | 0.30\% | 1,547 | \$255.25 | \$238.07 | (\$17.19) | -6.73\% |
| 8 Decrease of \$10 to \$15 | 944 | 0.20\% | 0.50\% | 1,435 | \$229.77 | \$217.66 | (\$12.11) | -5.27\% |
| 9 Decrease of \$5 to \$10 | 4,740 | 1.00\% | 1.50\% | 1,225 | \$183.37 | \$176.75 | (\$6.62) | -3.61\% |
| 10 Decrease of \$2 to \$5 | 22,262 | 4.69\% | 6.18\% | 862 | \$121.97 | \$118.94 | (\$3.03) | -2.49\% |
| 11 Decrease of \$1 to \$2 | 32,994 | 6.95\% | 13.13\% | 598 | \$83.04 | \$81.63 | (\$1.41) | -1.70\% |
| 12 Decrease of \$0 to \$1 | 85,355 | 17.97\% | 31.10\% | 447 | \$60.94 | \$60.50 | (\$0.44) | -0.72\% |
| 13 No Change | 384 | 0.08\% | 31.18\% | 16 | \$6.72 | \$6.72 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 94,150 | 19.82\% | 51.00\% | 474 | \$65.21 | \$65.69 | \$0.48 | 0.73\% |
| 15 Increase of \$1 to \$2 | 77,283 | 16.27\% | 67.27\% | 578 | \$81.20 | \$82.69 | \$1.49 | 1.83\% |
| 17 Increase of \$2 to \$5 | 138,436 | 29.15\% | 96.42\% | 727 | \$105.20 | \$108.38 | \$3.19 | 3.03\% |
| 18 Increase of \$5 to \$10 | 16,995 | 3.58\% | 100.00\% | 900 | \$133.43 | \$139.25 | \$5.83 | 4.37\% |
| 19 Increase of \$10 to \$15 | 12 | 0.00\% | 100.00\% | 1,239 | \$182.24 | \$193.28 | \$11.04 | 6.06\% |
|  | 474,976 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:HOT NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 12 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | ```Monthly Bill ETOUCL 2018``` | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 10 | 0.00\% | 0.00\% | 6,186 | \$1,455.73 | \$991.21 | (\$464.52) | -31.91\% |
| 2 Decrease of 20\% to 30\% | 95 | 0.02\% | 0.02\% | 3,470 | \$742.60 | \$559.31 | (\$183.29) | -24.68\% |
| 3 Decrease of 15\% to 20\% | 129 | 0.03\% | 0.05\% | 2,224 | \$427.88 | \$353.58 | (\$74.30) | -17.36\% |
| 4 Decrease of 10\% to 15\% | 387 | 0.08\% | 0.13\% | 1,665 | \$295.68 | \$259.65 | (\$36.03) | -12.18\% |
| 5 Decrease of 7.5\% to 10\% | 643 | 0.14\% | 0.27\% | 1,349 | \$226.78 | \$207.28 | (\$19.49) | -8.60\% |
| 6 Decrease of 5\% to 7.5\% | 3,110 | 0.65\% | 0.92\% | 775 | \$118.19 | \$111.17 | (\$7.02) | -5.94\% |
| 7 Decrease of 2.5\% to 5\% | 29,419 | 6.19\% | 7.11\% | 584 | \$81.41 | \$78.65 | (\$2.76) | -3.39\% |
| 8 Decrease of 0\% to 2.5\% | 113,923 | 23.98\% | 31.10\% | 572 | \$79.72 | \$78.87 | (\$0.85) | -1.07\% |
| 9 No Change | 384 | 0.08\% | 31.18\% | 16 | \$6.72 | \$6.72 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 178,241 | 37.53\% | 68.71\% | 637 | \$90.71 | \$91.93 | \$1.22 | 1.35\% |
| 11 Increase of 2.5\% to 5\% | 129,115 | 27.18\% | 95.89\% | 636 | \$90.89 | \$94.03 | \$3.14 | 3.45\% |
| 12 Increase of 5\% to 7.5\% | 18,267 | 3.85\% | 99.74\% | 504 | \$70.35 | \$74.37 | \$4.01 | 5.70\% |
| 13 Increase of 7.5\% to 10\% | 1,165 | 0.25\% | 99.98\% | 355 | \$48.22 | \$52.17 | \$3.95 | 8.19\% |
| 14 Increase of 10\% to 15\% | 88 | 0.02\% | 100.00\% | 273 | \$36.50 | \$40.48 | \$3.97 | 10.88\% |
| 15 Increase of 15\% to 20\% | 1 | 0.00\% | 100.00\% | 334 | \$44.93 | \$52.32 | \$7.40 | 16.47\% |
|  | 474,976 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill |
| :---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Impact |
| Range(\$) |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:ALL Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 12 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | $\begin{gathered} \text { Monthly } \\ \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | Monthly Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 38 | 0.01\% | 0.01\% | 5,055 | \$1,207.73 | \$818.77 | (\$388.97) | -32.21\% |
| 2 Decrease of 20\% to 30\% | 169 | 0.04\% | 0.05\% | 2,154 | \$455.49 | \$343.02 | (\$112.47) | -24.69\% |
| 3 Decrease of 15\% to 20\% | 193 | 0.05\% | 0.10\% | 1,479 | \$279.85 | \$231.42 | (\$48.43) | -17.30\% |
| 4 Decrease of 10\% to 15\% | 633 | 0.15\% | 0.25\% | 1,102 | \$192.16 | \$169.05 | (\$23.11) | -12.03\% |
| 5 Decrease of 7.5\% to 10\% | 1,092 | 0.27\% | 0.52\% | 867 | \$139.69 | \$127.73 | (\$11.96) | -8.56\% |
| 6 Decrease of 5\% to 7.5\% | 7,462 | 1.82\% | 2.34\% | 480 | \$71.00 | \$66.82 | (\$4.18) | -5.88\% |
| 7 Decrease of 2.5\% to 5\% | 105,621 | 25.77\% | 28.11\% | 317 | \$43.49 | \$42.05 | (\$1.44) | -3.31\% |
| 8 Decrease of 0\% to 2.5\% | 254,272 | 62.05\% | 90.16\% | 383 | \$54.03 | \$53.29 | (\$0.75) | -1.38\% |
| 9 No Change | 292 | 0.07\% | 90.23\% | 22 | \$7.18 | \$7.18 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 35,356 | 8.63\% | 98.86\% | 453 | \$64.72 | \$65.28 | \$0.56 | 0.87\% |
| 11 Increase of 2.5\% to 5\% | 4,332 | 1.06\% | 99.92\% | 414 | \$58.62 | \$60.51 | \$1.89 | 3.23\% |
| 12 Increase of 5\% to 7.5\% | 316 | 0.08\% | 99.99\% | 308 | \$43.11 | \$45.59 | \$2.48 | 5.74\% |
| 13 Increase of 7.5\% to 10\% | 22 | 0.01\% | 100.00\% | 222 | \$31.03 | \$33.59 | \$2.55 | 8.23\% |
|  | 409,798 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1L 2018 | Monthly <br> Winter Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 290 | 0.03\% | 0.03\% | 3,384 | \$745.02 | \$525.26 | (\$219.76) | -29.50\% |
| 2 Decrease of \$75 to \$100 | 161 | 0.02\% | 0.05\% | 2,025 | \$393.17 | \$307.83 | (\$85.34) | -21.71\% |
| 3 Decrease of \$50 to \$75 | 412 | 0.05\% | 0.10\% | 1,783 | \$328.48 | \$268.53 | (\$59.94) | -18.25\% |
| 4 Decrease of \$40 to \$50 | 373 | 0.04\% | 0.14\% | 1,648 | \$290.46 | \$246.06 | (\$44.40) | -15.29\% |
| 5 Decrease of \$30 to \$40 | 871 | 0.10\% | 0.24\% | 1,500 | \$256.93 | \$222.53 | (\$34.40) | -13.39\% |
| 6 Decrease of \$20 to \$30 | 2,562 | 0.29\% | 0.53\% | 1,423 | \$230.20 | \$206.32 | (\$23.89) | -10.38\% |
| 7 Decrease of \$15 to \$20 | 5,283 | 0.60\% | 1.13\% | 1,370 | \$209.77 | \$192.77 | (\$16.99) | -8.10\% |
| 8 Decrease of \$10 to \$15 | 20,407 | 2.32\% | 3.45\% | 1,137 | \$167.82 | \$155.90 | (\$11.92) | -7.10\% |
| 9 Decrease of \$5 to \$10 | 192,424 | 21.86\% | 25.31\% | 715 | \$105.05 | \$98.62 | (\$6.43) | -6.12\% |
| 10 Decrease of \$2 to \$5 | 522,843 | 59.41\% | 84.72\% | 383 | \$53.05 | \$49.63 | (\$3.43) | -6.46\% |
| 11 Decrease of \$1 to \$2 | 112,428 | 12.77\% | 97.50\% | 170 | \$21.95 | \$20.38 | (\$1.57) | -7.15\% |
| 12 Decrease of \$0 to \$1 | 20,613 | 2.34\% | 99.84\% | 82 | \$10.79 | \$10.07 | (\$0.72) | -6.65\% |
| 13 No Change | 1,126 | 0.13\% | 99.97\% | 9 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 276 | 0.03\% | 100.00\% | 19 | \$5.38 | \$5.40 | \$0.02 | 0.31\% |
|  | 880,069 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:ALL NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter <br> Bill <br> E1L 2018 | Monthly Winter Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 96 | 0.01\% | 0.01\% | 4,501 | \$1,059.38 | \$704.52 | (\$354.85) | -33.50\% |
| 2 Decrease of 20\% to 30\% | 486 | 0.06\% | 0.07\% | 2,039 | \$413.71 | \$312.26 | (\$101.45) | -24.52\% |
| 3 Decrease of 15\% to 20\% | 1,018 | 0.12\% | 0.18\% | 1,393 | \$250.88 | \$208.03 | (\$42.85) | -17.08\% |
| 4 Decrease of 10\% to 15\% | 5,112 | 0.58\% | 0.76\% | 1,029 | \$168.74 | \$148.51 | (\$20.23) | -11.99\% |
| 5 Decrease of 7.5\% to 10\% | 215,529 | 24.49\% | 25.25\% | 310 | \$41.25 | \$37.94 | (\$3.32) | -8.04\% |
| 6 Decrease of 5\% to 7.5\% | 605,030 | 68.75\% | 94.00\% | 483 | \$68.99 | \$64.67 | (\$4.32) | -6.26\% |
| 7 Decrease of 2.5\% to 5\% | 50,248 | 5.71\% | 99.71\% | 586 | \$88.43 | \$84.42 | (\$4.01) | -4.54\% |
| 8 Decrease of 0\% to 2.5\% | 1,150 | 0.13\% | 99.84\% | 71 | \$12.31 | \$12.10 | (\$0.21) | -1.73\% |
| 9 No Change | 1,126 | 0.13\% | 99.97\% | 9 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 272 | 0.03\% | 100.00\% | 19 | \$5.38 | \$5.39 | \$0.01 | 0.24\% |
| 11 Increase of 2.5\% to 5\% | 3 | 0.00\% | 100.00\% | 18 | \$5.73 | \$5.89 | \$0.16 | 2.81\% |
| 13 Increase of 7.5\% to 10\% | 1 | 0.00\% | 100.00\% | 0 | \$6.35 | \$6.94 | \$0.59 | 9.36\% |
|  | 880,069 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:COOL NEM/non-NEM:non-NEM

| Bill Impact Range(\$) | Cust Count = Num of months / 8 | \% Of Cust | CUM \% of Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter <br> Bill <br> E1L 2018 | Monthly <br> Winter <br> Bill <br> ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Current | $\begin{gathered} \text { Avg } \\ \text { \% } \\ \text { Change } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 79 | 0.04\% | 0.04\% | 3,617 | \$830.28 | \$562.51 | (\$267.77) | -32.25\% |
| 2 Decrease of $\$ 75$ to $\$ 100$ | 34 | 0.02\% | 0.06\% | 1,775 | \$353.78 | \$269.06 | (\$84.72) | -23.95\% |
| 3 Decrease of \$50 to \$ 75 | 73 | 0.04\% | 0.10\% | 1,535 | \$290.21 | \$230.64 | (\$59.57) | -20.53\% |
| 4 Decrease of \$40 to \$ 50 | 50 | 0.03\% | 0.13\% | 1,425 | \$256.58 | \$212.04 | (\$44.54) | -17.36\% |
| 5 Decrease of \$30 to \$40 | 184 | 0.10\% | 0.23\% | 1,283 | \$224.67 | \$190.19 | (\$34.47) | -15.34\% |
| 6 Decrease of \$20 to \$30 | 426 | 0.23\% | 0.46\% | 1,155 | \$190.94 | \$166.97 | (\$23.96) | -12.55\% |
| 7 Decrease of \$15 to \$20 | 790 | 0.43\% | 0.88\% | 974 | \$152.76 | \$135.66 | (\$17.10) | -11.19\% |
| 8 Decrease of \$10 to \$15 | 1,791 | 0.96\% | 1.84\% | 858 | \$133.31 | \$121.34 | (\$11.97) | -8.98\% |
| 9 Decrease of \$5 to \$10 | 20,495 | 11.03\% | 12.87\% | 657 | \$98.79 | \$92.53 | (\$6.25) | -6.33\% |
| 10 Decrease of \$2 to \$5 | 110,131 | 59.26\% | 72.14\% | 350 | \$48.98 | \$45.76 | (\$3.22) | -6.58\% |
| 11 Decrease of \$1 to \$2 | 41,511 | 22.34\% | 94.48\% | 161 | \$20.57 | \$19.03 | (\$1.54) | -7.49\% |
| 12 Decrease of \$0 to \$1 | 9,809 | 5.28\% | 99.76\% | 79 | \$10.21 | \$9.48 | (\$0.73) | -7.12\% |
| 13 No Change | 384 | 0.21\% | 99.96\% | 13 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 70 | 0.04\% | 100.00\% | 19 | \$5.04 | \$5.04 | \$0.00 | 0.03\% |
|  | 185,828 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:COOL NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter $\begin{gathered} \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | Monthly Winter Bill ETOUCL 2018 | $\$$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 47 | 0.03\% | 0.03\% | 4,404 | \$1,043.59 | \$688.07 | (\$355.52) | -34.07\% |
| 2 Decrease of 20\% to 30\% | 135 | 0.07\% | 0.10\% | 1,621 | \$328.21 | \$246.88 | (\$81.33) | -24.78\% |
| 3 Decrease of 15\% to 20\% | 280 | 0.15\% | 0.25\% | 1,138 | \$203.26 | \$168.78 | (\$34.48) | -16.96\% |
| 4 Decrease of 10\% to 15\% | 1,853 | 1.00\% | 1.25\% | 838 | \$131.95 | \$116.09 | (\$15.86) | -12.02\% |
| 5 Decrease of 7.5\% to 10\% | 55,853 | 30.06\% | 31.30\% | 229 | \$30.58 | \$28.11 | (\$2.47) | -8.07\% |
| 6 Decrease of 5\% to 7.5\% | 124,533 | 67.02\% | 98.32\% | 376 | \$53.77 | \$50.36 | (\$3.40) | -6.33\% |
| 7 Decrease of 2.5\% to 5\% | 2,345 | 1.26\% | 99.58\% | 472 | \$71.14 | \$67.77 | (\$3.37) | -4.73\% |
| 8 Decrease of 0\% to 2.5\% | 328 | 0.18\% | 99.76\% | 29 | \$5.25 | \$5.19 | (\$0.06) | -1.07\% |
| 9 No Change | 384 | 0.21\% | 99.96\% | 13 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 70 | 0.04\% | 100.00\% | 19 | \$5.04 | \$5.04 | \$0.00 | 0.03\% |
|  | 185,828 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1L 2018 | Monthly <br> Winter Bill ETOUCL 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 73 | 0.03\% | 0.03\% | 2,944 | \$632.01 | \$454.09 | (\$177.92) | -28.15\% |
| 2 Decrease of \$75 to \$100 | 40 | 0.02\% | 0.05\% | 2,006 | \$387.92 | \$302.75 | (\$85.17) | -21.96\% |
| 3 Decrease of \$50 to \$75 | 84 | 0.04\% | 0.09\% | 1,779 | \$327.48 | \$267.23 | (\$60.25) | -18.40\% |
| 4 Decrease of \$40 to \$50 | 90 | 0.04\% | 0.13\% | 1,586 | \$281.77 | \$237.51 | (\$44.26) | -15.71\% |
| 5 Decrease of \$30 to \$40 | 168 | 0.08\% | 0.20\% | 1,437 | \$247.25 | \$213.08 | (\$34.16) | -13.82\% |
| 6 Decrease of \$20 to \$30 | 464 | 0.21\% | 0.41\% | 1,293 | \$212.99 | \$189.06 | (\$23.93) | -11.23\% |
| 7 Decrease of \$15 to \$20 | 875 | 0.39\% | 0.81\% | 1,243 | \$195.37 | \$178.31 | (\$17.06) | -8.73\% |
| 8 Decrease of \$10 to \$15 | 3,441 | 1.55\% | 2.36\% | 1,071 | \$162.55 | \$150.67 | (\$11.88) | -7.31\% |
| 9 Decrease of \$5 to \$10 | 45,171 | 20.36\% | 22.72\% | 705 | \$104.24 | \$97.89 | (\$6.35) | -6.09\% |
| 10 Decrease of \$2 to \$5 | 136,359 | 61.47\% | 84.19\% | 367 | \$50.08 | \$46.69 | (\$3.38) | -6.76\% |
| 11 Decrease of \$1 to \$2 | 30,594 | 13.79\% | 97.98\% | 167 | \$21.37 | \$19.79 | (\$1.58) | -7.40\% |
| 12 Decrease of \$0 to \$1 | 4,283 | 1.93\% | 99.92\% | 81 | \$10.61 | \$9.87 | (\$0.74) | -7.01\% |
| 13 No Change | 144 | 0.06\% | 99.98\% | 8 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 44 | 0.02\% | 100.00\% | 16 | \$5.10 | \$5.11 | \$0.02 | 0.30\% |
|  | 221,830 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1L 2018 | Monthly <br> Winter Bill ETOUCL 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 18 | 0.01\% | 0.01\% | 3,539 | \$820.04 | \$550.42 | (\$269.62) | -32.88\% |
| 2 Decrease of 20\% to 30\% | 121 | 0.05\% | 0.06\% | 2,086 | \$422.78 | \$318.46 | (\$104.32) | -24.67\% |
| 3 Decrease of 15\% to 20\% | 213 | 0.10\% | 0.16\% | 1,456 | \$261.63 | \$217.09 | (\$44.54) | -17.03\% |
| 4 Decrease of 10\% to 15\% | 895 | 0.40\% | 0.56\% | 1,097 | \$182.27 | \$160.58 | (\$21.69) | -11.90\% |
| 5 Decrease of 7.5\% to 10\% | 62,609 | 28.22\% | 28.79\% | 286 | \$37.96 | \$34.91 | (\$3.05) | -8.03\% |
| 6 Decrease of 5\% to 7.5\% | 153,629 | 69.26\% | 98.04\% | 465 | \$66.24 | \$62.05 | (\$4.18) | -6.31\% |
| 7 Decrease of 2.5\% to 5\% | 3,990 | 1.80\% | 99.84\% | 633 | \$96.01 | \$91.48 | (\$4.53) | -4.72\% |
| 8 Decrease of 0\% to 2.5\% | 166 | 0.07\% | 99.92\% | 27 | \$5.53 | \$5.47 | (\$0.07) | -1.19\% |
| 9 No Change | 144 | 0.06\% | 99.98\% | 8 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 43 | 0.02\% | 100.00\% | 16 | \$5.09 | \$5.10 | \$0.01 | 0.24\% |
| 11 Increase of 2.5\% to 5\% | 1 | 0.00\% | 100.00\% | 29 | \$5.45 | \$5.59 | \$0.14 | 2.55\% |
|  | 221,830 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:HOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 8 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly <br> Winter <br> Bill E1L 2018 | Monthly Winter Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 138 | 0.03\% | 0.03\% | 3,482 | \$755.40 | \$541.26 | (\$214.15) | -28.35\% |
| 2 Decrease of \$75 to \$100 | 88 | 0.02\% | 0.05\% | 2,130 | \$410.80 | \$325.14 | (\$85.66) | -20.85\% |
| 3 Decrease of \$50 to \$75 | 255 | 0.05\% | 0.10\% | 1,856 | \$339.70 | \$279.76 | (\$59.94) | -17.65\% |
| 4 Decrease of \$40 to \$50 | 233 | 0.05\% | 0.15\% | 1,719 | \$301.08 | \$256.65 | (\$44.43) | -14.76\% |
| 5 Decrease of \$30 to \$40 | 519 | 0.11\% | 0.26\% | 1,597 | \$271.51 | \$237.06 | (\$34.45) | -12.69\% |
| 6 Decrease of \$20 to \$30 | 1,671 | 0.35\% | 0.61\% | 1,528 | \$245.01 | \$221.15 | (\$23.86) | -9.74\% |
| 7 Decrease of \$15 to \$20 | 3,618 | 0.77\% | 1.38\% | 1,487 | \$225.71 | \$208.75 | (\$16.95) | -7.51\% |
| 8 Decrease of \$10 to \$15 | 15,174 | 3.21\% | 4.59\% | 1,185 | \$173.08 | \$161.17 | (\$11.92) | -6.89\% |
| 9 Decrease of \$5 to \$10 | 126,757 | 26.83\% | 31.42\% | 728 | \$106.35 | \$99.87 | (\$6.48) | -6.10\% |
| 10 Decrease of \$2 to \$5 | 276,353 | 58.50\% | 89.92\% | 404 | \$56.15 | \$52.62 | (\$3.53) | -6.28\% |
| 11 Decrease of \$1 to \$2 | 40,324 | 8.54\% | 98.46\% | 181 | \$23.80 | \$22.21 | (\$1.59) | -6.68\% |
| 12 Decrease of \$0 to \$1 | 6,521 | 1.38\% | 99.84\% | 86 | \$11.79 | \$11.10 | (\$0.69) | -5.83\% |
| 13 No Change | 598 | 0.13\% | 99.97\% | 6 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 162 | 0.03\% | 100.00\% | 19 | \$5.61 | \$5.64 | \$0.02 | 0.42\% |
|  | 472,411 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:HOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 8 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1L 2018 | Monthly Winter Bill ETOUCL 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 32 | 0.01\% | 0.01\% | 5,187 | \$1,217.65 | \$815.67 | (\$401.99) | -33.01\% |
| 2 Decrease of 20\% to 30\% | 229 | 0.05\% | 0.06\% | 2,260 | \$459.51 | \$347.68 | (\$111.83) | -24.34\% |
| 3 Decrease of 15\% to 20\% | 525 | 0.11\% | 0.17\% | 1,503 | \$271.95 | \$225.32 | (\$46.64) | -17.15\% |
| 4 Decrease of 10\% to 15\% | 2,363 | 0.50\% | 0.67\% | 1,153 | \$192.47 | \$169.36 | (\$23.11) | -12.01\% |
| 5 Decrease of 7.5\% to 10\% | 97,066 | 20.55\% | 21.21\% | 372 | \$49.52 | \$45.54 | (\$3.98) | -8.04\% |
| 6 Decrease of 5\% to 7.5\% | 326,868 | 69.19\% | 90.40\% | 532 | \$76.09 | \$71.35 | (\$4.74) | -6.23\% |
| 7 Decrease of 2.5\% to 5\% | 43,912 | 9.30\% | 99.70\% | 587 | \$88.67 | \$84.67 | (\$4.00) | -4.51\% |
| 8 Decrease of 0\% to 2.5\% | 656 | 0.14\% | 99.84\% | 103 | \$17.56 | \$17.23 | (\$0.33) | -1.87\% |
| 9 No Change | 598 | 0.13\% | 99.97\% | 6 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 159 | 0.03\% | 100.00\% | 19 | \$5.61 | \$5.62 | \$0.02 | 0.32\% |
| 11 Increase of 2.5\% to 5\% | 2 | 0.00\% | 100.00\% | 12 | \$5.86 | \$6.04 | \$0.17 | 2.93\% |
| 13 Increase of 7.5\% to 10\% | 1 | 0.00\% | 100.00\% | 0 | \$6.35 | \$6.94 | \$0.59 | 9.36\% |
|  | 472,411 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill Impact <br> Range(\$) | Cust Count = Num of months / 8 | \% Of Cust | CUM \% of Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1L 2018 | Monthly <br> Winter <br> Bill <br> ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | $\begin{gathered} \text { Avg } \\ \text { \% } \\ \text { Change } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 152 | 0.04\% | 0.04\% | 3,295 | \$735.60 | \$510.74 | (\$224.86) | -30.57\% |
| 2 Decrease of \$ 75 to $\$ 100$ | 74 | 0.02\% | 0.06\% | 1,900 | \$372.24 | \$287.28 | (\$84.97) | -22.83\% |
| 3 Decrease of \$50 to \$75 | 156 | 0.04\% | 0.09\% | 1,665 | \$310.14 | \$250.21 | (\$59.94) | -19.33\% |
| 4 Decrease of \$ 40 to \$ 50 | 140 | 0.03\% | 0.13\% | 1,529 | \$272.83 | \$228.47 | (\$44.36) | -16.26\% |
| 5 Decrease of \$ 30 to \$ 40 | 352 | 0.09\% | 0.21\% | 1,356 | \$235.45 | \$201.12 | (\$34.33) | -14.58\% |
| 6 Decrease of \$20 to \$30 | 891 | 0.22\% | 0.43\% | 1,227 | \$202.43 | \$178.49 | (\$23.94) | -11.83\% |
| 7 Decrease of \$15 to \$20 | 1,666 | 0.41\% | 0.84\% | 1,116 | \$175.14 | \$158.07 | (\$17.08) | -9.75\% |
| 8 Decrease of \$10 to \$15 | 5,232 | 1.28\% | 2.13\% | 998 | \$152.54 | \$140.63 | (\$11.91) | -7.81\% |
| 9 Decrease of \$5 to \$10 | 65,667 | 16.11\% | 18.23\% | 690 | \$102.54 | \$96.22 | (\$6.32) | -6.16\% |
| 10 Decrease of \$2 to \$5 | 246,490 | 60.46\% | 78.70\% | 359 | \$49.59 | \$46.27 | (\$3.31) | -6.68\% |
| 11 Decrease of \$1 to \$2 | 72,105 | 17.69\% | 96.39\% | 164 | \$20.91 | \$19.35 | (\$1.56) | -7.45\% |
| 12 Decrease of \$0 to \$1 | 14,092 | 3.46\% | 99.84\% | 80 | \$10.33 | \$9.60 | (\$0.73) | -7.09\% |
| 13 No Change | 528 | 0.13\% | 99.97\% | 11 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 114 | 0.03\% | 100.00\% | 18 | \$5.06 | \$5.07 | \$0.01 | 0.13\% |
|  | 407,658 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:WINTER Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 8 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Winter Bill E1L 2018 | Monthly <br> Winter Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than 30\% | 65 | 0.02\% | 0.02\% | 4,164 | \$981.51 | \$649.84 | (\$331.66) | -33.79\% |
| 2 Decrease of 20\% to 30\% | 257 | 0.06\% | 0.08\% | 1,841 | \$372.91 | \$280.71 | (\$92.20) | -24.72\% |
| 3 Decrease of 15\% to 20\% | 493 | 0.12\% | 0.20\% | 1,275 | \$228.46 | \$189.64 | (\$38.82) | -16.99\% |
| 4 Decrease of 10\% to 15\% | 2,749 | 0.67\% | 0.87\% | 923 | \$148.34 | \$130.58 | (\$17.76) | -11.97\% |
| 5 Decrease of 7.5\% to 10\% | 118,462 | 29.06\% | 29.93\% | 259 | \$34.48 | \$31.71 | (\$2.77) | -8.05\% |
| 6 Decrease of 5\% to 7.5\% | 278,162 | 68.23\% | 98.17\% | 425 | \$60.65 | \$56.82 | (\$3.83) | -6.32\% |
| 7 Decrease of 2.5\% to 5\% | 6,335 | 1.55\% | 99.72\% | 573 | \$86.81 | \$82.71 | (\$4.10) | -4.72\% |
| 8 Decrease of 0\% to 2.5\% | 494 | 0.12\% | 99.84\% | 28 | \$5.35 | \$5.29 | (\$0.06) | -1.11\% |
| 9 No Change | 528 | 0.13\% | 99.97\% | 11 | \$5.03 | \$5.03 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 113 | 0.03\% | 100.00\% | 18 | \$5.06 | \$5.06 | \$0.01 | 0.11\% |
| 11 Increase of 2.5\% to 5\% | 1 | 0.00\% | 100.00\% | 29 | \$5.45 | \$5.59 | \$0.14 | 2.55\% |
|  | 407,658 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | Monthly Summer Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 185 | 0.02\% | 0.02\% | 4,716 | \$1,040.10 | \$812.61 | (\$227.49) | -21.87\% |
| 2 Decrease of \$75 to \$100 | 66 | 0.01\% | 0.03\% | 2,866 | \$579.91 | \$494.12 | (\$85.79) | -14.79\% |
| 3 Decrease of \$50 to \$75 | 139 | 0.02\% | 0.04\% | 2,588 | \$504.56 | \$442.72 | (\$61.84) | -12.26\% |
| 4 Decrease of \$40 to \$50 | 92 | 0.01\% | 0.05\% | 2,367 | \$445.10 | \$400.57 | (\$44.53) | -10.00\% |
| 5 Decrease of \$30 to \$40 | 138 | 0.02\% | 0.07\% | 2,110 | \$395.71 | \$361.05 | (\$34.65) | -8.76\% |
| 6 Decrease of \$20 to \$30 | 229 | 0.03\% | 0.09\% | 1,995 | \$364.03 | \$339.65 | (\$24.38) | -6.70\% |
| 7 Decrease of \$15 to \$20 | 154 | 0.02\% | 0.11\% | 1,892 | \$338.84 | \$321.54 | (\$17.30) | -5.11\% |
| 8 Decrease of \$10 to \$15 | 232 | 0.03\% | 0.14\% | 1,698 | \$301.80 | \$289.53 | (\$12.27) | -4.06\% |
| 9 Decrease of \$5 to \$10 | 319 | 0.04\% | 0.17\% | 1,703 | \$296.00 | \$288.57 | (\$7.43) | -2.51\% |
| 10 Decrease of \$2 to \$5 | 259 | 0.03\% | 0.20\% | 1,589 | \$272.22 | \$268.78 | (\$3.44) | -1.26\% |
| 11 Decrease of \$1 to \$2 | 133 | 0.01\% | 0.22\% | 1,483 | \$253.35 | \$251.86 | (\$1.49) | -0.59\% |
| 12 Decrease of \$0 to \$1 | 705 | 0.08\% | 0.30\% | 308 | \$53.77 | \$53.66 | (\$0.11) | -0.21\% |
| 13 No Change | 939 | 0.10\% | 0.40\% | 6 | \$4.91 | \$4.91 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 16,074 | 1.80\% | 2.20\% | 89 | \$11.74 | \$12.46 | \$0.72 | 6.10\% |
| 15 Increase of \$1 to \$2 | 71,709 | 8.02\% | 10.22\% | 151 | \$19.09 | \$20.64 | \$1.55 | 8.13\% |
| 17 Increase of \$2 to \$5 | 259,304 | 29.00\% | 39.22\% | 298 | \$39.10 | \$42.54 | \$3.45 | 8.82\% |
| 18 Increase of \$5 to \$10 | 246,408 | 27.56\% | 66.77\% | 551 | \$75.31 | \$82.47 | \$7.16 | 9.51\% |
| 19 Increase of \$10 to \$15 | 137,017 | 15.32\% | 82.10\% | 841 | \$118.13 | \$130.48 | \$12.35 | 10.45\% |
| 20 Increase of \$15 to \$20 | 91,659 | 10.25\% | 92.35\% | 1,109 | \$160.45 | \$177.74 | \$17.29 | 10.78\% |
| 21 Increase of \$20 to \$30 | 64,905 | 7.26\% | 99.61\% | 1,453 | \$215.95 | \$239.28 | \$23.33 | 10.81\% |
| 22 Increase of \$30 to \$40 | 3,344 | 0.37\% | 99.98\% | 1,949 | \$293.81 | \$326.17 | \$32.36 | 11.01\% |
| 23 Increase of \$40 to \$50 | 151 | 0.02\% | 100.00\% | 2,836 | \$421.38 | \$464.59 | \$43.21 | 10.25\% |
| 24 Increase of \$50 to \$75 | 23 | 0.00\% | 100.00\% | 3,369 | \$507.75 | \$562.79 | \$55.04 | 10.84\% |
|  | 894,185 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:ALL NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\%) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | Monthly Summer Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 113 | 0.01\% | 0.01\% | 4,903 | \$1,121.13 | \$844.88 | (\$276.25) | -24.64\% |
| 3 Decrease of 15\% to 20\% | 136 | 0.02\% | 0.03\% | 3,064 | \$635.77 | \$526.43 | (\$109.34) | -17.20\% |
| 4 Decrease of 10\% to 15\% | 243 | 0.03\% | 0.06\% | 2,309 | \$449.09 | \$394.16 | (\$54.93) | -12.23\% |
| 5 Decrease of 7.5\% to 10\% | 219 | 0.02\% | 0.08\% | 1,995 | \$374.05 | \$341.60 | (\$32.44) | -8.67\% |
| 6 Decrease of 5\% to 7.5\% | 281 | 0.03\% | 0.11\% | 1,870 | \$339.32 | \$318.34 | (\$20.98) | -6.18\% |
| 7 Decrease of 2.5\% to 5\% | 432 | 0.05\% | 0.16\% | 1,760 | \$310.41 | \$298.88 | (\$11.53) | -3.72\% |
| 8 Decrease of 0\% to 2.5\% | 1,226 | 0.14\% | 0.30\% | 965 | \$166.47 | \$164.59 | (\$1.88) | -1.13\% |
| 9 No Change | 939 | 0.10\% | 0.40\% | 6 | \$4.91 | \$4.91 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 1,745 | 0.20\% | 0.60\% | 936 | \$155.90 | \$158.01 | \$2.11 | 1.35\% |
| 11 Increase of 2.5\% to 5\% | 4,745 | 0.53\% | 1.13\% | 732 | \$113.32 | \$117.82 | \$4.51 | 3.98\% |
| 12 Increase of 5\% to 7.5\% | 85,768 | 9.59\% | 10.72\% | 463 | \$65.34 | \$69.77 | \$4.43 | 6.79\% |
| 13 Increase of $7.5 \%$ to $10 \%$ | 396,152 | 44.30\% | 55.02\% | 540 | \$75.68 | \$82.42 | \$6.75 | 8.91\% |
| 14 Increase of 10\% to 15\% | 390,529 | 43.67\% | 98.70\% | 714 | \$99.97 | \$111.45 | \$11.48 | 11.49\% |
| 15 Increase of 15\% to 20\% | 11,519 | 1.29\% | 99.98\% | 511 | \$67.63 | \$78.44 | \$10.81 | 15.98\% |
| 16 Increase of 20\% to 30\% | 138 | 0.02\% | 100.00\% | 366 | \$46.47 | \$56.29 | \$9.83 | 21.14\% |
|  | 894,185 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:COOL NEM/non-NEM:non-NEM

|  | Cust Count = Num of months / 4 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | $\begin{aligned} & \text { CUM } \\ & \% \text { of } \end{aligned}$ Cust | Avg <br> Monthly kwh for the range | Monthly <br> Summer <br> Bill <br> E1L 2018 | Monthly <br> Summer <br> Bill <br> ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | $\begin{gathered} \text { Avg } \\ \text { \% } \\ \text { Change } \end{gathered}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 51 | 0.03\% | 0.03\% | 4,414 | \$1,037.95 | \$766.80 | (\$271.15) | -26.12\% |
| 2 Decrease of \$ 75 to \$100 | 15 | 0.01\% | 0.03\% | 2,173 | \$466.55 | \$378.25 | (\$88.30) | -18.93\% |
| 3 Decrease of \$50 to \$ 75 | 32 | 0.02\% | 0.05\% | 1,744 | \$355.39 | \$294.56 | (\$60.83) | -17.12\% |
| 4 Decrease of \$40 to \$50 | 21 | 0.01\% | 0.06\% | 1,561 | \$312.85 | \$267.38 | (\$45.47) | -14.53\% |
| 5 Decrease of \$30 to \$40 | 36 | 0.02\% | 0.08\% | 1,426 | \$277.60 | \$243.15 | (\$34.45) | -12.41\% |
| 6 Decrease of \$20 to \$30 | 45 | 0.02\% | 0.11\% | 1,348 | \$253.95 | \$229.59 | (\$24.36) | -9.59\% |
| 7 Decrease of \$15 to \$20 | 41 | 0.02\% | 0.13\% | 1,159 | \$214.66 | \$197.23 | (\$17.43) | -8.12\% |
| 8 Decrease of \$10 to \$15 | 73 | 0.04\% | 0.17\% | 1,079 | \$194.77 | \$182.68 | (\$12.09) | -6.21\% |
| 9 Decrease of \$5 to \$10 | 97 | 0.05\% | 0.22\% | 1,031 | \$181.64 | \$174.13 | (\$7.51) | -4.13\% |
| 10 Decrease of \$2 to \$5 | 92 | 0.05\% | 0.27\% | 965 | \$166.56 | \$163.18 | (\$3.39) | -2.03\% |
| 11 Decrease of \$1 to \$2 | 49 | 0.03\% | 0.29\% | 950 | \$161.93 | \$160.42 | (\$1.51) | -0.93\% |
| 12 Decrease of \$0 to \$1 | 274 | 0.15\% | 0.44\% | 229 | \$39.82 | \$39.69 | (\$0.12) | -0.31\% |
| 13 No Change | 304 | 0.16\% | 0.60\% | 8 | \$4.90 | \$4.90 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 10,045 | 5.32\% | 5.92\% | 82 | \$10.51 | \$11.24 | \$0.73 | 6.95\% |
| 15 Increase of \$ 1 to \$2 | 40,585 | 21.51\% | 27.43\% | 147 | \$18.61 | \$20.14 | \$1.53 | 8.25\% |
| 17 Increase of \$2 to \$5 | 95,705 | 50.72\% | 78.15\% | 283 | \$38.75 | \$42.05 | \$3.30 | 8.51\% |
| 18 Increase of \$5 to \$10 | 39,610 | 20.99\% | 99.14\% | 515 | \$76.58 | \$83.16 | \$6.58 | 8.59\% |
| 19 Increase of \$10 to \$15 | 1,570 | 0.83\% | 99.97\% | 751 | \$113.85 | \$124.91 | \$11.06 | 9.72\% |
| 20 Increase of \$15 to \$20 | 46 | 0.02\% | 99.99\% | 1,217 | \$176.63 | \$193.33 | \$16.70 | 9.45\% |
| 21 Increase of \$20 to \$30 | 12 | 0.01\% | 100.00\% | 1,830 | \$269.49 | \$291.65 | \$22.16 | 8.22\% |
|  | 188,705 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:COOL NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 4 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | Monthly Summer Bill ETOUCL 2018 | $\$$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 59 | 0.03\% | 0.03\% | 4,083 | \$954.76 | \$708.19 | (\$246.57) | -25.83\% |
| 3 Decrease of 15\% to 20\% | 43 | 0.02\% | 0.05\% | 1,761 | \$363.41 | \$300.90 | (\$62.51) | -17.20\% |
| 4 Decrease of 10\% to 15\% | 76 | 0.04\% | 0.09\% | 1,431 | \$279.27 | \$244.19 | (\$35.07) | -12.56\% |
| 5 Decrease of 7.5\% to 10\% | 60 | 0.03\% | 0.13\% | 1,196 | \$223.33 | \$203.81 | (\$19.52) | -8.74\% |
| 6 Decrease of 5\% to 7.5\% | 82 | 0.04\% | 0.17\% | 1,092 | \$197.20 | \$184.86 | (\$12.34) | -6.26\% |
| 7 Decrease of 2.5\% to 5\% | 119 | 0.06\% | 0.23\% | 1,045 | \$182.85 | \$175.84 | (\$7.01) | -3.83\% |
| 8 Decrease of 0\% to 2.5\% | 390 | 0.21\% | 0.44\% | 451 | \$77.95 | \$77.15 | (\$0.80) | -1.02\% |
| 9 No Change | 304 | 0.16\% | 0.60\% | 8 | \$4.90 | \$4.90 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 580 | 0.31\% | 0.91\% | 379 | \$62.60 | \$63.46 | \$0.86 | 1.37\% |
| 11 Increase of 2.5\% to 5\% | 1,742 | 0.92\% | 1.83\% | 399 | \$60.72 | \$63.16 | \$2.44 | 4.02\% |
| 12 Increase of 5\% to 7.5\% | 35,233 | 18.67\% | 20.50\% | 320 | \$45.65 | \$48.76 | \$3.11 | 6.81\% |
| 13 Increase of 7.5\% to 10\% | 116,076 | 61.51\% | 82.01\% | 301 | \$42.22 | \$45.87 | \$3.65 | 8.65\% |
| 14 Increase of 10\% to 15\% | 33,573 | 17.79\% | 99.80\% | 248 | \$33.70 | \$37.40 | \$3.70 | 10.98\% |
| 15 Increase of 15\% to 20\% | 365 | 0.19\% | 100.00\% | 215 | \$28.44 | \$32.97 | \$4.53 | 15.91\% |
| 16 Increase of 20\% to 30\% | 5 | 0.00\% | 100.00\% | 158 | \$19.89 | \$24.09 | \$4.20 | 21.11\% |
|  | 188,705 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:MODERATE NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | Monthly <br> Summer Bill ETOUCL 2018 | Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 39 | 0.02\% | 0.02\% | 4,093 | \$926.38 | \$714.74 | (\$211.63) | -22.85\% |
| 2 Decrease of \$75 to \$100 | 22 | 0.01\% | 0.03\% | 2,525 | \$519.84 | \$434.24 | (\$85.60) | -16.47\% |
| 3 Decrease of \$50 to \$75 | 37 | 0.02\% | 0.04\% | 2,239 | \$448.66 | \$387.06 | (\$61.60) | -13.73\% |
| 4 Decrease of \$40 to \$50 | 21 | 0.01\% | 0.05\% | 1,995 | \$383.73 | \$339.15 | (\$44.57) | -11.62\% |
| 5 Decrease of \$30 to \$40 | 42 | 0.02\% | 0.07\% | 1,830 | \$348.25 | \$313.31 | (\$34.93) | -10.03\% |
| 6 Decrease of \$20 to \$30 | 94 | 0.04\% | 0.11\% | 1,680 | \$311.64 | \$287.06 | (\$24.58) | -7.89\% |
| 7 Decrease of \$15 to \$20 | 48 | 0.02\% | 0.13\% | 1,627 | \$293.48 | \$276.39 | (\$17.08) | -5.82\% |
| 8 Decrease of \$10 to \$15 | 78 | 0.03\% | 0.17\% | 1,529 | \$273.81 | \$261.44 | (\$12.37) | -4.52\% |
| 9 Decrease of \$5 to \$10 | 103 | 0.05\% | 0.22\% | 1,513 | \$264.30 | \$257.03 | (\$7.27) | -2.75\% |
| 10 Decrease of \$2 to \$5 | 73 | 0.03\% | 0.25\% | 1,385 | \$238.38 | \$234.92 | (\$3.46) | -1.45\% |
| 11 Decrease of \$1 to \$2 | 42 | 0.02\% | 0.27\% | 1,421 | \$242.75 | \$241.32 | (\$1.43) | -0.59\% |
| 12 Decrease of \$0 to \$1 | 129 | 0.06\% | 0.32\% | 465 | \$80.15 | \$79.98 | (\$0.16) | -0.20\% |
| 13 No Change | 124 | 0.06\% | 0.38\% | 3 | \$4.91 | \$4.91 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 3,722 | 1.65\% | 2.03\% | 96 | \$12.87 | \$13.61 | \$0.74 | 5.75\% |
| 15 Increase of \$1 to \$2 | 23,364 | 10.37\% | 12.40\% | 152 | \$19.19 | \$20.77 | \$1.58 | 8.22\% |
| 17 Increase of \$2 to \$5 | 99,221 | 44.03\% | 56.42\% | 295 | \$38.11 | \$41.53 | \$3.42 | 8.96\% |
| 18 Increase of \$5 to \$10 | 74,480 | 33.05\% | 89.47\% | 538 | \$76.34 | \$83.31 | \$6.97 | 9.13\% |
| 19 Increase of \$10 to \$15 | 19,547 | 8.67\% | 98.14\% | 831 | \$123.75 | \$135.68 | \$11.93 | 9.64\% |
| 20 Increase of \$15 to \$20 | 3,893 | 1.73\% | 99.87\% | 1,028 | \$155.20 | \$171.86 | \$16.66 | 10.74\% |
| 21 Increase of \$20 to \$30 | 273 | 0.12\% | 99.99\% | 1,294 | \$192.45 | \$214.50 | \$22.06 | 11.46\% |
| 22 Increase of \$30 to \$40 | 18 | 0.01\% | 100.00\% | 2,269 | \$340.49 | \$373.17 | \$32.68 | 9.60\% |
| 23 Increase of \$40 to \$50 | 2 | 0.00\% | 100.00\% | 3,397 | \$494.15 | \$541.62 | \$47.47 | 9.61\% |
|  | 225,372 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:MODERATE NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 4 | \% Of Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | Monthly Summer Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 29 | 0.01\% | 0.01\% | 4,521 | \$1,034.03 | \$787.72 | (\$246.31) | -23.82\% |
| 3 Decrease of 15\% to 20\% | 35 | 0.02\% | 0.03\% | 2,540 | \$528.13 | \$438.04 | (\$90.09) | -17.06\% |
| 4 Decrease of 10\% to 15\% | 81 | 0.04\% | 0.06\% | 2,012 | \$394.04 | \$344.74 | (\$49.30) | -12.51\% |
| 5 Decrease of 7.5\% to 10\% | 77 | 0.03\% | 0.10\% | 1,698 | \$320.42 | \$292.87 | (\$27.56) | -8.60\% |
| 6 Decrease of 5\% to 7.5\% | 96 | 0.04\% | 0.14\% | 1,642 | \$298.60 | \$280.04 | (\$18.56) | -6.22\% |
| 7 Decrease of 2.5\% to 5\% | 135 | 0.06\% | 0.20\% | 1,503 | \$265.28 | \$255.54 | (\$9.74) | -3.67\% |
| 8 Decrease of 0\% to 2.5\% | 276 | 0.12\% | 0.32\% | 1,000 | \$172.27 | \$170.32 | (\$1.96) | -1.13\% |
| 9 No Change | 124 | 0.06\% | 0.38\% | 3 | \$4.91 | \$4.91 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 411 | 0.18\% | 0.56\% | 892 | \$148.23 | \$150.16 | \$1.93 | 1.30\% |
| 11 Increase of 2.5\% to 5\% | 1,128 | 0.50\% | 1.06\% | 671 | \$104.48 | \$108.62 | \$4.14 | 3.96\% |
| 12 Increase of 5\% to 7.5\% | 26,700 | 11.85\% | 12.91\% | 436 | \$61.49 | \$65.69 | \$4.21 | 6.85\% |
| 13 Increase of 7.5\% to 10\% | 126,113 | 55.96\% | 68.87\% | 418 | \$58.00 | \$63.08 | \$5.08 | 8.76\% |
| 14 Increase of 10\% to 15\% | 68,907 | 30.57\% | 99.44\% | 406 | \$55.95 | \$62.27 | \$6.32 | 11.29\% |
| 15 Increase of 15\% to 20\% | 1,246 | 0.55\% | 99.99\% | 333 | \$44.05 | \$51.08 | \$7.03 | 15.97\% |
| 16 Increase of 20\% to 30\% | 15 | 0.01\% | 100.00\% | 233 | \$29.15 | \$35.26 | \$6.11 | 20.98\% |
|  | 225,372 | 100.00\% |  |  |  |  |  |  |

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:HOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | \% Of Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | Monthly Summer Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 95 | 0.02\% | 0.02\% | 5,136 | \$1,088.38 | \$877.58 | (\$210.80) | -19.37\% |
| 2 Decrease of \$75 to \$100 | 28 | 0.01\% | 0.03\% | 3,504 | \$687.77 | \$603.19 | (\$84.59) | -12.30\% |
| 3 Decrease of \$50 to \$75 | 70 | 0.01\% | 0.04\% | 3,168 | \$603.82 | \$541.38 | (\$62.44) | -10.34\% |
| 4 Decrease of \$40 to \$50 | 49 | 0.01\% | 0.05\% | 2,871 | \$528.06 | \$483.95 | (\$44.11) | -8.35\% |
| 5 Decrease of \$30 to \$40 | 60 | 0.01\% | 0.06\% | 2,728 | \$501.76 | \$467.18 | (\$34.58) | -6.89\% |
| 6 Decrease of \$20 to \$30 | 90 | 0.02\% | 0.08\% | 2,651 | \$474.53 | \$450.36 | (\$24.17) | -5.09\% |
| 7 Decrease of \$15 to \$20 | 65 | 0.01\% | 0.10\% | 2,556 | \$451.59 | \$434.22 | (\$17.38) | -3.85\% |
| 8 Decrease of \$10 to \$15 | 82 | 0.02\% | 0.11\% | 2,409 | \$423.59 | \$411.26 | (\$12.33) | -2.91\% |
| 9 Decrease of \$5 to \$10 | 119 | 0.02\% | 0.14\% | 2,414 | \$416.37 | \$408.86 | (\$7.50) | -1.80\% |
| 10 Decrease of \$2 to \$5 | 94 | 0.02\% | 0.16\% | 2,357 | \$401.85 | \$398.38 | (\$3.47) | -0.86\% |
| 11 Decrease of \$1 to \$2 | 41 | 0.01\% | 0.17\% | 2,184 | \$373.47 | \$371.93 | (\$1.54) | -0.41\% |
| 12 Decrease of \$0 to \$1 | 302 | 0.06\% | 0.23\% | 312 | \$55.15 | \$55.06 | (\$0.08) | -0.15\% |
| 13 No Change | 510 | 0.11\% | 0.33\% | 5 | \$4.92 | \$4.92 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 2,306 | 0.48\% | 0.81\% | 106 | \$15.32 | \$15.94 | \$0.62 | 4.05\% |
| 15 Increase of \$1 to \$2 | 7,759 | 1.62\% | 2.43\% | 166 | \$21.25 | \$22.82 | \$1.57 | 7.37\% |
| 17 Increase of \$2 to \$5 | 64,378 | 13.41\% | 15.84\% | 327 | \$41.13 | \$44.85 | \$3.72 | 9.03\% |
| 18 Increase of \$5 to \$10 | 132,318 | 27.56\% | 43.40\% | 568 | \$74.34 | \$81.78 | \$7.44 | 10.01\% |
| 19 Increase of \$10 to \$15 | 115,901 | 24.14\% | 67.54\% | 843 | \$117.24 | \$129.68 | \$12.43 | 10.61\% |
| 20 Increase of \$15 to \$20 | 87,721 | 18.27\% | 85.81\% | 1,113 | \$160.67 | \$177.99 | \$17.32 | 10.78\% |
| 21 Increase of \$20 to \$30 | 64,620 | 13.46\% | 99.27\% | 1,454 | \$216.04 | \$239.38 | \$23.34 | 10.80\% |
| 22 Increase of \$30 to \$40 | 3,326 | 0.69\% | 99.96\% | 1,947 | \$293.56 | \$325.91 | \$32.36 | 11.02\% |
| 23 Increase of \$40 to \$50 | 149 | 0.03\% | 100.00\% | 2,829 | \$420.40 | \$463.55 | \$43.15 | 10.26\% |
| 24 Increase of \$50 to \$75 | 23 | 0.00\% | 100.00\% | 3,369 | \$507.75 | \$562.79 | \$55.04 | 10.84\% |
|  | 480,107 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:HOT NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | $\begin{gathered} \text { Monthly } \\ \text { Summer } \\ \text { Bill } \\ \text { ETOUCL } 2018 \end{gathered}$ | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 25 | 0.01\% | 0.01\% | 7,252 | \$1,608.74 | \$1,228.83 | (\$379.91) | -23.62\% |
| 3 Decrease of 15\% to 20\% | 59 | 0.01\% | 0.02\% | 4,325 | \$898.28 | \$743.36 | (\$154.92) | -17.25\% |
| 4 Decrease of 10\% to 15\% | 87 | 0.02\% | 0.04\% | 3,351 | \$648.62 | \$571.10 | (\$77.52) | -11.95\% |
| 5 Decrease of 7.5\% to 10\% | 83 | 0.02\% | 0.05\% | 2,845 | \$532.09 | \$485.83 | (\$46.26) | -8.69\% |
| 6 Decrease of 5\% to 7.5\% | 103 | 0.02\% | 0.07\% | 2,700 | \$490.30 | \$460.19 | (\$30.11) | -6.14\% |
| 7 Decrease of 2.5\% to 5\% | 178 | 0.04\% | 0.11\% | 2,435 | \$430.30 | \$414.36 | (\$15.94) | -3.70\% |
| 8 Decrease of 0\% to 2.5\% | 561 | 0.12\% | 0.23\% | 1,307 | \$225.21 | \$222.61 | (\$2.59) | -1.15\% |
| 9 No Change | 510 | 0.11\% | 0.33\% | 5 | \$4.92 | \$4.92 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 754 | 0.16\% | 0.49\% | 1,389 | \$231.81 | \$234.98 | \$3.17 | 1.37\% |
| 11 Increase of 2.5\% to 5\% | 1,876 | 0.39\% | 0.88\% | 1,079 | \$167.47 | \$174.11 | \$6.64 | 3.97\% |
| 12 Increase of 5\% to 7.5\% | 23,836 | 4.96\% | 5.85\% | 703 | \$98.75 | \$105.40 | \$6.64 | 6.73\% |
| 13 Increase of 7.5\% to 10\% | 153,963 | 32.07\% | 37.92\% | 821 | \$115.38 | \$125.82 | \$10.45 | 9.05\% |
| 14 Increase of 10\% to 15\% | 288,049 | 60.00\% | 97.91\% | 841 | \$118.22 | \$131.85 | \$13.62 | 11.52\% |
| 15 Increase of 15\% to 20\% | 9,908 | 2.06\% | 99.98\% | 545 | \$72.04 | \$83.55 | \$11.51 | 15.98\% |
| 16 Increase of 20\% to 30\% | 117 | 0.02\% | 100.00\% | 393 | \$49.86 | \$60.41 | \$10.55 | 21.16\% |
|  | 480,107 | 100.00\% |  |  |  |  |  |  |

Run date: 12DEC16

Scenario: Dollar Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:NOTHOT NEM/non-NEM:non-NEM

| Bill <br> Impact <br> Range(\$) | Cust Count = Num of months / 4 | $\begin{aligned} & \text { \% Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer Bill E1L 2018 | Monthly <br> Summer Bill ETOUCL 2018 | $\$$ <br> Change <br> Between Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 Decrease of More Than \$100 | 90 | 0.02\% | 0.02\% | 4,274 | \$989.11 | \$744.01 | (\$245.10) | -24.78\% |
| 2 Decrease of \$75 to \$100 | 37 | 0.01\% | 0.03\% | 2,382 | \$498.21 | \$411.52 | (\$86.69) | -17.40\% |
| 3 Decrease of \$50 to \$75 | 70 | 0.02\% | 0.05\% | 2,009 | \$405.37 | \$344.13 | (\$61.24) | -15.11\% |
| 4 Decrease of \$40 to \$50 | 42 | 0.01\% | 0.06\% | 1,778 | \$348.26 | \$303.24 | (\$45.02) | -12.93\% |
| 5 Decrease of \$30 to \$40 | 79 | 0.02\% | 0.08\% | 1,643 | \$315.60 | \$280.89 | (\$34.71) | -11.00\% |
| 6 Decrease of \$20 to \$30 | 139 | 0.03\% | 0.11\% | 1,572 | \$292.83 | \$268.32 | (\$24.51) | -8.37\% |
| 7 Decrease of \$15 to \$20 | 89 | 0.02\% | 0.13\% | 1,409 | \$256.78 | \$239.54 | (\$17.25) | -6.72\% |
| 8 Decrease of \$10 to \$15 | 151 | 0.04\% | 0.17\% | 1,311 | \$235.58 | \$223.35 | (\$12.23) | -5.19\% |
| 9 Decrease of \$5 to \$10 | 200 | 0.05\% | 0.22\% | 1,279 | \$224.21 | \$216.83 | (\$7.38) | -3.29\% |
| 10 Decrease of \$2 to \$5 | 165 | 0.04\% | 0.26\% | 1,151 | \$198.25 | \$194.83 | (\$3.42) | -1.73\% |
| 11 Decrease of \$1 to \$2 | 92 | 0.02\% | 0.28\% | 1,167 | \$199.23 | \$197.76 | (\$1.47) | -0.74\% |
| 12 Decrease of \$0 to \$1 | 403 | 0.10\% | 0.38\% | 304 | \$52.74 | \$52.61 | (\$0.14) | -0.26\% |
| 13 No Change | 428 | 0.10\% | 0.48\% | 7 | \$4.90 | \$4.90 | \$0.00 | 0.00\% |
| 14 Increase of \$0 to \$1 | 13,768 | 3.32\% | 3.80\% | 86 | \$11.15 | \$11.88 | \$0.73 | 6.58\% |
| 15 Increase of \$1 to \$2 | 63,949 | 15.44\% | 19.25\% | 149 | \$18.82 | \$20.37 | \$1.55 | 8.24\% |
| 17 Increase of \$2 to \$5 | 194,926 | 47.07\% | 66.32\% | 289 | \$38.42 | \$41.78 | \$3.36 | 8.74\% |
| 18 Increase of \$5 to \$10 | 114,090 | 27.55\% | 93.88\% | 530 | \$76.42 | \$83.26 | \$6.83 | 8.94\% |
| 19 Increase of \$10 to \$15 | 21,116 | 5.10\% | 98.98\% | 825 | \$123.01 | \$134.88 | \$11.87 | 9.65\% |
| 20 Increase of \$15 to \$20 | 3,938 | 0.95\% | 99.93\% | 1,030 | \$155.45 | \$172.11 | \$16.66 | 10.72\% |
| 21 Increase of \$20 to \$30 | 285 | 0.07\% | 100.00\% | 1,316 | \$195.72 | \$217.78 | \$22.06 | 11.27\% |
| 22 Increase of \$30 to \$40 | 18 | 0.00\% | 100.00\% | 2,269 | \$340.49 | \$373.17 | \$32.68 | 9.60\% |
| 23 Increase of \$40 to \$50 | 2 | 0.00\% | 100.00\% | 3,397 | \$494.15 | \$541.62 | \$47.47 | 9.61\% |
|  | 414,077 | 100.00\% |  |  |  |  |  |  |

Scenario: Percent Comparison 745(d) No Med 12 months usage Schedule:E1L Comparison: E1L 2018 vs. ETOUCL 2018 Season:SUMMER Climate:NOTHOT NEM/non-NEM:non-NEM

| $\begin{gathered} \text { Bill } \\ \text { Impact } \\ \text { Range(\%) } \end{gathered}$ | Cust Count = Num of months / 4 | \% Of <br> Cust | CUM <br> \% of <br> Cust | Avg <br> Monthly kwh for the range | Monthly Summer $\begin{gathered} \text { Bill } \\ \text { E1L } 2018 \end{gathered}$ | Monthly <br> Summer Bill ETOUCL 2018 | \$ <br> Change <br> Between <br> Proposed and Currrent | Avg <br> \% <br> Change |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2 Decrease of 20\% to 30\% | 88 | 0.02\% | 0.02\% | 4,228 | \$981.13 | \$734.65 | (\$246.48) | -25.12\% |
| 3 Decrease of 15\% to 20\% | 78 | 0.02\% | 0.04\% | 2,115 | \$438.20 | \$363.17 | (\$75.03) | -17.12\% |
| 4 Decrease of 10\% to 15\% | 157 | 0.04\% | 0.08\% | 1,731 | \$338.47 | \$296.06 | (\$42.41) | -12.53\% |
| 5 Decrease of 7.5\% to 10\% | 136 | 0.03\% | 0.11\% | 1,479 | \$278.00 | \$253.95 | (\$24.05) | -8.65\% |
| 6 Decrease of 5\% to 7.5\% | 178 | 0.04\% | 0.15\% | 1,389 | \$251.91 | \$236.21 | (\$15.70) | -6.23\% |
| 7 Decrease of 2.5\% to 5\% | 254 | 0.06\% | 0.22\% | 1,288 | \$226.68 | \$218.22 | (\$8.46) | -3.73\% |
| 8 Decrease of 0\% to 2.5\% | 666 | 0.16\% | 0.38\% | 678 | \$116.99 | \$115.72 | (\$1.28) | -1.09\% |
| 9 No Change | 428 | 0.10\% | 0.48\% | 7 | \$4.90 | \$4.90 | \$0.00 | 0.00\% |
| 10 Increase of 0\% to 2.5\% | 991 | 0.24\% | 0.72\% | 591 | \$98.12 | \$99.42 | \$1.30 | 1.33\% |
| 11 Increase of 2.5\% to 5\% | 2,869 | 0.69\% | 1.41\% | 506 | \$77.92 | \$81.03 | \$3.11 | 3.99\% |
| 12 Increase of 5\% to 7.5\% | 61,932 | 14.96\% | 16.37\% | 370 | \$52.48 | \$56.06 | \$3.58 | 6.83\% |
| 13 Increase of 7.5\% to 10\% | 242,189 | 58.49\% | 74.86\% | 362 | \$50.44 | \$54.83 | \$4.40 | 8.71\% |
| 14 Increase of 10\% to 15\% | 102,480 | 24.75\% | 99.61\% | 354 | \$48.66 | \$54.12 | \$5.46 | 11.22\% |
| 15 Increase of 15\% to 20\% | 1,611 | 0.39\% | 100.00\% | 306 | \$40.51 | \$46.98 | \$6.47 | 15.96\% |
| 16 Increase of 20\% to 30\% | 20 | 0.00\% | 100.00\% | 214 | \$26.84 | \$32.47 | \$5.64 | 21.00\% |
|  | 414,077 | 100.00\% |  |  |  |  |  |  |

RATE DATA ANALYSIS BILL IMPACT SUMMARY
CURRENT: 2018 E1 rates
PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16

| RATE <br> SCHEDULE | COUNT | $\begin{aligned} & \text { SUM OF } \\ & \text { TOU KWH } \end{aligned}$ | TOTAL ANNUAL CURRENT BILLS | CURRENT AVG RATE | TOTAL ANNUAL PROPOSED BILLS | PROPOSED <br> AVG RATE | DIFFERENCE (PROPOSEDCURRENT) | (PROPOSEDCURRENT) I CURRENT | $\begin{gathered} \text { MAX } \\ \text { DIFFERENCE } \end{gathered}$ | MIN DIFFERENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E1 | 2,362,194 | 14,443,325,627 | \$3,367,430,409 | \$0.23315 | \$3,383,401,422 | \$0.23425 | \$15,971,012 | 0.47\% | \$491 | \$-302,224 |
| E1L | 885,297 | 5,365,834,387 | \$760,397,850 | \$0.14171 | \$760,731,958 | \$0.14177 | \$334,109 | 0.04\% | \$166 | \$-16,959 |
| TOTAL | 3,247,491 | 19,809,160,014 | \$4,127,828,259 | \$0.20838 | \$4,144,133,380 | \$0.20920 | \$16,305,121 | 0.40\% | \$657 | \$-319,182 |


| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 <br> Climate: All Climates Season: All seasons <br> Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{aligned} & -20--10 \% \\ & \text { DECREASE } \end{aligned}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5-2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \\ & \hline \end{aligned}$ |
| 4\% \$-1.28 | 6,412(0.3\%) | 15,318(0.6\%) | 17,770(0.8\%) | 20,544(0.9\%) | 34,886(1.5\%) | 0 | 0 | 0 | 0 | 0 | 4\% \$-1.28 |
| 8\% \$-0.64 | 0 | 0 | 0 | 7,802(0.3\%) | 89,774(3.8\%) | 0 | 0 | 0 | 0 | 0 | 8\% \$-0.64 |
| 12\% \$-0.47 | 0 | 0 | 0 | 2,630(0.1\%) | 88,931(3.8\%) | 0 | 0 | 0 | 0 | 0 | 12\% \$-0.47 |
| 16\% \$-0.35 | 0 | 0 | 0 | 1,934(0.1\%) | 100,063(4.2\%) | 0 | 0 | 0 | 0 | 0 | 16\% \$-0.35 |
| 20\% \$-0.26 | 0 | 0 | 0 | 752(0.0\%) | 92,011(3.9\%) | 0 | 0 | 0 | 0 | 0 | 20\% \$-0.26 |
| 24\% \$-0.17 | 0 | 0 | 0 | 0 | 97,634(4.1\%) | 0 | 0 | 0 | 0 | 0 | 24\% \$-0.17 |
| 28\% \$-0.08 | 0 | 0 | 0 | 0 | 88,252(3.7\%) | 0 | 0 | 0 | 0 | 0 | 28\% \$-0.08 |
| 32\% \$0.00 | 0 | 0 | 0 | 0 | 65,894(2.8\%) | 30,528(1.3\%) | 0 | 0 | 0 | 0 | 32\% \$0.00 |
| 36\% \$0.16 | 0 | 0 | 0 | 0 | 0 | 91,550(3.9\%) | 0 | 0 | 0 | 0 | 36\% \$0.16 |
| 40\% \$0.39 | 0 | 0 | 0 | 0 | 0 | 94,414(4.0\%) | 625(0.0\%) | 0 | 0 | 0 | 40\% \$0.39 |
| 44\% \$0.67 | 0 | 0 | 0 | 0 | 0 | 92,267(3.9\%) | 1,631(0.1\%) | 13(0.0\%) | 0 | 0 | 44\% \$0.67 |
| 48\% \$0.98 | 0 | 0 | 0 | 0 | 0 | 90,444(3.8\%) | 1,759(0.1\%) | 73(0.0\%) | 0 | 0 | 48\% \$0.98 |
| 52\% \$1.33 | 0 | 0 | 0 | 0 | 0 | 91,393(3.9\%) | 2,977(0.1\%) | 164(0.0\%) | 0 | 0 | 52\% \$1.33 |
| 56\% \$1.72 | 0 | 0 | 0 | 0 | 0 | 90,054(3.8\%) | 5,827(0.2\%) | 202(0.0\%) | 0 | 0 | 56\% \$1.72 |
| 60\% \$2.13 | 0 | 0 | 0 | 0 | 0 | 82,210(3.5\%) | 10,741(0.5\%) | 264(0.0\%) | 2(0.0\%) | 0 | 60\% \$2.13 |
| 64\% \$2.59 | 0 | 0 | 0 | 0 | 0 | 71,389(3.0\%) | 23,490(1.0\%) | 348(0.0\%) | 1(0.0\%) | 0 | 64\% \$2.59 |
| 68\% \$3.10 | 0 | 0 | 0 | 0 | 0 | 50,241(2.1\%) | 44,191(1.9\%) | 503(0.0\%) | 4(0.0\%) | 0 | 68\% \$3.10 |
| 72\% \$3.66 | 0 | 0 | 0 | 0 | 0 | 30,497(1.3\%) | 62,198(2.6\%) | 697(0.0\%) | 1(0.0\%) | 0 | 72\% \$3.66 |
| 76\% \$4.31 | 0 | 0 | 0 | 0 | 0 | 18,504(0.8\%) | 75,398(3.2\%) | 1,268(0.1\%) | 5(0.0\%) | 0 | 76\% \$4.31 |
| 80\% \$5.05 | 0 | 0 | 0 | 0 | 0 | 12,002(0.5\%) | 79,516(3.4\%) | 2,058(0.1\%) | 4(0.0\%) | 0 | 80\% \$5.05 |
| 84\% \$5.94 | 0 | 0 | 0 | 0 | 0 | 8,249(0.3\%) | 82,114(3.5\%) | 4,012(0.2\%) | 4(0.0\%) | 0 | 84\% \$5.94 |
| 88\% \$7.06 | 0 | 0 | 0 | 0 | 0 | 5,610(0.2\%) | 79,947(3.4\%) | 8,805(0.4\%) | 3(0.0\%) | 0 | 88\% \$7.06 |
| 92\% \$8.54 | 0 | 0 | 0 | 0 | 0 | 2,693(0.1\%) | 74,271(3.1\%) | 17,613(0.7\%) | 4(0.0\%) | 0 | 92\% \$8.54 |
| 96\% \$10.79 | 0 | 0 | 0 | 0 | 0 | 1,132(0.0\%) | 61,220(2.6\%) | 32,133(1.4\%) | 3(0.0\%) | 0 | 96\% \$10.79 |
| 100\% \$40.90 | 0 | 0 | 0 | 0 | 0 | 218(0.0\%) | 36,896(1.6\%) | 57,201(2.4\%) | 6(0.0\%) | 0 | 100\% \$40.90 |
| TOTAL | 6412 | 15318 | 17770 | 33662 | 657445 | 863395 | 642801 | 125354 | 37 | 0 | TOTAL |
|  | 0.3 \% | 0.6 \% | 0.8 \% | 1.4 \% | 27.8 \% | 36.6 \% | 27.2 \% | 5.3 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 6412 | 21730 | 39500 | 73162 | 730607 | 1594002 | 2236803 | 2362157 | 2362194 | 2362194 | CUMULATIVE |
|  | 0.3 \% | 0.9 \% | 1.7 \% | 3.1 \% | 30.9 \% | 67.5 \% | 94.7 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-393.1 | \$-88.0 | \$-28.6 | \$-6.3 | \$-0.5 | \$1.4 | \$5.8 | \$10.7 | \$6.4 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |



 RATE DATA ANALYSIS BILL IMPACT SUMMARY
CURRENT: 2018 E1 rates
PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16
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[^22]A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY <br> CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 <br> Climate: Cool Season: All seasons <br> Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $\begin{aligned} & \text { 5-10\% } \\ & \text { INCREASE } \end{aligned}$ | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \\ & \hline \end{aligned}$ |
| 4\% $\quad-1.48$ | 2,850(0.4\%) | 4,954(0.8\%) | 5,983(0.9\%) | 6,500(1.0\%) | 6,163(0.9\%) | 0 | 0 | 0 | 0 | 0 | 4\% -1.48 |
| 8\% \$-. 68 | 0 | 0 | 0 | 3,266(0.5\%) | 23,204(3.5\%) | 0 | 0 | 0 | 0 | 0 | 8\% \$-. 68 |
| 12\% \$-. 52 | 0 | 0 | 0 | 1,021(0.2\%) | 26,266(4.0\%) | 0 | 0 | 0 | 0 | 0 | 12\% \$-. 52 |
| 16\% \$-. 43 | 0 | 0 | 0 | 547(0.1\%) | 26,504(4.0\%) | 0 | 0 | 0 | 0 | 0 | 16\% \$-. 43 |
| 20\% \$-. 36 | 0 | 0 | 0 | 375(0.1\%) | 28,243(4.3\%) | 0 | 0 | 0 | 0 | 0 | 20\% \$-. 36 |
| 24\% \$-. 31 | 0 | 0 | 0 | 210(0.0\%) | 23,450(3.6\%) | 0 | 0 | 0 | 0 | 0 | 24\% \$-. 31 |
| 28\% \$-. 26 | 0 | 0 | 0 | 44(0.0\%) | 26,016(3.9\%) | 0 | 0 | 0 | 0 | 0 | 28\% \$-. 26 |
| 32\% \$-. 21 | 0 | 0 | 0 | 0 | 27,398(4.1\%) | 0 | 0 | 0 | 0 | 0 | 32\% \$-. 21 |
| 36\% \$-. 16 | 0 | 0 | 0 | 0 | 26,781(4.1\%) | 0 | 0 | 0 | 0 | 0 | 36\% \$-. 16 |
| 40\% \$-. 10 | 0 | 0 | 0 | 0 | 28,141(4.3\%) | 0 | 0 | 0 | 0 | 0 | 40\% \$-. 10 |
| 44\% \$-.03 | 0 | 0 | 0 | 0 | 25,227(3.8\%) | 0 | 0 | 0 | 0 | 0 | 44\% \$-. 03 |
| 48\% \$0.02 | 0 | 0 | 0 | 0 | 9,866(1.5\%) | 16,274(2.5\%) | 0 | 0 | 0 | 0 | 48\% \$0.02 |
| 52\% \$0.15 | 0 | 0 | 0 | 0 | 0 | 25,689(3.9\%) | 0 | 0 | 0 | 0 | 52\% \$0.15 |
| 56\% \$0.34 | 0 | 0 | 0 | 0 | 0 | 25,987(3.9\%) | 58(0.0\%) | 0 | 0 | 0 | 56\% \$0.34 |
| 60\% \$0.57 | 0 | 0 | 0 | 0 | 0 | 25,568(3.9\%) | 252(0.0\%) | 1(0.0\%) | 0 | 0 | 60\% \$0.57 |
| 64\% \$0.83 | 0 | 0 | 0 | 0 | 0 | 26,058(3.9\%) | 189(0.0\%) | 1(0.0\%) | 0 | 0 | 64\% \$0.83 |
| 68\% \$1.11 | 0 | 0 | 0 | 0 | 0 | 26,044(3.9\%) | 200(0.0\%) | 11(0.0\%) | 0 | 0 | 68\% \$1.11 |
| 72\% \$1.42 | 0 | 0 | 0 | 0 | 0 | 26,326(4.0\%) | 223(0.0\%) | 33(0.0\%) | 0 | 0 | 72\% \$1.42 |
| 76\% \$1.76 | 0 | 0 | 0 | 0 | 0 | 26,032(3.9\%) | 339(0.1\%) | 26(0.0\%) | 0 | 0 | 76\% \$1.76 |
| 80\% \$2.14 | 0 | 0 | 0 | 0 | 0 | 25,406(3.8\%) | 1,020(0.2\%) | 35(0.0\%) | 0 | 0 | 80\% \$2.14 |
| 84\% \$2.57 | 0 | 0 | 0 | 0 | 0 | 22,090(3.3\%) | 4,477(0.7\%) | 20(0.0\%) | 0 | 0 | 84\% \$2.57 |
| 88\% \$3.08 | 0 | 0 | 0 | 0 | 0 | 13,689(2.1\%) | 12,214(1.8\%) | 32(0.0\%) | 0 | 0 | 88\% \$3.08 |
| 92\% \$3.73 | 0 | 0 | 0 | 0 | 0 | 7,048(1.1\%) | 19,314(2.9\%) | 28(0.0\%) | 0 | 0 | 92\% \$3.73 |
| 96\% \$4.65 | 0 | 0 | 0 | 0 | 0 | 4,138(0.6\%) | 22,307(3.4\%) | 32(0.0\%) | 2(0.0\%) | 0 | 96\% \$4.65 |
| 100\% 23.91 | 0 | 0 | 0 | 0 | 0 | 1,283(0.2\%) | 24,936(3.8\%) | 132(0.0\%) | 0 | 0 | 100\% 23.91 |
| TOTAL | 2850 | 4954 |  |  | 277259 | 271632 |  | 351 | 2 | 0 | TOTAL |
|  | 0.4 \% | 0.8 \% | 0.9 \% | 1.8 \% | 42.0 \% | 41.1 \% | 12.9 \% | 0.1 \% | $0.0 \%$ | $0.0 \%$ |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| CUMULATIVE | 2850 | 7804 | 13787 | 25750 | 303009 | 574641 | 660170 | 660521 | 660523 | 660523 | CUMULATIVE |
|  | 0.4 \% | 1.2 \% | 2.1 \% | 3.9 \% | 45.9 \% | 87.0 \% | 99.9 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-354.7 | \$-66.2 | \$-19.9 | \$-4.5 | \$-0.4 | \$1.2 | \$4.0 | \$3.8 | \$4.2 | 0 | AVG.MO DIFF. |
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RATE DATA ANALYSIS BILL IMPACT SUMMARY
CURRENT: 2018 E1 rates
PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16
Climate: Cool Season: All seasons


$\stackrel{\rightharpoonup}{\square}$

| $\begin{array}{c}-10--5 \% \\ \text { DECREASE }\end{array}$ | $\begin{array}{c}-\mathbf{-}-\mathbf{- 2 . 5 \%} \\ \text { DECREASE }\end{array}$ |
| :---: | :---: |
| $2,776(1.5 \%)$ | $3,770(2.0 \%)$ |
| $653(0.3 \%)$ | $4,800(2.6 \%)$ |
| $361(0.2 \%)$ | $4,105(2.2 \%)$ |
| $226(0.1 \%)$ | $3,566(1.9 \%)$ |
| $178(0.1 \%)$ | $3,361(1.8 \%)$ |
| $121(0.1 \%)$ | $2,899(1.6 \%)$ |
| $110(0.1 \%)$ | $3,044(1.6 \%)$ |
| $79(0.0 \%)$ | $2,878(1.5 \%)$ |
| $44(0.0 \%)$ | $2,292(1.2 \%)$ |
| $67(0.0 \%)$ | $2,980(1.6 \%)$ |
| $41(0.0 \%)$ | $2,300(1.2 \%)$ |
| $31(0.0 \%)$ | $2,331(1.2 \%)$ |
| $23(0.0 \%)$ | $2,314(1.2 \%)$ |
| $27(0.0 \%)$ | $2,285(1.2 \%)$ |
| $22(0.0 \%)$ | $2,227(1.2 \%)$ |
| $20(0.0 \%)$ | $1,719(0.9 \%)$ |
| $22(0.0 \%)$ | $1,995(1.1 \%)$ |
| $11(0.0 \%)$ | $1,434(0.8 \%)$ |
| $12(0.0 \%)$ | $1,606(0.9 \%)$ |
| $8(0.0 \%)$ | $1,286(0.7 \%)$ |
| $3(0.0 \%)$ | $965(0.5 \%)$ |
| $2(0.0 \%)$ | $818(0.4 \%)$ |
| 0 | $458(0.2 \%)$ |
| 0 | $59(0.0 \%)$ |
| 0 | 0 |
| 4837 | 55492 |
| $2.6 \%$ | $29.7 \%$ |
| 5448 | 60940 |
| $2.9 \%$ | $32.6 \%$ |
| $\$-4.9$ | $\$-1.3$ |
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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \stackrel{1}{0} \\ & 0 \\ & 0 \\ & \end{aligned}$ | $\bigcirc$ | $\bigcirc$ | - | - | $\bigcirc$ | - | $\bigcirc$ | - | - | - | 0 | - | - | $\bigcirc$ | - | - | - | - | - | - | - | - | 0 | $\bigcirc$ | $\begin{aligned} & \stackrel{\ominus}{\mathrm{N}} \end{aligned}$ | $\begin{aligned} & 0 \\ & \underset{1}{1} \end{aligned}$ | $\begin{aligned} & \stackrel{\ominus}{\mathrm{N}} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & -1 \\ & 0 \end{aligned}$ | $\begin{aligned} & J \\ & \underset{~}{J} \\ & \underset{\sim}{\prime} \end{aligned}$ |
|  | $\stackrel{\infty}{\underset{\sim}{N}}$ ঃ৭ | $\begin{aligned} & \text { n } \\ & \underset{\sim}{1} \\ & \text { O} \end{aligned}$ |  |  |  |  | $\begin{gathered} \stackrel{\circ}{0} \\ \underset{i}{1} \\ \circ \\ \stackrel{\circ}{\circ} \\ \underset{\sim}{2} \end{gathered}$ |  |  |  | $\begin{aligned} & \stackrel{9}{9} \\ & \dot{6} \\ & \stackrel{2}{9} \\ & \dot{7} \end{aligned}$ | $\begin{gathered} \underset{\sim}{~} \\ \dot{\prime} \\ \dot{\prime} \\ \text { O } \\ \text { O } \end{gathered}$ | $\begin{gathered} 9 \\ \dot{9} \\ \dot{4} \\ 0 \\ \stackrel{\rightharpoonup}{i} \\ i \end{gathered}$ | $\begin{aligned} & \text { y } \\ & \dot{1} \\ & \dot{\theta} \\ & \text { oi } \\ & \text { in } \end{aligned}$ |  |  | $\begin{aligned} & \text { on } \\ & \dot{6} \\ & \dot{4} \\ & \circ \\ & 0 . \\ & 0 \end{aligned}$ |  |  | $\begin{aligned} & \infty \\ & \dot{m} \\ & \dot{\theta} \\ & \stackrel{0}{\circ} \\ & \infty \end{aligned}$ |  |  |  | $\begin{aligned} & 8 \\ & \dot{\theta} \\ & \dot{\theta} \\ & \stackrel{y}{\circ} \end{aligned}$ | $\begin{aligned} & \text { N } \\ & \text { N } \\ & \text { 内 } \\ & \text { O} \\ & \text { Ò } \end{aligned}$ |  |  |  |  |  |

A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY <br> CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 <br> Climate: Moderate Season: All seasons <br> Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \\ & \hline \end{aligned}$ |
| 4\% $\quad-1.24$ | 2,468(0.3\%) | 6,945(0.7\%) | 7,575(0.8\%) | 8,391(0.9\%) | 13,957(1.4\%) | 0 | 0 | 0 | 0 | 0 | 4\% -1.24 |
| 8\% \$-. 68 | 0 | 0 | 0 | 2,804(0.3\%) | 37,094(3.8\%) | 0 | 0 | 0 | 0 | 0 | 8\% \$-. 68 |
| 12\% \$-. 51 | 0 | 0 | 0 | 889(0.1\%) | 38,201(3.9\%) | 0 | 0 | 0 | 0 | 0 | 12\% \$-. 51 |
| 16\% \$-. 39 | 0 | 0 | 0 | 658(0.1\%) | 40,453(4.1\%) | 0 | 0 | 0 | 0 | 0 | 16\% \$-. 39 |
| 20\% \$-. 29 | 0 | 0 | 0 | 524(0.1\%) | 40,564(4.1\%) | 0 | 0 | 0 | 0 | 0 | 20\% \$-. 29 |
| 24\% \$-. 20 | 0 | 0 | 0 | 17(0.0\%) | 38,599(3.9\%) | 0 | 0 | 0 | 0 | 0 | 24\% \$-. 20 |
| 28\% \$-.11 | 0 | 0 | 0 | 0 | 36,883(3.8\%) | 0 | 0 | 0 | 0 | 0 | 28\% \$-. 11 |
| 32\% \$0.00 | 0 | 0 | 0 | 0 | 38,388(3.9\%) | 8,284(0.8\%) | 0 | 0 | 0 | 0 | 32\% \$0.00 |
| 36\% \$0.12 | 0 | 0 | 0 | 0 | 0 | 32,009(3.3\%) | 0 | 0 | 0 | 0 | 36\% \$0.12 |
| 40\% \$0.31 | 0 | 0 | 0 | 0 | 0 | 38,828(3.9\%) | 43(0.0\%) | 0 | 0 | 0 | 40\% \$0.31 |
| 44\% \$0.56 | 0 | 0 | 0 | 0 | 0 | 39,546(4.0\%) | 425(0.0\%) | 0 | 0 | 0 | 44\% \$0.56 |
| 48\% \$0.84 | 0 | 0 | 0 | 0 | 0 | 38,451(3.9\%) | 477(0.0\%) | 11(0.0\%) | 0 | 0 | 48\% \$0.84 |
| 52\% \$1.15 | 0 | 0 | 0 | 0 | 0 | 38,265(3.9\%) | 583(0.1\%) | 26(0.0\%) | 0 | 0 | 52\% \$1.15 |
| 56\% \$1.49 | 0 | 0 | 0 | 0 | 0 | 38,117(3.9\%) | 1,144(0.1\%) | 31(0.0\%) | 0 | 0 | 56\% \$1.49 |
| 60\% \$1.86 | 0 | 0 | 0 | 0 | 0 | 37,003(3.8\%) | 2,255(0.2\%) | 47(0.0\%) | 0 | 0 | 60\% \$1.86 |
| 64\% \$2.26 | 0 | 0 | 0 | 0 | 0 | 34,582(3.5\%) | 4,905(0.5\%) | 33(0.0\%) | 0 | 0 | 64\% \$2.26 |
| 68\% \$2.70 | 0 | 0 | 0 | 0 | 0 | 29,645(3.0\%) | 10,111(1.0\%) | 74(0.0\%) | 0 | 0 | 68\% \$2.70 |
| 72\% \$3.17 | 0 | 0 | 0 | 0 | 0 | 22,062(2.2\%) | 16,752(1.7\%) | 100(0.0\%) | 0 | 0 | 72\% \$3.17 |
| 76\% \$3.70 | 0 | 0 | 0 | 0 | 0 | 14,357(1.5\%) | 24,782(2.5\%) | 160(0.0\%) | 0 | 0 | 76\% \$3.70 |
| 80\% \$4.30 | 0 | 0 | 0 | 0 | 0 | 7,896(0.8\%) | 30,964(3.1\%) | 282(0.0\%) | 0 | 0 | 80\% \$4.30 |
| 84\% \$5.00 | 0 | 0 | 0 | 0 | 0 | 5,224(0.5\%) | 33,890(3.4\%) | 455(0.0\%) | 0 | 0 | 84\% \$5.00 |
| 88\% \$5.83 | 0 | 0 | 0 | 0 | 0 | 3,911(0.4\%) | 34,411(3.5\%) | 881(0.1\%) | 1(0.0\%) | 0 | 88\% \$5.83 |
| 92\% \$6.86 | 0 | 0 | 0 | 0 | 0 | 2,528(0.3\%) | 34,905(3.6\%) | 1,910(0.2\%) | 2(0.0\%) | 0 | 92\% \$6.86 |
| 96\% \$8.25 | 0 | 0 | 0 | 0 | 0 | 392(0.0\%) | 34,839(3.5\%) | 3,968(0.4\%) | 0 | 0 | 96\% \$8.25 |
| 100\% 25.16 | 0 | 0 | 0 | 0 | 0 | 75(0.0\%) | 29,576(3.0\%) | 9,449(1.0\%) | 0 | 0 | 100\% 25.16 |
| TOTAL | 2468 | 6945 | 7575 | 13283 | 284139 | 391175 | 260062 | 17427 | 3 | 0 | TOTAL |
|  | 0.3 \% | 0.7 \% | 0.8 \% | 1.4 \% | 28.9 \% | 39.8 \% | 26.5 \% | 1.8 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 2468 | 9413 | 16988 | 30271 | 314410 | 705585 | 965647 | 983074 | 983077 | 983077 | CUMULATIVE |
|  | 0.3 \% | 1.0 \% | 1.7 \% | 3.1 \% | 32.0 \% | 71.8 \% | 98.2 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-411.0 | \$-91.1 | \$-30.1 | \$-6.7 | \$-0.5 | \$1.4 | \$5.4 | \$8.3 | \$5.9 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |




A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY <br> CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 <br> Climate: Hot Season: All seasons <br> Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ <br> PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | -2.5-0\% <br> DECREASE | 0-2.5\% <br> INCREASE | $2.5 \text { - 5\% }$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \end{aligned}$ |
| 4\% \$-1.24 | 1,094(0.2\%) | 3,419(0.5\%) | 4,212(0.6\%) | 5,378(0.7\%) | 14,797(2.1\%) | 0 | 0 | 0 | 0 | 0 | 4\% \$-1.24 |
| 8\% \$-0.49 | 0 | 0 | 0 | 2,106(0.3\%) | 26,777(3.7\%) | 0 | 0 | 0 | 0 | 0 | 8\% \$-0.49 |
| 12\% \$-0.20 | 0 | 0 | 0 | 932(0.1\%) | 27,971(3.9\%) | 0 | 0 | 0 | 0 | 0 | 12\% \$-0.20 |
| 16\% \$0.00 | 0 | 0 | 0 | 0 | 26,502(3.7\%) | 11,007(1.5\%) | 0 | 0 | 0 | 0 | 16\% \$0.00 |
| 20\% \$0.18 | 0 | 0 | 0 | 0 | 0 | 20,060(2.8\%) | 0 | 0 | 0 | 0 | 20\% \$0.18 |
| 24\% \$0.51 | 0 | 0 | 0 | 0 | 0 | 28,268(3.9\%) | 723(0.1\%) | 0 | 0 | 0 | 24\% \$0.51 |
| 28\% \$0.91 | 0 | 0 | 0 | 0 | 0 | 26,899(3.7\%) | 1,278(0.2\%) | 49(0.0\%) | 0 | 0 | 28\% \$0.91 |
| 32\% \$1.38 | 0 | 0 | 0 | 0 | 0 | 26,311(3.7\%) | 2,466(0.3\%) | 121(0.0\%) | 0 | 0 | 32\% \$1.38 |
| 36\% \$1.89 | 0 | 0 | 0 | 0 | 0 | 23,279(3.2\%) | 5,317(0.7\%) | 170(0.0\%) | 1(0.0\%) | 0 | 36\% \$1.89 |
| 40\% \$2.42 | 0 | 0 | 0 | 0 | 0 | 19,116(2.7\%) | 9,218(1.3\%) | 283(0.0\%) | 2(0.0\%) | 0 | 40\% \$2.42 |
| 44\% \$2.97 | 0 | 0 | 0 | 0 | 0 | 13,434(1.9\%) | 14,780(2.1\%) | 367(0.1\%) | 1(0.0\%) | 0 | 44\% \$2.97 |
| 48\% \$3.54 | 0 | 0 | 0 | 0 | 0 | 9,123(1.3\%) | 19,417(2.7\%) | 492(0.1\%) | 3(0.0\%) | 0 | 48\% \$3.54 |
| 52\% \$4.11 | 0 | 0 | 0 | 0 | 0 | 6,021(0.8\%) | 21,646(3.0\%) | 753(0.1\%) | 4(0.0\%) | 0 | 52\% \$4.11 |
| 56\% \$4.71 | 0 | 0 | 0 | 0 | 0 | 4,392(0.6\%) | 23,648(3.3\%) | 1,070(0.1\%) | 2(0.0\%) | 0 | 56\% \$4.71 |
| 60\% \$5.31 | 0 | 0 | 0 | 0 | 0 | 3,199(0.4\%) | 23,620(3.3\%) | 1,482(0.2\%) | 3(0.0\%) | 0 | 60\% \$5.31 |
| 64\% \$5.95 | 0 | 0 | 0 | 0 | 0 | 2,539(0.4\%) | 24,228(3.4\%) | 2,296(0.3\%) | 2(0.0\%) | 0 | 64\% \$5.95 |
| 68\% \$6.60 | 0 | 0 | 0 | 0 | 0 | 1,997(0.3\%) | 22,976(3.2\%) | 3,399(0.5\%) | 1(0.0\%) | 0 | 68\% \$6.60 |
| 72\% \$7.31 | 0 | 0 | 0 | 0 | 0 | 1,732(0.2\%) | 22,295(3.1\%) | 4,990(0.7\%) | 1(0.0\%) | 0 | 72\% \$7.31 |
| 76\% \$8.07 | 0 | 0 | 0 | 0 | 0 | 1,339(0.2\%) | 20,639(2.9\%) | 6,607(0.9\%) | 1(0.0\%) | 0 | 76\% \$8.07 |
| 80\% \$8.91 | 0 | 0 | 0 | 0 | 0 | 940(0.1\%) | 19,119(2.7\%) | 8,715(1.2\%) | 2(0.0\%) | 0 | 80\% \$8.91 |
| 84\% \$9.88 | 0 | 0 | 0 | 0 | 0 | 512(0.1\%) | 17,537(2.4\%) | 10,769(1.5\%) | 0 | 0 | 84\% \$9.88 |
| 88\% \$11.00 | 0 | 0 | 0 | 0 | 0 | 244(0.0\%) | 15,674(2.2\%) | 12,813(1.8\%) | 4(0.0\%) | 0 | 88\% \$11.00 |
| 92\% \$12.41 | 0 | 0 | 0 | 0 | 0 | 108(0.0\%) | 13,683(1.9\%) | 14,779(2.1\%) | 3(0.0\%) | 0 | 92\% \$12.41 |
| 96\% \$14.32 | 0 | 0 | 0 | 0 | 0 | 56(0.0\%) | 11,679(1.6\%) | 17,010(2.4\%) | 2(0.0\%) | 0 | 96\% \$14.32 |
| 100\% \$40.90 | 0 | 0 | 0 | 0 | 0 | 12(0.0\%) | 7,267(1.0\%) | 21,411(3.0\%) | 0 | 0 | 100\% \$40.90 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| TOTAL | 1094 | 3419 | 4212 | 8416 | 96047 | 200588 | 297210 | 107576 | 32 | 0 | TOTAL |
|  | 0.2 \% | 0.5 \% | 0.6 \% | 1.2 \% | 13.4 \% | 27.9 \% | 41.4 \% | 15.0 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 1094 | 4513 | 8725 | 17141 | 113188 | 313776 | 610986 | 718562 | 718594 | 718594 | CUMULATIVE |
|  | 0.2 \% | 0.6 \% | 1.2 \% | 2.4 \% | 15.8 \% | 43.7 \% | 85.0 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-453.0 | \$-113.6 | \$-38.5 | \$-8.4 | \$-0.8 | \$1.6 | \$6.6 | \$11.1 | \$6.6 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |


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Rate Schedule=E1L | Climate: Hot Season: All seasons |
| :---: |
| Rate Schedule=E1L | $\qquad$

RATE DATA ANALYSIS BILL IMPACT SUMMARY
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|  | $\begin{aligned} & 0 \\ & \stackrel{\rightharpoonup}{2} \\ & 0 \\ & 0 \\ & 0 \\ & 10 \end{aligned}$ | - | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | 0 | 0 | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | 0 | 0 | 0 | $\bigcirc$ | 0 | $\bigcirc$ | $\bigcirc$ | $\begin{aligned} & 0 \\ & \text { in } \end{aligned}$ | $\begin{aligned} & 0 \\ & -1 \\ & 0 \end{aligned}$ | $\underset{\text { N}}{\underset{\sim}{2}}$ | $\begin{aligned} & 0 \\ & -1 \\ & -1 \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \text { O} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | - | 0 | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | - | - | - | - | $\bigcirc$ | $\bigcirc$ | - | - | - | - | - | - | - | $\bigcirc$ | - | O | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | 윽 | $\begin{aligned} & \circ \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & \dot{O} \\ & \underset{\sim}{\dot{1}} \end{aligned}$ |
|  |  | $\left\|\begin{array}{c} \underset{O}{0} \\ \dot{T} \\ \dot{\theta} \\ \circ \\ \circ \end{array}\right\|$ |  |  |  | $\begin{aligned} & \text { N } \\ & \text { ó } \\ & \dot{+} \\ & \stackrel{\rightharpoonup}{\circ} \\ & \underset{\sim}{n} \end{aligned}$ |  |  | $\begin{gathered} \text { N } \\ \text { N } \\ \text { O } \\ \text { O} \\ 0 \\ 0 \end{gathered}$ |  |  |  | $\begin{gathered} \circ \\ \dot{\circ} \\ \dot{\theta} \\ \text { in } \\ \stackrel{\rightharpoonup}{2} \\ i \end{gathered}$ |  |  |  |  | $\begin{aligned} & \text { N } \\ & \text { N } \\ & \text { + } \\ & \text { Nे } \end{aligned}$ |  | $\begin{aligned} & \text { N } \\ & \text { i } \\ & \text { 犬 } \\ & \text { Ò } \end{aligned}$ | $\begin{aligned} & 0 \\ & \underset{\sim}{N} \\ & \underset{\sim}{n} \\ & \underset{\infty}{\circ} \\ & \underset{\sim}{n} \end{aligned}$ |  |  |  | $\begin{aligned} & \text { N } \\ & \infty \\ & \text { m } \\ & \ddot{\otimes} \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & \underset{\nwarrow}{\overleftrightarrow{~}} \\ & \stackrel{\rightharpoonup}{\bullet} \end{aligned}$ |  |  |  |  |

RATE DATA ANALYSIS BILL IMPACT SUMMARY BILL IMPACT SUMMARY
PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16

| RATE SCHEDULE | COUNT | SUM OF TOU KWH | TOTAL ANNUAL CURRENT BILLS | CURRENT AVG RATE | TOTAL ANNUAL PROPOSED BILLS | PROPOSED AVG RATE | DIFFERENCE (PROPOSEDCURRENT) | (PROPOSEDCURRENT) <br> I CURRENT | MAX <br> DIFFERENCE | MIN DIFFERENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E1 | 1,643,600 | 8,624,630,376 | \$2,019,289,282 | \$0.23413 | \$2,007,836,951 | \$0.23280 | \$-11,452,331 | ( 0.57\%) | \$302 | \$-302,224 |
| E1L | 409,980 | 1,858,482,181 | \$262,461,642 | \$0.14122 | \$257,482,836 | \$0.13854 | \$-4,978,805 | ( 1.90\%) | \$83 | \$-16,959 |
| TOTAL | 2,053,580 | 10,483,112,557 | \$2,281,750,924 | \$0.21766 | \$2,265,319,788 | \$0.21609 | \$-16,431,137 | ( 0.72\%) | \$385 | \$-319,182 |

A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY <br> CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 <br> Climate: Not Hot Season: All seasons <br> Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{aligned} & -20-10 \% \\ & \text { DECREASE } \end{aligned}$ | $-10--5 \%$ <br> DECREASE | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \\ & \hline \end{aligned}$ |
| 4\% $\quad-1.31$ | 5,318(0.3\%) | 11,899(0.7\%) | 13,558(0.8\%) | 15,047(0.9\%) | 20,057(1.2\%) | 0 | 0 | 0 | 0 | 0 | 4\% -1.31 |
| 8\% \$-. 68 | 0 | 0 | 0 | 5,914(0.4\%) | 60,361(3.7\%) | 0 | 0 | 0 | 0 | 0 | 8\% \$-. 68 |
| 12\% \$-. 51 | 0 | 0 | 0 | 1,973(0.1\%) | 66,908(4.1\%) | 0 | 0 | 0 | 0 | 0 | 12\% \$-. 51 |
| 16\% \$-. 41 | 0 | 0 | 0 | 1,125(0.1\%) | 64,398(3.9\%) | 0 | 0 | 0 | 0 | 0 | 16\% \$-. 41 |
| 20\% \$-. 33 | 0 | 0 | 0 | 887(0.1\%) | 66,014(4.0\%) | 0 | 0 | 0 | 0 | 0 | 20\% \$-. 33 |
| 24\% \$-. 26 | 0 | 0 | 0 | 300(0.0\%) | 65,242(4.0\%) | 0 | 0 | 0 | 0 | 0 | 24\% \$-. 26 |
| 28\% \$-. 19 | 0 | 0 | 0 | 0 | 68,052(4.1\%) | 0 | 0 | 0 | 0 | 0 | 28\% \$-. 19 |
| 32\% \$-. 12 | 0 | 0 | 0 | 0 | 64,114(3.9\%) | 0 | 0 | 0 | 0 | 0 | 32\% \$-. 12 |
| 36\% \$-. 04 | 0 | 0 | 0 | 0 | 60,543(3.7\%) | 0 | 0 | 0 | 0 | 0 | 36\% \$-. 04 |
| 40\% \$0.04 | 0 | 0 | 0 | 0 | 25,709(1.6\%) | 40,845(2.5\%) | 0 | 0 | 0 | 0 | 40\% \$0.04 |
| 44\% \$0.20 | 0 | 0 | 0 | 0 | 0 | 67,098(4.1\%) | 0 | 0 | 0 | 0 | 44\% \$0.20 |
| 48\% \$0.41 | 0 | 0 | 0 | 0 | 0 | 64,098(3.9\%) | 338(0.0\%) | 0 | 0 | 0 | 48\% \$0.41 |
| 52\% \$0.67 | 0 | 0 | 0 | 0 | 0 | 66,117(4.0\%) | 700(0.0\%) | 4(0.0\%) | 0 | 0 | 52\% \$0.67 |
| 56\% \$0.95 | 0 | 0 | 0 | 0 | 0 | 64,181(3.9\%) | 673(0.0\%) | 19(0.0\%) | 0 | 0 | 56\% \$0.95 |
| 60\% \$1.26 | 0 | 0 | 0 | 0 | 0 | 64,610(3.9\%) | 908(0.1\%) | 59(0.0\%) | 0 | 0 | 60\% \$1.26 |
| 64\% \$1.60 | 0 | 0 | 0 | 0 | 0 | 64,044(3.9\%) | 1,663(0.1\%) | 60(0.0\%) | 0 | 0 | 64\% \$1.60 |
| 68\% \$1.97 | 0 | 0 | 0 | 0 | 0 | 62,227(3.8\%) | 3,342(0.2\%) | 74(0.0\%) | 0 | 0 | 68\% \$1.97 |
| 72\% \$2.38 | 0 | 0 | 0 | 0 | 0 | 57,670(3.5\%) | 8,517(0.5\%) | 77(0.0\%) | 0 | 0 | 72\% \$2.38 |
| 76\% \$2.83 | 0 | 0 | 0 | 0 | 0 | 44,831(2.7\%) | 19,966(1.2\%) | 98(0.0\%) | 0 | 0 | 76\% \$2.83 |
| 80\% \$3.35 | 0 | 0 | 0 | 0 | 0 | 29,784(1.8\%) | 35,474(2.2\%) | 152(0.0\%) | 0 | 0 | 80\% \$3.35 |
| 84\% \$3.97 | 0 | 0 | 0 | 0 | 0 | 17,597(1.1\%) | 48,680(3.0\%) | 270(0.0\%) | 0 | 0 | 84\% \$3.97 |
| 88\% \$4.72 | 0 | 0 | 0 | 0 | 0 | 9,906(0.6\%) | 55,048(3.3\%) | 417(0.0\%) | 2(0.0\%) | 0 | 88\% \$4.72 |
| 92\% \$5.71 | 0 | 0 | 0 | 0 | 0 | 6,195(0.4\%) | 58,093(3.5\%) | 990(0.1\%) | 1(0.0\%) | 0 | 92\% \$5.71 |
| 96\% \$7.27 | 0 | 0 | 0 | 0 | 0 | 3,390(0.2\%) | 59,218(3.6\%) | 3,135(0.2\%) | 2(0.0\%) | 0 | 96\% $\quad \$ 7.27$ |
| 100\% 25.16 | 0 | 0 | 0 | 0 | 0 | 214(0.0\%) | 52,971(3.2\%) | 12,423(0.8\%) | 0 | 0 | 100\% 25.16 |
| TOTAL | 5318 | 11899 | 13558 | 25246 | 561398 | 662807 | 345591 | 17778 | 5 | 0 | TOTAL |
|  | 0.3 \% | 0.7 \% | 0.8 \% | 1.5 \% | 34.2 \% | 40.3 \% | 21.0 \% | 1.1 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 5318 | 17217 | 30775 | 56021 | 617419 | 1280226 | 1625817 | 1643595 | 1643600 | 1643600 | CUMULATIVE |
|  | 0.3 \% | 1.0 \% | 1.9 \% | 3.4 \% | 37.6 \% | 77.9 \% | 98.9 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-380.8 | \$-80.7 | \$-25.6 | \$-5.7 | \$-0.5 | \$1.3 | \$5.1 | \$8.2 | \$5.2 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |



|  | - | - | - | 0 | - | 0 | - | - | - | - | - | 0 | - | - | $\bigcirc$ | - | 0 | - | - | - | - | - | - | 0 | - | $\bigcirc$ | $\begin{aligned} & \circ \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { O } \\ & \text { ó } \\ & \text { O } \end{aligned}$ | $\begin{aligned} & \text { ®o } \\ & 0 \\ & 0 \\ & \text { - } \end{aligned}$ | $\bigcirc$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | - | $\bigcirc$ | $\bigcirc$ | 0 | - | - | - | - | - | - | - | - | - | - | $\bigcirc$ | - | - | - | - | - | - | - | - | - | - | $\bigcirc$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  | $\begin{array}{\|c} \circ \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ | 0 |

 Rate Schedule $=E 1 L$

|  | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\begin{aligned} & \stackrel{o}{0} \\ & \underset{1}{2} \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ |  | $\begin{gathered} \stackrel{\leftrightarrow}{M} \\ \underset{\sim}{2} \end{gathered}$ | $\begin{aligned} & 0 \\ & 0 \\ & -1 \\ & -1 \end{aligned}$ | $\begin{aligned} & \text { N } \\ & \text { O} \\ & \text { 앙 } \end{aligned}$ | $\begin{aligned} & \text { ơ } \\ & 0 \\ & \dot{0} \end{aligned}$ | $\stackrel{O}{\dot{\theta}}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | - | - | - | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |  |  |  | $\begin{aligned} & \infty \\ & \hat{0} \\ & \hat{0} \end{aligned}$ | $\begin{aligned} & 0 \\ & \underset{\sim}{0} \\ & \underset{\infty}{2} \end{aligned}$ |  | $\begin{aligned} & \infty \\ & 0 \\ & \infty \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & 0 \\ & \dot{\theta} \\ & \bullet \end{aligned}$ |
|  |  |  |  |  |  |  | $\circ$ <br> $\vdots$ <br> $\vdots$ <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 |  |  |  |  |  |  |  |  |  |  |  |  |  | $\stackrel{\stackrel{\rightharpoonup}{\circ}}{\stackrel{\rightharpoonup}{+}}$ |  |  | $\bigcirc$ | - | $\begin{gathered} \stackrel{9}{n} \\ \stackrel{m}{n} \\ \stackrel{N}{N} \end{gathered}$ | $\begin{aligned} & \text { ơ } \\ & 0 \\ & \text { ì } \end{aligned}$ | $\begin{aligned} & \mathbf{N} \\ & \mathbf{0} \\ & \mathbf{O} \\ & \hline \end{aligned}$ | $\begin{gathered} 0 \\ 0 \\ 0 \\ \text { ón } \end{gathered}$ | $\begin{aligned} & \hat{y} \\ & o \\ & \dot{\theta} \end{aligned}$ |
|  |  | (\%カて) LZ6‘6 |  | $\begin{aligned} & \text { O} \\ & \text { on } \\ & - \\ & 0 \\ & 0 \\ & 0 \\ & r \end{aligned}$ | $\begin{aligned} & \stackrel{O}{\circ} \\ & 0 \\ & \underset{i}{i} \\ & \stackrel{N}{N} \\ & \underset{N}{N} \end{aligned}$ |  |  |  |  |  |  |  |  | $\begin{aligned} & \stackrel{O}{0} \\ & \text { - } \\ & \underset{\sim}{N} \\ & \underset{\sim}{j} \end{aligned}$ |  |  | O 0 0 0 0 0 $i$ $i$ | O 0 0 0 0 0 0 0 |  |  |  |  | $\bigcirc$ | - | - | $\begin{aligned} & \hat{0} \\ & 0 \\ & 0 \\ & 0 \\ & \mathbf{O} \end{aligned}$ | $\begin{aligned} & \text { O- } \\ & \infty \\ & \stackrel{1}{N} \\ & \end{aligned}$ | $\begin{aligned} & \text { O} \\ & \stackrel{N}{N} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & 0 \\ & \stackrel{0}{1} \\ & \underset{\sim}{\infty} \\ & \hline \end{aligned}$ | $\begin{gathered} t \\ \underset{\sim}{\dot{G}} \end{gathered}$ |
|  |  |  |  |  | $\begin{gathered} \stackrel{\varrho}{9} \\ \stackrel{1}{6} \\ \substack{e \\ ~} \end{gathered}$ | $\stackrel{\stackrel{\rightharpoonup}{9}}{\stackrel{1}{n}}$ | $\circ$ <br> 0 <br> 0 <br> 0 <br> 0 <br> $\cdots$ | $\circ$ 0 0 0 $\square$ $\square$ | ò | 0 <br> 0 <br> 0 <br> 0 <br> 0 <br> 0 | $\stackrel{\text { O}}{\stackrel{\circ}{\circ}}$ | O | o | $\begin{aligned} & \text { ò } \\ & \text { ò } \\ & \text { j} \\ & \text { y } \end{aligned}$ | $\begin{gathered} \stackrel{o}{\circ} \\ 0 \\ \stackrel{0}{7} \\ 7 \end{gathered}$ | 은 | 응 | $\begin{gathered} \stackrel{O}{\circ} \\ 0 \\ \stackrel{\rightharpoonup}{j} \end{gathered}$ |  | $\begin{gathered} \stackrel{\rightharpoonup}{\mathrm{o}} \\ \stackrel{\rightharpoonup}{\mathbf{0}} \end{gathered}$ | $\bigcirc$ | 0 | - | $\bigcirc$ | - | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & \infty \end{aligned}$ | $\begin{aligned} & 0 \\ & \stackrel{\rightharpoonup}{i} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \text { ๗ু } \\ & \text { గ/ } \end{aligned}$ | $\begin{aligned} & 0 \\ & \mathbf{o} \\ & \mathbf{N} \\ & \hline \end{aligned}$ | $\begin{gathered} \text { N } \\ \dot{L} \\ \dot{\theta} \end{gathered}$ |


|  |  | $\bigcirc$ | - | 0 | 0 | 0 | - | 0 | $\bigcirc$ | 0 | 0 | $\bigcirc$ | 0 | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | 0 | 0 | - | 0 | 0 | $\begin{gathered} 0 \\ \infty \\ \infty \end{gathered}$ | $\begin{aligned} & \text { O } \\ & \text { n } \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { M } \\ & \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & \underset{\sim}{N} \\ & \dot{\oplus} \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $o$ $\stackrel{o}{-}$ $\vdots$ $\stackrel{\rightharpoonup}{c}$ $\cdots$ | $\bigcirc$ | - | 0 | 0 | 0 | 0 | 0 | $\bigcirc$ | 0 | 0 | $\bigcirc$ | 0 | 0 | 0 | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | 0 | 0 | - | $\stackrel{N}{N}$ | $\begin{aligned} & 0 \\ & \underset{1}{1} \\ & 0 \end{aligned}$ | $\stackrel{N}{N}$ | $\begin{aligned} & 0 \\ & 0 \\ & -1 \end{aligned}$ |  |
|  | $\begin{aligned} & \hat{\sim} \\ & \underset{\sim}{1} \\ & \underset{\sim}{\circ} \\ & 0 \end{aligned}$ | $\begin{gathered} \text { O } \\ \text { i } \\ \text { i} \\ \text { O } \end{gathered}$ |  |  | $\begin{gathered} \underset{\sim}{m} \\ \underset{\sim}{1} \\ \stackrel{\rightharpoonup}{0} \\ \text { N} \end{gathered}$ | $\begin{aligned} & \stackrel{9}{7} \\ & \underset{1}{1} \\ & \stackrel{0}{\circ} \\ & \underset{\sim}{2} \end{aligned}$ |  | $\begin{gathered} \mathrm{O} \\ \text { ì } \\ \text { O} \\ \text { Nे } \end{gathered}$ | $\begin{aligned} & \text { M } \\ & \dot{\leftrightarrow} \\ & \dot{\leftrightarrow} \\ & \stackrel{y}{\circ} \\ & \dot{e} \end{aligned}$ | $\begin{aligned} & \circ \\ & 0 . \\ & \dot{\theta} \\ & 0 . \\ & \stackrel{\circ}{9} \end{aligned}$ |  |  |  | $\begin{gathered} \text { y } \\ \dot{y} \\ \dot{4} \\ \text { ó } \\ \dot{\circ} \end{gathered}$ | $\begin{aligned} & 0 \\ & 0 \\ & \dot{n} \\ & \dot{\theta} \\ & 0 . \\ & 0 . \end{aligned}$ | $\begin{gathered} \hat{n} \\ \dot{6} \\ \dot{6} \\ 0 \\ \dot{0} \end{gathered}$ |  | $\begin{gathered} \text { o } \\ \dot{4} \\ \stackrel{y}{n} \\ \stackrel{\rightharpoonup}{N} \end{gathered}$ |  | $\begin{gathered} \text { y } \\ \dot{\leftrightarrow} \\ \dot{\leftrightarrow} \\ \text { ò } \\ \infty \end{gathered}$ | $\begin{gathered} \text { O} \\ \underset{\leftrightarrow}{\prime} \\ \dot{\leftrightarrow} \\ \stackrel{y}{\circ} \\ \vdots \end{gathered}$ |  |  |  |  | $\begin{aligned} & \text { 1 } \\ & \stackrel{1}{6} \\ & \mathbf{O} \end{aligned}$ |  |  |  |  |

[^23]A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: All Climates Season: Winter 8 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{aligned} & -20-10 \% \\ & \text { DECREASE } \end{aligned}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | -5--2.5\% <br> DECREASE | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \end{aligned}$ |
| 4\% -6.06 | 8,402(0.4\%) | 19,736(0.8\%) | 26,144(1.1\%) | 35,663(1.5\%) | 4,690(0.2\%) | 0 | 0 | 0 | 0 | 0 | 4\% -6.06 |
| 8\% $\quad-3.49$ | 0 | 0 | 1,121(0.0\%) | 61,157(2.6\%) | 32,088(1.4\%) | 0 | 0 | 0 | 0 | 0 | 8\% $\quad-3.49$ |
| 12\% -2.70 | 0 | 0 | 1,466(0.1\%) | 75,036(3.2\%) | 18,374(0.8\%) | 0 | 0 | 0 | 0 | 0 | 12\% -2.70 |
| 16\% -2.44 | 0 | 0 | 758(0.0\%) | 82,314(3.5\%) | 11,440(0.5\%) | 0 | 0 | 0 | 0 | 0 | 16\% -2.44 |
| 20\% -2.27 | 0 | 0 | 532(0.0\%) | 86,672(3.7\%) | 13,570(0.6\%) | 0 | 0 | 0 | 0 | 0 | 20\% -2.27 |
| 24\% -2.14 | 0 | 0 | 449(0.0\%) | 74,946(3.2\%) | 18,917(0.8\%) | 0 | 0 | 0 | 0 | 0 | 24\% -2.14 |
| 28\% -2.02 | 0 | 0 | 491(0.0\%) | 67,215(2.8\%) | 28,151(1.2\%) | 0 | 0 | 0 | 0 | 0 | 28\% -2.02 |
| 32\% -1.92 | 0 | 0 | 424(0.0\%) | 54,289(2.3\%) | 32,559(1.4\%) | 0 | 0 | 0 | 0 | 0 | 32\% -1.92 |
| 36\% -1.82 | 0 | 0 | 441(0.0\%) | 55,943(2.4\%) | 37,757(1.6\%) | 0 | 0 | 0 | 0 | 0 | 36\% -1.82 |
| 40\% -1.72 | 0 | 0 | 434(0.0\%) | 58,242(2.5\%) | 41,258(1.7\%) | 0 | 0 | 0 | 0 | 0 | 40\% -1.72 |
| 44\% -1.63 | 0 | 0 | 396(0.0\%) | 51,308(2.2\%) | 40,581(1.7\%) | 0 | 0 | 0 | 0 | 0 | 44\% -1.63 |
| 48\% -1.54 | 0 | 0 | 408(0.0\%) | 46,182(2.0\%) | 44,487(1.9\%) | 0 | 0 | 0 | 0 | 0 | 48\% -1.54 |
| 52\% -1.44 | 0 | 0 | 486(0.0\%) | 43,240(1.8\%) | 53,546(2.3\%) | 0 | 0 | 0 | 0 | 0 | 52\% -1.44 |
| 56\% -1.34 | 0 | 0 | 408(0.0\%) | 37,455(1.6\%) | 55,384(2.3\%) | 0 | 0 | 0 | 0 | 0 | 56\% -1.34 |
| 60\% -1.23 | 0 | 0 | 438(0.0\%) | 36,981(1.6\%) | 59,107(2.5\%) | 0 | 0 | 0 | 0 | 0 | 60\% -1.23 |
| 64\% -1.11 | 0 | 0 | 425(0.0\%) | 36,552(1.5\%) | 61,291(2.6\%) | 0 | 0 | 0 | 0 | 0 | 64\% -1.11 |
| 68\% \$-. 99 | 0 | 0 | 324(0.0\%) | 32,398(1.4\%) | 57,863(2.4\%) | 0 | 0 | 0 | 0 | 0 | 68\% \$-. 99 |
| 72\% \$-. 85 | 0 | 0 | 311(0.0\%) | 33,576(1.4\%) | 62,548(2.6\%) | 0 | 0 | 0 | 0 | 0 | 72\% \$-. 85 |
| 76\% \$-.70 | 0 | 0 | 189(0.0\%) | 29,642(1.3\%) | 61,591(2.6\%) | 0 | 0 | 0 | 0 | 0 | 76\% \$-. 70 |
| 80\% \$-. 52 | 0 | 0 | 49(0.0\%) | 25,069(1.1\%) | 67,135(2.8\%) | 0 | 0 | 0 | 0 | 0 | 80\% \$-. 52 |
| 84\% \$-. 28 | 0 | 0 | 0 | 15,162(0.6\%) | 81,711(3.5\%) | 0 | 0 | 0 | 0 | 0 | 84\% \$-. 28 |
| 88\% \$-. 01 | 0 | 0 | 0 | 122(0.0\%) | 92,343(3.9\%) | 0 | 0 | 0 | 0 | 0 | 88\% \$-. 01 |
| 92\% \$0.24 | 0 | 0 | 0 | 0 | 7,158(0.3\%) | 87,239(3.7\%) | 0 | 0 | 0 | 0 | 92\% \$0.24 |
| 96\% \$0.84 | 0 | 0 | 0 | 0 | 0 | 94,073(4.0\%) | 19(0.0\%) | 0 | 0 | 0 | 96\% \$0.84 |
| 100\% \$8.45 | 0 | 0 | 0 | 0 | 0 | 94,299(4.0\%) | 19(0.0\%) | 0 | 0 | 0 | 100\% \$8.45 |
| TOTAL | 8402 | 19736 | 35694 | 1039164 | 983549 | 275611 | 38 | 0 | 0 | 0 | TOTAL |
|  | 0.4 \% | 0.8 \% | 1.5 \% | 44.0 \% | 41.6 \% | 11.7 \% | 0.0 \% | 0.0 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 8402 | 28138 | 63832 | 1102996 | 2086545 | 2362156 | 2362194 | 2362194 | 2362194 | 2362194 | CUMULATIVE |
|  | 0.4 \% | 1.2 \% | 2.7 \% | 46.7 \% | 88.3 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-357.3 | \$-73.7 | \$-18.2 | \$-2.3 | \$-1.3 | \$0.7 | \$1.3 | 0 | 0 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |


$0 \begin{array}{lll}0 & & \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0\end{array}$
 0
0
0
0
-1
-1

 $0 \begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0\end{aligned}$ | $\wedge$ | 0 |
| :--- | :--- |
| 0 | 0 |
| $N$ | 0 |
| $\infty$ | 0 |
| 0 | 0 |

|  | $\bigcirc$ | $\bigcirc$ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | $\bigcirc$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \hat{N} \\ & \underset{N}{2} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\bigcirc$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | 0 | - | - | - | 0 | - | $\bigcirc$ | 0 | - | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | - | 0 | - | $\bigcirc$ | 0 | 0 | - | $\bigcirc$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $N$ $N$ $\sim$ $\infty$ $\infty$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\bigcirc$ |


|  | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | - | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | - | $\bigcirc$ | - | - | $\bigcirc$ | $\begin{aligned} & \stackrel{\circ}{2} \\ & \stackrel{0}{\mathrm{O}} \\ & \hline \end{aligned}$ | $\checkmark$ | $\begin{aligned} & \text { oo } \\ & \text { O } \end{aligned}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \underset{\sim}{\infty} \\ & \infty \end{aligned}$ | $\begin{aligned} & \circ \\ & 0 \\ & 0 \\ & \hline- \end{aligned}$ | $\begin{aligned} & \bullet \\ & \dot{0} \\ & \theta \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\bigcirc$ | 0 | 0 | $\bigcirc$ | 0 | 0 | 0 | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | $\bigcirc$ | - | 0 | $\bigcirc$ | $\begin{aligned} & \text { oे } \\ & \stackrel{\text { cob }}{ } \end{aligned}$ | m | $\begin{aligned} & \text { oㅇ } \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \infty \\ & \underset{\sim}{N} \\ & \underset{\infty}{\infty} \end{aligned}$ | $\begin{aligned} & \circ \\ & 0 \\ & 0 \\ & \hline- \end{aligned}$ | $\begin{gathered} \text { y } \\ \dot{\theta} \end{gathered}$ |

 BELOW -20\%
 \$ MONTHLY \$ PCT DIFFERENCE


A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Cool Season: Winter 8 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5-2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \end{aligned}$ |
| 4\% -5.50 | 3,424(0.5\%) | 6,459(1.0\%) | 9,002(1.4\%) | 6,973(1.1\%) | 587(0.1\%) | 0 | 0 | 0 | 0 | 0 | 4\% -5.50 |
| 8\% -2.69 | 0 | 0 | 827(0.1\%) | 19,664(3.0\%) | 6,375(1.0\%) | 0 | 0 | 0 | 0 | 0 | 8\% -2.69 |
| 12\% -2.20 | 0 | 0 | 401(0.1\%) | 18,539(2.8\%) | 7,321(1.1\%) | 0 | 0 | 0 | 0 | 0 | 12\% -2.20 |
| 16\% -1.93 | 0 | 0 | 294(0.0\%) | 21,043(3.2\%) | 5,568(0.8\%) | 0 | 0 | 0 | 0 | 0 | 16\% -1.93 |
| 20\% -1.81 | 0 | 0 | 174(0.0\%) | 25,979(3.9\%) | 2,372(0.4\%) | 0 | 0 | 0 | 0 | 0 | 20\% -1.81 |
| 24\% -1.73 | 0 | 0 | 135(0.0\%) | 23,519(3.6\%) | 1,981(0.3\%) | 0 | 0 | 0 | 0 | 0 | 24\% -1.73 |
| 28\% -1.66 | 0 | 0 | 111(0.0\%) | 22,296(3.4\%) | 3,135(0.5\%) | 0 | 0 | 0 | 0 | 0 | 28\% -1.66 |
| 32\% -1.59 | 0 | 0 | 108(0.0\%) | 21,274(3.2\%) | 5,655(0.9\%) | 0 | 0 | 0 | 0 | 0 | 32\% -1.59 |
| 36\% -1.52 | 0 | 0 | 125(0.0\%) | 18,537(2.8\%) | 8,663(1.3\%) | 0 | 0 | 0 | 0 | 0 | 36\% -1.52 |
| 40\% -1.45 | 0 | 0 | 151(0.0\%) | 15,395(2.3\%) | 11,233(1.7\%) | 0 | 0 | 0 | 0 | 0 | 40\% -1.45 |
| 44\% -1.38 | 0 | 0 | 125(0.0\%) | 13,591(2.1\%) | 12,424(1.9\%) | 0 | 0 | 0 | 0 | 0 | 44\% -1.38 |
| 48\% -1.31 | 0 | 0 | 126(0.0\%) | 12,655(1.9\%) | 13,122(2.0\%) | 0 | 0 | 0 | 0 | 0 | 48\% -1.31 |
| 52\% -1.24 | 0 | 0 | 121(0.0\%) | 11,584(1.8\%) | 12,613(1.9\%) | 0 | 0 | 0 | 0 | 0 | 52\% -1.24 |
| 56\% -1.16 | 0 | 0 | 139(0.0\%) | 12,565(1.9\%) | 14,077(2.1\%) | 0 | 0 | 0 | 0 | 0 | 56\% -1.16 |
| 60\% -1.07 | 0 | 0 | 130(0.0\%) | 13,336(2.0\%) | 15,201(2.3\%) | 0 | 0 | 0 | 0 | 0 | 60\% -1.07 |
| 64\% \$-.99 | 0 | 0 | 99(0.0\%) | 11,111(1.7\%) | 12,687(1.9\%) | 0 | 0 | 0 | 0 | 0 | 64\% \$-. 99 |
| 68\% \$-. 89 | 0 | 0 | 120(0.0\%) | 12,844(1.9\%) | 15,067(2.3\%) | 0 | 0 | 0 | 0 | 0 | 68\% \$-. 89 |
| 72\% \$-.79 | 0 | 0 | 82(0.0\%) | 11,710(1.8\%) | 13,623(2.1\%) | 0 | 0 | 0 | 0 | 0 | 72\% \$-. 79 |
| 76\% \$-. 67 | 0 | 0 | 64(0.0\%) | 11,904(1.8\%) | 15,601(2.4\%) | 0 | 0 | 0 | 0 | 0 | 76\% \$-. 67 |
| 80\% \$-. 54 | 0 | 0 | 15(0.0\%) | 9,371(1.4\%) | 15,244(2.3\%) | 0 | 0 | 0 | 0 | 0 | 80\% \$-. 54 |
| 84\% \$-. 35 | 0 | 0 | 0 | 7,040(1.1\%) | 20,394(3.1\%) | 0 | 0 | 0 | 0 | 0 | 84\% \$-. 35 |
| 88\% \$-. 12 | 0 | 0 | 0 | 1,226(0.2\%) | 24,905(3.8\%) | 0 | 0 | 0 | 0 | 0 | 88\% \$-. 12 |
| 92\% \$0.00 | 0 | 0 | 0 | 0 | 14,023(2.1\%) | 11,979(1.8\%) | 0 | 0 | 0 | 0 | 92\% \$0.00 |
| 96\% \$0.46 | 0 | 0 | 0 | 0 | 0 | 26,096(4.0\%) | 0 | 0 | 0 | 0 | 96\% \$0.46 |
| 100\% \$4.59 | 0 | 0 | 0 | 0 | 0 | 26,182(4.0\%) | 7(0.0\%) | 0 | 0 | 0 | 100\% \$4.59 |
| TOTAL | 3424 | 6459 | 12349 | 322156 | 251871 | 64257 | 7 | 0 | 0 | 0 | TOTAL |
|  | 0.5 \% | 1.0 \% | 1.9 \% | 48.8 \% | 38.1 \% | 9.7 \% | 0.0 \% | 0.0 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 3424 | 9883 | 22232 | 344388 | 596259 | 660516 | 660523 | 660523 | 660523 | 660523 | CUMULATIVE |
|  | 0.5 \% | 1.5 \% | 3.4 \% | 52.1 \% | 90.3 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-336.7 | \$-57.7 | \$-14.2 | \$-1.7 | \$-1.1 | \$0.5 | \$1.9 | 0 | 0 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |



|  |  | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | － 0 | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\bigcirc$ | － |  |  |  |  |  |  |  | $\bigcirc$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | － | 0 | $\bigcirc$ | － | 0 | － | $\bigcirc$ | － | $\bigcirc$ | － | － | 。 |  |  |  |  |  |  | － | － |

 Climate：Cool Season：Winter 8 months

|  | － | － | 0 | O | － | 0 | － | 0 | $\bigcirc$ | 0 | － | － | － | － | 0 | － | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | 0 | 0 | 0 | 0 | $\bigcirc$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & -\underset{0}{0} \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $\bigcirc$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\bigcirc$ | 0 | 0 | 0 | － | 0 | － | 0 | $\bigcirc$ | $\bigcirc$ | 0 | － | － | － | 0 | － | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | 0 | － | $\bigcirc$ |  | $\stackrel{1}{8}$ | $\begin{aligned} & \text { O} \\ & \\ & 0 \end{aligned}$ | $\begin{aligned} & -1 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \end{aligned}$ | $\begin{aligned} & \text { ò } \\ & 0 \\ & 0 \\ & \text { O} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & \theta \end{aligned}$ |
|  | $\bigcirc$ | 0 | 0 | 0 | － | 0 | － | 0 | $\bigcirc$ | 0 | 0 | － | $\bigcirc$ | 0 | 0 | － | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | 0 | 0 | 0 | $\begin{aligned} & \stackrel{\rightharpoonup}{\mathrm{o}} \\ & \stackrel{y}{0} \\ & \stackrel{\mathrm{O}}{\mathrm{O}} \end{aligned}$ | M্লি | $\begin{aligned} & 0 \\ & \text { o } \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { t } \\ & \text { O } \\ & 0 \\ & 0 \\ & -1 \end{aligned}$ | $\begin{aligned} & \text { ơ } \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { r- } \\ & \dot{0} \\ & \dot{\theta} \end{aligned}$ |
|  | $\circ$ <br> 0 <br> 0 <br> 0 <br> - | $\begin{gathered} 0 \\ \stackrel{\rightharpoonup}{7} \\ \stackrel{0}{0} \\ -7 \end{gathered}$ | $\stackrel{\rightharpoonup}{2}$ $\stackrel{-}{-}$ $\stackrel{N}{N}$ N |  |  |  |  |  |  | $\begin{aligned} & \text { O} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \infty \end{aligned}$ | 응 |  | $\begin{aligned} & 0 \\ & 0 . \\ & 0 \\ & 9 \\ & \hline 7 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  | 응 |  |  | 응 | $\begin{aligned} & \text { O} \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  | 응 | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & \text { O} \\ & \text { - } \end{aligned}$ |  | $\stackrel{\circ}{\sim}$ | $\begin{aligned} & \circ \\ & \text { o } \\ & \underset{i}{2} \end{aligned}$ | $$ | $\begin{aligned} & \circ \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\dot{N}} \\ & \underset{\sim}{2} \end{aligned}$ |
|  | $\begin{aligned} & \stackrel{O}{\circ} \\ & 0 \\ & \underset{\sim}{\mathrm{j}} \\ & \stackrel{N}{N} \\ & \stackrel{N}{0} \end{aligned}$ |  | $\begin{aligned} & \stackrel{\varrho}{0} \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \\ & \underset{N}{2} \end{aligned}$ |  |  | 응 | $\begin{aligned} & \stackrel{O}{O} \\ & 0 \\ & \underset{\sim}{U} \\ & \underset{\sim}{J} \\ & \underset{N}{2} \end{aligned}$ |  |  |  |  |  |  |  | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \text { N} \\ & \underset{N}{0} \\ & \stackrel{N}{N} \\ & \hline \end{aligned}$ |  |  | $\begin{aligned} & \text { O} \\ & 0 \\ & \underset{U}{\dot{U}} \\ & \text { N } \\ & \underset{N}{2} \end{aligned}$ |  |  |  | $\begin{aligned} & \stackrel{O}{\circ} \\ & 0 \\ & \stackrel{y}{c} \\ & \stackrel{n}{n} \\ & \underset{\sim}{n} \end{aligned}$ |  |  |  | $\begin{aligned} & \infty \\ & \underset{\sim}{\infty} \\ & \underset{\sim}{\infty} \end{aligned}$ | $\begin{aligned} & 0 \\ & \underset{\sim}{1} \\ & \stackrel{\rightharpoonup}{0} \end{aligned}$ | $\begin{aligned} & \infty \\ & \underset{\sim}{\wedge} \\ & \underset{\sim}{\infty} \\ & \hline \end{aligned}$ | $\begin{aligned} & o \\ & \infty \\ & \infty \\ & \infty \\ & \hline \end{aligned}$ | $\begin{aligned} & \underset{\sim}{-} \\ & \underset{\sim}{n} \end{aligned}$ |
|  | $\begin{aligned} & \stackrel{O}{0} \\ & \underset{\sim}{3} \\ & \underset{1}{3} \\ & 0 \\ & \vdots \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\circ$ <br> 0 <br> 0 <br> $\stackrel{0}{0}$ | $\begin{aligned} & \stackrel{\varrho}{2} \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \stackrel{\circ}{\circ} \\ & 0 \\ & \stackrel{\rightharpoonup}{\gamma} \end{aligned}$ | － |  | $\begin{aligned} & \stackrel{\circ}{\circ} \\ & \stackrel{0}{\circ} \\ & \stackrel{\rightharpoonup}{0} \end{aligned}$ | $\begin{gathered} \stackrel{\circ}{\circ} \\ \stackrel{\rightharpoonup}{0} \\ \text { O} \end{gathered}$ | 0 | － | 0 | － | － | 0 | － | － | 0 |  | － | $\begin{aligned} & \stackrel{\varrho}{2} \\ & 0 \\ & 0 \\ & \hline-1 \end{aligned}$ | － | － | － | － | $\begin{aligned} & 0 \\ & \underset{A}{2} \end{aligned}$ | $\begin{aligned} & 0 \\ & \underset{i}{\prime} \\ & i \end{aligned}$ | $\begin{gathered} \underset{\sim}{N} \end{gathered}$ | $\begin{gathered} 0 \\ \text { or } \\ \end{gathered}$ | $\begin{aligned} & m \\ & \infty \\ & \underset{\sim}{1} \\ & \dot{\theta} \end{aligned}$ |

A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Moderate Season: Winter 8 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ <br> PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{aligned} & -20--10 \% \\ & \text { DECREASE } \end{aligned}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \end{aligned}$ |
| 4\% -4.94 | 3,191(0.3\%) | 7,940(0.8\%) | 9,622(1.0\%) | 14,442(1.5\%) | 4,132(0.4\%) | 0 | 0 | 0 | 0 | 0 | 4\% -4.94 |
| 8\% $\quad-2.91$ | 0 | 0 | 475(0.0\%) | 29,373(3.0\%) | 9,551(1.0\%) | 0 | 0 | 0 | 0 | 0 | 8\% -2.91 |
| 12\% -2.50 | 0 | 0 | 429(0.0\%) | 32,801(3.3\%) | 6,845(0.7\%) | 0 | 0 | 0 | 0 | 0 | 12\% -2.50 |
| 16\% -2.35 | 0 | 0 | 213(0.0\%) | 35,551(3.6\%) | 2,978(0.3\%) | 0 | 0 | 0 | 0 | 0 | 16\% -2.35 |
| 20\% -2.24 | 0 | 0 | 179(0.0\%) | 37,953(3.9\%) | 2,717(0.3\%) | 0 | 0 | 0 | 0 | 0 | 20\% -2.24 |
| 24\% $\quad-2.15$ | 0 | 0 | 158(0.0\%) | 35,520(3.6\%) | 4,332(0.4\%) | 0 | 0 | 0 | 0 | 0 | 24\% -2.15 |
| 28\% -2.07 | 0 | 0 | 160(0.0\%) | 30,727(3.1\%) | 7,025(0.7\%) | 0 | 0 | 0 | 0 | 0 | 28\% -2.07 |
| 32\% -1.99 | 0 | 0 | 148(0.0\%) | 27,915(2.8\%) | 11,186(1.1\%) | 0 | 0 | 0 | 0 | 0 | 32\% -1.99 |
| 36\% -1.91 | 0 | 0 | 163(0.0\%) | 23,625(2.4\%) | 15,357(1.6\%) | 0 | 0 | 0 | 0 | 0 | 36\% -1.91 |
| 40\% -1.82 | 0 | 0 | 175(0.0\%) | 21,922(2.2\%) | 20,566(2.1\%) | 0 | 0 | 0 | 0 | 0 | 40\% -1.82 |
| $44 \%$ -1.74 | 0 | 0 | 143(0.0\%) | 16,458(1.7\%) | 19,758(2.0\%) | 0 | 0 | 0 | 0 | 0 | 44\% -1.74 |
| 48\% -1.65 | 0 | 0 | 171(0.0\%) | 16,532(1.7\%) | 22,869(2.3\%) | 0 | 0 | 0 | 0 | 0 | 48\% -1.65 |
| 52\% -1.55 | 0 | 0 | 164(0.0\%) | 16,040(1.6\%) | 24,850(2.5\%) | 0 | 0 | 0 | 0 | 0 | 52\% -1.55 |
| 56\% -1.45 | 0 | 0 | 188(0.0\%) | 14,346(1.5\%) | 24,033(2.4\%) | 0 | 0 | 0 | 0 | 0 | 56\% -1.45 |
| 60\% -1.34 | 0 | 0 | 182(0.0\%) | 14,002(1.4\%) | 25,462(2.6\%) | 0 | 0 | 0 | 0 | 0 | 60\% -1.34 |
| 64\% -1.22 | 0 | 0 | 181(0.0\%) | 13,470(1.4\%) | 25,870(2.6\%) | 0 | 0 | 0 | 0 | 0 | 64\% -1.22 |
| 68\% $\quad-1.10$ | 0 | 0 | 157(0.0\%) | 11,808(1.2\%) | 24,530(2.5\%) | 0 | 0 | 0 | 0 | 0 | 68\% -1.10 |
| 72\% \$-. 95 | 0 | 0 | 123(0.0\%) | 12,176(1.2\%) | 28,367(2.9\%) | 0 | 0 | 0 | 0 | 0 | 72\% \$-. 95 |
| 76\% \$-. 79 | 0 | 0 | 107(0.0\%) | 10,601(1.1\%) | 27,856(2.8\%) | 0 | 0 | 0 | 0 | 0 | 76\% \$-. 79 |
| 80\% \$-. 60 | 0 | 0 | 36(0.0\%) | 9,144(0.9\%) | 29,755(3.0\%) | 0 | 0 | 0 | 0 | 0 | 80\% \$-. 60 |
| 84\% \$-. 36 | 0 | 0 | 0 | 5,976(0.6\%) | 33,355(3.4\%) | 0 | 0 | 0 | 0 | 0 | 84\% \$-. 36 |
| 88\% \$-. 07 | 0 | 0 | 0 | 915(0.1\%) | 38,410(3.9\%) | 0 | 0 | 0 | 0 | 0 | 88\% \$-. 07 |
| 92\% \$0.24 | 0 | 0 | 0 | 0 | 8,995(0.9\%) | 30,225(3.1\%) | 0 | 0 | 0 | 0 | 92\% \$0.24 |
| 96\% \$0.86 | 0 | 0 | 0 | 0 | 0 | 39,498(4.0\%) | 3(0.0\%) | 0 | 0 | 0 | 96\% \$0.86 |
| 100\% \$6.54 | 0 | 0 | 0 | 0 | 0 | 38,947(4.0\%) | 3(0.0\%) | 0 | 0 | 0 | 100\% \$6.54 |
| TOTAL | 3191 | 7940 | 13174 | 431297 | 418799 | 108670 | 6 | 0 | 0 | 0 | TOTAL |
|  | 0.3 \% | 0.8 \% | 1.3 \% | 43.9 \% | 42.6 \% | 11.1 \% | 0.0 \% | 0.0 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 3191 | 11131 | 24305 | 455602 | 874401 | 983071 | 983077 | 983077 | 983077 | 983077 | CUMULATIVE |
|  | 0.3 \% | 1.1 \% | 2.5 \% | 46.3 \% | 88.9 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-372.7 | \$-79.8 | \$-19.6 | \$-2.2 | \$-1.3 | \$0.8 | \$1.6 | 0 | 0 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |



|  |  |  |  | - |  | - | $\bigcirc$ | $\bigcirc$ |  |  |  | - |  |  |  |  |  |  | $\begin{aligned} & \circ \\ & 0 \\ & 0 \end{aligned}$ |  | $\begin{aligned} & \circ \\ & 00 \\ & 0 . \\ & 0 \end{aligned}$ | $\bigcirc$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\bigcirc$ | $\bigcirc$ | - | $\bigcirc$ | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | - |  |  | $\stackrel{\circ}{\circ}$ |  | - | $\bigcirc$ |

RATE DATA ANALYSIS BILL IMPACT SUMMARY
CURRENT: 2018 E1 rates
PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16
Climate: Moderate Season: Winter 8 months

| 势岂 |  |  |  |  |  | - | - |  |  | - | $\bigcirc$ |  |  | - |  |  | - |  |  | - |  | $\because$ |  | $\begin{aligned} & \circ \\ & \circ \\ & \vdots \\ & \vdots \\ & \hline 1 \end{aligned}$ | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | - 0 | $\bigcirc$ | - | - | - | - | $\bigcirc$ | - | - | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 |  | 0 | - |  |  | - |  | - |  |  | \% |


| RATE SCHEDULE | COUNT | $\begin{aligned} & \text { SUM OF } \\ & \text { TOU KWH } \end{aligned}$ | TOTAL ANNUAL CURRENT BILLS | CURRENT avg rate | TOTAL ANNUAL PROPOSED BILLS | PROPOSED AVG RATE | DIFFERENCE (PROPOSEDCURRENT | (PROPOSEDCURRENT) ICURRENT | MAX <br> DIFFERENCE | MIN DIFFERENCE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E1 | 718,594 | 3,305,946,401 | \$761,514,826 | \$0.23035 | \$741,243,341 | \$0.22422 | \$-20,271,484 | ( 2.66\%) | \$67 | \$-23,851 |
| E1L | 475,317 | 1,947,393,026 | \$274,619,258 | \$0.14102 | \$256,793,964 | \$0.13187 | \$-17,825,293 | ( 6.49\%) | \$5 | \$-7,808 |
| TOTAL | 1,193,911 | 5,253,339,427 | \$1,036,134,083 | \$0.19723 | \$998,037,306 | \$0.18998 | \$-38,096,778 | ( 3.68\%) | \$72 | \$-31,660 |

A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Hot Season: Winter 8 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | -5--2.5\% <br> DECREASE | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{aligned} & \text { \$ MONTHLY \$ } \\ & \text { PERCENT } \\ & \text { DIFFERENCE } \end{aligned}$ |
| 4\% $\quad-6.67$ | 1,787(0.2\%) | 5,337(0.7\%) | 7,636(1.1\%) | 12,257(1.7\%) | 1,730(0.2\%) | 0 | 0 | 0 | 0 | 0 | 4\% -6.67 |
| 8\% $\quad-5.13$ | 0 | 0 | 165(0.0\%) | 24,127(3.4\%) | 4,720(0.7\%) | 0 | 0 | 0 | 0 | 0 | 8\% -5.13 |
| 12\% -4.13 | 0 | 0 | 195(0.0\%) | 18,421(2.6\%) | 9,994(1.4\%) | 0 | 0 | 0 | 0 | 0 | 12\% -4.13 |
| 16\% -3.06 | 0 | 0 | 409(0.1\%) | 16,820(2.3\%) | 11,378(1.6\%) | 0 | 0 | 0 | 0 | 0 | 16\% -3.06 |
| 20\% -2.65 | 0 | 0 | 257(0.0\%) | 25,300(3.5\%) | 4,002(0.6\%) | 0 | 0 | 0 | 0 | 0 | 20\% -2.65 |
| 24\% -2.48 | 0 | 0 | 150(0.0\%) | 25,481(3.5\%) | 2,336(0.3\%) | 0 | 0 | 0 | 0 | 0 | 24\% -2.48 |
| 28\% -2.34 | 0 | 0 | 123(0.0\%) | 24,591(3.4\%) | 4,120(0.6\%) | 0 | 0 | 0 | 0 | 0 | 28\% -2.34 |
| 32\% -2.21 | 0 | 0 | 106(0.0\%) | 21,514(3.0\%) | 7,950(1.1\%) | 0 | 0 | 0 | 0 | 0 | 32\% -2.21 |
| 36\% -2.09 | 0 | 0 | 108(0.0\%) | 16,568(2.3\%) | 11,191(1.6\%) | 0 | 0 | 0 | 0 | 0 | 36\% -2.09 |
| 40\% -1.96 | 0 | 0 | 131(0.0\%) | 15,230(2.1\%) | 15,230(2.1\%) | 0 | 0 | 0 | 0 | 0 | 40\% -1.96 |
| 44\% -1.84 | 0 | 0 | 121(0.0\%) | 11,748(1.6\%) | 15,609(2.2\%) | 0 | 0 | 0 | 0 | 0 | 44\% -1.84 |
| 48\% -1.71 | 0 | 0 | 123(0.0\%) | 11,192(1.6\%) | 17,908(2.5\%) | 0 | 0 | 0 | 0 | 0 | 48\% -1.71 |
| 52\% -1.58 | 0 | 0 | 127(0.0\%) | 9,613(1.3\%) | 18,562(2.6\%) | 0 | 0 | 0 | 0 | 0 | 52\% -1.58 |
| 56\% -1.44 | 0 | 0 | 148(0.0\%) | 9,507(1.3\%) | 19,551(2.7\%) | 0 | 0 | 0 | 0 | 0 | 56\% -1.44 |
| 60\% -1.30 | 0 | 0 | 99(0.0\%) | 8,315(1.2\%) | 19,568(2.7\%) | 0 | 0 | 0 | 0 | 0 | 60\% -1.30 |
| 64\% -1.15 | 0 | 0 | 97(0.0\%) | 7,868(1.1\%) | 20,538(2.9\%) | 0 | 0 | 0 | 0 | 0 | 64\% -1.15 |
| 68\% \$-.98 | 0 | 0 | 85(0.0\%) | 7,833(1.1\%) | 21,760(3.0\%) | 0 | 0 | 0 | 0 | 0 | 68\% \$-. 98 |
| 72\% \$-. 80 | 0 | 0 | 69(0.0\%) | 7,187(1.0\%) | 21,549(3.0\%) | 0 | 0 | 0 | 0 | 0 | 72\% \$-. 80 |
| 76\% \$-. 60 | 0 | 0 | 22(0.0\%) | 6,429(0.9\%) | 21,822(3.0\%) | 0 | 0 | 0 | 0 | 0 | 76\% \$-. 60 |
| 80\% \$-. 36 | 0 | 0 | 0 | 4,929(0.7\%) | 24,255(3.4\%) | 0 | 0 | 0 | 0 | 0 | 80\% \$-. 36 |
| 84\% \$-. 10 | 0 | 0 | 0 | 781(0.1\%) | 27,254(3.8\%) | 0 | 0 | 0 | 0 | 0 | 84\% \$-. 10 |
| 88\% \$0.05 | 0 | 0 | 0 | 0 | 11,852(1.6\%) | 16,623(2.3\%) | 0 | 0 | 0 | 0 | 88\% \$0.05 |
| 92\% \$0.50 | 0 | 0 | 0 | 0 | 0 | 28,718(4.0\%) | 5(0.0\%) | 0 | 0 | 0 | 92\% \$0.50 |
| 96\% \$1.18 | 0 | 0 | 0 | 0 | 0 | 28,769(4.0\%) | 13(0.0\%) | 0 | 0 | 0 | 96\% \$1.18 |
| 100\% \$8.45 | 0 | 0 | 0 | 0 | 0 | 28,574(4.0\%) | 7(0.0\%) | 0 | 0 | 0 | 100\% \$8.45 |
| TOTAL | 1787 | 5337 | 10171 | 285711 | 312879 | 102684 | 25 | 0 | 0 | 0 | TOTAL |
|  | 0.2 \% | 0.7 \% | 1.4 \% | 39.8 \% | 43.5 \% | 14.3 \% | 0.0 \% | 0.0 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 1787 | 7124 | 17295 | 303006 | 615885 | 718569 | 718594 | 718594 | 718594 | 718594 | CUMULATIVE |
|  | 0.2 \% | 1.0 \% | 2.4 \% | 42.2 \% | 85.7 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-369.4 | \$-83.9 | \$-21.1 | \$-2.9 | \$-1.5 | \$0.9 | \$1.1 | 0 | 0 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |


$\stackrel{\rightharpoonup}{\overleftrightarrow{~}}$


 RATE DATA ANALYSIS BILL IMPACT SUMMARY
CURRENT: 2018 E1 rates
PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Hot Season: Winter 8 months





|  |  | - | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ | $\bigcirc$ | 0 | - | - |  | 0 | 0 | - | - | $\bigcirc$ | - |  | $\stackrel{\text { § }}{\sim}$ | $\begin{gathered} \circ \\ \\ \end{gathered}$ | $\begin{aligned} & \underset{M}{N} \\ & \stackrel{N}{\alpha} \end{aligned}$ |  | O |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\bigcirc$ | - | - | 0 | $\bigcirc$ | - | - | - | - | - | $\bigcirc$ | $\circ$ | O |  | 0 |  | - | $\circ$ <br> 0 <br> 0 <br> 1 |  |  | O | $\begin{aligned} & \text { ò } \\ & \text { ó } \\ & \text { d } \end{aligned}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \stackrel{1}{0} \\ & \underset{\sim}{6} \end{aligned}$ | $\stackrel{\circ}{\circ}$ | $$ | $\begin{aligned} & \tilde{N} \\ & \stackrel{y}{4} \\ & \underset{\sim}{2} \end{aligned}$ |  | O |
|  | $\begin{aligned} & \stackrel{O}{0} \\ & \stackrel{0}{0} \\ & 0.0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \stackrel{\rightharpoonup}{0} \\ & \stackrel{\rightharpoonup}{4} \end{aligned}$ |  |  |  |  | $\begin{aligned} & \stackrel{0}{\partial} \\ & \stackrel{0}{0} \\ & \stackrel{\rightharpoonup}{7} \\ & \underset{N}{2} \end{aligned}$ | $\stackrel{\circ}{0}$ $\stackrel{1}{0}$ $\stackrel{N}{N}$ $\underset{N}{0}$ | $\begin{aligned} & \stackrel{\circ}{0} \\ & \stackrel{0}{0} \\ & \stackrel{\sim}{0} \\ & \stackrel{N}{N} \end{aligned}$ | $\begin{gathered} \stackrel{\circ}{\circ} \\ \stackrel{0}{0} \\ \text { M} \\ \text { N } \end{gathered}$ |  |  |  |  | $\dot{e}$ |  |  |  | $\stackrel{\stackrel{\rightharpoonup}{9}}{\substack{\circ}}$ |  |  |  |  | $\begin{aligned} & \stackrel{O}{O} \\ & \stackrel{\rightharpoonup}{0} \\ & \stackrel{\rightharpoonup}{0} \\ & \stackrel{N}{0} \\ & \stackrel{N}{2} \end{aligned}$ | $\stackrel{A}{7}$ | $\begin{aligned} & \circ \\ & \stackrel{\circ}{\circ} \\ & \stackrel{y}{2} \end{aligned}$ | $\begin{gathered} \underset{\sim}{\circ} \\ \stackrel{\sim}{\sim} \\ \underset{\sim}{2} \end{gathered}$ |  | O |
|  |  |  |  |  | $\begin{gathered} \stackrel{O}{0} \\ \stackrel{0}{0} \\ \underset{\sim}{0} \\ \underset{\sim}{n} \end{gathered}$ |  |  | $\overparen{\circ}$ $\stackrel{0}{3}$ $\stackrel{y}{3}$ $\stackrel{7}{7}$ | $\begin{aligned} & \stackrel{0}{0} \\ & \stackrel{0}{0} \\ & \stackrel{0}{0} \\ & \stackrel{0}{0} \end{aligned}$ |  |  |  |  |  |  |  |  | - | $\stackrel{̊}{\grave{a}}$ |  |  |  |  |  | へion | $\begin{aligned} & \circ \\ & \infty \\ & \dot{\infty} \\ & \dot{\infty} \end{aligned}$ | $\begin{gathered} N \\ \underset{N}{N} \\ \hline \end{gathered}$ |  | $\stackrel{\bigcirc}{+}$ |



[^24]A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Not Hot Season: Winter 8 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ <br> PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} 0-2.5 \% \\ \text { INCREASE } \end{gathered}$ | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | \$ MONTHLY \$ PCT DIFFERENCE |
| 4\% -5.08 | 6,615(0.4\%) | 14,399(0.9\%) | 18,688(1.1\%) | 21,346(1.3\%) | 4,742(0.3\%) | 0 | 0 | 0 | 0 | 0 | 4\% -5.08 |
| 8\% $\quad-2.82$ | 0 | 0 | 1,193(0.1\%) | 48,187(2.9\%) | 16,348(1.0\%) | 0 | 0 | 0 | 0 | 0 | 8\% -2.82 |
| 12\% -2.44 | 0 | 0 | 758(0.0\%) | 55,288(3.4\%) | 10,514(0.6\%) | 0 | 0 | 0 | 0 | 0 | 12\% -2.44 |
| 16\% -2.26 | 0 | 0 | 429(0.0\%) | 60,973(3.7\%) | 7,113(0.4\%) | 0 | 0 | 0 | 0 | 0 | 16\% -2.26 |
| 20\% -2.13 | 0 | 0 | 335(0.0\%) | 55,814(3.4\%) | 8,962(0.5\%) | 0 | 0 | 0 | 0 | 0 | 20\% -2.13 |
| 24\% -2.01 | 0 | 0 | 362(0.0\%) | 52,205(3.2\%) | 16,000(1.0\%) | 0 | 0 | 0 | 0 | 0 | 24\% -2.01 |
| 28\% -1.91 | 0 | 0 | 333(0.0\%) | 43,643(2.7\%) | 20,686(1.3\%) | 0 | 0 | 0 | 0 | 0 | 28\% -1.91 |
| 32\% -1.82 | 0 | 0 | 307(0.0\%) | 41,875(2.5\%) | 22,326(1.4\%) | 0 | 0 | 0 | 0 | 0 | 32\% -1.82 |
| 36\% -1.73 | 0 | 0 | 314(0.0\%) | 44,596(2.7\%) | 24,479(1.5\%) | 0 | 0 | 0 | 0 | 0 | 36\% -1.73 |
| 40\% -1.65 | 0 | 0 | 272(0.0\%) | 40,071(2.4\%) | 24,114(1.5\%) | 0 | 0 | 0 | 0 | 0 | 40\% -1.65 |
| 44\% -1.57 | 0 | 0 | 262(0.0\%) | 36,680(2.2\%) | 27,092(1.6\%) | 0 | 0 | 0 | 0 | 0 | 44\% -1.57 |
| 48\% -1.49 | 0 | 0 | 300(0.0\%) | 31,727(1.9\%) | 30,549(1.9\%) | 0 | 0 | 0 | 0 | 0 | 48\% -1.49 |
| 52\% -1.40 | 0 | 0 | 335(0.0\%) | 30,381(1.8\%) | 36,763(2.2\%) | 0 | 0 | 0 | 0 | 0 | 52\% -1.40 |
| 56\% -1.31 | 0 | 0 | 305(0.0\%) | 27,524(1.7\%) | 37,149(2.3\%) | 0 | 0 | 0 | 0 | 0 | 56\% -1.31 |
| 60\% -1.21 | 0 | 0 | 329(0.0\%) | 27,202(1.7\%) | 39,065(2.4\%) | 0 | 0 | 0 | 0 | 0 | 60\% -1.21 |
| 64\% -1.11 | 0 | 0 | 284(0.0\%) | 25,152(1.5\%) | 37,684(2.3\%) | 0 | 0 | 0 | 0 | 0 | 64\% -1.11 |
| 68\% \$-.99 | 0 | 0 | 264(0.0\%) | 26,970(1.6\%) | 42,498(2.6\%) | 0 | 0 | 0 | 0 | 0 | 68\% \$-. 99 |
| $72 \%$ \$-. 87 | 0 | 0 | 236(0.0\%) | 24,087(1.5\%) | 39,531(2.4\%) | 0 | 0 | 0 | 0 | 0 | $72 \%$ \$-. 87 |
| 76\% \$-.73 | 0 | 0 | 161(0.0\%) | 23,699(1.4\%) | 42,160(2.6\%) | 0 | 0 | 0 | 0 | 0 | 76\% \$-. 73 |
| 80\% \$-.57 | 0 | 0 | 56(0.0\%) | 20,083(1.2\%) | 43,737(2.7\%) | 0 | 0 | 0 | 0 | 0 | 80\% \$-. 57 |
| 84\% \$-. 36 | 0 | 0 | 0 | 13,538(0.8\%) | 51,757(3.1\%) | 0 | 0 | 0 | 0 | 0 | 84\% \$-. 36 |
| 88\% \$-. 09 | 0 | 0 | 0 | 2,412(0.1\%) | 64,835(3.9\%) | 0 | 0 | 0 | 0 | 0 | 88\% \$-. 09 |
| 92\% \$0.13 | 0 | 0 | 0 | 0 | 22,566(1.4\%) | 41,607(2.5\%) | 0 | 0 | 0 | 0 | 92\% \$0.13 |
| 96\% \$0.69 | 0 | 0 | 0 | 0 | 0 | 65,943(4.0\%) | 2(0.0\%) | 0 | 0 | 0 | 96\% \$0.69 |
| 100\% \$6.54 | 0 | 0 | 0 | 0 | 0 | 65,377(4.0\%) | 11(0.0\%) | 0 | 0 | 0 | 100\% \$6.54 |
| TOTAL | 6615 | 14399 | 25523 | 753453 | 670670 | 172927 | 13 | 0 | 0 | 0 | TOTAL |
|  | 0.4 \% | 0.9 \% | 1.6 \% | 45.8 \% | 40.8 \% | 10.5 \% | 0.0 \% | 0.0 \% | 0.0 \% | 0.0 \% |  |
| CUMULATIVE | 6615 | 21014 | 46537 | 799990 | 1470660 | 1643587 | 1643600 | 1643600 | 1643600 | 1643600 | CUMULATIVE |
|  | 0.4 \% | 1.3 \% | 2.8 \% | 48.7 \% | 89.5 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-354.0 | \$-69.9 | \$-17.0 | \$-2.0 | \$-1.2 | \$0.7 | \$1.7 | 0 | 0 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |




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| 0 |
| $\vdots$ |
| 0 | 0


A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: All Climates Season: Summer 4 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ <br> PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{aligned} & -20--10 \% \\ & \text { DECREASE } \end{aligned}$ | $-10-5 \%$ <br> DECREASE | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} 0-2.5 \% \\ \text { INCREASE } \end{gathered}$ | $\begin{gathered} 2.5-5 \% \\ \text { INCREASE } \end{gathered}$ | 5-10\% <br> INCREASE | $\begin{gathered} \text { 10-20\% } \\ \text { INCREASE } \end{gathered}$ | ABOVE 20\% INCREASE | $\begin{gathered} \text { \$ MONTHLY \$ } \\ \text { PCT } \\ \text { DIFFERENCE } \end{gathered}$ |
| 4\% \$0.12 | 3,940(0.2\%) | 12,175(0.5\%) | 11,762(0.5\%) | 7,839(0.3\%) | 17,692(0.7\%) | 41,323(1.7\%) | 0 | 0 | 0 | 0 | 4\% \$0.12 |
| 8\% \$1.08 | 0 | 0 | 0 | 0 | 0 | 9,118(0.4\%) | 42,966(1.8\%) | 43,847(1.9\%) | 2(0.0\%) | 0 | 8\% \$1.08 |
| 12\% \$1.54 | 0 | 0 | 0 | 0 | 0 | 860(0.0\%) | 22,327(0.9\%) | 69,581(2.9\%) | 90(0.0\%) | 0 | 12\% \$1.54 |
| 16\% \$1.97 | 0 | 0 | 0 | 0 | 0 | 753(0.0\%) | 16,149(0.7\%) | 79,553(3.4\%) | 152(0.0\%) | 0 | 16\% \$1.97 |
| 20\% \$2.39 | 0 | 0 | 0 | 0 | 0 | 606(0.0\%) | 9,850(0.4\%) | 82,697(3.5\%) | 199(0.0\%) | 0 | 20\% \$2.39 |
| 24\% \$2.85 | 0 | 0 | 0 | 0 | 0 | 603(0.0\%) | 6,743(0.3\%) | 86,379(3.7\%) | 233(0.0\%) | 0 | 24\% \$2.85 |
| 28\% \$3.36 | 0 | 0 | 0 | 0 | 0 | 671(0.0\%) | 4,143(0.2\%) | 90,534(3.8\%) | 369(0.0\%) | 1(0.0\%) | 28\% \$3.36 |
| 32\% \$3.91 | 0 | 0 | 0 | 0 | 0 | 745(0.0\%) | 2,963(0.1\%) | 88,922(3.8\%) | 569(0.0\%) | 0 | 32\% \$3.91 |
| 36\% \$4.54 | 0 | 0 | 0 | 0 | 0 | 882(0.0\%) | 2,586(0.1\%) | 90,722(3.8\%) | 749(0.0\%) | 0 | 36\% \$4.54 |
| 40\% \$5.22 | 0 | 0 | 0 | 0 | 0 | 953(0.0\%) | 2,006(0.1\%) | 89,813(3.8\%) | 1,108(0.0\%) | 0 | 40\% \$5.22 |
| 44\% \$5.96 | 0 | 0 | 0 | 0 | 0 | 953(0.0\%) | 1,406(0.1\%) | 91,014(3.9\%) | 1,523(0.1\%) | 0 | 44\% \$5.96 |
| 48\% \$6.76 | 0 | 0 | 0 | 0 | 0 | 791(0.0\%) | 1,176(0.0\%) | 90,026(3.8\%) | 2,135(0.1\%) | 0 | 48\% \$6.76 |
| 52\% \$7.64 | 0 | 0 | 0 | 0 | 0 | 814(0.0\%) | 983(0.0\%) | 89,929(3.8\%) | 3,295(0.1\%) | 0 | 52\% \$7.64 |
| 56\% \$8.60 | 0 | 0 | 0 | 0 | 0 | 834(0.0\%) | 996(0.0\%) | 87,448(3.7\%) | 4,932(0.2\%) | 1(0.0\%) | 56\% \$8.60 |
| 60\% \$9.67 | 0 | 0 | 0 | 0 | 0 | 614(0.0\%) | 1,341(0.1\%) | 84,700(3.6\%) | 7,345(0.3\%) | 0 | 60\% \$9.67 |
| 64\% \$10.87 | 0 | 0 | 0 | 0 | 0 | 325(0.0\%) | 1,865(0.1\%) | 81,747(3.5\%) | 10,857(0.5\%) | 0 | 64\% \$10.87 |
| 68\% \$12.21 | 0 | 0 | 0 | 0 | 0 | 339(0.0\%) | 1,444(0.1\%) | 76,785(3.3\%) | 15,568(0.7\%) | 0 | 68\% \$12.21 |
| 72\% \$13.73 | 0 | 0 | 0 | 0 | 0 | 338(0.0\%) | 1,570(0.1\%) | 71,183(3.0\%) | 21,436(0.9\%) | 0 | 72\% \$13.73 |
| 76\% \$15.48 | 0 | 0 | 0 | 0 | 0 | 210(0.0\%) | 2,016(0.1\%) | 64,029(2.7\%) | 28,411(1.2\%) | 2(0.0\%) | 76\% \$15.48 |
| 80\% \$17.55 | 0 | 0 | 0 | 0 | 0 | 88(0.0\%) | 1,659(0.1\%) | 56,347(2.4\%) | 36,113(1.5\%) | 0 | 80\% \$17.55 |
| 84\% \$20.09 | 0 | 0 | 0 | 0 | 0 | 23(0.0\%) | 960(0.0\%) | 47,911(2.0\%) | 45,890(1.9\%) | 1(0.0\%) | 84\% \$20.09 |
| 88\% \$23.11 | 0 | 0 | 0 | 0 | 0 | 2(0.0\%) | 1,051(0.0\%) | 41,037(1.7\%) | 52,298(2.2\%) | 0 | 88\% \$23.11 |
| 92\% \$26.92 | 0 | 0 | 0 | 0 | 0 | 0 | 956(0.0\%) | 34,518(1.5\%) | 58,940(2.5\%) | 0 | 92\% \$26.92 |
| 96\% \$33.46 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 508(0.0\%) | 26,093(1.1\%) | 67,810(2.9\%) | 0 | 96\% \$33.46 |
| 100\% 134.49 | 0 | 0 | 0 | 0 | 0 | 0 | 14(0.0\%) | 24,662(1.0\%) | 69,756(3.0\%) | 0 | 100\% 134.49 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| TOTAL | 3940 | 12175 | 11762 | 7839 | 17692 | 61846 | 127678 | 1689477 | 429780 | 5 | TOTAL |
|  | 0.2 \% | 0.5 \% | 0.5 \% | 0.3 \% | 0.7 \% | 2.6 \% | 5.4 \% | 71.5 \% | 18.2 \% | 0.0 \% |  |
| CUMULATIVE | 3940 | 16115 | 27877 | 35716 | 53408 | 115254 | 242932 | 1932409 | 2362189 | 2362194 | CUMULATIVE |
|  | 0.2 \% | 0.7 \% | 1.2 \% | 1.5 \% | 2.3 \% | 4.9 \% | 10.3 \% | 81.8 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-469.1 | \$-120.4 | \$-41.6 | \$-18.0 | \$-2.9 | \$1.1 | \$3.2 | \$8.4 | \$23.5 | \$12.0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |


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| :--- |
| $\underset{\sim}{*}$ |


A Percentage difference which falls on a column boundary is included in the higher column
A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY <br> CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 <br> Climate: Cool Season: Summer 4 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} 0-2.5 \% \\ \text { INCREASE } \end{gathered}$ | $2.5-5 \%$ <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{gathered} \text { \$ MONTHLY \$ } \\ \text { PCT } \\ \text { DIFFERENCE } \end{gathered}$ |
| 4\% \$0.00 | 1,992(0.3\%) | 3,677(0.6\%) | 3,126(0.5\%) | 2,036(0.3\%) | 5,684(0.9\%) | 13,829(2.1\%) | 0 | 0 | 0 | 0 | 4\% \$0.00 |
| 8\% \$0.76 | 0 | 0 | 0 | 0 | 0 | 5,073(0.8\%) | 11,304(1.7\%) | 6,690(1.0\%) | 0 | 0 | 8\% \$0.76 |
| 12\% \$1.05 | 0 | 0 | 0 | 0 | 0 | 222(0.0\%) | 7,767(1.2\%) | 18,892(2.9\%) | 0 | 0 | 12\% \$1.05 |
| 16\% \$1.28 | 0 | 0 | 0 | 0 | 0 | 116(0.0\%) | 5,900(0.9\%) | 19,848(3.0\%) | 8(0.0\%) | 0 | 16\% \$1.28 |
| 20\% \$1.50 | 0 | 0 | 0 | 0 | 0 | 107(0.0\%) | 4,950(0.7\%) | 21,729(3.3\%) | 23(0.0\%) | 0 | 20\% \$1.50 |
| 24\% \$1.71 | 0 | 0 | 0 | 0 | 0 | 116(0.0\%) | 4,119(0.6\%) | 22,182(3.4\%) | 23(0.0\%) | 0 | 24\% \$1.71 |
| 28\% \$1.92 | 0 | 0 | 0 | 0 | 0 | 143(0.0\%) | 3,220(0.5\%) | 23,007(3.5\%) | 15(0.0\%) | 0 | 28\% \$1.92 |
| 32\% \$2.15 | 0 | 0 | 0 | 0 | 0 | 129(0.0\%) | 2,051(0.3\%) | 24,419(3.7\%) | 44(0.0\%) | 0 | 32\% \$2.15 |
| 36\% \$2.40 | 0 | 0 | 0 | 0 | 0 | 125(0.0\%) | 1,133(0.2\%) | 24,063(3.6\%) | 44(0.0\%) | 0 | 36\% \$2.40 |
| 40\% \$2.72 | 0 | 0 | 0 | 0 | 0 | 142(0.0\%) | 811(0.1\%) | 25,692(3.9\%) | 52(0.0\%) | 0 | 40\% \$2.72 |
| 44\% \$3.10 | 0 | 0 | 0 | 0 | 0 | 194(0.0\%) | 490(0.1\%) | 25,850(3.9\%) | 56(0.0\%) | 0 | 44\% \$3.10 |
| 48\% \$3.53 | 0 | 0 | 0 | 0 | 0 | 201(0.0\%) | 211(0.0\%) | 25,942(3.9\%) | 72(0.0\%) | 0 | 48\% \$3.53 |
| 52\% \$3.99 | 0 | 0 | 0 | 0 | 0 | 248(0.0\%) | 137(0.0\%) | 25,898(3.9\%) | 94(0.0\%) | 0 | 52\% \$3.99 |
| 56\% \$4.49 | 0 | 0 | 0 | 0 | 0 | 262(0.0\%) | 124(0.0\%) | 25,891(3.9\%) | 77(0.0\%) | 0 | 56\% \$4.49 |
| 60\% \$5.02 | 0 | 0 | 0 | 0 | 0 | 265(0.0\%) | 110(0.0\%) | 25,887(3.9\%) | 115(0.0\%) | 0 | 60\% \$5.02 |
| 64\% \$5.58 | 0 | 0 | 0 | 0 | 0 | 275(0.0\%) | 126(0.0\%) | 25,826(3.9\%) | 172(0.0\%) | 0 | 64\% \$5.58 |
| 68\% \$6.18 | 0 | 0 | 0 | 0 | 0 | 170(0.0\%) | 277(0.0\%) | 25,464(3.9\%) | 226(0.0\%) | 0 | 68\% \$6.18 |
| 72\% \$6.84 | 0 | 0 | 0 | 0 | 0 | 33(0.0\%) | 443(0.1\%) | 25,684(3.9\%) | 336(0.1\%) | 0 | 72\% \$6.84 |
| 76\% \$7.57 | 0 | 0 | 0 | 0 | 0 | 0 | 524(0.1\%) | 25,417(3.8\%) | 481(0.1\%) | 0 | 76\% \$7.57 |
| 80\% \$8.39 | 0 | 0 | 0 | 0 | 0 | 3(0.0\%) | 587(0.1\%) | 25,268(3.8\%) | 720(0.1\%) | 0 | 80\% \$8.39 |
| 84\% \$9.34 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 726(0.1\%) | 24,460(3.7\%) | 1,042(0.2\%) | 0 | 84\% \$9.34 |
| 88\% \$10.51 | 0 | 0 | 0 | 0 | 0 | 0 | 800(0.1\%) | 24,019(3.6\%) | 1,559(0.2\%) | 0 | 88\% \$10.51 |
| 92\% \$11.99 | 0 | 0 | 0 | 0 | 0 | 0 | 379(0.1\%) | 24,037(3.6\%) | 2,086(0.3\%) | 0 | 92\% \$11.99 |
| 96\% \$14.07 | 0 | 0 | 0 | 0 | 0 | 0 | 32(0.0\%) | 23,501(3.6\%) | 2,858(0.4\%) | 0 | 96\% \$14.07 |
| 100\% \$77.73 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 8(0.0\%) | 21,061(3.2\%) | 5,294(0.8\%) | 0 | 100\% \$77.73 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| TOTAL | 1992 | 3677 | 3126 | 2036 | 5684 | 21655 | 46229 | 560727 | 15397 | 0 | TOTAL |
|  | 0.3 \% | 0.6 \% | 0.5 \% | 0.3 \% | 0.9 \% | 3.3 \% | 7.0 \% | 84.9 \% | 2.3 \% | 0.0 \% |  |
| CUMULATIVE | 1992 | 5669 | 8795 | 10831 | 16515 | 38170 | 84399 | 645126 | 660523 | 660523 | CUMULATIVE |
|  | 0.3 \% | 0.9 \% | 1.3 \% | 1.6 \% | 2.5 \% | 5.8 \% | 12.8 \% | 97.7 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-396.2 | \$-83.0 | \$-26.4 | \$-11.2 | \$-1.4 | \$0.5 | \$1.8 | \$5.4 | \$12.3 | 0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |







A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Moderate Season: Summer 4 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ <br> PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} 0-2.5 \% \\ \text { INCREASE } \end{gathered}$ | $\begin{gathered} 2.5-5 \% \\ \text { INCREASE } \end{gathered}$ | 5-10\% <br> INCREASE | $\begin{gathered} \text { 10-20\% } \\ \text { INCREASE } \end{gathered}$ | ABOVE 20\% INCREASE | $\begin{gathered} \text { \$ MONTHLY \$ } \\ \text { PCT } \\ \text { DIFFERENCE } \end{gathered}$ |
| 4\% \$0.39 | 1,477(0.2\%) | 6,294(0.6\%) | 6,113(0.6\%) | 3,978(0.4\%) | 7,107(0.7\%) | 12,996(1.3\%) | 1,513(0.2\%) | 0 | 0 | 0 | 4\% \$0.39 |
| 8\% \$1.35 | 0 | 0 | 0 | 0 | 0 | 988(0.1\%) | 17,609(1.8\%) | 20,915(2.1\%) | 7(0.0\%) | 0 | 8\% \$1.35 |
| 12\% \$1.88 | 0 | 0 | 0 | 0 | 0 | 338(0.0\%) | 8,564(0.9\%) | 30,184(3.1\%) | 51(0.0\%) | 0 | 12\% \$1.88 |
| 16\% \$2.31 | 0 | 0 | 0 | 0 | 0 | 226(0.0\%) | 5,644(0.6\%) | 33,232(3.4\%) | 58(0.0\%) | 0 | 16\% \$2.31 |
| 20\% \$2.71 | 0 | 0 | 0 | 0 | 0 | 228(0.0\%) | 3,732(0.4\%) | 35,934(3.7\%) | 77(0.0\%) | 0 | 20\% \$2.71 |
| 24\% \$3.09 | 0 | 0 | 0 | 0 | 0 | 245(0.0\%) | 2,007(0.2\%) | 36,750(3.7\%) | 92(0.0\%) | 0 | 24\% \$3.09 |
| 28\% \$3.50 | 0 | 0 | 0 | 0 | 0 | 252(0.0\%) | 918(0.1\%) | 38,149(3.9\%) | 159(0.0\%) | 1(0.0\%) | 28\% \$3.50 |
| 32\% \$3.97 | 0 | 0 | 0 | 0 | 0 | 289(0.0\%) | 456(0.0\%) | 38,481(3.9\%) | 234(0.0\%) | 0 | 32\% \$3.97 |
| 36\% \$4.51 | 0 | 0 | 0 | 0 | 0 | 365(0.0\%) | 275(0.0\%) | 37,938(3.9\%) | 306(0.0\%) | 0 | 36\% \$4.51 |
| 40\% \$5.13 | 0 | 0 | 0 | 0 | 0 | 429(0.0\%) | 146(0.0\%) | 38,096(3.9\%) | 453(0.0\%) | 0 | 40\% \$5.13 |
| 44\% \$5.81 | 0 | 0 | 0 | 0 | 0 | 429(0.0\%) | 82(0.0\%) | 38,565(3.9\%) | 634(0.1\%) | 0 | 44\% \$5.81 |
| 48\% \$6.52 | 0 | 0 | 0 | 0 | 0 | 463(0.0\%) | 39(0.0\%) | 37,746(3.8\%) | 788(0.1\%) | 0 | 48\% \$6.52 |
| 52\% \$7.28 | 0 | 0 | 0 | 0 | 0 | 563(0.1\%) | 32(0.0\%) | 37,461(3.8\%) | 1,201(0.1\%) | 0 | 52\% \$7.28 |
| 56\% \$8.10 | 0 | 0 | 0 | 0 | 0 | 546(0.1\%) | 69(0.0\%) | 37,076(3.8\%) | 1,807(0.2\%) | 1(0.0\%) | 56\% \$8.10 |
| 60\% \$8.98 | 0 | 0 | 0 | 0 | 0 | 486(0.0\%) | 187(0.0\%) | 36,053(3.7\%) | 2,729(0.3\%) | 0 | 60\% \$8.98 |
| 64\% \$9.92 | 0 | 0 | 0 | 0 | 0 | 166(0.0\%) | 622(0.1\%) | 34,350(3.5\%) | 3,846(0.4\%) | 0 | 64\% \$9.92 |
| 68\% \$10.97 | 0 | 0 | 0 | 0 | 0 | 7(0.0\%) | 927(0.1\%) | 33,085(3.4\%) | 5,531(0.6\%) | 0 | 68\% \$10.97 |
| 72\% \$12.12 | 0 | 0 | 0 | 0 | 0 | 2(0.0\%) | 1,042(0.1\%) | 30,567(3.1\%) | 7,663(0.8\%) | 0 | 72\% \$12.12 |
| 76\% \$13.40 | 0 | 0 | 0 | 0 | 0 | 0 | 1,177(0.1\%) | 28,082(2.9\%) | 9,947(1.0\%) | 0 | 76\% \$13.40 |
| 80\% \$14.87 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 1,430(0.1\%) | 25,298(2.6\%) | 12,624(1.3\%) | 1(0.0\%) | 80\% \$14.87 |
| 84\% \$16.58 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 1,391(0.1\%) | 22,524(2.3\%) | 15,260(1.6\%) | 1(0.0\%) | 84\% \$16.58 |
| 88\% \$18.61 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 320(0.0\%) | 21,205(2.2\%) | 17,830(1.8\%) | 0 | 88\% \$18.61 |
| 92\% \$21.07 | 0 | 0 | 0 | 0 | 0 | 0 | 10(0.0\%) | 19,109(1.9\%) | 20,235(2.1\%) | 1(0.0\%) | 92\% \$21.07 |
| 96\% \$24.28 | 0 | 0 | 0 | 0 | 0 | 0 | 2(0.0\%) | 17,462(1.8\%) | 21,800(2.2\%) | 0 | 96\% \$24.28 |
| 100\% \$86.85 | 0 | 0 | 0 | 0 | 0 | 0 | 3(0.0\%) | 11,320(1.2\%) | 27,971(2.8\%) | 0 | 100\% \$86.85 |
| TOTAL | 1477 | 6294 | 6113 | 3978 | 7107 | 19021 | 48197 | 739582 | 151303 | 5 | TOTAL |
|  | 0.2 \% | 0.6 \% | 0.6 \% | 0.4 \% | 0.7 \% | 1.9 \% | 4.9 \% | 75.2 \% | 15.4 \% | 0.0 \% |  |
| CUMULATIVE | 1477 | 7771 | 13884 | 17862 | 24969 | 43990 | 92187 | 831769 | 983072 | 983077 | CUMULATIVE |
|  | 0.2 \% | 0.8 \% | 1.4 \% | 1.8 \% | 2.5 \% | 4.5 \% | 9.4 \% | 84.6 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-511.7 | \$-118.1 | \$-39.8 | \$-17.0 | \$-3.5 | \$1.5 | \$3.3 | \$7.8 | \$18.3 | \$12.0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |

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$\square$



A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY <br> CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 <br> Climate: Hot Season: Summer 4 months <br> Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ <br> PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20--10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | 0-2.5\% <br> INCREASE | $\begin{gathered} 2.5-5 \% \\ \text { INCREASE } \end{gathered}$ | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{gathered} \text { \$ MONTHLY \$ } \\ \text { PCT } \\ \text { DIFFERENCE } \end{gathered}$ |
| 4\% \$0.27 | 471(0.1\%) | 2,204(0.3\%) | 2,523(0.4\%) | 1,825(0.3\%) | 4,901(0.7\%) | 16,744(2.3\%) | 100(0.0\%) | 0 | 0 | 0 | 4\% \$0.27 |
| 8\% \$1.73 | 0 | 0 | 0 | 0 | 0 | 1,183(0.2\%) | 13,183(1.8\%) | 14,369(2.0\%) | 64(0.0\%) | 0 | 8\% \$1.73 |
| 12\% \$ ${ }^{\text {\% }}$ - 07 | 0 | 0 | 0 | 0 | 0 | 435(0.1\%) | 6,132(0.9\%) | 22,047(3.1\%) | 232(0.0\%) | 0 | 12\% \$3.07 |
| 16\% \$4.26 | 0 | 0 | 0 | 0 | 0 | 259(0.0\%) | 4,471(0.6\%) | 23,636(3.3\%) | 399(0.1\%) | 0 | 16\% \$4.26 |
| 20\% \$5.36 | 0 | 0 | 0 | 0 | 0 | 237(0.0\%) | 2,838(0.4\%) | 24,830(3.5\%) | 664(0.1\%) | 0 | 20\% \$5.36 |
| 24\% \$6.56 | 0 | 0 | 0 | 0 | 0 | 280(0.0\%) | 1,376(0.2\%) | 26,145(3.6\%) | 1,061(0.1\%) | 0 | 24\% \$6.56 |
| 28\% \$7.91 | 0 | 0 | 0 | 0 | 0 | 298(0.0\%) | 485(0.1\%) | 26,108(3.6\%) | 1,723(0.2\%) | 0 | 28\% \$7.91 |
| 32\% \$9.39 | 0 | 0 | 0 | 0 | 0 | 359(0.0\%) | 118(0.0\%) | 25,702(3.6\%) | 2,603(0.4\%) | 0 | 32\% \$9.39 |
| 36\% \$10.88 | 0 | 0 | 0 | 0 | 0 | 381(0.1\%) | 45(0.0\%) | 24,564(3.4\%) | 3,807(0.5\%) | 0 | 36\% \$10.88 |
| 40\% \$12.38 | 0 | 0 | 0 | 0 | 0 | 379(0.1\%) | 57(0.0\%) | 22,944(3.2\%) | 5,425(0.8\%) | 0 | 40\% \$12.38 |
| 44\% \$13.86 | 0 | 0 | 0 | 0 | 0 | 312(0.0\%) | 138(0.0\%) | 20,948(2.9\%) | 7,337(1.0\%) | 0 | 44\% \$13.86 |
| 48\% \$15.35 | 0 | 0 | 0 | 0 | 0 | 181(0.0\%) | 280(0.0\%) | 18,964(2.6\%) | 9,252(1.3\%) | 0 | 48\% \$15.35 |
| 52\% \$16.83 | 0 | 0 | 0 | 0 | 0 | 85(0.0\%) | 368(0.1\%) | 17,314(2.4\%) | 10,895(1.5\%) | 0 | 52\% \$16.83 |
| 56\% \$18.35 | 0 | 0 | 0 | 0 | 0 | 22(0.0\%) | 507(0.1\%) | 15,661(2.2\%) | 12,637(1.8\%) | 0 | 56\% \$18.35 |
| 60\% \$19.90 | 0 | 0 | 0 | 0 | 0 | 12(0.0\%) | 563(0.1\%) | 14,042(2.0\%) | 14,229(2.0\%) | 0 | 60\% \$19.90 |
| 64\% \$21.50 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 560(0.1\%) | 12,498(1.7\%) | 15,538(2.2\%) | 0 | 64\% \$21.50 |
| 68\% \$23.17 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 576(0.1\%) | 11,374(1.6\%) | 16,773(2.3\%) | 0 | 68\% \$23.17 |
| 72\% \$24.94 | 0 | 0 | 0 | 0 | 0 | 0 | 533(0.1\%) | 10,474(1.5\%) | 17,817(2.5\%) | 0 | 72\% \$24.94 |
| 76\% \$26.86 | 0 | 0 | 0 | 0 | 0 | 0 | 397(0.1\%) | 9,569(1.3\%) | 18,772(2.6\%) | 0 | 76\% \$26.86 |
| 80\% \$28.99 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 274(0.0\%) | 8,942(1.2\%) | 19,486(2.7\%) | 0 | 80\% \$28.99 |
| 84\% \$31.40 | 0 | 0 | 0 | 0 | 0 | 0 | 181(0.0\%) | 8,453(1.2\%) | 20,103(2.8\%) | 0 | 84\% \$31.40 |
| 88\% \$34.27 | 0 | 0 | 0 | 0 | 0 | 0 | 63(0.0\%) | 8,248(1.1\%) | 20,391(2.8\%) | 0 | 88\% $\quad \$ 34.27$ |
| 92\% \$37.84 | 0 | 0 | 0 | 0 | 0 | 0 | 5(0.0\%) | 8,155(1.1\%) | 20,621(2.9\%) | 0 | 92\% \$37.84 |
| 96\% \$42.70 | 0 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 7,721(1.1\%) | 21,011(2.9\%) | 0 | 96\% \$42.70 |
| 100\% 134.49 | 0 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 6,460(0.9\%) | 22,240(3.1\%) | 0 | 100\% 134.49 |
| TOTAL | 471 | 2204 | 2523 | 1825 | 4901 | 21170 | 33252 | 389168 | 263080 | 0 | TOTAL |
|  | 0.1 \% | 0.3 \% | 0.4 \% | 0.3 \% | 0.7 \% | 2.9 \% | 4.6 \% | 54.2 \% | 36.6 \% | 0.0 \% |  |
| CUMULATIVE | 471 | 2675 | 5198 | 7023 | 11924 | 33094 | 66346 | 455514 | 718594 | 718594 | CUMULATIVE |
|  | 0.1 \% | 0.4 \% | 0.7 \% | 1.0 \% | 1.7 \% | 4.6 \% | 9.2 \% | 63.4 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-643.5 | \$-189.3 | \$-64.6 | \$-27.8 | \$-4.0 | \$1.3 | \$4.9 | \$14.0 | \$27.1 | 0 | AVG.MO DIFF. |
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## CURRENT： 2018 E1 rates

 8 ETOUC Rates No Med 12 months usage Runtime：Climate：Hot Season：Summer 4 months
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| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \stackrel{o}{\circ} \\ & \stackrel{\rightharpoonup}{0} \\ & \stackrel{N}{n} \end{aligned}$ | － | － | － | － | 0 | $\bigcirc$ | 0 | 0 | 0 | 0 | 0 | － | $\bigcirc$ | $\bigcirc$ | 0 | 0 | 0 | 0 | 0 | 0 | － | 0 | $\bigcirc$ | $\bigcirc$ | $\stackrel{\sim}{\sim}$ | $\begin{aligned} & \circ \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\stackrel{\sim}{\sim}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \dot{\forall} \\ & \underset{\sim}{2} \\ & \underset{\sim}{\infty} \end{aligned}$ |
|  |  | $\begin{aligned} & \infty \\ & \underset{\sim}{0} \\ & \underset{\sim}{\infty} \\ & \underset{\infty}{\circ} \end{aligned}$ |  |  | $$ |  | $\begin{aligned} & \underset{\sim}{7} \\ & \underset{\sim}{\oplus} \\ & \underset{\sim}{\circ} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \stackrel{\sim}{\infty} \\ & \underset{\leftrightarrow}{0} \\ & \underset{\sim}{\circ} \\ & \underset{\sim}{\circ} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ |  |  |  |  |  | $\begin{aligned} & \text { n } \\ & \\ & \underset{\infty}{\infty} \\ & \text { ò } \\ & 0 \end{aligned}$ | $\begin{gathered} \underset{\sim}{N} \\ \underset{\sim}{j} \\ \dot{\theta} \\ 0 \\ \stackrel{\rightharpoonup}{U} \end{gathered}$ |  |  |  | $\begin{aligned} & n \\ & \underset{\sim}{n} \\ & \infty \\ & 0 \\ & \infty \\ & 0 \\ & 0 \\ & 0 \\ & \infty \end{aligned}$ |  |  |  |  | 7 <br> $\underset{\sim}{1}$ <br> 0 <br> 0 <br>  <br> 0 <br> 0 <br> - |  |  |  |  |  |

A Percentage difference which falls on a column boundary is included in the higher column

| RATE DATA ANALYSIS BILL IMPACT SUMMARY CURRENT: 2018 E1 rates <br> PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Not Hot Season: Summer 4 months Rate Schedule=E1 |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| \$ MONTHLY \$ PCT DIFFERENCE | BELOW -20\% DECREASE | $\begin{gathered} -20-10 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -10--5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -5--2.5 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{gathered} -2.5-0 \% \\ \text { DECREASE } \end{gathered}$ | $\begin{aligned} & 0-2.5 \% \\ & \text { INCREASE } \end{aligned}$ | 2.5-5\% <br> INCREASE | $5-10 \%$ <br> INCREASE | 10-20\% <br> INCREASE | ABOVE 20\% INCREASE | $\begin{gathered} \text { \$ MONTHLY \$ } \\ \text { PCT } \\ \text { DIFFERENCE } \end{gathered}$ |
| 4\% \$0.03 | 3,469(0.2\%) | 9,971(0.6\%) | 9,239(0.6\%) | 6,014(0.4\%) | 12,791(0.8\%) | 24,387(1.5\%) | 0 | 0 | 0 | 0 | 4\% \$0.03 |
| 8\% \$0.98 | 0 | 0 | 0 | 0 | 0 | 8,367(0.5\%) | 29,623(1.8\%) | 27,733(1.7\%) | 0 | 0 | 8\% \$0.98 |
| 12\% \$1.38 | 0 | 0 | 0 | 0 | 0 | 544(0.0\%) | 17,265(1.1\%) | 49,710(3.0\%) | 28(0.0\%) | 0 | 12\% \$1.38 |
| 16\% \$1.71 | 0 | 0 | 0 | 0 | 0 | 384(0.0\%) | 12,205(0.7\%) | 51,952(3.2\%) | 65(0.0\%) | 0 | 16\% \$1.71 |
| 20\% \$2.03 | 0 | 0 | 0 | 0 | 0 | 399(0.0\%) | 9,142(0.6\%) | 56,667(3.4\%) | 73(0.0\%) | 0 | 20\% \$2.03 |
| 24\% \$2.36 | 0 | 0 | 0 | 0 | 0 | 342(0.0\%) | 5,984(0.4\%) | 59,759(3.6\%) | 105(0.0\%) | 0 | 24\% \$2.36 |
| 28\% \$2.71 | 0 | 0 | 0 | 0 | 0 | 350(0.0\%) | 4,079(0.2\%) | 60,212(3.7\%) | 130(0.0\%) | 0 | 28\% \$2.71 |
| 32\% \$3.09 | 0 | 0 | 0 | 0 | 0 | 439(0.0\%) | 2,510(0.2\%) | 62,743(3.8\%) | 149(0.0\%) | 0 | 32\% \$3.09 |
| 36\% \$3.51 | 0 | 0 | 0 | 0 | 0 | 459(0.0\%) | 1,141(0.1\%) | 64,426(3.9\%) | 236(0.0\%) | 1(0.0\%) | 36\% \$3.51 |
| 40\% \$3.97 | 0 | 0 | 0 | 0 | 0 | 531(0.0\%) | 583(0.0\%) | 63,606(3.9\%) | 320(0.0\%) | 0 | 40\% \$3.97 |
| 44\% \$4.50 | 0 | 0 | 0 | 0 | 0 | 624(0.0\%) | 401(0.0\%) | 64,699(3.9\%) | 384(0.0\%) | 0 | 44\% \$4.50 |
| 48\% \$5.08 | 0 | 0 | 0 | 0 | 0 | 708(0.0\%) | 271(0.0\%) | 64,039(3.9\%) | 552(0.0\%) | 0 | 48\% \$5.08 |
| 52\% \$5.70 | 0 | 0 | 0 | 0 | 0 | 670(0.0\%) | 228(0.0\%) | 63,656(3.9\%) | 749(0.0\%) | 0 | 52\% \$5.70 |
| 56\% \$6.37 | 0 | 0 | 0 | 0 | 0 | 573(0.0\%) | 395(0.0\%) | 63,952(3.9\%) | 971(0.1\%) | 0 | 56\% \$6.37 |
| 60\% \$7.09 | 0 | 0 | 0 | 0 | 0 | 526(0.0\%) | 520(0.0\%) | 63,120(3.8\%) | 1,452(0.1\%) | 0 | 60\% \$7.09 |
| 64\% \$7.87 | 0 | 0 | 0 | 0 | 0 | 567(0.0\%) | 591(0.0\%) | 62,225(3.8\%) | 2,143(0.1\%) | 0 | 64\% \$7.87 |
| 68\% \$8.73 | 0 | 0 | 0 | 0 | 0 | 519(0.0\%) | 829(0.1\%) | 61,305(3.7\%) | 3,314(0.2\%) | 1(0.0\%) | 68\% \$8.73 |
| 72\% \$ $\$ 9.70$ | 0 | 0 | 0 | 0 | 0 | 268(0.0\%) | 1,188(0.1\%) | 59,491(3.6\%) | 4,804(0.3\%) | 0 | 72\% \$9.70 |
| 76\% \$10.79 | 0 | 0 | 0 | 0 | 0 | 12(0.0\%) | 1,683(0.1\%) | 56,640(3.4\%) | 7,002(0.4\%) | 0 | 76\% \$10.79 |
| 80\% \$12.06 | 0 | 0 | 0 | 0 | 0 | 3(0.0\%) | 1,350(0.1\%) | 54,247(3.3\%) | 10,097(0.6\%) | 0 | 80\% \$12.06 |
| 84\% \$13.57 | 0 | 0 | 0 | 0 | 0 | 0 | 1,420(0.1\%) | 50,559(3.1\%) | 13,885(0.8\%) | 0 | 84\% \$13.57 |
| 88\% \$15.43 | 0 | 0 | 0 | 0 | 0 | 3(0.0\%) | 1,821(0.1\%) | 45,312(2.8\%) | 18,569(1.1\%) | 2(0.0\%) | 88\% \$15.43 |
| 92\% \$18.00 | 0 | 0 | 0 | 0 | 0 | 1(0.0\%) | 1,172(0.1\%) | 39,382(2.4\%) | 25,159(1.5\%) | 0 | 92\% \$18.00 |
| 96\% \$22.02 | 0 | 0 | 0 | 0 | 0 | 0 | 19(0.0\%) | 32,044(1.9\%) | 33,670(2.0\%) | 1(0.0\%) | 96\% \$22.02 |
| 100\% \$86.85 | 0 | 0 | 0 | 0 | 0 | 0 | 6(0.0\%) | 22,830(1.4\%) | 42,843(2.6\%) | 0 | 100\% \$86.85 |
| TOTAL | 3469 | 9971 | 9239 | 6014 | 12791 | 40676 | 94426 | 1300309 | 166700 | 5 | TOTAL |
|  | 0.2 \% | 0.6 \% | 0.6 \% | 0.4 \% | 0.8 \% | 2.5 \% | 5.7 \% | 79.1 \% | 10.1 \% | 0.0 \% |  |
| CUMULATIVE | 3469 | 13440 | 22679 | 28693 | 41484 | 82160 | 176586 | 1476895 | 1643595 | 1643600 | CUMULATIVE |
|  | 0.2 \% | 0.8 \% | 1.4 \% | 1.7 \% | 2.5 \% | 5.0 \% | 10.7 \% | 89.9 \% | 100.0 \% | 100.0 \% |  |
| AVG.MO DIFF. | \$-445.4 | \$-105.2 | \$-35.3 | \$-15.1 | \$-2.5 | \$0.9 | \$2.6 | \$6.8 | \$17.7 | \$12.0 | AVG.MO DIFF. |
|  |  |  |  |  |  |  |  |  |  |  |  |






 | 0 | 0 |
| :---: | :---: |
| 0 | 0 |
| 0 |  |
| 0 | 0 |
| 0 | 0 |
| 0 | 0 |
|  | 0 |
|  |  |





 0
0
-
-
-1
-1
-7
-1











 CURRENT: 2018 E1 rates
PROPOSED: 2018 ETOUC Rates No Med 12 months usage Runtime: 12DEC16 Climate: Not Hot Season: Summer 4 months

| 2.5-5\% |
| :---: |
| INCREASE |
| $803(0.2 \%)$ |
| $240(0.1 \%)$ | $\begin{array}{ll}\bigcirc 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 & 0 \\ \end{array}$ $\widehat{\circ}$

0
0
0
0
0
0
 77(0.0\%)
$66(0.0 \%)$ 47(0.0\%) 37(0.0\%)
 oc 52(0.0\%) 72(0.0\%)

$74(0.0 \%)$ | $\circ$ |
| :---: |
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |

 101(0.0\%)
124(0.0\%) 응 O $\begin{array}{ccc}0 & 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 & 0 \\ -7 & 0 & 0\end{array}$ $\stackrel{0}{\infty}$
 $\underset{\sim}{\underset{\sim}{\infty}}$ $\square$
Bill Impact Run date：12DEC16
Scenario：Comparison 745（d）Schedule：E1 ：E1 2018 vs．ETOUC 2018 Season：All seasons Climate：ALL NEM／non－NEM：non－NEM

|  |  |  |  | $\begin{array}{ll} \hline \stackrel{\rightharpoonup}{0} \\ \\ \vdots \\ i \end{array}$ |  |  | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \mathrm{S} \\ & \text { ón } \\ & \hline \end{aligned}$ | $\begin{array}{lll} \hline \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \\ \hline \end{array}$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{2} \\ \stackrel{\rightharpoonup}{i} \\ \dot{i} \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{i} \end{array} \right\rvert\,$ | $\begin{array}{\|c} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \hat{N} \\ \underset{\mathrm{~N}}{ } \end{array}$ | $\begin{gathered} \stackrel{\rightharpoonup}{0} \\ \infty \\ \infty \\ \underset{\sim}{2} \end{gathered}$ |  | $\underset{\sim}{\underset{\sim}{2}} \underset{\sim}{\sim}$ |  |  | $\begin{array}{\|c\|} \hline \stackrel{c}{2} \\ \underset{\sim}{n} \\ \hline \end{array}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{n} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\stackrel{\rightharpoonup}{2}$ | $\begin{aligned} & \stackrel{y}{0} \\ & \\ & \underset{\sim}{2} \\ & \end{aligned}$ | $\underset{\sim}{\underset{\sim}{2}} \underset{\sim}{2}$ | $\mathfrak{c}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \stackrel{y}{c} \\ & \stackrel{1}{2} \end{aligned}$ |  | $\begin{array}{\|c\|} \hline \stackrel{0}{+} \\ \infty \\ \underset{寸}{\prime} \end{array}$ | $\left.\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \hat{N} \\ & \underset{\sim}{7} \end{aligned} \right\rvert\,$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{2} \\ \underset{\sim}{e} \\ \underset{1}{2} \end{array}\right\|$ | $\begin{aligned} & \stackrel{\circ}{0} \\ & \hat{n} \\ & \underset{i}{i} \\ & 7 \end{aligned}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \underset{\sim}{i} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{gathered} \underset{\sim}{c} \\ \underset{\sim}{c} \\ \underset{1}{2} \end{gathered}$ |  | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \stackrel{\rightharpoonup}{N} \\ \underset{\sim}{n} \end{array}\right\|$ | $\underset{\substack{\circ \\ \underset{1}{2} \\ \underset{\sim}{2} \\ \hline}}{ }$ | $\left\|\begin{array}{c} \underset{\sim}{\circ} \\ \underset{\sim}{\infty} \\ \underset{\sim}{\infty} \end{array}\right\|$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{0} \\ \underset{\sim}{\infty} \\ \hline \end{array}\right\|$ | $\begin{gathered} \stackrel{\rightharpoonup}{2} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} 0 \\ 0 \\ i \end{gathered}$ | $$ | $\begin{gathered} \underset{N}{n} \\ 0 \end{gathered}$ | $\begin{aligned} & 0 \\ & \underset{\sim}{2} \\ & i_{2} \end{aligned}$ | $\begin{aligned} & 7 \\ & 7 \\ & 0 \\ & 0 \end{aligned}$ | $0$ | $\begin{aligned} & \hline m \\ & \dot{\sim} \\ & i \end{aligned}$ | $\begin{array}{l\|l} \hline \hat{y} & 0 \\ i \\ i & i \\ i \end{array}$ | $\begin{array}{\|c\|} \hline \\ n \\ i n \\ i n \\ \hline \end{array}$ | $\begin{gathered} \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{array}{\|c} \infty \\ \underset{\sim}{n} \\ \hline \end{array}$ | $\begin{aligned} & \infty \\ & \stackrel{\infty}{n} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \infty \\ & \\ & \underset{\sim}{\infty} \\ & \vdots \end{aligned}$ | $\begin{array}{\|c\|c} n \\ 0 \\ \dot{\sim} \\ \sim \end{array}$ |  |  | $\left.\begin{array}{\|l\|} \hline \infty \\ 0 \\ 0 \\ \bullet \\ \hline \end{array} \right\rvert\, .$ | $\begin{array}{\|c} \hline n \\ 0 \\ 0 \\ 0 \end{array}$ | $\hat{i}$ | $\stackrel{i n}{0}$ |  | $\stackrel{\infty}{\substack{\alpha \\ \dot{\infty} \\ \dot{n}}}$ | $\begin{aligned} & \infty \\ & \stackrel{1}{i} \\ & \stackrel{i}{n} \end{aligned}$ | $\begin{gathered} \infty \\ \infty \\ \underset{\sim}{\infty} \end{gathered}$ | $\begin{gathered} \hat{\sim} \\ \underset{\sim}{\mathrm{N}} \end{gathered}$ | $\left.\begin{array}{\|c} \overbrace{0} \\ 0 \\ n \\ n \end{array} \right\rvert\,$ | $\begin{array}{\|c} \hline \stackrel{9}{n} \\ 0 \\ \tilde{n} \\ \sqrt[n]{2} \end{array}$ | 0 <br> 0 <br> 0 <br> 0 <br>  |  | $\begin{array}{\|c\|} \hline \frac{n}{n} \\ \infty \\ \infty \\ n \\ n \end{array}$ |  |  | $\begin{array}{\|c\|} \underset{N}{N} \\ \infty \\ \infty \\ \underset{\sim}{n} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \vec{\infty} \\ \overrightarrow{1} \\ \overrightarrow{9} \\ \hat{0} \end{array}$ | $\begin{gathered} \underset{y}{c} \\ i n \\ i n \\ i \\ i n \\ i \end{gathered}$ | $\begin{gathered} n \\ 0 \\ 0 \\ 0 \\ i \\ i n \\ i \end{gathered}$ |  |
|  | $\begin{gathered} n \\ m \\ \vdots \\ i \\ \hline \end{gathered}$ | $\begin{array}{\|c\|} \hline \stackrel{n}{n} \\ \stackrel{n}{n} \end{array}$ | $\begin{gathered} m \\ \\ \\ \sim \end{gathered}$ | $\left.\begin{array}{\|c\|} \hline N \\ 0 \\ \sim \\ \sim \\ \sim \end{array} \right\rvert\,$ |  | $\left. \right\rvert\,$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\left\|\begin{array}{c} \underset{\sim}{0} \\ \underset{i}{n} \\ \underset{\sim}{n} \end{array}\right\|$ | $$ |  | $\left.\begin{array}{\|c\|} \hline 9 \\ 9 \\ 0 \\ \\ i \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline n \\ n \\ n \\ n \\ n \end{array} \right\rvert\,$ | $\begin{gathered} \hat{N} \\ \underset{\sim}{3} \\ \dot{\sim} \end{gathered}$ | $\begin{gathered} n \\ 0 \\ 0 \\ 0 \\ i \end{gathered}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ \\ \hline 0 \end{array}$ |  | $\left\|\begin{array}{c} \vec{m} \\ 0 \\ 0 \\ 0 \\ n \end{array}\right\|$ | $\begin{array}{l\|} \hline- \\ 0 \\ n \\ \sim \\ n \end{array}$ |  | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ i \end{array}\right\|$ |  | $\begin{aligned} & \infty \\ & \underset{\sim}{\infty} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \infty \\ & \infty \\ & 0 \\ & \tilde{\sim} \\ & \sim \end{aligned}$ | $\begin{gathered} c_{0}^{0} \\ 0 \\ 0 \\ 0 \\ n \end{gathered}$ |  | $\left.\begin{array}{\|l\|} \hline 0 \\ \hat{n} \\ \mathrm{~N} \\ n \end{array} \right\rvert\,$ | $\left.\begin{array}{\|l\|} 9 \\ 0 \\ 0 \\ n \\ n \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|c\|} \hat{N} \\ \dot{e} \\ \hat{0} \\ \hat{\sim} \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \left.\begin{array}{c} 0 \\ \underset{i}{2} \\ \underset{\sim}{n} \end{array} \right\rvert\, \\ \hline \end{array}$ |  | $\begin{array}{\|c\|} \hline n \\ \\ 0 \\ \vdots \\ \vec{n} \\ \hline \end{array}$ |  |  | $\begin{array}{\|c} \substack{~ \\ \hat{e} \\ \underset{\sim}{v} \\ \underset{\sim}{n} \\ \hline} \end{array}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & i n \\ & n \\ & n \\ & n \end{aligned}$ |  |  |
|  | $\begin{gathered} \stackrel{n}{n} \\ 0 \\ i n \\ i n \end{gathered}$ | $\begin{aligned} & \hline \underset{n}{n} \\ & \stackrel{n}{n} \end{aligned}$ | $\begin{aligned} & \stackrel{\sim}{\sim} \\ & \sim \\ & n \\ & \sim \end{aligned}$ | $\begin{aligned} & \infty \\ & \underset{\sim}{n} \\ & \tilde{n} \end{aligned}$ |  | $\begin{aligned} & \hat{6} \\ & \dot{0} \\ & \mathbf{n} \end{aligned} .$ | $\left\|\begin{array}{c} \tilde{N} \\ \infty \\ 0 \\ n \end{array}\right\|$ | $\begin{array}{\|c\|} \hline \infty \\ \sim \\ \infty \\ \infty \\ \infty \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{\sim}{n} \\ \underset{\sim}{n} \\ \hline \end{array}$ | 8 <br> 0 <br> 0 <br> 0 <br> $i$ | $\begin{aligned} & \sqrt{n} \\ & \underset{\sim}{3} \\ & \sqrt{2} \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ n \\ n \end{array} \right\rvert\,$ | $\begin{aligned} & \dot{9} \\ & \underset{\sim}{\dot{2}} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \tilde{N} \\ & \underset{n}{n} \\ & \stackrel{n}{n} \end{aligned}$ |  | 0 0 0 0 0 $i n$ | $\left\|\begin{array}{c} \tilde{0} \\ 0 \\ \underset{\sim}{n} \\ \end{array}\right\|$ | $\left.\begin{array}{l\|} \hline \stackrel{0}{0} \\ \dot{0} \\ 0 \\ \infty \end{array} \right\rvert\,$ | $\mathfrak{c}$ | $\begin{aligned} & \underset{\sim}{\sim} \\ & \sim \\ & \sim \\ & \sim \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{gathered} n \\ \underset{\sim}{2} \\ 0 \\ \sim \end{gathered}$ | $\left.\begin{array}{\|c\|} \hline \underset{\sim}{n} \\ \underset{\sim}{n} \\ \tilde{n} \end{array} \right\rvert\,$ | $\begin{aligned} & \infty \\ & \stackrel{\infty}{n} \\ & \sim \end{aligned}$ |  | $\left. \right\rvert\,$ | $\left.\begin{array}{l\|} \hline \infty \\ n_{n} \\ 0 \\ 0 \\ \infty \\ \sim \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline \\ n \\ \hat{0} \\ 0 \\ i \\ i \end{array} \right\rvert\,$ |  | $\left.\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ n \\ 5 \\ i \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline-\overrightarrow{6} \\ \underset{\sim}{i} \\ \underset{i n}{2} \end{array}$ | $\begin{array}{\|c\|} \hline \infty \\ \infty \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \underset{\sim}{2} \end{array}$ | $\begin{gathered} \infty \\ \infty \\ \dot{\infty} \\ \underset{\sim}{\infty} \\ \underset{\sim}{n} \end{gathered}$ | $\left\|\begin{array}{c} \infty \\ \infty \\ 0 \\ 0 \\ \underset{\sim}{n} \\ n \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline-7 \\ \infty \\ 0 \\ 0 \\ n \\ n \\ n \end{array} \right\rvert\,$ |  |  |
|  | $\stackrel{\sim}{\sim}$ | N | $\underset{\sim}{\underset{\sim}{2}}$ |  | $\|\underset{N}{N}\|$ | ? | $\left\lvert\, \begin{gathered} \stackrel{\sim}{\sim} \\ \hline \end{gathered}\right.$ | \|n | $\left\|\begin{array}{c} \stackrel{N}{\boldsymbol{q}} \end{array}\right\|$ | $\begin{array}{\|l\|} \frac{n}{2} \\ \hline \end{array}$ | \| | $\left\lvert\, \begin{array}{\|c\|} \hline \mathrm{N} \\ \hline \end{array}\right.$ | \| | $$ | $\underset{N}{N}$ | $\overline{\mathrm{A}} \mathrm{~A}$ | $\underset{\infty}{\underset{\sim}{2}} \mid$ | $\begin{array}{\|c\|} \hline \underset{\infty}{\prime} \\ \hline \end{array}$ | $\hat{\sigma}$ | $\hat{i}$ | $\begin{aligned} & \hat{F} \\ & 7 \\ & i \end{aligned}$ | $\underset{\sim}{\underset{\sim}{\underset{N}{2}}}$ | $\left\lvert\, \begin{gathered} \hat{f} \\ \underset{i}{2} \end{gathered}\right.$ | $\underset{i}{f}$ | $\begin{aligned} & \hline 9 \\ & \underset{i}{9} \\ & -1 \end{aligned}$ | $\begin{array}{\|c\|} \hline{ }_{0}^{2} \\ \underset{N}{n} \end{array}$ | $\begin{aligned} & \underset{\sim}{2} \\ & \underset{N}{ } \end{aligned}$ | $\left\|\begin{array}{c} \underset{\sim}{n} \\ \underset{m}{2} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \underset{\sim}{n} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline g \\ 寸 \\ f \end{array}$ | $\begin{array}{\|l} \hline 0 \\ f \\ j \end{array}$ | $\left.\begin{array}{\|c\|} \hline N \\ \underset{\sim}{n} \\ \dot{0} \end{array} \right\rvert\,$ | $\begin{aligned} & 0 \\ & \underset{\sim}{2} \\ & \sim \end{aligned}$ | $\left\|\begin{array}{c} \infty \\ \underset{\infty}{\infty} \\ \infty \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline g \\ \underset{\sigma}{c} \end{array} \right\rvert\,$ | $\begin{aligned} & \infty \\ & \vec{j} \\ & \vec{j} \\ & \hline \end{aligned}$ |  |
|  | $\begin{gathered} \text { oे } \\ \text { in } \end{gathered}$ | $\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \stackrel{\rightharpoonup}{4} \\ \text { in } \end{array}$ | $\begin{gathered} o \\ 0 \\ 0 \\ \vdots \\ \end{gathered}$ |  | $\begin{gathered} \stackrel{\rightharpoonup}{\hat{N}} \\ \stackrel{1}{n} \\ \underset{\sim}{2} \end{gathered}$ | $\left\|\begin{array}{c} \circ \\ \infty \\ 0 \\ \dot{m} \end{array}\right\|$ | $\begin{array}{\|c\|} \hline 0 \\ \hline 0 \\ 0 \\ \infty \\ \infty \\ \hline \end{array}$ | $\begin{array}{\|c} \stackrel{\rightharpoonup}{0} \\ \stackrel{\rightharpoonup}{\dot{G}} \end{array}$ | $\begin{aligned} & \hline \stackrel{\rightharpoonup}{0} \\ & \overrightarrow{9} \\ & \underset{i}{2} \end{aligned}$ | $\begin{array}{\|c\|} \hline \stackrel{\circ}{2} \\ \underset{\sim}{n} \\ \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \substack{2 \\ \dot{~} \\ \hline} \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{y}{\circ} \\ \underset{y}{2} \\ \underset{o}{2} \end{array}$ |  | $\stackrel{\rightharpoonup}{\circ}$ | $\stackrel{0}{0}$ | $\stackrel{\stackrel{\rightharpoonup}{\circ}}{\stackrel{\rightharpoonup}{\dot{~}}}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \hat{n} \\ \infty \\ \infty \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline 0 \\ \hat{N} \\ \infty \\ \infty \\ \infty \end{array} \right\rvert\,$ | $\begin{aligned} & o \\ & \hline 0 \\ & 6 \\ & \text { gi } \\ & \hline \end{aligned}$ | $\begin{gathered} \stackrel{\rightharpoonup}{2} \\ \underset{\sim}{2} \\ \end{gathered}$ |  |  |  | $\begin{aligned} & \stackrel{\rightharpoonup}{2} \\ & \underset{\sim}{2} \\ & \infty \\ & \infty \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \vec{m} \\ \underset{\sigma}{2} \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{0} \\ \stackrel{1}{2} \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\circ}{\hat{~}} \\ \dot{\beta} \\ \hline \end{array}$ |  | $\begin{array}{\|l\|} \hline \infty \\ \infty \\ \infty \\ \text { gi } \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{y}{\circ} \\ \underset{~}{2} \\ \text { gi } \end{array}$ | $\begin{array}{\|l} \hline \text { ò } \\ \text { ó } \\ \text { gi } \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{y}{n} \\ \hat{j} \\ g_{2} \end{array}$ | $\left.\begin{array}{\|c\|} \hline 0 \\ \underset{o}{2} \\ \dot{g} \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \text { ুi } \end{array}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \dot{ু} \end{array} \right\rvert\,$ |  |  |
| 苍 苟 | $\begin{array}{\|c\|} \hline \stackrel{0}{\circ} \\ \underset{\sim}{i} \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\mathrm{o}} \\ \underset{\mathrm{~m}}{ } \end{array}$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{\infty} \\ \stackrel{\infty}{\infty} \\ \underset{寸}{ } \end{gathered}\right.$ | $\stackrel{\rightharpoonup}{7}$ |  |  | $\begin{array}{\|l\|} \hline \stackrel{\circ}{2} \\ \hat{n} \\ \end{array}$ | $\left.\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \stackrel{0}{n} \\ & \stackrel{n}{2} \end{aligned} \right\rvert\,$ | ి융 | $\begin{array}{\|l\|} \hline \stackrel{0}{0} \\ \underset{\sim}{2} \\ \hline \end{array}$ | 웅 | Ò | $\circ$ $\stackrel{\circ}{\circ}$ $\underset{\sim}{\circ}$ | 군 | へion |  |  | $\left\|\begin{array}{c} \text { సे } \\ \underset{\mathrm{N}}{\mathrm{~N}} \end{array}\right\|$ |  | $\stackrel{\stackrel{\rightharpoonup}{\mathrm{N}}}{\underset{\mathrm{~N}}{\mathrm{~N}}}$ | ice | $\stackrel{\stackrel{\rightharpoonup}{0}}{\stackrel{1}{2}}$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{\infty} \\ \infty \\ 0 \end{gathered}\right.$ |  | $\left\lvert\, \begin{gathered} \stackrel{\circ}{\circ} \\ \underset{i}{i} \\ \hline \end{gathered}\right.$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ ⿳ 亠 丷 ⿵ 冂 \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \underset{0}{3} \\ \underset{0}{2} \end{array}$ |  | or | $\begin{array}{\|c} \substack{0 \\ 0 . \\ 0 \\ 0} \end{array}$ | $$ | $\left\|\right\|$ | $\begin{array}{\|l\|} \hline \stackrel{0}{\circ} \\ 0 \\ 0 \\ \hline \end{array}$ | $\begin{array}{\|c} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{0} \\ 0 \end{array}$ | $\left\|\begin{array}{l} \mid O \\ \hline \mathbf{O} \\ \text { O} \end{array}\right\|$ | $\stackrel{\rightharpoonup}{\circ}$ | ＋ |
|  | $\begin{gathered} N \\ N \\ \underset{\sim}{n} \end{gathered}$ | $\left.\begin{aligned} & \infty \\ & \infty \\ & \underset{n}{\infty} \\ & \underset{N}{2} \end{aligned} \right\rvert\,$ | $\begin{gathered} \underset{0}{0} \\ \underset{\sim}{n} \\ \end{gathered}$ | $\begin{aligned} & 0 \\ & \\ & 0 \\ & 0 \\ & -1 \end{aligned}$ | $\begin{aligned} & n \\ & \stackrel{0}{n} \\ & \hat{0} \\ & 0 \end{aligned}$ | $\begin{aligned} & \stackrel{\sim}{n} \\ & \underset{\sim}{n} \\ & \underset{N}{2} \end{aligned}$ |  | $\begin{aligned} & \hat{N} \\ & \infty \\ & \underset{\sim}{n} \\ & \hline \end{aligned}$ |  | $\left\|\begin{array}{c} \hat{0} \\ \hat{n} \\ \underset{\sim}{j} \end{array}\right\|$ |  | $\left\|\begin{array}{c} 0 \\ \sim \\ 0 \\ n_{n} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ \underset{\sim}{n} \\ 0 \end{array} \right\rvert\,$ |  | 0 |  | $$ | $\left.\begin{gathered} 0 \\ \hat{N} \\ \underset{\sigma}{*} \end{gathered} \right\rvert\,$ | $\begin{gathered} \vec{~} \\ \underset{\sim}{n} \\ \hline \end{gathered}$ | $\begin{aligned} & 0 \\ & n \\ & n_{2} \\ & n_{2} \end{aligned}$ | $\left(\left.\begin{array}{c} 0 \\ \\ \infty \\ \infty \end{array} \right\rvert\,\right.$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\mathrm{N}} \\ & \stackrel{\mathrm{~N}}{2} \end{aligned}$ | $\begin{aligned} & 0 \\ & n_{2} \\ & \sigma_{1} \end{aligned}$ | $\left(\begin{array}{l} \underset{N}{n} \\ \underset{\sim}{2} \end{array}\right.$ | $\left\|\begin{array}{c} 2 \\ n \\ n_{n}^{0} \\ \hline \end{array}\right\|$ | $\begin{aligned} & \mid c \\ & 0 \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ \mathrm{~m} \end{array}$ | $$ | \|ঞ̆ | $\left.\begin{array}{\|c\|} \hline 0 \\ \underset{i}{n} \\ i \end{array} \right\rvert\,$ | $\begin{array}{\|l\|} \hline \infty \\ 0 \\ \hline \end{array}$ | $\left\lvert\, \begin{array}{\|c\|} \hline 0 \\ \hline \end{array}\right.$ | $\vec{\sim}$ | $\hat{\exists}$ | ถ | $\begin{array}{\|c\|c\|} \hline \stackrel{\sim}{n} \\ \hline \end{array}$ | crin |
|  | $\left\|\begin{array}{c} 0 \\ N \\ N \\ \underset{0}{3} \\ \hline \end{array}\right\|$ | $\begin{array}{\|c\|} \hline 0 \\ \underset{\sim}{i} \\ \text { on } \end{array}$ |  |  |  | $\left\|\begin{array}{c} N_{0} \\ 0 \\ 0 \\ \underset{\sim}{N} \\ \underset{N}{2} \end{array}\right\|$ | $\begin{array}{\|c\|} \hline 9 \\ \\ \tilde{y} \\ \underset{\sim}{n} \\ \hline \end{array}$ |  | $\left. \right\rvert\,$ |  | $\begin{array}{\|c\|} \hline 0 \\ \mathbf{N} \\ 0 \\ 0 \\ 0 \\ - \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ \infty \\ \stackrel{\infty}{7} \\ \underset{\sim}{c} \\ \mid \end{array}$ | $\left\|\begin{array}{c} \infty \\ \underset{\sim}{2} \\ \underset{\sim}{\sim} \\ \underset{\sim}{2} \end{array}\right\|$ |  | 放 |  | $\begin{array}{\|c\|} \hline \hat{0} \\ - \\ 0 \\ \hline 0 \\ \hline \end{array}$ | O <br> 0 <br> 0 <br> 0 <br> in | $\begin{aligned} & \infty \\ & e_{0} \\ & \infty \\ & \infty \\ & \infty \end{aligned}$ |  |  | $\left\lvert\, \begin{gathered} \underset{n}{n} \\ \underset{n}{7} \\ \underset{m}{2} \end{gathered}\right.$ | $\begin{array}{\|c} \underset{\sim}{2} \\ \underset{N}{2} \\ \underset{N}{2} \end{array}$ | $\left\lvert\, \begin{gathered} \infty \\ \substack{0 \\ 0 \\ 0 \\ 0 \\ 1} \end{gathered}\right.$ | $\left\|\begin{array}{l} 0 \\ 0 \\ \hat{0} \\ \underset{\sim}{n} \\ m \end{array}\right\|$ | $\begin{aligned} & \mathrm{N} \\ & \underset{\sim}{j} \\ & \underset{\sim}{2} \end{aligned}$ | $\left\|\begin{array}{l} 0 \\ \infty \\ 0 \\ 0 \\ 0 \\ \hline \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline \hat{0} \\ 0 \\ 0 \\ \hline \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline 9 \\ \infty \\ \vec{~} \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} n \\ \infty \\ \\ \end{array}\right\|$ | $\begin{gathered} N \\ \underset{\sim}{N} \end{gathered}$ | $\begin{array}{\|c\|} \underset{\sim}{\tilde{f}} \\ \underset{\sim}{2} \end{array}$ |  |  | $\mid \underset{\sigma}{\infty}$ | $\cdots$ | c｜ |
|  | $\begin{array}{\|c\|} \underset{\sim}{7} \\ \underset{\sim}{0} \\ 0 \\ \underset{\sim}{n} \\ \underset{\sim}{2} \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ n_{n} \\ \omega_{0} \\ 0 \\ \hline \end{array}$ |  | $\left\|\begin{array}{c} \underset{N}{N} \\ 0 \\ 0_{n} \\ n_{0} \\ 0 \end{array}\right\|$ | $\begin{gathered} o \\ n \\ N \\ n \\ n_{n} \\ z_{1} \end{gathered}$ |  | $\left.\begin{array}{\|l\|} \hline \mathrm{n} \\ \\ \mathrm{~N} \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,$ |  | $\left.\begin{array}{\|c\|} \hline \vec{N} \\ \hat{N} \\ \underset{\sim}{n} \\ 0 \\ 0 \\ \infty \end{array} \right\rvert\,$ |  |  |  |  |  | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ \infty \\ \hat{e} \\ 0 \end{array}$ | O |  |  |  |  |  |  |  | $\begin{gathered} \sim \\ \underset{\sim}{\infty} \\ \underset{\sim}{n} \\ \underset{\sim}{N} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{array}{\|c\|} \hline \stackrel{y}{n} \\ \hat{N} \\ 0 \\ 0 \\ 0 \\ i \\ \hline \end{array}$ |  |  | $\begin{array}{\|c\|} \hline 0 \\ \tilde{N} \\ 0 \\ \vdots \\ \vdots \\ \tilde{d} \end{array}$ |  | $\begin{array}{\|c\|} \hline \hat{0} \\ 0 \\ 0 \\ 0 \\ 0 \\ \vdots \\ 0 \\ \hline \end{array}$ |  |  | $\left\|\begin{array}{c} \tilde{\sim} \\ 0 \\ 0 \\ 0 \\ 0 \\ \underset{i}{2} \end{array}\right\|$ |  | $\left.\begin{array}{\|c} \underset{\sim}{2} \\ 0 \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,$ |  |  |
|  | $\left(\begin{array}{l} 0 \\ y \\ y \\ 3 \\ 0 \end{array}\right.$ | $\left\|\begin{array}{c} 0 \\ i \\ y \\ y \\ 0 \\ i \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ n \\ v \\ 0 \\ 0 \\ -1 \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ \underset{\sim}{y} \\ y \\ 0 \\ 0 \\ \underset{\sim}{2} \end{array}\right\|$ |  |  | $\left\|\begin{array}{c} 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ o \\ y \\ y \\ 0 \\ 0 \\ n \end{array}\right\|$ |  | $\left\|\begin{array}{l} 8 \\ 0 \\ y \\ y \\ 0 \\ u \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ \hat{u} \\ y \\ y \\ 0 \\ 0 \\ n \end{array}\right\|$ | $\left(\begin{array}{l} 8 \\ 0 \\ y \\ y \\ 0 \\ 0 \end{array}\right]$ | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \end{array}\right\|$ |  | $\left\|\begin{array}{l} o n \\ \hat{n} \\ y \\ 0 \\ 0 \\ \end{array}\right\|$ | $\left\lvert\, \begin{aligned} & 0 \\ & 0 \\ & y \\ & y \\ & 0 \\ & \end{aligned}\right.$ | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ y \\ 0 \\ \infty \\ \infty \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ y \\ y \\ 0 \\ \infty \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ v \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ \underset{~}{7} \\ v \\ 0 \\ 0 \\ 0 \\ \hline \end{array}\right\|$ |  | $\left\lvert\, \begin{gathered} 0 \\ \underset{\sim}{2} \\ y \\ 0 \\ \underset{\sim}{2} \end{gathered}\right.$ |  |  | $\left\|\begin{array}{l} 0 \\ \hline 0 \\ \underset{N}{v} \\ y \\ 0 \\ 0 \\ \underset{\sim}{2} \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ \hat{N} \\ v \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ \hline 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ i \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ 0 \\ v \\ y \\ 0 \\ 0 \\ 0 \\ \hline \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ \hline 0 \\ \underset{y}{c} \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ h \\ y \\ 0 \\ 0 \\ 9 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  | $\left\|\begin{array}{l} 0 \\ O \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ \vdots \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ -1 \\ y \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\begin{aligned} & 1 \\ & \hline \end{aligned}$ |  |

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:All seasons Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date：12DEC16
Scenario：Comparison 745（d）Schedule：E1 ：E1 2018 vs．ETOUC 2018 Season：All seasons Climate：MODERATE NEM／non－NEM：non－NEM

|  | $\begin{gathered} 0 \\ \underset{\sim}{0} \\ 0 \\ 0 \\ i \end{gathered}$ |  | $\left\lvert\, \begin{gathered} 0 \\ \underset{\sim}{0} \\ 0 \\ 0 \\ 1 \end{gathered}\right.$ | $\begin{gathered} o ̊ \\ \underset{\sim}{\lambda} \\ \vdots \\ i \end{gathered}$ |  | $\left\lvert\, \begin{gathered} \substack{0 \\ N \\ \vdots \\ i \\ i} \end{gathered}\right.$ | $\left\lvert\, \begin{gathered} \circ \\ \underset{\sim}{0} \\ \underset{o}{0} \end{gathered}\right.$ | $\left\lvert\, \begin{gathered} \circ \\ \stackrel{y}{4} \\ 0 \\ 0 \end{gathered}\right.$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{aligned} & \hline \stackrel{\rightharpoonup}{\mathrm{m}} \\ & \mathrm{O} \\ & \mathrm{~N} \end{aligned}$ | $\left\lvert\, \begin{gathered} \circ \\ \underset{\sim}{2} \\ \underset{\sim}{i} \end{gathered}\right.$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \stackrel{i}{\mathrm{~N}} \end{gathered}\right.$ |  | $\left\lvert\, \begin{aligned} & \infty \\ & \infty \\ & \underset{1}{1} \\ & \dot{m} \end{aligned}\right.$ |  | $\begin{array}{\|l\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \hline 0 \\ m \\ m \end{array}$ |  | $\left\lvert\, \begin{gathered} \hline \stackrel{\rightharpoonup}{+} \\ \underset{\sim}{n} \\ \hline \end{gathered}\right.$ |  |  | $\begin{array}{\|c\|} \hline \stackrel{0}{0} \\ \infty \\ 0 \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{0}{0} \\ \underset{\sim}{3} \\ \stackrel{i}{1} \\ \hline \end{array}$ | $\left\lvert\, \begin{gathered} \text { ò } \\ \underset{\sim}{n} \\ \underset{i}{2} \end{gathered}\right.$ | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{n} \\ \stackrel{i}{1} \end{gathered}$ |  |  | $\left\lvert\, \begin{gathered} \hline \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \hline \end{gathered}\right.$ | $\begin{gathered} \hline \stackrel{y}{n} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{gathered} \hline \stackrel{0}{0} \\ 0 \\ \underset{\sim}{n} \\ \underset{N}{2} \end{gathered}$ |  |  | $\left\lvert\, \begin{gathered} \stackrel{2}{\mathrm{~N}} \\ \underset{N}{N} \\ \underset{N}{2} \end{gathered}\right.$ |  | $$ | ò | $\begin{aligned} & \hline \stackrel{\rightharpoonup}{\circ} \\ & \substack{0 \\ 0 \\ 0 \\ 0} \end{aligned}$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\begin{gathered} \underset{\sim}{n} \\ \underset{\sim}{2} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{gathered} \underset{\sim}{n} \\ \vdots \\ \cdots \\ \cdots \end{gathered}$ | $\begin{aligned} & n \\ & \cdots \\ & \vdots \\ & \vdots \\ & \cdots \end{aligned}$ | $\begin{gathered} 2 \\ n \\ \vdots \\ 0 \\ \cdots \\ n \end{gathered}$ | $\begin{array}{\|c} \overparen{\sigma} \\ \underset{-}{2} \\ 0 \\ \underset{\sim}{2} \end{array}$ | $\left\|\begin{array}{l} 9 \\ \underset{-}{0} \\ -i \end{array}\right\|$ | $\left\|\begin{array}{l} n \\ n \\ 0 \\ n \end{array}\right\|$ | $\mid$ | $\begin{gathered} m \\ \underset{\sim}{n} \\ \underset{n}{n} \end{gathered}$ | $\left\|\begin{array}{l} n \\ \infty \\ i \\ n \end{array}\right\|$ | $\left\lvert\,\right.$ | $\left\|\begin{array}{c} -1 \\ n \\ \underset{\sim}{n} \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ n \\ n \end{array}\right\|$ | $\left\|\begin{array}{c} \mathbf{0} \\ \mathbf{u} \\ \dot{n} \end{array}\right\|$ | $\left\|\begin{array}{l} \vec{~} \\ \vec{e} \\ \hat{n} \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} -\infty \\ 0 \\ \vdots \\ - \end{array}\right\|$ | $\left\|\begin{array}{l} \hat{N} \\ \hat{0} \\ \dot{n} \end{array}\right\|$ | $\begin{aligned} & \text { in } \\ & \text { in } \end{aligned}$ | $$ | $\left\lvert\, \begin{aligned} & \infty \\ & \underset{\sim}{n} \\ & \underset{\sim}{2} \end{aligned}\right.$ | $\begin{array}{r} 0 \\ 0 \\ 0 \\ 0 \\ n \\ n \end{array}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \underset{N}{n} \\ & \underset{n}{2} \end{aligned}$ |  | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ -1 \\ \sqrt{2} \\ \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{0}{N} \\ \underset{N}{2} \\ \underset{N}{2} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{array}$ | $\begin{aligned} & 0 \\ & n \\ & \tilde{n} \\ & \tilde{n} \\ & \underset{\sim}{n} \\ & n \end{aligned}$ | $\begin{aligned} & 0 \\ & + \\ & \infty \\ & 0 \\ & \underset{\sim}{n} \\ & N \end{aligned}$ | $\begin{aligned} & 0 \\ & 6 \\ & 0 \\ & \infty \\ & \underset{\sim}{n} \\ & \end{aligned}$ |  | $\begin{aligned} & 0 \\ & \infty \\ & 0 \\ & \vdots \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  | $\begin{aligned} & \underset{\sim}{2} \\ & \underset{\sim}{2} \\ & \underset{\sim}{n} \end{aligned}$ |  | $\begin{aligned} & \hline \widehat{0} \\ & 0 \\ & \dot{0} \\ & 0 \\ & 0 \\ & -1 \\ & i \end{aligned}$ |  |
|  | $\left.\begin{gathered} 0 \\ m \\ 0 \\ 0 \\ -1 \\ i \end{gathered} \right\rvert\,$ | $\begin{aligned} & n \\ & \infty \\ & n \\ & n \\ & n \\ & n \end{aligned}$ | $\begin{aligned} & \infty \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \text { n } \\ & 0 \\ & n \\ & n \\ & n \end{aligned}$ | $\begin{gathered} 0 \\ \underset{-}{n} \\ \dot{-} \\ - \end{gathered}$ | $\left.\begin{array}{\|c\|} \hline n \\ n \\ n \\ n \\ n \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} \underset{子}{子} \\ \hat{e} \\ \sim \end{array}\right\|$ |  | $\begin{aligned} & \hline n \\ & 0 \\ & \dot{n} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \hat{N} \\ & \underset{N}{0} \\ & \underset{n}{n} \end{aligned}$ | $\left\lvert\, \begin{gathered} \hat{n} \\ o \\ \underset{\sim}{n} \\ \underset{n}{n} \end{gathered}\right.$ | $\begin{array}{\|c\|} \hline n \\ \underset{j}{\dot{n}} \\ \underset{\sim}{n} \\ \hline \end{array}$ | $\begin{aligned} & N \\ & N \\ & \infty \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \end{aligned}$ | $\left\|\begin{array}{c} \underset{\sim}{n} \\ \underset{i}{0} \\ \underset{n}{n} \end{array}\right\|$ | $\left\lvert\, \begin{gathered} n \\ \underset{n}{n} \\ \underset{\sim}{n} \\ -1 \end{gathered}\right.$ |  | $\begin{array}{\|c\|} \hline \stackrel{n}{n} \\ \underset{n}{n} \\ \underset{\sim}{n} \\ \underset{n}{2} \end{array}$ | $\left\lvert\, \begin{gathered} \hat{N} \\ \underset{\sim}{-} \\ \underset{\sim}{n} \\ -N \end{gathered}\right.$ | $\left\|\begin{array}{l} n \\ 0 \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \sim \end{array}\right\|$ |  | $\begin{array}{\|c\|} \hline \stackrel{O}{N} \\ \vec{i} \\ \underset{N}{n} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline n \\ \underset{-}{2} \\ \underset{\sim}{n} \\ \sim \\ \sim \end{array}$ | $$ | $\begin{aligned} & \hline \left.\begin{array}{c} 9 \\ \underset{n}{2} \\ \\ \sim \\ \sim \end{array} \right\rvert\, \end{aligned}$ | $\begin{aligned} & \infty \\ & o \\ & - \\ & \underset{\sim}{f} \\ & \dot{v} \end{aligned}$ | $\begin{array}{\|c\|} \hline \infty \\ \stackrel{+}{+} \\ \infty \\ \infty \\ \sim \\ \sim \end{array}$ | $\begin{gathered} o \\ \underset{\sim}{2} \\ \underset{\sim}{N} \\ \underset{\sim}{n} \end{gathered}$ | $\left\|\begin{array}{c} \underset{-}{7} \\ \underset{\sim}{n} \\ 0 \\ \infty \\ \sim \end{array}\right\|$ | $\begin{gathered} N \\ \underset{\sim}{2} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}$ | $\left\lvert\, \begin{gathered} n \\ n \\ \infty \\ \underset{\sim}{n} \\ - \\ - \\ i \end{gathered}\right.$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ i \\ 0 \\ \vdots \\ -2 \\ i \end{array}$ | $\left.\begin{gathered} 0 \\ \infty \\ n \\ \underset{\sim}{2} \\ \underset{\sim}{2} \\ -i \end{gathered} \right\rvert\,$ |  | $\begin{aligned} & 0 \\ & n \\ & n \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \end{aligned}$ | $\left\|\begin{array}{l} 0 \\ 0 \\ \hat{n} \\ \hat{N} \\ \hat{n} \\ \underset{\sim}{2} \end{array}\right\|$ |  |  |
|  |  |  | $\begin{gathered} \infty \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{aligned} & 0 \\ & n \\ & n \\ & n \end{aligned}$ |  |  | $\begin{array}{\|c} \underset{N}{N} \\ \underset{\sim}{n} \\ \underset{v}{n} \end{array}$ | $\left.\begin{array}{\|c\|} \hline n \\ n \\ n \\ n \end{array} \right\rvert\,$ | $\left\lvert\, \begin{gathered} \underset{N}{N} \\ \underset{\sim}{2} \\ \underset{\sim}{n} \end{gathered}\right.$ |  | $\left\lvert\, \begin{aligned} & \underset{-}{7} \\ & \infty \\ & \underset{\sim}{7} \\ & \underset{\sim}{n} \end{aligned}\right.$ | $\begin{array}{\|c\|} \hline n \\ n \\ \vec{n} \\ \underset{n}{n} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline-\underset{N}{2} \\ \dot{J} \\ \underset{\sim}{n} \\ \vec{n} \end{array}$ | $\begin{gathered} n \\ n \\ n \\ n \\ n \\ n \end{gathered}$ | $\begin{array}{\|c\|} \hline \stackrel{o}{N} \\ \stackrel{1}{2} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{array}$ | $$ | $\begin{array}{\|c\|} \hline \stackrel{n}{n} \\ \dot{6} \\ 9 \\ \vec{n} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{n}{n} \\ \dot{o} \\ \underset{\sim}{n} \\ \hat{n} \end{array}$ | $\left\|\begin{array}{l} n \\ \underset{n}{2} \\ \underset{\sim}{n} \\ \underset{N}{n} \end{array}\right\|$ | $$ | $\begin{array}{\|c\|} \hline \underset{\sim}{0} \\ \underset{\sim}{0} \\ \underset{\sim}{n} \\ \sim \end{array}$ | $\begin{array}{\|c\|} \hline \underset{~}{\underset{~}{2}} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{array}$ | $\begin{gathered} 2 \\ \hat{n} \\ n \end{gathered}$ | $\begin{aligned} & \underset{\sim}{9} \\ & \dot{\sim} \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \end{aligned}$ |  | $\begin{array}{\|c\|} \hline n \\ \underset{n}{n} \\ n \\ - \\ \sim \end{array}$ |  | $\begin{gathered} \hat{0} \\ \dot{1} \\ \underset{o}{0} \\ 0 \\ -i \\ i \end{gathered}$ | $\begin{gathered} \underset{\sim}{n} \\ \underset{n}{2} \\ \underset{N}{2} \\ \underset{\sim}{n} \end{gathered}$ | $\left\lvert\, \begin{gathered} n \\ \underset{\sim}{\infty} \\ \infty \\ n \\ - \\ \underset{n}{2} \end{gathered}\right.$ | $\begin{gathered} n \\ 0 \\ \infty \\ \infty \\ - \\ -1 \end{gathered}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ \underset{y}{n} \\ \vdots \\ n \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \vdots \\ n \end{array}$ | $\begin{aligned} & \hat{n} \\ & 0 \\ & 0 \\ & \underset{N}{n} \\ & \tilde{n} \\ & \cdots \end{aligned}$ | $$ | $\left\|\begin{array}{c} -1 \\ 0 \\ \dot{0} \\ \underset{\sim}{2} \\ 0 \\ 0 \\ \sim \end{array}\right\|$ |  |
|  | N | N | $\underset{\sim}{N}$ | $\begin{array}{\|c} \hline 0 \\ \underset{7}{2} \end{array}$ | $\left.\begin{array}{\|l\|} \hline \stackrel{\rightharpoonup}{N} \end{array} \right\rvert\,$ | $\stackrel{N}{N}$ | $$ | $\left\lvert\, \begin{aligned} & n \\ & n \\ & m \end{aligned}\right.$ | $\underset{\sim}{\sim}$ | $\frac{\pi}{J}$ | \|ㄱN | $$ | $\underset{N}{\underset{N}{2}}$ | $\frac{\pi}{\hat{6}}$ | $\underset{N}{\sim}$ | $\stackrel{+}{\mathrm{N}}$ | $\underset{\substack{\text { N } \\ \hline \\ \hline}}{ }$ | $\underset{\infty}{\stackrel{N}{N}}$ | $\stackrel{ু}{\mathrm{G}}$ | $\begin{aligned} & \mathrm{J} \\ & \mathrm{O} \\ & \mathrm{i} \end{aligned}$ | $\left.\begin{aligned} & 6 \\ & \underset{-}{2} \\ & -i \end{aligned} \right\rvert\,$ | $\begin{gathered} \underset{\sim}{\mathrm{N}} \\ \underset{\sim}{2} \end{gathered}$ | $\underset{-}{\stackrel{\rightharpoonup}{2}}$ | $\begin{aligned} & \infty \\ & \underset{寸}{+} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{aligned} & n \\ & 0 \\ & 6 \\ & i \end{aligned}$ | $\begin{aligned} & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \underset{N}{2} \\ & \sim \end{aligned}$ | $\begin{aligned} & \underset{N}{N} \\ & \underset{n}{n} \end{aligned}$ | $\begin{aligned} & \infty \\ & \underset{-}{n} \\ & n \\ & n \end{aligned}$ | $\begin{aligned} & n \\ & 0 \\ & \underset{\sim}{f} \\ & \hline \end{aligned}$ | $\begin{gathered} n \\ \tilde{v} \\ \stackrel{y}{n} \end{gathered}$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\begin{gathered} \underset{~}{~} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{aligned} & \hat{0} \\ & \underset{\infty}{\infty} \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \hline \stackrel{N}{\underset{~}{j}} \\ \underset{\sim}{2} \end{array}$ | $\begin{aligned} & 9 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |
|  | $\begin{aligned} & o \\ & o े \\ & \vdots \\ & \vdots \\ & i \end{aligned}$ | $\left\lvert\, \begin{aligned} & 0 \\ & \stackrel{0}{2} \\ & \hat{n} \\ & n \end{aligned}\right.$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \stackrel{y}{n} \\ & \end{aligned}$ | $\begin{aligned} & \substack{0 \\ o \\ \infty \\ \underset{\sim}{1} \\ \text { n }} \end{aligned}$ | $\begin{gathered} \substack{\circ \\ \underset{~}{-1} \\ o \\ \text { N }} \end{gathered}$ |  | $\begin{gathered} \hline \stackrel{\circ}{\circ} \\ \underset{\sim}{n} \\ \underset{m}{2} \end{gathered}$ |  |  |  |  | $\begin{array}{\|c\|} \hline \stackrel{0}{0} \\ \dot{b} \\ \underset{\sim}{n} \end{array}$ |  | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{-}{2} \\ -i \end{gathered}\right.$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{\lambda} \\ \stackrel{1}{n} \\ \infty \end{array}$ | $$ |  | $\begin{gathered} \circ \\ \stackrel{\circ}{f} \\ \underset{\sim}{2} \end{gathered}$ |  | $\begin{array}{\|c\|} \hline \stackrel{y}{0} \\ \underset{n}{n} \\ \dot{n} \\ \hline \end{array}$ | $\begin{aligned} & 0 \\ & \infty \\ & \infty \\ & \infty \\ & \dot{0} \\ & 0 \end{aligned}$ |  |  | $\begin{aligned} & \text { ol } \\ & \text { on } \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \underset{\sim}{2} \\ & \dot{\Omega} \end{aligned}$ |  |  | $\begin{aligned} & \text { ò } \\ & 0 \\ & 0 \\ & \text { gi } \end{aligned}$ | $\begin{aligned} & \text { oे } \\ & \infty \\ & \dot{\infty} \\ & \dot{\Omega} \end{aligned}$ | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{y}{2} \\ \dot{\Omega} \end{gathered}$ | oे̀ | $\begin{aligned} & \text { ờ } \\ & \stackrel{1}{\alpha} \\ & \dot{\Omega} \end{aligned}$ |  | $\begin{aligned} & \text { oे } \\ & \text { ू̀ } \\ & \text { ूi } \end{aligned}$ |  | $\begin{aligned} & \text { oे } \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & -1 \end{aligned}$ |  |
|  | $\begin{aligned} & \text { ồ } \\ & 0 \\ & \vdots \\ & i \\ & i \end{aligned}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \stackrel{n}{n} \\ & \underset{i}{n} \end{aligned}$ | $\left\lvert\, \begin{aligned} & \stackrel{\rightharpoonup}{2} \\ & \stackrel{\rightharpoonup}{\lambda} \\ & n \end{aligned}\right.$ | $\begin{array}{\|c}  \\ \hline 0 \\ 0 \\ 0 \\ \text { ni } \end{array}$ | $\begin{aligned} & \stackrel{0}{\mathrm{~N}} \\ & \underset{\sim}{\mathrm{~N}} \end{aligned}$ | $\left\lvert\, \begin{gathered} -\infty \\ \infty \\ \underset{\sim}{0} \\ \infty \\ \infty \end{gathered}\right.$ | $\begin{array}{\|c\|} \hline \stackrel{0}{\wedge} \\ \stackrel{1}{\wedge} \\ \infty \end{array}$ | $\stackrel{\stackrel{\rightharpoonup}{\circ}}{\stackrel{\rightharpoonup}{N}} \underset{\infty}{\infty}$ |  |  | $\begin{aligned} & \\ & \hline \stackrel{0}{\circ} \\ & \dot{0} \\ & \dot{0} \end{aligned}$ | $\left.\begin{array}{\|l\|} \hline \stackrel{\circ}{0} \\ \hat{n} \\ \hat{n} \\ \hline \end{array} \right\rvert\,$ |  | $\begin{aligned} & \\ & \hline 0 \\ & \infty \\ & \infty \\ & n \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{n} \\ \stackrel{\rightharpoonup}{n} \\ \underset{~ n}{2} \\ \hline \end{array}$ | $$ | $\begin{array}{\|l\|} \hline \stackrel{\rightharpoonup}{0} \\ \stackrel{\rightharpoonup}{\lambda} \\ \dot{N} \end{array}$ | $\begin{gathered} 20 \\ \underset{N}{N} \\ \underset{i}{ } \end{gathered}$ |  |  |  | $\begin{array}{\|c\|} \hline \stackrel{\circ}{0} \\ \stackrel{\rightharpoonup}{\circ} \\ 0 \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{0}{n} \\ \hat{n} \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ \hline 0 \\ \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ \vdots \\ 0 \\ 0 \end{array}$ | $\left\lvert\, \begin{gathered} 0 \\ \stackrel{0}{0} \\ \stackrel{y}{0} \\ 0 \end{gathered}\right.$ | $\begin{aligned} & 0 \\ & \stackrel{\rightharpoonup}{-1} \\ & -1 \\ & 0 \end{aligned}$ | 응 | 은 | $\begin{aligned} & 1 \\ & o े \\ & \vdots \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 1 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline 0 \\ \stackrel{-1}{0} \\ 0 \\ 0 \end{array}$ | 응 |  | － |
|  | $\left\lvert\, \begin{aligned} & \infty \\ & \underset{+}{2} \\ & \underset{-}{2} \end{aligned}\right.$ |  | $\left\lvert\, \begin{aligned} & \underset{\sim}{n} \\ & \underset{\sim}{x} \\ & e^{2} \end{aligned}\right.$ | $\begin{array}{\|c} n \\ 8 \\ \text { n } \\ \text { nn } \end{array}$ | $\begin{aligned} & \text { og } \\ & \underset{N}{N} \\ & \underset{i}{2} \end{aligned}$ | $\left\|\begin{array}{c} 0 \\ 0 \\ \underset{\infty}{2} \\ i \end{array}\right\|$ |  | $\left\lvert\, \begin{aligned} & \underset{\lambda}{-7} \\ & \underset{\sim}{n} \\ & \infty \end{aligned}\right.$ | $\left\lvert\, \begin{gathered} \underset{n}{n} \\ \underset{\sim}{2} \\ 0 \\ \infty \end{gathered}\right.$ | $\begin{aligned} & \infty \\ & \underset{\sim}{\infty} \\ & \underset{N}{n} \end{aligned}$ | $\begin{array}{\|c\|} \hline \infty \\ \underset{\sim}{8} \\ \underset{\sim}{6} \end{array}$ | $\left\|\begin{array}{l} \stackrel{n}{2} \\ \underset{\sim}{2} \\ \dot{n} \end{array}\right\|$ |  | $\left\|\begin{array}{l} \infty \\ 0 \\ 0 \\ n \\ n \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline \\ \infty \\ 0 \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\begin{aligned} & \mathrm{N} \\ & \stackrel{0}{n} \\ & \stackrel{n}{N} \end{aligned}$ | $\begin{aligned} & n \\ & \text { n } \\ & \hat{n} \\ & 0 \\ & \end{aligned}$ | $\begin{aligned} & \sim \\ & \tilde{n} \\ & 0 \\ & \vdots \\ & \end{aligned}$ | $\left.\begin{gathered} \infty \\ 0 \\ 0 \\ n \\ n \end{gathered} \right\rvert\,$ | $\left\|\begin{array}{l} 9 \\ \underset{\infty}{\infty} \\ 0 \\ 0 \end{array}\right\|$ | $\begin{aligned} & \underset{\sim}{n} \\ & m \\ & - \\ & - \end{aligned}$ | $\begin{aligned} & \hat{0} \\ & \hat{N} \\ & \hat{n} \end{aligned}$ | $\left\lvert\, \begin{aligned} & 6 \\ & \underset{\sim}{n} \\ & \text { ni } \end{aligned}\right.$ | $\begin{array}{\|l\|} \hline 0 \\ n \\ n \\ n \end{array}$ | $\left\lvert\, \begin{aligned} & \infty \\ & N \\ & \infty \\ & \infty \end{aligned}\right.$ | $\begin{aligned} & \hat{N} \\ & \hat{n} \\ & \underset{N}{2} \end{aligned}$ | $$ | No | $\hat{N}$ | in | $\underset{\sim}{\infty}$ | $\stackrel{\substack{7 \\ 7}}{ }$ | $\begin{array}{\|c\|} \hline 0 \\ \hline \end{array}$ | ¢ | m | $\bigcirc$ | N |
|  | $\begin{aligned} & N \\ & \infty \\ & -1 \\ & N \\ & N \end{aligned}$ | $\left\lvert\, \begin{aligned} & n \\ & \underset{\alpha}{n} \\ & s_{2} \\ & \underset{\sim}{n} \end{aligned}\right.$ | $\begin{aligned} & \hat{N} \\ & 0 \\ & \hat{N} \\ & \underset{\gamma}{2} \end{aligned}$ | $\begin{aligned} & -7 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \underset{1}{n} \\ & \underset{\sim}{n} \\ & \underset{\sim}{\sim} \\ & \infty \end{aligned}$ | $\begin{aligned} & \infty \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \vdots \\ & \sigma \end{aligned}$ | $\begin{array}{\|c\|} \hline 0 \\ \infty \\ -i \\ \tilde{n} \\ 0 \\ -i \end{array}$ | $\left\lvert\, \begin{gathered} o \\ \underset{N}{n} \\ \infty \\ \underset{\sim}{0} \\ 0 \\ i \end{gathered}\right.$ | $\left\lvert\, \begin{aligned} & \mathrm{N} \\ & \mathrm{~N} \\ & \hat{N} \\ & \hat{0} \\ & \sigma \end{aligned}\right.$ | $\begin{aligned} & \hline \\ & \infty \\ & \underset{\sim}{N} \\ & \underset{\infty}{N} \end{aligned}$ | $\begin{aligned} & 9 \\ & \stackrel{9}{2} \\ & -7 \\ & \underset{\sim}{0} \end{aligned}$ | $\left\|\begin{array}{c} 9 \\ 4 \\ 10 \\ -19 \\ 0 \end{array}\right\|$ | $\begin{array}{\|l\|} \hline 8 \\ 0 \\ 0 \\ \text { in } \\ \text { in } \end{array}$ | $\left\lvert\, \begin{gathered} \underset{\sim}{2} \\ \underset{7}{n} \\ \underset{y}{2} \end{gathered}\right.$ | $\begin{array}{\|l\|} \hline 8 \\ \infty \\ \infty \\ \underset{n}{n} \end{array}$ | $\begin{array}{\|c\|} \hline- \\ \underset{\sim}{n} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{array}$ | $\left\lvert\, \begin{gathered} \underset{\sim}{n} \\ \underset{\sim}{n} \\ \underset{\sim}{j} \\ \sim \end{gathered}\right.$ | $\begin{aligned} & \underset{\sim}{n} \\ & \underset{\sim}{1} \\ & \underset{N}{n} \\ & \hline \end{aligned}$ |  | $\left\lvert\, \begin{aligned} & 0 \\ & 0 \\ & \infty \\ & - \\ & \underset{\sim}{2} \\ & \text { N } \end{aligned}\right.$ | $\begin{array}{\|c\|} \hline n \\ 0 \\ 0 \\ 0 \\ 0 \\ \underset{-}{2} \end{array}$ | $\left\lvert\, \begin{aligned} & \Omega_{2} \\ & \underset{\sim}{2} \\ & n \\ & n \end{aligned}\right.$ | $\begin{aligned} & 9 \\ & \underset{\sim}{n} \\ & \underset{0}{2} \end{aligned}$ | $\left\lvert\, \begin{aligned} & \underset{\sim}{2} \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \end{aligned}\right.$ | $n$ $n$ $n$ $n$ $\Omega$ | O g g m | $\begin{aligned} & \underset{N}{N} \\ & \underset{\sim}{N} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & N \\ & \underset{N}{1} \\ & \underset{N}{2} \end{aligned}$ |  | $1 \begin{aligned} & \theta_{0} \\ & \infty \\ & \alpha_{0} \end{aligned}$ | $\begin{aligned} & {\underset{7}{2}}^{n} \\ & \dot{N} \end{aligned}$ | $\begin{aligned} & 0 \\ & \infty \\ & \infty \\ & i \end{aligned}$ | $\begin{aligned} & n \\ & \lambda \\ & N \\ & \lambda \end{aligned}$ | $\begin{array}{\|c\|} \hline \infty \\ \text { ¢ } \end{array}$ | $\begin{aligned} & \hline \text { প্ } \end{aligned}$ |  |  |
|  |  |  | $\infty$ 0 $\underset{N}{2}$ $\underset{N}{n}$ $n$ $n$ $n$ $n$ |  |  |  |  | $\begin{aligned} & \hat{N} \\ & \underset{\sim}{n} \\ & \underset{\sim}{n} \\ & \hat{n} \\ & n \\ & n \\ & 0 \\ & n \end{aligned}$ |  |  |  |  | $\left\lvert\, \begin{aligned} & 0 \\ & \underset{\sim}{n} \\ & 0 \\ & N \\ & N \\ & n \\ & \tilde{m} \end{aligned}\right.$ |  |  |  |  |  |  | $\begin{aligned} & \overrightarrow{-} \\ & 0 \\ & 0 \\ & \underset{\sim}{2} \\ & \underset{-}{2} \\ & \underset{\sim}{\lambda} \end{aligned}$ | $\begin{gathered} n \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ n \\ n \\ n \end{gathered}$ |  | $\left\lvert\, \begin{gathered} N \\ 0 \\ 0 \\ 0 \\ \underset{n}{n} \\ \underset{\sim}{n} \\ \infty \end{gathered}\right.$ | $\begin{aligned} & \underset{\sim}{n} \\ & \underset{N}{n} \\ & n \\ & n \\ & n \\ & 0 \end{aligned}$ | $\begin{gathered} o \\ \underset{n}{n} \\ \underset{\sim}{n} \\ m \\ 0 \\ 0 \\ -1 \end{gathered}$ | $\begin{gathered} \hat{c} \\ n \\ -2 \\ n \\ \hat{0} \\ \end{gathered}$ |  |  |  |  |  |  |  |  | $\left\lvert\, \begin{aligned} & \underset{7}{7} \\ & \overrightarrow{2} \\ & -7 \\ & n \\ & n \\ & n \end{aligned}\right.$ |  |  |
|  |  | $\left.\begin{gathered} O \\ 0 \\ -1 \\ y \\ 1 \\ 0 \\ n \end{gathered} \right\rvert\,$ | $\begin{gathered} 0 \\ r \\ r \\ y \\ 0 \\ 0 \\ \underset{r}{2} \end{gathered}$ |  |  | $\left\|\begin{array}{c} \mathrm{O} \\ \underset{n}{2} \\ y \\ 0 \\ \underset{\sim}{n} \\ \sim \end{array}\right\|$ | $\left\lvert\, \begin{gathered} o \\ \hline 0 \\ M \\ y \\ \vdots \\ \hline \\ \hline \end{gathered}\right.$ |  |  |  |  | $\left\|\begin{array}{l} 8 \\ 0 \\ y \\ y \\ 0 \\ \hat{H} \end{array}\right\|$ | $\left\lvert\, \begin{array}{l\|} \hline 0 \\ 0 \\ 0 \\ y \\ 1 \\ 8 \\ \hline \end{array}\right.$ |  |  |  |  |  | $\left.\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & -1 \\ & 1 \\ & 1 \\ & 8 \\ & 0 \\ & 0 \end{aligned} \right\rvert\,$ | $1000-<1100$ |  | $1200-<1300$ | $1300-<1400$ | $1400-<1500$ | $1500-<2000$ |  | $\mathfrak{c}$ | $3000-<3500$ | $\begin{aligned} & \mathrm{O} \\ & \mathrm{O} \\ & \hline \\ & + \\ & y \\ & y \\ & \mathrm{O} \\ & \mathrm{O} \\ & \mathrm{~m} \end{aligned}$ |  | $\begin{aligned} & \mathrm{O} \\ & \hline 0 \\ & 0 \\ & 1 \\ & 1 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & \\ & y \\ & 1 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ y \\ 1 \\ O \\ \hline \\ \hline \end{array}$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  | $\begin{aligned} & \text { I } \\ & \text { O } \\ & \text { I } \\ & 1 \\ & \text { O} \\ & 0 \\ & \hline \mathrm{O} \end{aligned}$ |  |

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:ALL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:MODERATE NEM/non-NEM:non-NEM

Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:HOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:NOTHOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Winter 8 months Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Winter 8 months Climate:MODERATE NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:All seasons Climate:ALL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:All seasons Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:All seasons Climate:HOT NEM/non-NEM:non-NEM

| Monthly <br> Usage <br> Grp(kwh) | Annual Usage kwh | Num Of Months | $\begin{aligned} & \text { Cust Count } \\ & =\text { Num of } \\ & \text { months / } 12 \end{aligned}$ | $\begin{aligned} & \% \text { Of } \\ & \text { Cust } \end{aligned}$ | CUM <br> \% of <br> Cust |  | Monthly <br> E1L 2018 | Monthly <br> Bill <br> ETOUCL 2018 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LOW -< 50 | 297,316 | 15,347 | 1,279 | 0.27\% | 0.27\% | 19 | \$5.46 | \$5.46 | \$0.01 | 0.12\% |
| $50-<100$ | 2,158,643 | 26,964 | 2,247 | 0.47\% | 0.74\% | 80 | \$10.46 | \$10.43 | (\$0.02) | -0.23\% |
| $100-<150$ | 9,335,101 | 72,744 | 6,062 | 1.28\% | 2.02\% | 128 | \$16.35 | \$16.35 | (\$0.01) | -0.04\% |
| $150-200$ | 24,755,972 | 139,565 | 11,630 | 2.45\% | 4.47\% | 177 | \$22.51 | \$22.55 | \$0.04 | 0.18\% |
| $200-250$ | 47,157,524 | 208,511 | 17,376 | 3.66\% | 8.13\% | 226 | \$28.74 | \$28.86 | \$0.12 | 0.42\% |
| $250-300$ | 75,213,908 | 272,555 | 22,713 | 4.78\% | 12.91\% | 276 | \$35.20 | \$35.41 | \$0.21 | 0.60\% |
| $300-350$ | 106,109,996 | 325,808 | 27,151 | 5.72\% | 18.62\% | 326 | \$41.88 | \$42.19 | \$0.31 | 0.74\% |
| $350-400$ | 137,199,478 | 365,508 | 30,459 | 6.41\% | 25.04\% | 375 | \$48.88 | \$49.33 | \$0.44 | 0.91\% |
| $400-450$ | 168,474,609 | 396,225 | 33,019 | 6.95\% | 31.99\% | 425 | \$56.26 | \$56.88 | \$0.61 | 1.09\% |
| $450-500$ | 194,216,124 | 408,899 | 34,075 | 7.17\% | 39.16\% | 475 | \$63.90 | \$64.71 | \$0.81 | 1.27\% |
| $500-550$ | 216,687,869 | 412,831 | 34,403 | 7.24\% | 46.41\% | 525 | \$71.75 | \$72.78 | \$1.03 | 1.44\% |
| $550-<600$ | 228,016,125 | 396,650 | 33,054 | 6.96\% | 53.36\% | 575 | \$79.77 | \$81.04 | \$1.27 | 1.59\% |
| $600-<650$ | 237,357,316 | 379,883 | 31,657 | 6.66\% | 60.03\% | 625 | \$87.80 | \$89.27 | \$1.47 | 1.67\% |
| $650->700$ | 235,352,903 | 348,777 | 29,065 | 6.12\% | 66.15\% | 675 | \$95.89 | \$97.53 | \$1.64 | 1.71\% |
| $700-750$ | 228,638,835 | 315,558 | 26,296 | 5.54\% | 71.68\% | 725 | \$103.96 | \$105.74 | \$1.77 | 1.71\% |
| $750-800$ | 216,252,734 | 279,231 | 23,269 | 4.90\% | 76.58\% | 774 | \$112.09 | \$114.01 | \$1.91 | 1.71\% |
| $800-<850$ | 203,976,903 | 247,419 | 20,618 | 4.34\% | 80.92\% | 824 | \$120.14 | \$122.12 | \$1.98 | 1.65\% |
| $850-<900$ | 182,345,912 | 208,584 | 17,382 | 3.66\% | 84.58\% | 874 | \$128.18 | \$130.27 | \$2.09 | 1.63\% |
| $900-1000$ | 304,169,554 | 321,233 | 26,769 | 5.64\% | 90.22\% | 947 | \$139.88 | \$141.99 | \$2.10 | 1.50\% |
| $1000-<1100$ | 218,254,047 | 208,625 | 17,385 | 3.66\% | 93.88\% | 1,046 | \$155.79 | \$157.65 | \$1.86 | 1.20\% |
| $1100-<1200$ | 149,740,306 | 130,720 | 10,893 | 2.29\% | 96.17\% | 1,146 | \$171.40 | \$172.71 | \$1.31 | 0.76\% |
| $1200-<1300$ | 93,667,292 | 75,233 | 6,269 | 1.32\% | 97.49\% | 1,245 | \$186.69 | \$187.09 | \$0.39 | 0.21\% |
| $1300-<1400$ | 60,859,734 | 45,195 | 3,766 | 0.79\% | 98.29\% | 1,347 | \$202.45 | \$201.53 | (\$0.93) | -0.46\% |
| $1400-<1500$ | 42,891,079 | 29,647 | 2,471 | 0.52\% | 98.81\% | 1,447 | \$218.67 | \$216.56 | (\$2.11) | -0.97\% |
| $1500-2000$ | 93,438,187 | 55,702 | 4,642 | 0.98\% | 99.78\% | 1,677 | \$257.77 | \$251.44 | (\$6.33) | -2.46\% |
| $2000-2500$ | 18,751,706 | 8,575 | 715 | 0.15\% | 99.93\% | 2,187 | \$348.44 | \$330.59 | (\$17.85) | -5.12\% |
| $2500-<3000$ | 6,535,263 | 2,435 | 203 | 0.04\% | 99.98\% | 2,684 | \$455.19 | \$411.49 | (\$43.70) | -9.60\% |
| $3000-<3500$ | 1,767,131 | 551 | 46 | 0.01\% | 99.99\% | 3,206 | \$597.78 | \$506.72 | (\$91.06) | -15.23\% |
| $3500-<4000$ | 805,994 | 216 | 18 | 0.00\% | 99.99\% | 3,731 | \$744.99 | \$595.58 | (\$149.41) | -20.06\% |
| $4000-5000$ | 1,416,346 | 324 | 27 | 0.01\% | 100.00\% | 4,371 | \$889.71 | \$694.76 | (\$194.96) | -21.91\% |
| $5000-<6000$ | 261,517 | 48 | 4 | 0.00\% | 100.00\% | 5,448 | \$1,192.66 | \$871.69 | (\$320.97) | -26.91\% |
| $6000->7000$ | 550,494 | 84 | 7 | 0.00\% | 100.00\% | 6,582 | \$1,448.99 | \$1,057.76 | (\$391.23) | -27.00\% |
| $7000-<8000$ | 178,113 | 24 | 2 | 0.00\% | 100.00\% | 7,421 | \$1,701.21 | \$1,228.07 | (\$473.15) | -27.81\% |
| $9000-10000$ | 116,248 | 12 | 1 | 0.00\% | 100.00\% | 9,687 | \$2,342.00 | \$1,562.87 | (\$779.13) | -33.27\% |
| 10000 - HIGH | 401,924 | 36 | 3 | 0.00\% | 100.00\% | 11,144 | \$2,625.37 | \$1,810.18 | (\$815.19) | -31.05\% |
|  | 3,507,352,206 | 5,699,718 | 474,976 | 100.00\% |  |  |  |  |  |  |

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:MODERATE NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:HOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:NOTHOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Bill Impact Run date：12DEC16
Scenario：Comparison 745（d）Schedule：E1L ：E1L 2018 vs．ETOUCL 2018 Season：Winter 8 months Climate：HOT NEM／non－NEM：non－NEM

|  | ¢ | ＋ | $\stackrel{\substack{2 \\ \underset{\sim}{2}\\}}{ }$ | Bo | $\begin{aligned} & \substack{\infty \\ \\ \\ \hline} \end{aligned}$ | $\stackrel{\substack{0 \\ \hline \\ \underset{\sim}{2} \\ \\ \hline}}{ }$ | Reo | $\stackrel{\substack{0 \\ \\ \\ \\ \hline}}{ }$ |  |  |  | 耪 | $\mathfrak{c}$ | $\mathfrak{c}$ | $\mathfrak{c}$ | $\mathfrak{c}$ | olo | $\mathfrak{c}$ | ol | \|o | $\begin{array}{l\|l} \hline \stackrel{\rightharpoonup}{0} \\ \underset{i}{2} \\ i \end{array}$ | $\begin{gathered} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{2} \\ \underset{1}{2} \\ \hline \end{gathered}$ | ＋io | $\stackrel{\stackrel{1}{0}}{\substack{\text { n } \\ \sim}}$ |  | ¢ |  |  | $\mathfrak{l}$ | $\underset{\substack{\underset{\sim}{N} \\ \underset{N}{N} \\ \underset{N}{n}}}{ }$ |  | $\underset{\substack{\underset{\sim}{2} \\ \underset{\sim}{\infty} \\ \underset{\sim}{1} \\ \hline}}{ }$ |  | ｜c｜ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & 0.0 \\ & 0 \\ & 0 \end{aligned}$ | $0$ | $\begin{array}{\|c} \text { নi} \\ \underset{i}{2} \end{array}$ | $\begin{gathered} c \\ i \\ i \end{gathered}$ |  |  | in |  | $\underset{\sim}{\infty}$ |  |  |  | $0$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{n} \\ i n \\ i n \end{array} \right\rvert\,$ | $\mathfrak{n}$ | $\begin{aligned} & n \\ & n \\ & 0 \\ & 0 \\ & n \end{aligned}$ | $\begin{aligned} & 0 \\ & n \\ & n \\ & i n \end{aligned}$ | $\underset{\substack{2 \\ \underset{\sim}{n} \\ \hline}}{2}$ | $\begin{array}{r} 0 \\ \infty \\ \infty \\ 0 \\ 0 \end{array}$ | $\begin{gathered} n \\ n \\ 0 \\ i n \\ i n \end{gathered}$ |  | $\begin{aligned} & \text { त } \\ & n \\ & n \\ & n \end{aligned}$ | $\begin{gathered} o \\ \underset{n}{n} \\ i n \\ i \end{gathered}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & i n \\ & i n \end{aligned}$ | $\begin{array}{\|c} \widehat{\hat{N}} \\ 0 \\ 0 \\ \hat{n} \end{array}$ | $\begin{array}{\|l\|} \hline \hat{n} \\ 0 \\ \\ \end{array}$ | $\begin{array}{\|l} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{N}{N} \\ 0 \\ 0 \\ \sqrt[n]{2} \\ \hline \end{array}$ |  |  |  |  | $\begin{gathered} 0 \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \sim \sim \end{gathered}$ |  |  |
|  | $\begin{array}{\|l\|} \hline \left.\begin{array}{r} n \\ \stackrel{n}{n} \\ \sim \\ \sim \end{array} \right\rvert\, \\ \hline \end{array}$ | $\begin{array}{\|c} 9 \\ \underset{\sim}{2} \\ \underset{n}{2} \end{array}$ | $\begin{gathered} n \\ n \\ i \\ i \end{gathered}$ | $\left.\begin{array}{\|c\|} \underset{\sim}{n} \\ \underset{\sim}{n} \end{array} \right\rvert\,$ | $\begin{gathered} n \\ \underset{N}{n} \\ \sim \end{gathered}$ |  | $\begin{array}{\|c} n \\ n \\ 0 \\ \vdots \\ \vdots \end{array}$ |  | N | $\left.\begin{array}{\|l\|} \hline \stackrel{9}{n} \\ \underset{i}{0} \\ \dot{\sim} \end{array} \right\rvert\,$ |  | $\begin{aligned} & n \\ & n \\ & \underset{n}{n} \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline-1 \\ \omega \\ \omega \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\begin{aligned} & 0 \\ & \underset{\sim}{2} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\left.\begin{array}{\|c} 9 \\ \stackrel{9}{2} \\ \vdots \\ i n \end{array} \right\rvert\,$ | $\begin{aligned} & 9 \\ & n \\ & \vdots \\ & \vdots \end{aligned}$ | $\begin{gathered} 0 \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{aligned} & \infty \\ & 0 \\ & \overrightarrow{1} \\ & \stackrel{n}{n} \end{aligned}$ |  |  | $\begin{gathered} n \\ i \\ i \\ i n \\ i n \end{gathered}$ | $\begin{gathered} n \\ \substack{n \\ \infty \\ \infty \\ \cdots \\ n} \end{gathered}$ | $\begin{array}{\|c} \hline 7 \\ \underset{0}{2} \\ 0 \\ \sim \end{array}$ | $\begin{array}{\|c} \hline N \\ \sim \\ \sim \\ \sim \\ \sim \end{array}$ | $\mathfrak{n}$ |  |  | $\begin{array}{ll} 0 \\ 0 \\ 0 \\ n \\ n & 0 \\ n & 0 \end{array}$ |  | $\begin{aligned} & \text { ה } \\ & \dot{j} \\ & \substack{ \\ \infty \\ n} \end{aligned}$ |  |  | $\left.\begin{array}{\|c\|} \hline n \\ 0 \\ \underset{N}{n} \\ \stackrel{i}{n} \end{array} \right\rvert\,$ |  |
|  | $\left.\begin{array}{\|l\|} \underset{N}{N} \\ \dot{\sim} \\ \sim \end{array} \right\rvert\,$ | $\begin{gathered} n \\ n \\ 0 \\ \vdots \\ \vdots \end{gathered}$ | $\begin{gathered} \infty \\ \substack{\infty \\ 0 \\ 0 \\ \vdots \\ 0} \end{gathered}$ | $\begin{aligned} & \infty \\ & \infty \\ & \dot{\sim} \\ & \sim \end{aligned}$ | $\begin{gathered} n \\ 0 \\ 2 \\ \underset{\sim}{n} \end{gathered}$ |  |  | $\begin{array}{ll} 0 \\ 0 \\ 0 \\ 0 \\ n \\ n \end{array}$ |  | $\begin{aligned} & n \\ & \substack{\lambda \\ \vdots \\ \vdots \\ 0 \\ n \\ n} \end{aligned}$ |  | $\begin{aligned} & \infty \\ & \infty \\ & \infty \\ & \infty \\ & \infty \\ & \infty \end{aligned}$ |  |  | $\left.\begin{array}{\|c} \infty \\ 0 \\ 0 \\ 0 \\ -i n \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \underset{~}{2} \\ \dot{j} \\ \overrightarrow{i n} \end{array} \right\rvert\,$ | $\begin{gathered} \substack{\underset{\sim}{2} \\ \underset{\sim}{n} \\ \vdots} \end{gathered}$ | $\begin{gathered} 0 \\ 0 \\ \vdots \\ \vdots \end{gathered}$ | $\begin{aligned} & N \\ & N \\ & 9 \\ & i \end{aligned}$ | $\begin{gathered} 9 \\ \substack{n \\ n \\ n \\ n} \end{gathered}$ | $\begin{gathered} \vec{m} \\ \dot{n} \\ \stackrel{n}{n} \end{gathered}$ | $\begin{gathered} \mathcal{y} \\ \dot{\infty} \\ i n \end{gathered}$ | $\begin{gathered} \underset{\sim}{n} \\ \vdots \\ \underset{\sim}{n} \end{gathered}$ | $\left. \right\rvert\,$ |  | $\begin{array}{\|c} \substack{n \\ \underset{\sim}{e} \\ \underset{\sim}{e} \\ \hline} \end{array}$ | $$ |  | $\left.\begin{gathered} n \\ c \\ \underset{i}{n} \\ n \end{gathered} \right\rvert\,$ | $\begin{gathered} 0 \\ \underset{\sim}{c} \\ \underset{\sim}{\infty} \\ \sim \end{gathered}$ | $\begin{gathered} \hat{6} \\ \underset{\sim}{\sim} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{gathered} 0 \\ 9 \\ 9 \\ \vdots \end{gathered}$ |  | $\begin{gathered} \sim \\ 0 \\ 0 \\ 0 \\ 0 \\ \vdots \\ n \end{gathered}$ |  |
|  | N | $\infty$ | $\left.\begin{array}{\|c} \infty \\ \underset{\sim}{n} \end{array} \right\rvert\,$ | $\underset{\sim}{\mathrm{A}}$ | $\stackrel{\stackrel{\rightharpoonup}{N}}{ }$ | $\stackrel{\rightharpoonup}{*} \stackrel{0}{\sim}$ | $\left\lvert\, \begin{gathered} \stackrel{N}{N} \\ \hline \end{gathered}\right.$ | $\stackrel{n}{n}$ | $\underset{\sim}{\sim}$ | $\underset{y}{n}$ | n | $\sqrt{n}$ | $$ | $$ | $$ | 갗 | $\underset{\infty}{\underset{\sim}{\infty}}$ | $\underset{\infty}{\prime}$ | $\begin{aligned} & 6 \\ & 6 \\ & \hline \end{aligned}$ | 合 | $\begin{aligned} & \hat{7} \\ & \underset{i}{2} \end{aligned}$ | $\underset{\sim}{\underset{\sim}{\underset{\sim}{c}}}$ | $\mathfrak{c}$ |  | $0$ | $\begin{array}{\|l\|} \hline \\ \underset{\sim}{n} \\ \underset{N}{2} \end{array}$ | $\begin{array}{\|l\|} \stackrel{m}{n} \\ \stackrel{y}{n} \end{array}$ | $\begin{array}{\|c} \hline \underset{\sim}{2} \\ \underset{\sim}{n} \end{array}$ | $\begin{array}{\|l} \hline \stackrel{0}{\circ} \\ \\ \hline \end{array}$ | $\underset{\sim}{n}$ | $: \begin{aligned} & n \\ & \substack{n \\ n} \end{aligned}$ | $\left(\begin{array}{l} \hat{y} \\ 0 \\ 0 \end{array}\right.$ | $\begin{aligned} & 8 \\ & \hline 0 \\ & \end{aligned}$ | $\left.\begin{array}{\|c\|c} \hline 0 \\ 0 \\ 0 \\ 0 \\ \hline \end{array} \right\rvert\,$ |  |
| $\left\lvert\, \begin{array}{lll} \sum_{亏}^{4} & 4 \\ \text { do } \\ \hline \end{array}\right.$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \mathrm{~m} \\ \mathrm{o} \end{array} \right\rvert\,$ | $\stackrel{\rightharpoonup}{i}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{3}{0} \\ \overrightarrow{0} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\begin{aligned} & 0 \\ & \hline 0 \\ & \hline \\ & \hline \end{aligned}$ | $\begin{gathered} \underset{\sim}{0} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}$ |  |  | $\mathfrak{h i c}$ |  | $\mathfrak{c}$ |  |  |  | $\begin{array}{\|l\|} \hline \stackrel{0}{7} \\ \vec{i} \\ \infty \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{y}{\circ} \\ \underset{y}{\infty} \\ \dot{\infty} \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\circ}{2} \\ \stackrel{1}{\infty} \\ \stackrel{1}{2} \\ \hline \end{array}$ | $\begin{gathered} \stackrel{\rightharpoonup}{n} \\ \hat{m} \\ \dot{n} \end{gathered}$ |  | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{2} \\ \dot{\sigma} \end{gathered}$ |  | $\begin{aligned} & \stackrel{2}{2} \\ & \stackrel{n}{n} \\ & \end{aligned}$ | $\begin{gathered} \stackrel{O}{0} \\ \underset{\sim}{\infty} \\ \infty \end{gathered}$ | $\begin{aligned} & o \\ & \infty \\ & \infty \\ & \infty \\ & \infty \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \hline \stackrel{\circ}{0} \\ \text { on } \\ \text { gin } \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\circ}{\circ} \\ \grave{\alpha} \\ \text { j} \end{array}$ | $\begin{array}{\|c\|} \hline \begin{array}{l} \circ \\ \hline \end{array} \\ \alpha \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\circ}{\circ} \\ \dot{3} \\ 8 \end{array}$ |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 1 \\ & \hline 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & -1 \end{aligned}$ | $\begin{gathered} 0 . \\ 0 \\ 0 \\ 0 \\ 0 \\ \hline 1 \end{gathered}$ |  |  |  |
| ¿̀ 芌 | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{2} \\ \mathrm{~m} \\ \mathrm{o} \end{array} \right\rvert\,$ | $\mathfrak{c}$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{7} \\ \underset{\sim}{\mathrm{i}} \end{array}$ | $\mathfrak{c}$ | $\begin{gathered} \underset{\sim}{2} \\ \underset{\omega}{n} \\ \hline \end{gathered}$ | $\underbrace{2}_{0}$ | $\mathfrak{R}$ | $\begin{gathered} 0 \\ 0 \\ 0 \\ 0 \\ \infty \\ \infty \\ \infty \end{gathered}$ | Bo | $\hat{B}_{\substack{3}}^{\substack{0 \\ \infty \\ \infty \\ \infty \\ \infty \\ \hline}}$ | $\begin{array}{c\|c} 0 \\ 0 \\ 0 \\ n \\ 0 & 0 \\ 0 \\ \\ \end{array}$ | ? | Bo | $\mathfrak{i}$ | $\begin{array}{\|c\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \infty \\ \mathrm{~m} \end{array}$ |  |  | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \hline \end{aligned}$ |  | $\begin{gathered} \substack { o \\ 0 \\ \begin{subarray}{c}{e \\ n{ o \\ 0 \\ \begin{subarray} { c } { e \\ n } } \\ {\hline} \end{gathered}$ | $\begin{gathered} \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}$ |  | $\begin{aligned} & \substack{\circ \\ \infty \\ 0 \\ 0} \end{aligned}$ | $\begin{array}{\|c} \hline \stackrel{0}{0} \\ \mathbf{m} \\ 0 \end{array}$ | $\stackrel{\circ}{\stackrel{\circ}{\lambda}}$ | $\begin{array}{\|c} \hline 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\rightharpoonup}{0} \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c} \hline 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c} \hline \stackrel{\rightharpoonup}{0} \\ \mathbf{O} \\ \mathbf{o} \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{0}{0} \\ \hline \mathbf{C} \\ \hline \end{array}$ | $0$ | $0$ | $\begin{array}{\|c} \hline 0 . \\ 0 . \\ 0 \end{array}$ | $\left.\begin{array}{\|l\|} \hline \stackrel{0}{\circ} \\ 0 \\ 0 \end{array} \right\rvert\,$ | － |
|  | $\stackrel{n}{i}$ | $\underset{\sim}{\sim}$ |  | $\begin{aligned} & \overrightarrow{0} \\ & \underset{N}{i} \end{aligned}$ | $\begin{aligned} & \hline 0 \\ & 0 \\ & 0 \\ & \underset{N}{0} \end{aligned}$ |  | $0$ |  | $\begin{array}{l\|l} v & 0 \\ 0 \\ 0 \\ -i & \underset{7}{7} \end{array}$ | $\mathfrak{c}$ | $\begin{array}{l\|l\|} \hline 0 \\ 0 \\ n \\ n \\ n & 0 \\ 0 \\ n \\ \end{array}$ | $\begin{array}{ll} 1 & 0 \\ \infty \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ |  |  |  |  | $\begin{gathered} \infty \\ n \\ n \\ n \end{gathered}$ | $\left(\begin{array}{l} \infty \\ \infty \\ \infty \\ \infty \end{array}\right.$ | $\left\{\begin{array}{c} \substack{0 \\ 0 \\ \underset{\sim}{2} \\ \hline} \\ \hline \end{array}\right.$ | $\underset{\sim}{\infty}$ | $\underset{\sim}{\substack{n \\ \underset{f}{2}}}$ | $\stackrel{\substack{\infty \\ \underset{\sim}{\infty} \\ n_{2} \\ \hline}}{ }$ | $\begin{aligned} & 0 \\ & \underset{\sim}{n} \\ & \sim \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{n}{\mathrm{o}} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\begin{array}{\|l\|} \hline \stackrel{y}{n} \\ \hline \end{array}$ | $\begin{aligned} & \infty \\ & \underset{\sim}{\infty} \\ & \hline \end{aligned}$ | ¢ | $\cdots$ | $\bigcirc$ | $\sim$ | $\wedge$ | $\sim$ | $\stackrel{\circ}{ }$ | $C$ |
|  | $\begin{aligned} & \underset{\sim}{\hat{2}} \\ & \underset{\sim}{2} \\ & \hline \end{aligned}$ | $\underset{n}{n}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{0}{0} \\ \vec{~} \\ \vec{\sigma} \end{array} \right\rvert\,$ | $\begin{aligned} & \mathrm{J} \\ & \mathrm{~N} \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $$ |  |  |  |  | $\mathfrak{n} \left\lvert\, \begin{gathered} n \\ n \\ 0 \\ 0 \\ 0 \\ n \\ n \end{gathered}\right.$ |  |  |  | $\left\lvert\, \begin{aligned} & n \\ & \\ & 0 \\ & 0 \\ & \end{aligned}\right.$ | $\begin{aligned} & \underset{\sim}{\infty} \\ & \underset{\sim}{d} \\ & \underset{\sim}{f} \end{aligned}$ | $\begin{aligned} & n \\ & 0 \\ & \underset{\sim}{n} \\ & \end{aligned}$ | on | $\begin{aligned} & 2 \\ & 0 \\ & i \\ & i \end{aligned}$ | $\begin{aligned} & \mathrm{A} \\ & 0 \\ & 0 \\ & 0 \\ & \hline 1 \end{aligned}$ | $\begin{aligned} & \left.1 \begin{array}{l} \text { on } \\ 0 \\ 0 \\ \text { in } \end{array} \right\rvert\, \end{aligned}$ | $\left\lvert\, \begin{gathered} \underset{\sim}{2} \\ \underset{\sim}{\infty} \\ \hline \end{gathered}\right.$ | $\stackrel{\underset{N}{\mathrm{~N}}}{\substack{0}}$ | $\left\lvert\, \begin{gathered} 0 \\ 0 \\ 0 \\ 0 \end{gathered}\right.$ | $\underset{\sim}{c}$ | ic |  | Bn | O－m | $\xrightarrow{\sim}$ | － | \％ | i | $\stackrel{\sim}{\sim}$ | m | ch |
|  | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \hline \end{array}$ |  | $\mathfrak{c}$ | $0 \begin{gathered} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 2 \\ 2 \end{gathered}$ | $\begin{gathered} n \\ \\ \vdots \\ 0 \\ 0 \\ n \\ n \\ n \end{gathered}$ |  | $\left\|\begin{array}{l\|} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  |  |  |  |  |  |  | $\mathfrak{c}$ | $\begin{aligned} & n \\ & N \\ & 0 \\ & 0 \\ & 0 \\ & \sim_{n} \end{aligned}$ | $\mathfrak{c}$ |  | $\begin{gathered} n \\ n \\ 0 \\ 0 \\ 0 \\ n \\ 0 \\ 0 \end{gathered}$ |  | $\begin{aligned} & \underset{\sim}{\mathrm{N}} \\ & \sim \\ & \mathrm{~N} \\ & \mathrm{~N} \\ & \mathrm{~m} \end{aligned}$ |  |  | $\mathfrak{c}$ |  | nc | $0$ |  |  | $\mathfrak{c}$ | $\begin{gathered} \tilde{N} \\ \infty \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\left.\begin{aligned} & \hat{0} \\ & 0 \\ & \hat{0} \\ & 0 \end{aligned} \right\rvert\,$ |  | － |
|  | $\left\|\begin{array}{l} 0 \\ 0 \\ y \\ \vdots \\ 3 \\ 0 \\ 0 \end{array}\right\|$ | $\mathfrak{l}$ | $\left\|\begin{array}{c} 0 \\ r \\ y \\ 0 \\ 0 \\ -1 \end{array}\right\|$ | $\begin{array}{\|c} \substack{0 \\ \tilde{y} \\ y \\ 0 \\ n \\ n} \end{array}$ |  |  | $\mathfrak{n}$ |  |  |  |  | $\begin{aligned} & 2 \\ & \\ & \hline \end{aligned}$ | $0$ | $\left\lvert\, \begin{aligned} & \mathrm{O} \\ & \hat{y} \\ & y \\ & 0 \\ & 0 \end{aligned}\right.$ | $\begin{aligned} & n \\ & \hat{n} \\ & y \\ & 0 \\ & n \end{aligned}$ | $\begin{aligned} & o \\ & 0 \\ & y \\ & y \\ & 0 \\ & n \end{aligned}$ | $\left\lvert\, \begin{gathered} 0 \\ \infty \\ y \\ y \\ 0 \\ 0 \\ \infty \end{gathered}\right.$ | $\left\lvert\, \begin{aligned} & o \\ & 0 \\ & y \\ & \vdots \\ & 0 \\ & \infty \end{aligned}\right.$ |  |  |  |  |  |  | $\mathfrak{c}$ |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & y \\ & \vdots \\ & 0 \\ & n \\ & n \end{aligned}$ |  |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & y \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & y \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \mathrm{O} \\ & \mathrm{C} \\ & \mathrm{y} \\ & \mathrm{O} \\ & 0 \\ & 0 \end{aligned}$ | $\left\|\begin{array}{l\|} \hline 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  |

Bill Impact Run date: 12DEC16

Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:All seasons Climate:ALL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date：12DEC16
Scenario：Comparison 745（d）Schedule：E1 ：E1 2018 vs．ETOUC 2018 Season：All seasons Climate：MODERATE NEM／non－NEM：non－NEM

|  | OO |  | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \infty \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} \stackrel{\rightharpoonup}{\hat{N}} \\ \hat{i} \\ i \end{array}\right\|$ | $\begin{array}{\|c} \substack{\hat{n} \\ \hat{n} \\ 0 \\ i} \end{array}$ |  |  |  | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{0} \\ \tilde{n} \\ \underset{i}{2} \end{gathered}\right.$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\mathrm{m}} \\ & \mathbf{O} \\ & \text { in } \end{aligned}$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{2} \\ \underset{\sim}{\mathrm{j}} \end{gathered}\right.$ | $\begin{gathered} \stackrel{\rightharpoonup}{\mathrm{j}} \\ \underset{\mathrm{i}}{ } \end{gathered}$ |  | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{n} \\ \underset{\sim}{2} \end{array}\right\|$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{0} \\ \underset{m}{n} \end{array} \right\rvert\,$ |  |  | $\begin{gathered} \underset{\sim}{2} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \\ \hline \end{gathered}$ |  |  | io | ले으웅 |  | $\begin{array}{\|c} \hline \stackrel{\rightharpoonup}{\mathrm{N}} \\ \stackrel{1}{2} \end{array}$ | io | $\left\lvert\, \begin{gathered} \stackrel{\circ}{\infty} \\ \stackrel{1}{n} \\ \underset{\sim}{2} \end{gathered}\right.$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{2} \\ \underset{1}{2} \end{array}\right\|$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{i} \\ \underset{i}{2} \end{gathered}\right.$ | $\begin{gathered} \stackrel{\rightharpoonup}{0} \\ 0 \\ \underset{\sim}{0} \\ \underset{1}{2} \end{gathered}$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{4} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}\right.$ |  | $\left.\begin{array}{\|l\|} \hline \stackrel{\rightharpoonup}{N} \\ \\ \end{array} \right\rvert\,$ | $\left\|\begin{array}{l} \stackrel{\rightharpoonup}{0} \\ \stackrel{0}{0} \\ \stackrel{1}{0} \end{array}\right\|$ | $\begin{aligned} & \circ \\ & \hline 0 \\ & 0 \\ & \mathbf{N}_{1} \\ & 1 \end{aligned}$ | $\left\lvert\, \begin{gathered} \stackrel{0}{0} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}\right.$ | $\left\lvert\, \begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \underset{\substack{2}}{\substack{2}} \end{aligned}\right.$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $0$ | $\begin{gathered} \widetilde{N} \\ \overrightarrow{1} \\ 0 \\ 0 \end{gathered}$ | $\begin{array}{\|c} \underset{\sim}{n} \\ 0 \\ 0 \\ i \end{array}$ |  | $\begin{aligned} & \substack{n \\ n \\ i} \end{aligned}$ | $\begin{array}{\|c} \underset{7}{7} \\ \underset{0}{0} \\ i n \end{array}$ |  | $\begin{gathered} \text { in } \\ n_{i} \\ i \end{gathered}$ | 亲 | $\begin{array}{\|l\|l\|} \substack{n \\ i \\ i} \\ \hline \end{array}$ | $\left\lvert\, \begin{aligned} & \hat{\infty} \\ & \underset{\sim}{\infty} \\ & \underset{\sim}{2} \end{aligned}\right.$ | $\begin{aligned} & 0 \\ & \underset{n}{n} \end{aligned}$ | $\left\|\begin{array}{c} \vec{m} \\ \underset{\sim}{2} \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  | $\left.\begin{aligned} & 0 \\ & 6 \\ & 0 \\ & 0 \end{aligned} \right\rvert\,$ |  |  |  | $\begin{array}{\|l\|l\|} \hline n & 0 \\ i & 0 \\ i n & \underset{n}{n} \end{array}$ |  | $\left.\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ i n \\ \end{array} \right\rvert\,$ | $\begin{array}{\|c} 0 \\ \underset{\sim}{0} \\ 0 \\ i \\ i \end{array}$ | $\underset{\sim}{f}$ | $\begin{gathered} 2 \\ 0 \\ 0 \\ 9 \\ \end{gathered}$ | $\begin{array}{\|c} \underset{\sim}{c} \\ \underset{\sim}{n} \\ \stackrel{~ n}{n} \end{array}$ |  | 0 0 0 0 0 |  | $$ |  |  | $\begin{array}{\|c} \underset{\sim}{\sim} \\ \underset{\sim}{\sim} \\ \underset{\sim}{2} \end{array}$ |  | $\begin{gathered} c_{0} \\ 0 \\ 0 \\ e_{n} \\ i n \end{gathered}$ |  |
|  | $\begin{gathered} o \\ \text { on } \\ \vdots \\ \vdots \\ \hline \end{gathered}$ | $\begin{gathered} \infty \\ \infty \\ n \\ n \\ n \end{gathered}$ | $\left.\begin{array}{\|c\|} \hline \infty \\ \underset{\sim}{n} \\ \sim \\ \sim \end{array} \right\rvert\,$ | $\left. \right\rvert\,$ | $$ | $\left.\begin{array}{\|c\|} \hline n \\ \hat{n} 0 \\ \sim \sim \\ \sim \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline-7 \\ \underset{\sim}{i} \\ i n \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \hat{N} \\ \mathbf{N} \\ \mathbf{0} \\ \hline \end{array}$ | $\left.\begin{array}{\|c\|} \hline \\ \stackrel{n}{n} \\ \underset{\sim}{n} \end{array} \right\rvert\,$ |  | $\left.\begin{array}{\|c} \hat{0} \\ \underset{i}{n} \\ \underset{i n}{n} \end{array} \right\rvert\,$ | $\begin{array}{l\|} \hline \stackrel{n}{n} \\ \dot{子} \\ \underset{\sim}{n} \end{array}$ | $\begin{array}{\|c\|} \substack{N \\ \infty \\ 0 \\ 0 \\ -i n \\ i} \\ i \end{array}$ | $\left\|\begin{array}{c} \underset{\sim}{\underset{\sim}{2}} \\ \underset{\sim}{n} \\ \stackrel{\sim}{n} \end{array}\right\|$ | $\left.\begin{gathered} n \\ n \\ n \\ \underset{n}{n} \end{gathered} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline \lambda \\ \hat{i} \\ 0 \\ i n \\ i n \end{array} \right\rvert\,$ |  |  |  |  |  |  | $n$ $\underset{\sim}{2}$ 6 0 $\sim$ | $\begin{aligned} & \underset{\sim}{2} \\ & \underset{\sim}{2} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{gathered} \infty \\ \underset{i}{2} \\ \underset{\sim}{2} \end{gathered}$ | $\left\|\begin{array}{c} \infty \\ \infty \\ \dot{\sim} \\ \infty \\ i \\ \sim \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline \underset{\sim}{n} \\ \underset{\sim}{\sim} \\ \underset{\sim}{n} \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \underset{\sim}{7} \\ \underset{\sim}{0} \\ \stackrel{0}{2} \end{array}$ | $$ | $\left\|\begin{array}{c} \hat{N} \\ \infty \\ \underset{\sim}{2} \\ \underset{i}{n} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ \dot{0} \\ \vdots \\ i-2 \\ i \end{array} \right\rvert\,$ | $\left.\begin{gathered} o \\ \infty \\ \dot{n} \\ \underset{\sim}{n} \\ \vec{n} \end{gathered} \right\rvert\,$ | $\left.\begin{array}{\|c} 9 \\ 0 \\ 0 \\ 0 \\ 0 \\ n \\ n \\ n \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} o \\ n \\ n \\ \underset{\sim}{2} \\ \underset{\sim}{n} \end{array}\right\|$ | $\begin{gathered} 0 \\ 0 \\ n \\ n \\ n \\ n \end{gathered}$ |  |  |
|  | $\begin{gathered} o \\ \substack{n \\ \vdots \\ i n} \end{gathered}$ | $1 \begin{aligned} & n \\ & n \\ & n \end{aligned}$ | $\begin{array}{\|c\|} \hline \infty \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{array}$ | $\begin{array}{\|l\|} \hline 0 \\ \underset{n}{n} \\ n \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{\sim}{n} \\ \underset{\sim}{n} \\ \stackrel{y}{n} \\ \hline \end{array}$ | $\begin{aligned} & \infty \\ & 0 \\ & n \\ & n \\ & n \end{aligned}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \hat{6} \\ & n \end{aligned}$ | $\begin{array}{\|c} n \\ n \\ \\ \underset{n}{n} \end{array}$ | $\begin{aligned} & \underset{\sim}{2} \\ & \underset{\sim}{2} \\ & \sim \\ & \sim \end{aligned}$ | $\left.\begin{aligned} & \dot{1} \\ & \vec{i} \\ & 0 \\ & i \end{aligned} \right\rvert\,$ | $\begin{array}{\|l\|} \hline 7 \\ \infty \\ \vec{n} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \\ \underset{\sim}{2} \\ \vec{n} \\ i \end{array}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \underset{寸}{j} \\ & \vec{i} \end{aligned}$ | $\left.\begin{array}{\|c} \stackrel{N}{\mathrm{~N}} \\ \stackrel{n}{n} \\ i \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c} 2 \\ 0 \\ 0 \\ n \\ n \end{array} \right\rvert\,$ | $\left. \right\rvert\,$ |  |  |  |  |  |  | $\begin{aligned} & \underset{\sim}{2} \\ & \underset{\sim}{n} \\ & \sim \\ & \sim \end{aligned}$ | $\begin{aligned} & \underset{\sim}{9} \\ & \underset{\sim}{\underset{\sim}{2}} \\ & \end{aligned}$ | $\begin{gathered} \mathcal{F} \\ \underset{\infty}{\infty} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{array}{\|c\|} \hline n \\ n \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{aligned} & \substack{0 \\ \underset{\sim}{2} \\ \dot{8} \\ \hline} \end{aligned}$ | $\left\|\begin{array}{c} \hat{0} \\ \dot{y} \\ 0 \\ -2 \\ i \end{array}\right\|$ | $\begin{array}{\|c\|} \hline \underset{\sim}{9} \\ \underset{\sim}{2} \\ \underset{2}{2} \end{array}$ | $\left.\begin{gathered} n \\ 0 \\ 0 \\ n \\ n \\ n \end{gathered} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \omega \\ 0 \\ 0 \\ 0 \\ \stackrel{\rightharpoonup}{2} \\ \hline \end{array}$ | $\left\|\begin{array}{c} n \\ 0 \\ 0 \\ 0 \\ 0 \\ i \\ i \end{array}\right\|$ | $$ |  | $\left\lvert\, \begin{gathered} \infty \\ \underset{\sim}{c} \\ \underset{\sim}{c} \\ \underset{\sim}{n} \end{gathered}\right.$ | $\begin{aligned} & -1 \\ & \stackrel{0}{0} \\ & \underset{\sim}{0} \\ & \stackrel{0}{n} \end{aligned}$ |  |
|  | $\sim$ | N | $$ | $\begin{array}{\|l\|} \hline \stackrel{0}{7} \\ \underset{7}{ } \end{array}$ | $\|\stackrel{\stackrel{\rightharpoonup}{N}}{ }\|$ | $$ | $\underset{\sim}{\sim}$ | $\left\lvert\, \begin{aligned} & n \\ & \underset{m}{n} \end{aligned}\right.$ | $\underset{\sim}{\sim}$ | $\frac{\pi}{\sigma}$ | $\|\underset{\sim}{i}\|$ | $\begin{array}{\|c\|} \hline \mathrm{i} \\ \hline \text { \| } \end{array}$ | Nid | $\left.\begin{array}{\|c\|} \hline \\ \hline 6 \end{array} \right\rvert\,$ | \|ন্ㅈN | \|g | \|ন্ম | $$ | जু |  |  | $\begin{array}{\|c\|c} \underset{\sim}{\underset{\sim}{\sim}} \underset{\sim}{\sim} & \underset{\sim}{\sim} \\ \hline \end{array}$ | $\begin{gathered} \hat{\mathrm{f}} \\ \mathrm{~m} \\ \underset{i}{ } \end{gathered}$ | $\left\|\begin{array}{c} \infty \\ \underset{i}{+} \\ i \end{array}\right\|$ | $\begin{aligned} & \text { n } \\ & \text { in } \\ & \hline \end{aligned}$ | $\left\|\begin{array}{c} \underset{\sim}{\underset{N}{N}} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \underset{\sim}{N} \\ \underset{N}{ } \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} \underset{\sim}{N} \\ \mathrm{~m} \end{array}\right\|$ | $\left.\begin{aligned} & \infty \\ & \stackrel{\infty}{\lambda} \\ & \mathrm{m} \end{aligned} \right\rvert\,$ |  | $\left.\begin{array}{\|c} \hline 0 \\ \underset{y}{n} \\ \dot{n} \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} 0 \\ \hline 0 \\ \dot{6} \end{array}\right\|$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\mathrm{G}} \\ & \stackrel{y}{2} \end{aligned}$ | $$ | $\left\|\begin{array}{l} n \\ \underset{~}{2} \end{array}\right\|$ |  |  |
| $\left\|\begin{array}{lll} \sum_{\mathrm{U}} & \text { oㅇ } & \stackrel{\pi}{3} \end{array}\right\|$ |  | $\stackrel{\substack{\circ \\ \underset{n}{n}\\}}{ }$ | $\begin{array}{\|c} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{2} \\ \hline \end{array}$ | $\left.\begin{array}{\|c} \stackrel{\circ}{\circ} \\ \infty \\ \underset{~}{\mathrm{u}} \end{array} \right\rvert\,$ | $\left.\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \stackrel{\rightharpoonup}{1} \\ & \stackrel{\sim}{n} \end{aligned} \right\rvert\,$ | $\begin{array}{\|c\|} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{\alpha} \\ \infty \\ \hline \end{array}$ | $\mid$ | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \substack{n \\ \dot{g}} \end{gathered}$ |  |  |  | $\begin{array}{\|c\|} \hline \stackrel{0}{0} \\ \dot{1} \\ \stackrel{y}{2} \end{array}$ | $\begin{array}{\|l\|l} \hline \stackrel{\rightharpoonup}{7} \\ \overrightarrow{7} \\ \infty \\ \sim & 0 \\ \hline \end{array}$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{4} \\ \dot{\infty} \end{array}\right\|$ | $\left.\begin{aligned} & \hline \stackrel{\rightharpoonup}{\circ} \\ & \stackrel{\rightharpoonup}{\hat{0}} \\ & \dot{\infty} \end{aligned} \right\rvert\,$ |  |  |  |  |  |  |  | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{0} \\ \stackrel{0}{0} \\ \infty \\ o \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{\circ} \\ \hat{N} \\ \infty \\ \infty \end{array} \right\rvert\,$ | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{g} \\ \dot{g} \end{gathered}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \hline \mathbf{~} \\ \text { gi } \end{array} \right\rvert\,$ | $\left.\begin{array}{\|l\|} \hline 0 \\ \hline 0 \\ \infty \\ \text { gi } \end{array} \right\rvert\,$ | $\left\|\begin{array}{l\|} \hline \stackrel{\circ}{0} \\ \infty \\ \dot{\circ} \\ \hline \end{array}\right\|$ |  |  | $\begin{array}{\|l} \hline \stackrel{\circ}{\circ} \\ \text { ö } \\ \text { gi } \end{array}$ |  | $\begin{aligned} & \stackrel{\circ}{\circ} \\ & \stackrel{1}{6} \\ & \stackrel{y}{2} \end{aligned}$ | $\begin{aligned} & \text { ö̀ } \\ & \text { ুi } \end{aligned}$ |  |  |  |
|  | $\begin{array}{\|c\|} \hline \stackrel{\circ}{0} \\ \dot{0} \\ i \\ i \end{array}$ | $\stackrel{\stackrel{\rightharpoonup}{\mathrm{o}}}{\stackrel{1}{\mathrm{~N}}}$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{n} \\ \dot{m} \end{array}\right\|$ | 合 | $\stackrel{\stackrel{\rightharpoonup}{\mathrm{N}}}{\stackrel{\mathrm{~N}}{\mathrm{~N}}}$ | $\left\|\begin{array}{c} \infty \\ \underset{\sim}{0} \\ \infty \\ \infty \end{array}\right\|$ | $\mid$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{N} \\ \infty \\ \infty \end{gathered}\right.$ |  |  | ò | $\left.\begin{array}{\|l\|} \hline \stackrel{\circ}{0} \\ \hat{n} \\ \mathrm{n} \end{array} \right\rvert\,$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \mathbf{0} \\ & \dot{子} \end{aligned}$ | $\left.\begin{array}{\|c\|c\|} \hline \stackrel{y}{\circ} \\ \infty \\ \underset{1}{n} \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\mathrm{o}} \\ \stackrel{\rightharpoonup}{\mathrm{~m}} \end{array} \right\rvert\,$ |  | 응 |  | へั |  |  | ò | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \hat{N} \\ 0 \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | が | $\left\|\begin{array}{c} \stackrel{0}{0} \\ \stackrel{0}{0} \\ 0 \end{array}\right\|$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \overrightarrow{0} \\ \hline \end{array}$ | O－ | O | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \vdots \\ 0 \\ \hline \end{array}$ | 응 | $$ | $\begin{aligned} & 1 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & \hline 0 \\ & 0 \\ & 0 \end{aligned}$ | O | － | － |
|  |  | $\begin{aligned} & \underset{\sim}{2} \\ & \substack{n \\ n} \end{aligned}$ |  | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ i n g \end{array} \right\rvert\,$ | $\begin{gathered} 0 \\ \underset{\sim}{2} \\ i \end{gathered}$ |  | $\begin{aligned} & 1 \\ & \infty \\ & n_{n} \\ & \infty \\ & \hline \end{aligned}$ | $\left\{\begin{array}{c} \vec{त} \\ \hat{N} \\ \infty \end{array}\right.$ | $\begin{aligned} & \vec{\sim} \\ & \underset{\sim}{2} \\ & \infty \\ & \infty \end{aligned}$ | $\begin{aligned} & \infty \\ & \underset{N}{2} \\ & N \end{aligned}$ | $\begin{gathered} \infty \\ \underset{\sim}{2} \\ \underset{6}{6} \end{gathered}$ | $\begin{array}{\|l\|} \hline \stackrel{\sim}{n} \\ \underset{\sim}{2} \\ \dot{n} \end{array}$ |  | $\left.\begin{aligned} & \infty \\ & 0 \\ & 0 \\ & \hat{m} \end{aligned} \right\rvert\,$ | $\begin{aligned} & \infty \\ & \infty \\ & 0 \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ |  | $\begin{array}{l\|l} \substack{n \\ 0 \\ 0 \\ 0 \\ 0 \\ y} \\ y \end{array}$ |  |  |  |  |  | $\left.\begin{array}{\|c} \underset{\sim}{n} \\ i \\ n \end{array} \right\rvert\,$ | $\left.\begin{array}{\|l\|} \hline 0 \\ \stackrel{0}{2} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\stackrel{\substack{0 \\ \underset{N}{2} \\ \infty \\ \hline}}{2}$ | $\begin{array}{\|c} \hat{N} \\ \underset{N}{n} \\ \underset{N}{2} \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{e}{\circ} \\ \underset{\sim}{2} \end{array}$ | \|ig | $\underset{m}{N}$ | $\mid \dot{\sigma}$ | $\stackrel{\infty}{\sim}$ | $\mid \underset{\sim}{\mathrm{a}}$ | $0$ | t | m | $\stackrel{\circ}{\bullet}$ | N |
|  | $\left\|\begin{array}{c} \sim \\ \sim \\ \underset{N}{N} \\ \vec{n} \end{array}\right\|$ | $\begin{aligned} & n \\ & \hat{n} \\ & \hat{n} \\ & 0 \end{aligned}$ | $\begin{array}{\|c} \hat{\mathrm{O}} \\ \underset{\mathrm{y}}{\mathrm{y}} \end{array}$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c} \underset{\sim}{n} \\ \underset{\sim}{2} \\ \underset{\infty}{2} \end{array} \right\rvert\,$ | $\begin{aligned} & \infty \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  | $\left\{\begin{array}{c} \hat{\lambda} \\ \underset{N}{\hat{2}} \\ 0 \end{array}\right.$ | $\begin{aligned} & 0 \\ & \underset{\sim}{2} \\ & \underset{\infty}{\infty} \end{aligned}$ |  |  | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 9 \\ i \\ i \end{array}$ |  | $\begin{array}{\|l\|} \hline 0 \\ \infty \\ \underset{m}{n} \\ \hline \end{array}$ | $\begin{aligned} & \vec{\infty} \\ & \text { a } \\ & -8 \\ & \hline \end{aligned}$ |  |  |  |  | $\begin{array}{\|c\|c\|c} \hline 0 & \underset{O}{0} \\ 0 \\ 0 & \underset{\sim}{c} \\ \hline \end{array}$ | $\begin{array}{\|c\|c} \hline 0 & 0 \\ \underset{\sim}{2} & \underset{\sim}{n} \\ & 0 \end{array}$ | $\begin{array}{\|c\|} \hline 9 \\ \mathbf{N} \\ \mathrm{O} \end{array}$ | $\left.\begin{array}{\|c} \underset{7}{7} \\ \underset{子}{2} \end{array} \right\rvert\,$ | $\begin{aligned} & n \\ & m \\ & g_{2} \end{aligned}$ | $\begin{array}{\|c\|} \hline 0 \\ 寸 \\ \substack{0} \end{array}$ | $\begin{array}{\|c} \substack{n \\ \tilde{n} \\ \hline \\ \hline} \end{array}$ | $\begin{array}{\|c} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \underset{\sim}{2} \end{array}$ | $\left.\begin{array}{\|c} \underset{\sim}{N} \\ \underset{\sim}{\mathrm{~N}} \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline 0 \\ \infty \\ \underset{\sim}{2} \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \substack{1 \\ b \\ i \\ i} \end{array}$ | $\left.\begin{gathered} 0 \\ 0 \\ \infty \\ - \end{gathered} \right\rvert\,$ | $\underset{\substack{\lambda \\ \underset{\sim}{2} \\ \hline}}{ }$ | $\mathbf{Q}_{0}^{\infty}$ | $\stackrel{\leftrightarrow}{9}$ | जू |  |
|  | $\begin{array}{\|c\|} \hline \underset{1}{n} \\ \infty \\ 0 \\ 0 \\ \tilde{m} \\ \hline \end{array}$ |  | $\left\|\begin{array}{c} \infty \\ 0 \\ 0 \\ 0 \\ n \\ n \\ n \\ n \\ n \end{array}\right\|$ |  |  | $\left\lvert\, \begin{gathered} \sim \\ N \\ \tilde{N} \\ 0 \\ 0 \\ 0 \\ 0 \\ N \end{gathered}\right.$ |  |  |  |  | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ \hat{0} \\ 0 \\ 0 \\ { }_{2}^{2} \\ 0 \end{array}\right\|$ | $\left\lvert\, \begin{array}{l\|} \hline 0 \\ \underset{\sim}{f} \\ \underset{\sim}{n} \\ \underset{\sim}{d} \\ \underset{m}{2} \\ \hline \end{array}\right.$ |  | $\left\|\begin{array}{c} \infty \\ \underset{\sim}{n} \\ \underset{N}{N} \\ \underset{\sim}{\tilde{j}} \\ \underset{o}{2} \end{array}\right\|$ |  |  |  |  |  |  |  |  | $\left\|\begin{array}{c} \tilde{n} \\ 0 \\ 0 \\ n_{n}^{n} \\ \vdots \\ \infty \end{array}\right\|$ |  |  |  |  |  | $\begin{array}{\|c\|} \hline 9 \\ \infty \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \hline \end{array}$ | $\left.\begin{array}{\|c} \hat{\infty} \\ 0 \\ 0 \\ 0 \\ 0 \\ -i \\ i \end{array} \right\rvert\,$ | $\begin{array}{l\|} \hline 0 \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \underset{\sim}{2} \end{array}$ |  |  | $\begin{gathered} \mathcal{Z}_{1} \\ \underset{\sim}{\infty} \\ \infty \\ \dot{\sim} \end{gathered}$ | $\begin{gathered} \underset{\sim}{c} \\ \underset{n}{n} \\ n \\ n \end{gathered}$ |  | $\left.\begin{array}{\|c\|} \hline 1 \\ \tilde{m} \\ 0 \\ 0 \\ 0 \\ \tilde{n} \\ 0 \\ 0 \\ n \end{array} \right\rvert\,$ |
|  |  |  | $\left\|\begin{array}{c} 0 \\ \hat{n} \\ v \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} \underset{\sim}{\sim} \\ y \\ y \\ 0 \\ \underset{\sim}{2} \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ \underset{\sim}{n} \\ y \\ 0 \\ 0 \\ \hline \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ \underset{\sim}{y} \\ y \\ 0 \\ n \end{array}\right\|$ |  |  |  | $\left\|\begin{array}{l} 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ y \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ \hat{n} \\ y \\ y \\ 0 \\ 0 \\ i \end{array}\right\|$ | $\left[\left.\begin{array}{l} 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,\right.$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\left\|\begin{array}{l} 0 \\ \hat{O} \\ \mathrm{y} \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ \hat{n} \\ y \\ 0 \\ 0 \\ n \end{array}\right\|$ | $\begin{aligned} & 8 \\ & 0 \\ & 0 \\ & y \\ & 0 \\ & 0 \\ & n \end{aligned}$ |  | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \end{array}\right\|$ |  | $\left\|\begin{array}{c} 0 \\ \underset{~}{7} \\ \vec{y} \\ 0 \\ 0 \\ 0 \\ -1 \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ \underset{\sim}{7} \\ y \\ 0 \\ 0 \\ 7 \\ 7 \end{array}\right\|$ |  | $\left\|\begin{array}{c} o \\ \underset{\sim}{2} \\ v \\ 0 \\ 0 \\ \underset{\sim}{2} \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ \hat{n} \\ y \\ 0 \\ O \\ \underset{\sim}{2} \end{array}\right\|$ |  | $\left\|\begin{array}{c} o \\ 0 \\ \hat{n} \\ v \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \\ y \\ 0 \\ O \\ i \\ N \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \\ \hline \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ \hline 0 \\ \vdots \\ y \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ 0 \\ y \\ y \\ 0 \\ O \\ \hline \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ O \\ 0 \\ -1 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  |

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|  | Oo | $\begin{gathered} \stackrel{0}{2} \\ \mathrm{n} \\ \dot{o} \end{gathered}$ | $\begin{gathered} \stackrel{\rightharpoonup}{N} \\ \underset{N}{0} \end{gathered}$ | $\left.\begin{array}{\|c\|} \hline 0 \\ \stackrel{-1}{0} \\ 0 \end{array} \right\rvert\,$ | $\begin{aligned} & \stackrel{0}{\infty} \\ & \stackrel{0}{0} \\ & 0 \end{aligned}$ | $\begin{aligned} & \dot{2} \\ & \dot{\infty} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & ⿳ 亠 丷 厂 犬 \\ & \vec{~} \\ & \vec{i} \end{aligned}$ |  |  | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{0} \\ \dot{c} \\ \dot{\mathrm{c}} \end{gathered}\right.$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \infty \\ & \underset{\sim}{2} \end{aligned}$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{2} \\ \vec{m} \\ \dot{m} \end{array} \right\rvert\,$ | $\left.\begin{aligned} & \hline \stackrel{\rightharpoonup}{0} \\ & \dot{c} \\ & \dot{m} \end{aligned} \right\rvert\,$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{0} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\begin{aligned} & \stackrel{\rightharpoonup}{c} \\ & \stackrel{c}{\mathrm{~m}} \end{aligned}$ | $\underset{\sim}{2} \dot{\sim}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \mathbf{o} \\ & \dot{\sim} \end{aligned}$ |  | $\begin{aligned} & \stackrel{\rightharpoonup}{-1} \\ & \underset{\sim}{7} \\ & \underset{\sim}{2} \\ & 7 \end{aligned}$ | $\begin{gathered} \stackrel{\rightharpoonup}{2} \\ \underset{\sim}{\mathrm{z}} \\ \hline \end{gathered}$ | ふ̀ | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{\mathrm{m}} \\ \mathrm{~m} \end{gathered}$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\mathrm{j}} \\ \vec{m} \end{array}$ | $\left\|\begin{array}{l} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{\mathrm{~N}} \end{array}\right\|$ | $\left.\begin{gathered} 20 \\ \hat{n} \\ 0 \\ 0 \end{gathered} \right\rvert\,$ | $\left\|\begin{array}{l} \stackrel{0}{0} \\ \hat{R} \\ \vdots \\ \vdots \end{array}\right\|$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{4} \\ \underset{\sim}{1} \end{array}\right\|$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{O} \\ \underset{\substack{1}}{\substack{2}} \mid \end{gathered}\right.$ | $\begin{gathered} \stackrel{\rightharpoonup}{4} \\ \underset{\sim}{4} \\ \underset{7}{2} \end{gathered}$ | $\begin{gathered} \stackrel{\rightharpoonup}{0} \\ 0 \\ \underset{\substack{2}}{0} \end{gathered}$ | $\stackrel{\substack{\circ \\ \underset{\sim}{2} \\ \underset{\sim}{2} \\ \hline}}{ }$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{0} \\ \infty \\ \underset{\sim}{0} \\ \underset{\sim}{2} \end{gathered}\right.$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \underset{\substack{2}}{ } \end{array}\right\|$ |  | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \stackrel{y}{c} \\ \underset{\sim}{2} \end{array}\right\|$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $0$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & i n \end{aligned}$ | $\left.\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & i \end{aligned} \right\rvert\,$ | $\left\|\begin{array}{c} \underset{N}{N} \\ \boldsymbol{N} \end{array}\right\|$ | $\left.\begin{gathered} n \\ 8 \\ i \end{gathered} \right\rvert\,$ | $\begin{aligned} & 0 \\ & \hat{i} \\ & i \end{aligned}$ | $\begin{aligned} & \infty \\ & \underset{\sim}{2} \\ & i \end{aligned}$ | $\begin{array}{\|c\|c} \hline n & \alpha \\ \dot{n} & \alpha \\ i n & 0 \end{array}$ | $\left\|\begin{array}{c} \infty \\ \underset{\sim}{i} \\ \hline \end{array}\right\|$ | $\underset{\substack{\hat{N} \\ \underset{\sim}{n} \\ 5}}{5}$ | $\begin{aligned} & -\underset{\sim}{0} \\ & \dot{-} \end{aligned}$ |  | $\left\|\begin{array}{l} 0 \\ n \\ n \\ n \end{array}\right\|$ | $\left\|\begin{array}{c} \tilde{N} \\ \dot{n} \end{array}\right\| .$ |  | $\begin{gathered} 0 \\ 0 \\ i \\ i n \end{gathered}$ |  |  |  | $\begin{array}{\|c\|c} \hline 0 & 0 \\ \infty & 0 \\ 0 & 0 \\ -i & -i \end{array}$ |  | $\begin{gathered} 9 \\ 9 \\ 0 \\ 9 \end{gathered}$ | $\left.\begin{array}{\|c\|} \underset{\sim}{N} \\ 0 \\ \sim \end{array} \right\rvert\,$ | $\left.\begin{gathered} \underset{\sim}{\underset{~}{f}} \\ \underset{\sim}{\mathrm{i}} \end{gathered} \right\rvert\,$ | $\begin{aligned} & 0 \hat{0} \\ & \underset{2}{2} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{\hat{n}} \\ & \vec{i} \\ & \hat{n} \end{aligned}$ |  | $\widetilde{N}$ N 0 0 0 | $\begin{aligned} & 0 \\ & \underset{-1}{0} \\ & \underset{-}{0} \\ & \underset{\sim}{n} \end{aligned}$ |  |  |  |  | $\begin{array}{\|c} \vec{m} \\ \underset{n}{n} \\ \hat{n} \\ \hat{n} \end{array}$ |  |  |
|  | $\begin{gathered} 0 \\ n \\ \vdots \\ \vdots \\ \vdots \end{gathered}$ | $\left.\begin{aligned} & \infty \\ & \infty \\ & n \\ & n \\ & n \end{aligned} \right\rvert\,$ | $\left\|\begin{array}{c} \hat{n} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{array}\right\|$ | $\left.\begin{array}{\|l\|} \hline \underset{\sim}{n} \\ \omega \\ \sim \\ \sim \end{array} \right\rvert\,$ | $$ |  | $\begin{aligned} & \infty \\ & \infty \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{gathered} n \\ \infty \\ \infty \\ n \\ n \end{gathered}$ | $\begin{array}{\|l\|} \hline n \\ 0 \\ 0 \\ -2 \end{array}$ | $\begin{array}{\|c\|} \hline N \\ 0 \\ 0 \\ i \\ i \end{array}$ | $\left.\begin{array}{\|l\|} \hat{n} \\ 0 \\ \vec{v} \\ \vec{v} \end{array} \right\rvert\,$ | $\left. \right\rvert\,$ | $\left.\begin{aligned} & 0 \\ & \underset{\sim}{2} \\ & \underset{\sim}{n} \end{aligned} \right\rvert\,$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left.\begin{array}{\|c} 0 \\ 0 \\ 0 \\ 9 \\ i \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} n \\ n \\ \infty \\ 0 \\ i n \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline 0 \\ \dot{0} \\ \stackrel{2}{n} \end{array}$ |  |  |  |  |  | $\begin{array}{\|c\|} \hline \left.\begin{array}{c} 9 \\ n \\ n \\ n \\ n \end{array} \right\rvert\, \end{array}$ | $\begin{aligned} & \underset{N}{N} \\ & \dot{j} \\ & \underset{\sim}{2} \end{aligned}$ | $\left\lvert\, \begin{gathered} \underset{\sim}{\underset{7}{2}} \\ \underset{\sim}{0} \\ \underset{\sim}{2} \end{gathered}\right.$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ i n \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \substack{n \\ \stackrel{1}{2} \\ \dot{\infty} \\ \sim} \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ i \end{array}$ | $$ | $\begin{gathered} N \\ \underset{y}{2} \\ = \\ i \end{gathered}$ |  | $\begin{gathered} 2 \\ \underset{y}{2} \\ \underset{i}{2} \\ 0 \end{gathered}$ |  | $\left.\begin{array}{\|c\|} \hline \sim \\ \underset{\sim}{\mathrm{N}} \\ \hat{N} \\ \underset{\sim}{n} \end{array} \right\rvert\,$ | $\begin{gathered} o \\ 0 \\ \underset{n}{0} \\ \underset{n}{n} \\ n \end{gathered}$ |  |
|  | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ i \\ i \end{array}$ | $\begin{aligned} & 2 \\ & n \\ & n \end{aligned}$ | $$ | $\begin{array}{\|l\|} \hline \vec{n} \\ \omega \\ n \\ n \end{array}$ | $$ | $\left.\begin{aligned} & n \\ & n \\ & n \\ & \sim \\ & \sim \end{aligned} \right\rvert\,$ | $\begin{aligned} & 8 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{array}{\|l\|} \hline \stackrel{\sim}{n} \\ \underset{\sim}{n} \\ \hline \end{array}$ |  | $\begin{aligned} & \infty \\ & \infty \\ & 0 \\ & 0 \\ & i \\ & i \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline \\ n \\ n \\ \vec{n} \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \infty \\ \infty \\ n \\ \underset{n}{n} \\ i \end{array} \right\rvert\,$ | $\begin{aligned} & \infty \\ & \infty \\ & \infty \\ & \tilde{n} \end{aligned}$ | $\begin{aligned} & \hline n \\ & \vdots \\ & i \\ & i n \\ & i \end{aligned}$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \\ i n \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 2 \\ 2 \end{array}\right\|$ |  |  |  |  |  |  | $$ | $\left.\begin{aligned} & i n \\ & \hat{n} \\ & \hat{0} \\ & \tilde{n} \end{aligned} \right\rvert\,$ |  | $\begin{array}{\|c\|} \hline 9 \\ \hline \\ 0 \\ 0 \\ 0 \\ i n \end{array} .$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\left. \right\rvert\,$ |  | $$ | $\begin{gathered} 0 \\ n \\ 0 \\ 0 \\ \vdots \\ i \end{gathered}$ | $\left\|\begin{array}{c} \underset{N}{N} \\ 0 \\ 0 \\ N \\ N \\ n \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ \underset{N}{N} \\ \hat{N} \\ n \end{array}\right\|$ | $\begin{array}{\|c\|} \hline \stackrel{i n}{n} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \hat{N} \\ \dot{\sim} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{array}$ |  |  |
|  | $\stackrel{\sim}{\sim}$ | N | $\|\underset{\sim}{\mathbf{A}}\|$ | $\begin{array}{\|l\|} \hline \stackrel{0}{7} \\ \underset{7}{ } \end{array}$ | $\|\stackrel{\stackrel{\rightharpoonup}{N}}{ }\|$ | $\stackrel{\circ}{N}$ | $\underset{\sim}{\mathbf{N}}$ | $\underset{\sim}{n}$ | $\underset{\sim}{\sim}$ | $\frac{n}{2}$ | $\mathfrak{n}$ | $\left. \right\rvert\,$ | $\mathfrak{N}$ | $\left.\begin{array}{\|c\|c} n \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\|\stackrel{N}{N}\|$ | $\mid \stackrel{N}{N}$ | \|ন্ম |  |  |  | $\begin{array}{\|c\|c} \stackrel{\rightharpoonup}{\underset{\sim}{A}} \underset{\sim}{A} \\ \underset{\sim}{\prime} \end{array}$ |  | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{m} \\ \underset{i}{2} \end{array}$ | $$ | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ e \\ i \end{array} \right\rvert\,$ | $\left.\begin{gathered} \underset{\sim}{\mathrm{N}} \\ \mathrm{~N} \end{gathered} \right\rvert\,$ | $\begin{array}{\|c\|} \underset{\sim}{n} \\ \underset{N}{2} \end{array}$ | $\left.\begin{array}{\|c\|} \underset{\sim}{\mathrm{N}} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c} \mathrm{N} \\ \mathrm{~N} \end{array} \right\rvert\,$ | $$ | $\begin{aligned} & 0 \\ & 0 \\ & i \\ & i \end{aligned}$ | $\left\|\begin{array}{c} g \\ \underset{寸}{g} \end{array}\right\|$ | $\begin{array}{\|c\|} \hline 0 \\ \underset{\sim}{2} \\ \hline \end{array}$ | $\left\lvert\, \begin{gathered} \vec{g} \\ \underset{\infty}{\infty} \end{gathered}\right.$ | $\left.\begin{aligned} & 9 \\ & i n \\ & i \\ & \sigma \end{aligned} \right\rvert\,$ | $\begin{gathered} \vec{n} \\ \underset{y}{n} \\ \end{gathered}$ |  |
| $\left\|\begin{array}{lll} \sum_{\mathrm{U}} & \text { oㅇ } & \stackrel{\pi}{3} \end{array}\right\|$ | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \stackrel{\rightharpoonup}{0} \\ & \dot{-} \end{aligned}$ | $\left.\begin{array}{\|l\|} \hline 0 \\ 0 \\ \vdots \\ \dot{0} \end{array} \right\rvert\,$ | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \stackrel{\rightharpoonup}{\mathrm{~N}} \\ \hline \end{gathered}\right.$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \underset{\sim}{\mathrm{j}} \end{array}\right\|$ |  | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\circ} \\ \underset{N}{\mathrm{O}} \end{array}\right\|$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\mathrm{N}} \\ & \stackrel{N}{\mathrm{~N}} \end{aligned}$ | 융 | $\begin{aligned} & \circ \\ & \stackrel{\rightharpoonup}{\circ} \\ & \dot{y} \\ & \dot{N} \end{aligned}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{0} \\ & \underset{\sim}{2} \\ & \underset{\text { g}}{ } \end{aligned}$ | ờ |  |  | $\begin{array}{\|l\|} \hline \stackrel{\circ}{0} \\ \dot{6} \\ \dot{b} \end{array}$ | $\begin{aligned} & \hline \stackrel{\rightharpoonup}{0} \\ & \underset{\sim}{2} \\ & \dot{\circ} \end{aligned}$ |  |  |  |  |  | ぷ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{n} \\ \underset{\sim}{2} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \stackrel{\circ}{\circ} \\ \dot{4} \\ \dot{\circ} \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} \circ \\ \stackrel{\rightharpoonup}{\circ} \\ \infty \\ \infty \\ \infty \end{array}\right\|$ |  | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \stackrel{c}{\mathrm{~N}} \\ & \underset{\mathrm{~g}}{ } \end{aligned}$ |  | $\left.\begin{array}{\|l\|} \hline 0 \\ \infty \\ \infty \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \stackrel{y}{0} \\ \underset{\sim}{2} \\ \dot{g} \end{array}$ | $\begin{aligned} & \circ \stackrel{0}{\circ} \\ & \stackrel{\circ}{\circ} \end{aligned}$ |  |  | $\begin{array}{\|l} \hline \stackrel{\circ}{\circ} \\ \text { ুু } \\ \text { S- } \end{array}$ |  | $\circ$ <br>  <br>  <br>  |  |
|  |  | $\stackrel{\underset{\sim}{\circ}}{\underset{\sim}{2}}$ | $\left\|\begin{array}{l} \circ \\ \hline 0 \\ \mathrm{O} \\ \text { in } \end{array}\right\|$ | $\left.\begin{array}{\|c} \stackrel{\mathrm{N}}{\mathrm{~N}} \\ \mathrm{~N} \\ \mathrm{~N} \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \mathbf{0} \\ \mathrm{m} \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} \mathbf{O} \\ \mathbf{C} \\ \mathrm{m} \end{array}\right\|$ |  | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \underset{子}{子} \\ \hline \end{gathered}$ | ㄴํㅇ |  | $\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \underset{\sim}{n} \\ \text { in } \end{array}$ |  | ి융 |  | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \mathbf{0} \\ \text { in } \end{array}$ |  |  |  | ふั̀ |  | $\stackrel{\circ}{2}$ |  | $\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \infty \\ \underset{\sim}{2} \end{array}$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \underset{\sim}{2} \end{array}\right\|$ | $\begin{array}{\|c\|} \stackrel{\rightharpoonup}{\stackrel{ }{2}} \\ \stackrel{\rightharpoonup}{\mathrm{~N}} \end{array}$ | $\left\|\begin{array}{l} \mathbf{O} \\ \hline \mathbf{6} \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \underset{\mathrm{O}}{ } \end{array}\right\|$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \stackrel{\rightharpoonup}{0} \\ 0 \end{array}$ | O | $\left.\begin{array}{\|c\|} \hline \stackrel{0}{\circ} \\ \mathbf{0} \\ 0 \end{array} \right\rvert\,$ | 侖 | 2 0 0 0 0 0 | $\left\|\begin{array}{c} 0 \\ \stackrel{\rightharpoonup}{0} \\ 0 \\ 0 \end{array}\right\|$ | $$ | $\left\|\begin{array}{l} \hline 0 \\ \hline \mathbf{O} \\ \text { O} \end{array}\right\|$ | Bo | － |
|  |  | $\begin{aligned} & n \\ & 0 \\ & 0 \\ & n \\ & \hline \end{aligned}$ |  | $\left.\begin{array}{\|c\|} \hline \\ 7 \\ 0 \\ \underset{\sim}{0} \end{array} \right\rvert\,$ | $\begin{aligned} & \hline \left.\begin{array}{l} n \\ \infty \\ \infty \\ \underset{N}{2} \end{array} \right\rvert\, \end{aligned}$ | $\stackrel{\infty}{\infty} \underset{\substack{\infty \\ \underset{\sim}{2} \\ \hline}}{ }$ | $\left\lvert\, \begin{gathered} \tilde{\sim} \\ \underset{n}{n} \\ \vec{m} \end{gathered}\right.$ | $\begin{aligned} & \stackrel{\rightharpoonup}{n} \\ & N_{n} \end{aligned}$ |  | $\begin{aligned} & \infty \\ & \substack{0 \\ -\\ \vec{y} \\ \hline \\ \hline} \\ & \hline \end{aligned}$ | $\begin{aligned} & \dot{8} \\ & \mathbf{o} \\ & \underset{子}{\mathcal{y}} \end{aligned}$ | $\begin{aligned} & \hat{e} \\ & \mathbf{\infty} \\ & \underset{\gamma}{ } \end{aligned}$ |  | $\begin{array}{\|c\|} \hline \infty \\ \underset{\sim}{2} \\ \underset{\sim}{2} \\ \hline \end{array}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \underset{\sim}{0} \\ & \hline \end{aligned}$ | $\begin{array}{\|l\|} \hline \mathbf{0} \\ 0 \\ \underset{m}{2} \end{array}$ |  | $$ |  |  |  |  | $\left.\begin{array}{\|c\|} \hline \underset{\sim}{n} \\ \tilde{j} \end{array} \right\rvert\,$ | $\left\|\begin{array}{c} \hat{\mathrm{y}} \\ \infty \end{array}\right\|$ | $\begin{aligned} & \mathrm{N} \\ & \mathrm{~N} \\ & \mathrm{~N} \end{aligned}$ | $\left.\begin{gathered} \underset{\sim}{9} \\ \underset{\sim}{n} \\ \hline \end{gathered} \right\rvert\,$ | $\begin{aligned} & \underset{i}{9} \\ & \underset{i}{2} \end{aligned}$ | $\mid \underset{o}{\|c\|}$ | $\left\lvert\, \begin{aligned} & \infty \\ & \hline 0 \\ & \hline \end{aligned}\right.$ | $\|\vec{m}\|$ | $\stackrel{J}{\mathrm{~N}}$ | $\|\overrightarrow{9}\|$ | $\stackrel{\rightharpoonup}{2}$ | $\stackrel{\infty}{\circ}$ | ～ | $\stackrel{\circ}{\circ}$ |  |
|  | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ \underset{N}{n} \end{array}\right\|$ |  | $\begin{gathered} \hat{N} \\ \infty \\ \infty \\ \underset{\sim}{n} \end{gathered}$ | $\left\lvert\, \begin{gathered} \underset{\sim}{n} \\ \underset{\sim}{n} \\ \hline \end{gathered}\right.$ | $\left.\begin{gathered} \mid c \\ 0 \\ \underset{N}{\infty} \\ \underset{N}{2} \end{gathered} \right\rvert\,$ | $\begin{aligned} & \tilde{N} \\ & \stackrel{N}{n} \\ & \underset{n}{2} \end{aligned}$ | $\left\lvert\, \begin{aligned} & \infty \\ & \infty \\ & \underset{m}{n} \\ & \end{aligned}\right.$ | $\begin{aligned} & 0 \\ & \underset{\sim}{2} \\ & \underset{子}{\sim} \end{aligned}$ | $\left\|\begin{array}{c} \infty \\ \stackrel{\infty}{\infty} \\ \underset{子}{+} \\ \dot{\sigma} \end{array}\right\|$ | $\begin{aligned} & \mathrm{N} \\ & \underset{j}{g} \\ & \underset{寸}{ } \end{aligned}$ | $\left.\begin{aligned} & 0 \\ & 0 \\ & \infty \\ & i \\ & i n \\ & i n \end{aligned} \right\rvert\,$ | $\left.\begin{array}{\|c} o \\ 0 \\ 寸 \\ \underset{\sim}{n} \\ i \end{array} \right\rvert\,$ |  |  | $\begin{array}{\|c\|} \hline-8 \\ \infty \\ \underset{\sim}{\infty} \\ \underset{\sim}{2} \end{array}$ | $\begin{aligned} & \hat{\lambda} \\ & \underset{\sim}{2} \\ & \vec{m} \\ & \underset{\sim}{2} \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline \\ \underset{\sim}{2} \\ \underset{\sim}{\hat{N}} \end{array} \right\rvert\,$ |  |  |  |  |  | $\begin{gathered} \stackrel{o}{\infty} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\left\|\begin{array}{l} \infty \\ 0 \\ \underset{\sim}{0} \\ \underset{\sim}{0} \end{array}\right\|$ | $\left\|\begin{array}{l} \hat{0} \\ \dot{0} \\ \underset{\sim}{n} \\ \underset{N}{2} \end{array}\right\|$ | $\left.\begin{gathered} \infty \\ 0 \\ \infty \\ i n \\ i \end{gathered} \right\rvert\,$ | $\left.\begin{gathered} \underset{\sim}{2} \\ \underset{\sim}{\infty} \\ \hline \end{gathered} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline 0.0 \\ \infty \\ \infty \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \underset{子}{\underset{\sim}{f}} \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ i \\ \mathfrak{O} \\ \underset{寸}{ } \end{array}$ |  | $\begin{aligned} & \underset{\sim}{\underset{~}{n}} \end{aligned}$ | $\begin{array}{\|c\|} \sim \\ \infty \\ \infty \end{array}$ | $\left\lvert\,\right.$ | $\underset{\sim}{\infty}$ | $\begin{aligned} & 0 \\ & i n \end{aligned}$ | N｜ |
|  | $4,173,875$ |  | $\left\|\begin{array}{c} \underset{\sim}{c} \\ \sim_{2} \\ \underset{\sim}{N} \\ \underset{\sim}{2} \end{array}\right\|$ |  |  |  | $\left\|\begin{array}{c} n \\ 0 \\ 0 \\ 0 \\ 0 \\ \tilde{N}^{2} \end{array}\right\|$ |  |  |  |  | $\left\|\begin{array}{c} \underset{\sim}{n} \\ \underset{\sim}{\lambda} \\ \underset{N}{n} \\ \underset{\sim}{2} \end{array}\right\|$ | $\left\|\begin{array}{c} { }_{0}^{\infty} \\ n \\ \vec{n} \\ \underset{\sim}{n} \\ \tilde{m} \end{array}\right\|$ |  |  |  |  | $n$ $\underset{N}{n}$ $\vdots$ |  |  |  |  |  | $\left\|\begin{array}{c} 0 \\ 0 \\ n_{0}^{\infty} \\ \infty \\ n \\ n \\ \underset{\sim}{n} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline 2 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array} \right\rvert\,$ |  |  | $\left.\begin{array}{\|c\|} \hline 0 \\ 0 \\ o \\ 0 \\ 0 \\ 0 \\ c \end{array} \right\rvert\,$ | $\begin{gathered} o \\ 0 \\ 0 \\ \underset{\sim}{寸} \\ \underset{c}{0} \end{gathered}$ | $\left.\begin{array}{\|c\|} \hline \underset{N}{N} \\ n \\ 0 \\ 0 \\ 0 \\ \hline \end{array} \right\rvert\,$ | $\left\lvert\, \begin{gathered} \hat{N} \\ n \\ 0 \\ 0 \\ \underset{y}{c} \end{gathered}\right.$ | $\begin{array}{\|l\|} \hline 0 \\ \hat{0} \\ 0 \\ 0 \\ \\ \end{array}$ | $\left\|\begin{array}{c} \mathbf{n}^{\infty} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{N} \\ \dot{\sim} \\ \infty \\ \infty \\ \sigma^{2} \end{array}$ |  |  | $\mathfrak{c}$ |
|  | $\left\lvert\, \begin{aligned} & 0 \\ & 0 \\ & y \\ & 3 \\ & 0 \\ & 0 \end{aligned}\right.$ |  |  | $\left\|\begin{array}{l} \mathrm{O} \\ \mathbf{N} \\ y \\ 0 \\ 0 \\ \end{array}\right\|$ | $\left\|\begin{array}{c} \underset{\sim}{n} \\ \underset{y}{y} \\ \underset{\sim}{0} \\ \mid \end{array}\right\|$ | $\left\lvert\, \begin{gathered} o \\ \underset{n}{x} \\ y \\ \underset{n}{n} \end{gathered}\right.$ | $\left\|\begin{array}{c} o \\ O \\ y \\ y \\ O \\ O \\ 0 \end{array}\right\|$ |  |  |  |  | $\left\|\begin{array}{l} o \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ i n \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} o \\ \hat{O} \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ \hat{n} \\ y \\ y \\ o \\ o \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ n \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ \infty \\ y \\ 0 \\ 0 \\ \infty \\ \infty \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ \infty \end{array}\right\|$ | $\left\lvert\, \begin{aligned} & 0 \\ & 0 \\ & 0 \\ & \vec{v} \\ & y \\ & 0 \\ & 0 \\ & \hline \end{aligned}\right.$ | $\left\|\begin{array}{c} 0 \\ \underset{\sim}{\overrightarrow{1}} \\ \mathrm{y} \\ 0 \\ 0 \\ 0 \\ - \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ \underset{\sim}{7} \\ \vec{y} \\ 0 \\ 0 \\ \vec{~} \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ \underset{1}{v} \\ y \\ 0 \\ \underset{\sim}{u} \end{array}\right\|$ |  | $\left\|\begin{array}{c} o \\ 0 \\ h \\ y \\ 0 \\ o \\ \underset{~}{7} \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ n \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ \hat{N} \\ y \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ \hat{N} \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \\ \hline \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ \vdots \\ y \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ 子 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ \infty \end{array}\right\|$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 1 \\ & 1 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{array}{l\|l\|} \substack{3 \\ 3 \\ n} \\ \hline \end{array}$ |  |

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:ALL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:HOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Summer 4 months Climate:NOTHOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Winter 8 months Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1 : E1 2018 vs. ETOUC 2018 Season:Winter 8 months Climate:MODERATE NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:All seasons Climate:ALL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:All seasons Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date：12DEC16
Scenario：Comparison 745（d）Schedule：E1L ：E1L 2018 vs．ETOUCL 2018 Season：All seasons Climate：HOT NEM／non－NEM：non－NEM

|  | 웅 | － | ¢ | $\left\lvert\, \begin{gathered} 00 \\ \underset{0}{0} \\ \underset{0}{2} \end{gathered}\right.$ | ion | \|ocio |  | $\begin{aligned} & \circ \\ & \hline 0 \\ & \bar{o} \\ & 0 \end{aligned}$ |  |  |  |  | $\left\|\begin{array}{l} 20 \\ \hat{0} \\ i \end{array}\right\|$ | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \stackrel{\rightharpoonup}{\mathrm{i}} \end{array}\right\|$ |  | $\left\|\begin{array}{c} \stackrel{\circ}{2} \\ \stackrel{\rightharpoonup}{i} \end{array}\right\|$ | $\left\|\begin{array}{l} \stackrel{\circ}{0} \\ \mathbf{0} \\ \mathrm{i} \end{array}\right\|$ | $\left\|\begin{array}{l} \stackrel{\rightharpoonup}{0} \\ \hat{0} \\ i \end{array}\right\|$ | $\begin{aligned} & \circ \\ & \hline 0 \\ & n \\ & c \end{aligned}$ | O- | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{l\|l} \hline \stackrel{\rightharpoonup}{0} \\ \stackrel{\rightharpoonup}{2} \\ \circ & 0 \\ 0 \end{array}$ | $\begin{array}{lll} \hline 0 . \\ 0 \\ \vdots \\ \vdots \\ i \end{array}$ | 융 | $\left\lvert\, \begin{aligned} & \substack{0 \\ \dot{u} \\ \underset{i}{2} \\ i} \end{aligned}\right.$ | $\stackrel{\circ}{7}$ |  | $\left\|\begin{array}{c} \stackrel{\circ}{0} \\ \underset{\sim}{n} \\ \underset{i}{2} \end{array}\right\|$ |  | $\left\|\begin{array}{l} \underset{\sim}{2} \\ \underset{\sim}{\mathrm{j}} \end{array}\right\|$ | $\xrightarrow[\substack{o \\ \underset{\sim}{\circ} \\ \underset{N}{2} \\ \hline}]{ }$ | $\stackrel{O}{0}$ | $\mathfrak{c}$ | $\mathfrak{c}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\left\|\begin{array}{c} -1 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 . \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & i \end{aligned}$ | $\hat{i}$ | $\begin{gathered} n \\ \underset{i}{n} \end{gathered}$ | $\begin{gathered} - \\ \infty \\ \infty \end{gathered}$ | $\begin{gathered} 2 \\ 8 \\ i \end{gathered}$ |  |  | $\begin{array}{c\|c} n \\ \underset{i}{2} & \stackrel{\rightharpoonup}{i} \end{array}$ |  | $\stackrel{\hat{q}}{i}$ | $\left\|\begin{array}{c} i \\ 0 \\ i n \end{array}\right\|$ | $\underset{i n}{N}$ | $\begin{aligned} & 7 \\ & \underset{i n}{2} \end{aligned}$ | $\left\|\begin{array}{c} \infty \\ 0 \\ -i \\ \hline \end{array}\right\|$ | $\underset{\sim}{\circ}$ | $\begin{gathered} 0 \\ \underset{i}{n} \\ i \end{gathered}$ |  | $\begin{gathered} \underset{\sim}{n} \\ \dot{n} \end{gathered}$ | $\begin{array}{c\|c} o \\ \infty \\ c \\ i & 2 \\ i \end{array}$ |  |  | $\begin{array}{\|l\|} \hline \underset{\sim}{n} \\ \substack{0 \\ 0} \\ \hline \end{array}$ | $\begin{aligned} & \hat{n} \\ & \infty \\ & \dot{\infty} \\ & \vdots \\ & i \end{aligned}$ | $\begin{gathered} \hat{0} \\ \underset{y}{2} \\ \stackrel{y}{v} \end{gathered}$ |  |  |  |  | $\begin{gathered} \underset{\sim}{n} \\ \underset{\sim}{2} \\ \underset{\sim}{n} \\ \end{gathered}$ |  | $\begin{array}{\|c\|} \hline \stackrel{n}{n} \\ \underset{1}{n} \\ \hat{n} \\ \hline \end{array}$ |  |  |
|  |  | $\left.\begin{gathered} n \\ \underset{\sim}{n} \\ i n \\ i n \end{gathered} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \hline \stackrel{n}{n} \\ 0 \\ 0 \\ i n \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c} \stackrel{\sim}{\sim} \\ \underset{\sim}{\mathrm{N}} \end{array} \right\rvert\,$ | $\begin{gathered} \infty \\ \infty \\ \infty \\ \infty \\ \infty \end{gathered}$ | $\begin{aligned} & \overrightarrow{7} \\ & \underset{\sim}{n} \\ & \sim \\ & n \end{aligned}$ |  | $\begin{gathered} n \\ \sim \\ o \\ \underset{\sim}{n} \end{gathered}$ | $\begin{aligned} & \infty \\ & \infty \\ & 0 \\ & 0 \\ & 0 \\ & n \\ & n \end{aligned}$ |  | $\begin{array}{ll} \infty \\ \underset{\sim}{n} \\ \underset{\sim}{n} & \underset{\sim}{n} \\ \alpha \end{array}$ |  | $\begin{array}{\|c\|} \hline \\ \underset{\sim}{0} \\ \underset{\sim}{\infty} \end{array}$ | $$ | $\begin{gathered} \underset{\sim}{n} \\ \underset{n}{0} \\ i n \end{gathered}$ | $\begin{array}{\|c\|} \hline-1 \\ \underset{\sim}{g} \\ \underset{\sim}{n} \\ \hline \end{array}$ | $\left.\begin{array}{\|c} \underset{\sim}{\mathrm{N}} \\ \underset{\sim}{\mathrm{~N}} \end{array} \right\rvert\,$ | $$ | $\begin{gathered} \underset{\sim}{9} \\ \underset{j}{j} \\ \stackrel{\rightharpoonup}{2} \end{gathered}$ | $\begin{array}{ll} n \\ n \\ n \\ n \\ n \end{array}$ | $\begin{array}{\|c\|} \underset{i}{\mathrm{~N}} \\ \underset{\sim}{\mathrm{n}} \\ \hline \end{array}$ |  |  |  | $\begin{aligned} & \underset{\sim}{Z} \\ & \underset{i}{n} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \hline \left.\begin{array}{c} n \\ n \\ 0 \\ \tilde{m} \\ \sim \end{array} \right\rvert\, \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \hline \underset{\sim}{9} \\ \underset{\sim}{7} \\ \underset{\sim}{7} \end{array}$ | $\begin{gathered} N \\ \hat{e} \\ 0 \\ 0 \\ n \end{gathered}$ | $\left.\begin{aligned} & \infty \\ & \hat{n} \\ & \hat{n} \\ & 0 \\ & 0 \\ & n \end{aligned} \right\rvert\,$ |  |  | $\begin{gathered} 0 \\ i \\ i n \\ i \\ i n \end{gathered}$ | $\mathfrak{c}$ | $\mathfrak{c}$ | $\left.\begin{array}{\|c\|} \hline \\ \sim \\ 0 \\ 0 \\ \infty \\ -2 \\ -i \end{array} \right\rvert\,$ |  |
|  |  | $\left.\begin{gathered} 0 \\ 0 \\ 0 \\ i n \end{gathered} \right\rvert\,$ | $\left\|\begin{array}{c} n \\ 0 \\ i n \\ i n \end{array}\right\|$ | $\left\|\begin{array}{l} \mathrm{N} \\ \underset{\sim}{\mathrm{~N}} \end{array}\right\|$ | $\underset{i}{\infty}$ | $\begin{gathered} 0 \\ \sim \\ n \\ n \end{gathered}$ | $\begin{aligned} & \infty \\ & \infty \\ & \dot{\sim} \\ & \hline \end{aligned}$ | $\begin{gathered} \infty \\ \infty \\ \infty \\ \infty \\ \infty \end{gathered}$ | $\begin{array}{c\|c} 0 \\ 0 \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \end{array}$ |  |  | $\begin{array}{c\|c} N & 0 \\ 0 \\ i n & 0 \\ i n \\ 0 \end{array}$ | $\begin{gathered} \infty \\ 0 \\ 0 \\ 0 \end{gathered}$ | $$ | $\left\|\begin{array}{c} \infty \\ \underset{\sim}{n} \\ \underset{n}{2} \end{array}\right\|$ | $\left\|\begin{array}{c} 8 \\ \underset{i}{7} \\ i n \end{array}\right\|$ | $\left\|\begin{array}{c} \underset{7}{7} \\ \underset{0}{2} \\ \sqrt{2} \end{array}\right\|$ | $\begin{array}{\|c\|} \hline \infty \\ \underset{\sim}{0} \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \hline \end{array}$ | $\begin{aligned} & \infty \\ & \infty \\ & 0 \\ & \tilde{n} \\ & i \end{aligned}$ | $\begin{aligned} & n \\ & n \\ & n \\ & n \\ & n \\ & n \end{aligned}$ | $\left\|\begin{array}{c} 9 \\ i \\ i \\ i n \end{array}\right\|$ | $\begin{aligned} & 9 \\ & 0 \\ & \infty \\ & \dot{\infty} \\ & -i \end{aligned}$ | $\left\|\begin{array}{c} n \\ \underset{\sim}{i} \\ \underset{\sim}{\sim} \end{array}\right\|$ | $\begin{array}{l\|l} \hat{6} & 1 \\ \infty \\ \underset{N}{2} & 2 \\ n & i \end{array}$ |  |  | $\left\|\begin{array}{c} \underset{\sim}{n} \\ \dot{N} \\ \underset{\sim}{2} \end{array}\right\|$ | $\begin{gathered} \infty \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ |  | $\begin{gathered} 1 \\ \underset{\alpha}{\infty} \\ \infty \\ \infty \\ \sim \end{gathered}$ | $\left\|\begin{array}{c} 0 \\ 0 \\ \underset{~}{9} \\ - \\ i n \end{array}\right\|$ |  |  |  | $\left\|\begin{array}{c} \hat{n} \\ \hat{N} \\ \hat{0} \\ \hat{n} \\ \hat{n} \end{array}\right\|$ |  |
|  | 9 | $\infty$ | $\left\|\right\|$ | $\underset{\sim}{\mathrm{N}}$ | $\stackrel{\stackrel{\rightharpoonup}{N}}{ }$ | $\stackrel{0}{\sim}$ | $\underset{\sim}{\underset{\sim}{2}}$ | $\underset{m}{n}$ | $\underset{\sim}{\sim}$ | $\underset{\sim}{n}$ | $\begin{array}{l\|l} N \\ N & N \\ N \end{array}$ | $$ | $\left\|\begin{array}{c} \mathrm{N} \\ \mathrm{O} \end{array}\right\|$ | $\begin{array}{\|c\|} \hline N \\ \hline 6 \\ \hline \end{array}$ | $\stackrel{N}{N}$ | N | $$ | $\left.\begin{array}{\|c\|} \hline \\ \infty \\ \hline \end{array} \right\rvert\,$ | $\hat{\mathrm{o}}$ | $\left\lvert\, \begin{aligned} & 0 \\ & \hline \end{aligned}\right.$ | $\begin{aligned} & 0 \\ & \underset{\sim}{0} \\ & \overrightarrow{-} \\ & \overrightarrow{2} \end{aligned}$ | $\underset{\sim}{\underset{\sim}{\sim}} \underset{\sim}{\sim}$ | $\underset{\sim}{\underset{\sim}{c}} \underset{\sim}{n}$ | $\underset{\sim}{f}$ | $\begin{array}{\|c\|c} \hat{\lambda} \\ 0 \\ i & 0 \\ i \end{array}$ | $\begin{aligned} & \hat{\infty} \\ & \vec{N} \\ & \underset{\sim}{2} \\ & \end{aligned}$ | $\left.\begin{aligned} & \dot{0} \\ & \stackrel{0}{0} \\ & i \end{aligned} \right\rvert\,$ | $\left\lvert\, \begin{aligned} & 0 \\ & \underset{N}{2} \\ & \mathrm{~m} \end{aligned}\right.$ | $\left\lvert\, \begin{aligned} & \underset{n}{n} \\ & \underset{m}{n} \end{aligned}\right.$ | $\underset{\sim}{\underset{\sim}{2}} \underset{\sim}{c}$ | $\left\lvert\, \begin{gathered} \infty \\ 寸 \\ \dot{n} \end{gathered}\right.$ | $\left\|\begin{array}{l} \infty \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $$ | $\begin{array}{\|l\|} \hline \hat{e}^{0} \\ 0 \\ \sigma \end{array}$ | $\left.\begin{aligned} & \vec{y} \\ & \vec{~} \\ & \vec{j} \end{aligned} \right\rvert\,$ |  |
|  | $\circ$ $\vdots$ $\vdots$ | $\left.\begin{array}{\|c\|} \hline \stackrel{2}{\mathrm{~N}} \\ \mathrm{o} \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{\mathrm{O}} \\ \mathbf{c} \\ \mathrm{~N} \end{array} \right\rvert\,$ | $\left.\begin{array}{c\|} \stackrel{\circ}{\dot{\circ}} \\ \dot{\sim} \end{array} \right\rvert\,$ | $\begin{gathered} \underset{\sim}{0} \\ \underset{\infty}{n} \\ \infty \end{gathered}$ | $\begin{gathered} \stackrel{\rightharpoonup}{2} \\ \underset{\sim}{2} \\ \underset{\sim}{n} \end{gathered}$ |  | co | $\square$ |  |  |  | $\begin{aligned} & 20 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  | $\begin{gathered} \stackrel{\circ}{\infty} \\ \stackrel{e}{n} \\ i \end{gathered}$ |  | $\begin{array}{\|c\|} \hline \stackrel{y}{\circ} \\ \hat{N} \\ 0 \\ \infty \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ \substack{0 \\ n \\ \infty \\ \infty} \end{array}$ | $\begin{gathered} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \mathrm{~N} \\ \mathrm{O} \end{gathered}$ | $\begin{aligned} & \stackrel{0}{\infty} \\ & \infty \\ & \underset{\sim}{n} \end{aligned}$ |  |  | $\left\|\begin{array}{c} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{\infty} \\ \circ \end{array}\right\|$ |  | ○잉 |  | $\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \underset{\alpha}{2} \\ \dot{\circ} \end{array}$ | oे̀ | ஷì | $\begin{array}{\|c} \hline 0 \\ 0 \\ 0 \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & \text { Oे } \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ \hline \end{array}$ |  | $\left.\begin{array}{\|c\|} \hline 0 \\ \hline 0 \\ 0 \\ 0 \\ \hline \end{array} \right\rvert\,$ |  |  |
| ¿̀ 芌 | $\begin{gathered} \stackrel{\circ}{\circ} \\ \underset{\sim}{\mathrm{N}} \end{gathered}$ | $\begin{gathered} \stackrel{\circ}{\circ} \\ \stackrel{\rightharpoonup}{f} \\ 0 \end{gathered}$ | $\left\|\begin{array}{c} \circ \\ \underset{\sim}{0} \\ \underset{i}{\prime} \end{array}\right\|$ | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{y}{c} \\ \underset{i}{\prime} \end{gathered}$ |  | $\begin{gathered} \stackrel{\circ}{\circ} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}$ | N | $\begin{aligned} & \stackrel{\rightharpoonup}{2} \\ & \overrightarrow{2} \\ & \dot{0} \end{aligned}$ | へ응 | $\begin{aligned} & \stackrel{\rightharpoonup}{2} \\ & \stackrel{\rightharpoonup}{n} \\ & \stackrel{n}{n} \end{aligned}$ | $\stackrel{\rightharpoonup}{\underset{\sim}{n}}$ |  | $\left\|\begin{array}{l} \stackrel{0}{0} \\ \stackrel{0}{6} \\ \dot{0} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \stackrel{\rightharpoonup}{\mathrm{N}} \\ \text { ते } \end{array} \right\rvert\,$ |  |  | $\left.\begin{gathered} \stackrel{\rightharpoonup}{\stackrel{0}{2}} \\ \underset{\sim}{\sim} \end{gathered} \right\rvert\,$ | $\left\|\begin{array}{l} \mathbf{o} \\ \hline \mathbf{e} \\ \dot{c} \end{array}\right\|$ | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \mathbf{C} \\ & \stackrel{y}{2} \end{aligned}$ | $\mathfrak{i}$ | $\begin{array}{\|c\|c} \hline \stackrel{\rightharpoonup}{2} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \\ \hline \end{array}$ |  | $\left\lvert\, \begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \stackrel{1}{n} \\ 0 \end{gathered}\right.$ |  | ஹ융 | $\left.\begin{array}{\|c\|} \hline \stackrel{\circ}{\circ} \\ \stackrel{3}{c} \\ 0 \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{\circ} \\ \vdots \\ 0 \\ \hline \end{array}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $0$ | $\begin{aligned} & \circ \\ & \hline 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \circ \\ & \hline 0 \\ & 0 \\ & 0 \end{aligned}$ | $0$ | $5$ | $\left.\begin{array}{\|c\|} \hline 0 \\ \hline 0 \\ 0 \end{array} \right\rvert\,$ | $\left\|\begin{array}{l} \hline \stackrel{0}{0} \\ 0 \\ 0 \\ \hline \end{array}\right\|$ | － |
|  | $\underset{\sim}{\underset{\sim}{n}}$ | $\left\lvert\, \begin{array}{\|c\|} \underset{\sim}{\underset{N}{N}} \end{array}\right.$ | $\left\lvert\, \begin{gathered} \mathbf{C} \\ 0 \\ \hline \end{gathered}\right.$ | $\left.\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & i \end{aligned} \right\rvert\,$ | $\begin{aligned} & \stackrel{0}{n} \\ & \stackrel{n}{n} \\ & \underset{\sim}{2} \end{aligned}$ | $\underset{\sim}{\underset{\sim}{n}} \underset{\sim}{\underset{N}{2}}$ | $\begin{aligned} & \stackrel{n}{n} \\ & \underset{N}{N} \end{aligned}$ |  |  |  |  |  | $\left\|\begin{array}{c} \hat{n} \\ \hat{n} \\ \vec{n} \end{array}\right\|$ | $\hat{C}$ | $\left(\begin{array}{c} \substack{2 \\ 2 \\ \underset{\sim}{2} \\ \hline} \end{array}\right.$ |  | $\left.\begin{aligned} & \hline \infty \\ & \vdots \\ & 0 \\ & 0 \\ & 0 \end{aligned} \right\rvert\,$ | $\left\|\begin{array}{c} \sim \\ \underset{\sim}{\infty} \\ \underset{\sim}{2} \end{array}\right\|$ |  |  | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  | $\left\|\begin{array}{l} 0 \\ e \\ 1 \\ m \end{array}\right\|$ |  |  | $\stackrel{\sim}{n}$ | \|⿳八人口欠| | $\bigcirc$ | $\stackrel{\infty}{\square}$ | N | － | N | $\sim$ | $\rightarrow$ | m | － |
|  | $\left\lvert\, \begin{aligned} & \hat{y} \\ & \underset{\sim}{n} \\ & \underset{\sim}{2} \end{aligned}\right.$ | $\left.\begin{array}{\|c\|} \hline \mathbf{A} \\ \mathbf{S}_{\mathbf{N}} \end{array} \right\rvert\,$ | $\begin{gathered} G \\ \underset{N}{2} \\ N \end{gathered}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ 0 \\ \underset{\sim}{n} \\ \hline \end{array}$ |  | $\begin{array}{\|c} \substack{n \\ N \\ N \\ N} \end{array}$ |  | $\begin{array}{l\|l} \infty \\ 0 \\ 0 \\ \hat{n} \\ \mathbf{N} \\ \mathrm{~m} \end{array}$ |  |  |  |  | $\left\lvert\, \begin{aligned} & \tilde{\infty} \\ & \infty \\ & \infty \\ & \underset{m}{n} \end{aligned}\right.$ | $\left\lvert\, \begin{gathered} \hat{N} \\ p_{0} \\ \substack{2} \end{gathered}\right.$ | $\begin{aligned} & \infty \\ & \stackrel{n}{n} \\ & \stackrel{n}{n} \\ & \end{aligned}$ | $\left\|\begin{array}{c} \underset{\sim}{N} \\ \underset{\sim}{n} \\ \underset{N}{2} \end{array}\right\|$ | $\left\|\begin{array}{c} \underset{\sim}{\underset{\sim}{\sim}} \\ \underset{\sim}{2} \end{array}\right\|$ | $\left.\begin{array}{\|c\|} \hline \\ \mathbf{N}_{2}^{\infty} \\ \sim_{0}^{\infty} \end{array} \right\rvert\,$ | $\left\lvert\, \begin{gathered} \underset{\sim}{n} \\ \underset{\sim}{n} \\ \end{gathered}\right.$ |  |  | N |  | $\begin{aligned} & \hat{G} \\ & \dot{N} \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline 0 \\ \hat{0} \\ i n \end{array} \right\rvert\,$ | $\begin{array}{\|c\|} \substack{n \\ \hat{n} \\ \infty \\ \hline \\ \hline} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \substack{n \\ \underset{\sim}{n} \\ \hline} \end{array}$ | n | $\stackrel{\rightharpoonup}{\mathrm{N}}$ | $\underset{\sim}{\underset{\sim}{n}}$ | $\stackrel{\circ}{\circ}$ | $\pm$ | N | $\underset{7}{ }$ | ¢ | － |
|  | $\left\|\begin{array}{c} 0 \\ \underset{\sim}{n} \\ \underset{\sim}{2} \end{array}\right\|$ |  |  | $\left.\begin{array}{\|c} \underset{N}{N} \\ \underset{N}{n} \\ N \\ \underset{\sim}{c} \end{array} \right\rvert\,$ |  | $\begin{gathered} \infty \\ 0 \\ n \\ \underset{N}{n} \\ n \\ n \end{gathered}$ |  | $\begin{aligned} & \infty \\ & \underset{\sim}{2} \\ & \underset{\sim}{2} \\ & \underset{\sim}{2} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & \underset{y}{2} \\ & 2 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  |  |  | $\left.\begin{gathered} n \\ 0 \\ n \\ n \\ n \\ n \\ n \\ n \\ n \end{gathered} \right\rvert\,$ | $\begin{gathered} \sim \\ \infty \\ \infty \\ 0 \\ 0 \\ 0 \\ 0 \\ n_{n} \end{gathered}$ |  |  |  |  |  |  | $\left.\begin{array}{\|c} \underset{\sim}{2} \\ \hat{e} \\ 0 \\ n_{2} \end{array} \right\rvert\,$ | $\begin{gathered} 2 \\ \substack{2 \\ 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \hline} \end{gathered}$ |  |  | $\left\lvert\, \begin{gathered} o \\ 0 \\ n \\ n \\ n \\ n_{1} \\ \hline \end{gathered}\right.$ | $\left. \right\rvert\,$ |  |  |  |  |  |  |  | $\left\|\begin{array}{c} \underset{\sim}{2} \\ \text { } \\ \vec{q} \end{array}\right\|$ | On |
|  | $\left\{\left.\begin{array}{l} 0 \\ 0 \\ y \\ 3 \\ 3 \\ 0 \end{array} \right\rvert\,\right.$ | $\left\|\begin{array}{c} \mathrm{O} \\ \overrightarrow{1} \\ y \\ 0 \\ i n \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ \underset{r}{v} \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  | $\begin{aligned} & 0 \\ & 0 \\ & y \\ & 0 \\ & 0 \\ & \tilde{n} \end{aligned}$ | $\begin{gathered} o \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ \hline \end{gathered}$ | $\left\|\begin{array}{c} o \\ \vdots \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  | $\left\lvert\, \begin{aligned} & 0 \\ & 0 \\ & y \\ & y \\ & 0 \\ & n_{2} \end{aligned}\right.$ |  | $\begin{array}{\|c\|c} 0 & 0 \\ 0 & 0 \\ 0 & 0 \\ y & y \\ 0 & 0 \\ 0 & 0 \\ 0 & 0 \end{array}$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ \\ y \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ | $\begin{aligned} & \mathrm{O} \\ & \mathrm{n} \\ & \mathrm{y} \\ & \mathrm{o} \\ & \mathrm{n} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & 0 \\ & n \\ & n \end{aligned}$ | $\left\|\begin{array}{c} 0 \\ 0 \\ y \\ y \\ 0 \\ \infty \end{array}\right\|$ | $\left\|\begin{array}{c} o \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ \infty \end{array}\right\|$ | $\left\|\begin{array}{c} 0 \\ 0 \\ -1 \\ v \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  | $\left\|\begin{array}{c} 0 \\ \underset{\sim}{7} \\ y \\ y \\ 0 \\ \underset{7}{7} \end{array}\right\|$ |  |  | $\left\|\begin{array}{c} o \\ 0 \\ h \\ v \\ y \\ 0 \\ \underset{\sim}{c} \end{array}\right\|$ | $\left\|\begin{array}{l} 0 \\ 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ \hat{C} \end{array}\right\|$ |  |  |  |  |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & y \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \mathrm{O} \\ & \mathrm{C} \\ & \mathrm{y} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{array}{\|c} 0 \\ 0 \\ 0 \\ y \\ y \\ 0 \\ 0 \\ 0 \\ \end{array}$ |  |  |  |

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:COOL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:MODERATE NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:HOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Summer 4 months Climate:NOTHOT NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16
Scenario:Comparison 745(d) Schedule:E1L : E1L 2018 vs. ETOUCL 2018 Season:Winter 8 months Climate:ALL NEM/non-NEM:non-NEM

Bill Impact Run date: 12DEC16

Bill Impact Run date: 12DEC16

Bill Impact Run date：12DEC16
Scenario：Comparison 745（d）Schedule：E1L ：E1L 2018 vs．ETOUCL 2018 Season：Winter 8 months Climate：HOT NEM／non－NEM：non－NEM

|  | ¢ | ＋ | $\stackrel{\substack{2 \\ \underset{\sim}{2}\\}}{ }$ | Bo | $\begin{aligned} & \substack{\infty \\ \\ \\ \hline} \end{aligned}$ | $\stackrel{\substack{0 \\ \hline \\ \underset{\sim}{2} \\ \\ \hline}}{ }$ | Reo | $\stackrel{\substack{0 \\ \\ \\ \\ \hline}}{ }$ |  |  |  | 耪 | $\mathfrak{c}$ | $\mathfrak{c}$ | $\mathfrak{c}$ | $\mathfrak{c}$ | olo | $\mathfrak{c}$ | ol | \|o | $\begin{array}{l\|l} \hline \stackrel{\rightharpoonup}{0} \\ \underset{i}{2} \\ i \end{array}$ | $\begin{gathered} \stackrel{\rightharpoonup}{0} \\ \underset{\sim}{2} \\ \underset{1}{2} \\ \hline \end{gathered}$ | ＋io | $\stackrel{\stackrel{1}{0}}{\substack{\text { n } \\ \sim}}$ |  | ¢ |  |  | $\mathfrak{l}$ | $\underset{\substack{\underset{\sim}{N} \\ \underset{N}{N} \\ \underset{N}{n}}}{ }$ |  | $\underset{\substack{\underset{\sim}{2} \\ \underset{\sim}{\infty} \\ \underset{\sim}{1} \\ \hline}}{ }$ |  | ｜c｜ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & 0.0 \\ & 0 \\ & 0 \end{aligned}$ | $0$ | $\begin{array}{\|c} \text { নi} \\ \underset{i}{2} \end{array}$ | $\begin{gathered} c \\ i \\ i \end{gathered}$ |  |  | in |  | $\underset{\sim}{\infty}$ |  |  |  | $0$ | $\left.\begin{array}{\|c} \stackrel{\rightharpoonup}{n} \\ i n \\ i n \end{array} \right\rvert\,$ | $\mathfrak{n}$ | $\begin{aligned} & n \\ & n \\ & 0 \\ & 0 \\ & n \end{aligned}$ | $\begin{aligned} & 0 \\ & n \\ & n \\ & i n \end{aligned}$ | $\underset{\substack{2 \\ \underset{\sim}{n} \\ \hline}}{2}$ | $\begin{array}{r} 0 \\ \infty \\ \infty \\ 0 \\ 0 \end{array}$ | $\begin{gathered} n \\ n \\ 0 \\ i n \\ i n \end{gathered}$ |  | $\begin{aligned} & \text { त } \\ & n \\ & n \\ & n \end{aligned}$ | $\begin{gathered} o \\ \underset{n}{n} \\ i n \\ i \end{gathered}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & i n \\ & i n \end{aligned}$ | $\begin{array}{\|c} \widehat{\hat{N}} \\ 0 \\ 0 \\ \hat{n} \end{array}$ | $\begin{array}{\|l\|} \hline \hat{n} \\ 0 \\ \\ \end{array}$ | $\begin{array}{\|l} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{N}{N} \\ 0 \\ 0 \\ \sqrt[n]{2} \\ \hline \end{array}$ |  |  |  |  | $\begin{gathered} 0 \\ \underset{\sim}{n} \\ \underset{\sim}{n} \\ \sim \sim \end{gathered}$ |  |  |
|  | $\begin{array}{\|l\|} \hline \left.\begin{array}{r} n \\ \stackrel{n}{n} \\ \sim \\ \sim \end{array} \right\rvert\, \\ \hline \end{array}$ | $\begin{array}{\|c} 9 \\ \underset{\sim}{2} \\ \underset{n}{2} \end{array}$ | $\begin{gathered} n \\ n \\ i \\ i \end{gathered}$ | $\left.\begin{array}{\|c\|} \underset{\sim}{n} \\ \underset{\sim}{n} \end{array} \right\rvert\,$ | $\begin{gathered} n \\ \underset{N}{n} \\ \sim \end{gathered}$ |  | $\begin{array}{\|c} n \\ n \\ 0 \\ \vdots \\ \vdots \end{array}$ |  | N | $\left.\begin{array}{\|l\|} \hline \stackrel{9}{n} \\ \underset{i}{0} \\ \dot{\sim} \end{array} \right\rvert\,$ |  | $\begin{aligned} & n \\ & n \\ & \underset{n}{n} \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline-1 \\ \omega \\ \omega \\ 0 \\ 0 \end{array} \right\rvert\,$ | $\begin{aligned} & 0 \\ & \underset{\sim}{2} \\ & \underset{\sim}{2} \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\left.\begin{array}{\|c} 9 \\ \stackrel{9}{2} \\ \vdots \\ i n \end{array} \right\rvert\,$ | $\begin{aligned} & 9 \\ & n \\ & \vdots \\ & \vdots \end{aligned}$ | $\begin{gathered} 0 \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{aligned} & \infty \\ & 0 \\ & \overrightarrow{1} \\ & \stackrel{n}{n} \end{aligned}$ |  |  | $\begin{gathered} n \\ i \\ i \\ i n \\ i n \end{gathered}$ | $\begin{gathered} n \\ \substack{n \\ \infty \\ \infty \\ \cdots \\ n} \end{gathered}$ | $\begin{array}{\|c} \hline 7 \\ \underset{0}{2} \\ 0 \\ \sim \end{array}$ | $\begin{array}{\|c} \hline N \\ \sim \\ \sim \\ \sim \\ \sim \end{array}$ | $\mathfrak{n}$ |  |  | $\begin{array}{ll} 0 \\ 0 \\ 0 \\ n \\ n & 0 \\ n & 0 \end{array}$ |  | $\begin{aligned} & \text { ה } \\ & \dot{j} \\ & \substack{ \\ \infty \\ n} \end{aligned}$ |  |  | $\left.\begin{array}{\|c\|} \hline n \\ 0 \\ \underset{N}{n} \\ \stackrel{i}{n} \end{array} \right\rvert\,$ |  |
|  | $\left.\begin{array}{\|l\|} \underset{N}{N} \\ \dot{\sim} \\ \sim \end{array} \right\rvert\,$ | $\begin{gathered} n \\ n \\ 0 \\ \vdots \\ \vdots \end{gathered}$ | $\begin{gathered} \infty \\ \substack{\infty \\ 0 \\ 0 \\ \vdots \\ 0} \end{gathered}$ | $\begin{aligned} & \infty \\ & \infty \\ & \dot{\sim} \\ & \sim \end{aligned}$ | $\begin{gathered} n \\ 0 \\ 2 \\ \underset{\sim}{n} \end{gathered}$ |  |  | $\begin{array}{ll} 0 \\ 0 \\ 0 \\ 0 \\ n \\ n \end{array}$ |  | $\begin{aligned} & n \\ & \substack{\lambda \\ \vdots \\ \vdots \\ 0 \\ n \\ n} \end{aligned}$ |  | $\begin{aligned} & \infty \\ & \infty \\ & \infty \\ & \infty \\ & \infty \\ & \infty \end{aligned}$ |  |  | $\left.\begin{array}{\|c} \infty \\ 0 \\ 0 \\ 0 \\ -i n \end{array} \right\rvert\,$ | $\left.\begin{array}{\|c\|} \underset{~}{2} \\ \dot{j} \\ \overrightarrow{i n} \end{array} \right\rvert\,$ | $\begin{gathered} \substack{\underset{\sim}{2} \\ \underset{\sim}{n} \\ \vdots} \end{gathered}$ | $\begin{gathered} 0 \\ 0 \\ \vdots \\ \vdots \end{gathered}$ | $\begin{aligned} & N \\ & N \\ & 9 \\ & i \end{aligned}$ | $\begin{gathered} 9 \\ \substack{n \\ n \\ n \\ n} \end{gathered}$ | $\begin{gathered} \vec{m} \\ \dot{n} \\ \stackrel{n}{n} \end{gathered}$ | $\begin{gathered} \mathcal{y} \\ \dot{\infty} \\ i n \end{gathered}$ | $\begin{gathered} \underset{\sim}{n} \\ \vdots \\ \underset{\sim}{n} \end{gathered}$ | $\left. \right\rvert\,$ |  | $\begin{array}{\|c} \substack{n \\ \underset{\sim}{e} \\ \underset{\sim}{e} \\ \hline} \end{array}$ | $$ |  | $\left.\begin{gathered} n \\ c \\ \underset{i}{n} \\ n \end{gathered} \right\rvert\,$ | $\begin{gathered} 0 \\ \underset{\sim}{c} \\ \underset{\sim}{\infty} \\ \sim \end{gathered}$ | $\begin{gathered} \hat{6} \\ \underset{\sim}{\sim} \\ \underset{\sim}{n} \end{gathered}$ | $\begin{gathered} 0 \\ 9 \\ 9 \\ \vdots \end{gathered}$ |  | $\begin{gathered} \sim \\ 0 \\ 0 \\ 0 \\ 0 \\ \vdots \\ n \end{gathered}$ |  |
|  | N | $\infty$ | $\left.\begin{array}{\|c} \infty \\ \underset{\sim}{n} \end{array} \right\rvert\,$ | $\underset{\sim}{\mathrm{A}}$ | $\stackrel{\stackrel{\rightharpoonup}{N}}{ }$ | $\stackrel{\rightharpoonup}{*} \stackrel{0}{\sim}$ | $\left\lvert\, \begin{gathered} \stackrel{N}{N} \\ \hline \end{gathered}\right.$ | $\stackrel{n}{n}$ | $\underset{\sim}{\sim}$ | $\underset{y}{n}$ | n | $\sqrt{n}$ | $$ | $$ | $$ | 갗 | $\underset{\infty}{\underset{\sim}{\infty}}$ | $\underset{\infty}{\prime}$ | $\begin{aligned} & 6 \\ & 6 \\ & \hline \end{aligned}$ | 合 | $\begin{aligned} & \hat{7} \\ & \underset{i}{2} \end{aligned}$ | $\underset{\sim}{\underset{\sim}{\underset{\sim}{c}}}$ | $\mathfrak{c}$ |  | $0$ | $\begin{array}{\|l\|} \hline \\ \underset{\sim}{n} \\ \underset{N}{2} \end{array}$ | $\begin{array}{\|l\|} \stackrel{m}{n} \\ \stackrel{y}{n} \end{array}$ | $\begin{array}{\|c} \hline \underset{\sim}{2} \\ \underset{\sim}{n} \end{array}$ | $\begin{array}{\|l} \hline \stackrel{0}{\circ} \\ \\ \hline \end{array}$ | $\underset{\sim}{n}$ | $: \begin{aligned} & n \\ & \substack{n \\ n} \end{aligned}$ | $\left(\begin{array}{l} \hat{y} \\ 0 \\ 0 \end{array}\right.$ | $\begin{aligned} & 8 \\ & \hline 0 \\ & \end{aligned}$ | $\left.\begin{array}{\|c\|c} \hline 0 \\ 0 \\ 0 \\ 0 \\ \hline \end{array} \right\rvert\,$ |  |
| $\left\lvert\, \begin{array}{lll} \sum_{亏}^{4} & 4 \\ \text { do } \\ \hline \end{array}\right.$ | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \mathrm{~m} \\ \mathrm{o} \end{array} \right\rvert\,$ | $\stackrel{\rightharpoonup}{i}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{3}{0} \\ \overrightarrow{0} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\begin{aligned} & 0 \\ & \hline 0 \\ & \hline \\ & \hline \end{aligned}$ | $\begin{gathered} \underset{\sim}{0} \\ \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}$ |  |  | $\mathfrak{h i c}$ |  | $\mathfrak{c}$ |  |  |  | $\begin{array}{\|l\|} \hline \stackrel{0}{7} \\ \vec{i} \\ \infty \end{array}$ | $\begin{array}{\|c\|} \hline \stackrel{y}{\circ} \\ \underset{y}{\infty} \\ \dot{\infty} \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\circ}{2} \\ \stackrel{1}{\infty} \\ \stackrel{1}{2} \\ \hline \end{array}$ | $\begin{gathered} \stackrel{\rightharpoonup}{n} \\ \hat{m} \\ \dot{n} \end{gathered}$ |  | $\begin{gathered} \stackrel{\rightharpoonup}{\circ} \\ \underset{\sim}{2} \\ \dot{\sigma} \end{gathered}$ |  | $\begin{aligned} & \stackrel{2}{2} \\ & \stackrel{n}{n} \\ & \end{aligned}$ | $\begin{gathered} \stackrel{O}{0} \\ \underset{\sim}{\infty} \\ \infty \end{gathered}$ | $\begin{aligned} & o \\ & \infty \\ & \infty \\ & \infty \\ & \infty \\ & \hline \end{aligned}$ | $\begin{array}{\|c\|} \hline \stackrel{\circ}{0} \\ \text { on } \\ \text { gin } \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\circ}{\circ} \\ \grave{\alpha} \\ \text { j} \end{array}$ | $\begin{array}{\|c\|} \hline \begin{array}{l} \circ \\ \hline \end{array} \\ \alpha \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline 0 \\ 0 \\ \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\circ}{\circ} \\ \dot{3} \\ 8 \end{array}$ |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 1 \\ & \hline 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & -1 \end{aligned}$ | $\begin{gathered} 0 . \\ 0 \\ 0 \\ 0 \\ 0 \\ \hline 1 \end{gathered}$ |  |  |  |
| ¿̀ 芌 | $\left.\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{2} \\ \mathrm{~m} \\ \mathrm{o} \end{array} \right\rvert\,$ | $\mathfrak{c}$ | $\begin{array}{\|c\|} \hline \stackrel{\rightharpoonup}{7} \\ \underset{\sim}{\mathrm{i}} \end{array}$ | $\mathfrak{c}$ | $\begin{gathered} \underset{\sim}{2} \\ \underset{\omega}{n} \\ \hline \end{gathered}$ | $\underbrace{2}_{0}$ | $\mathfrak{R}$ | $\begin{gathered} 0 \\ 0 \\ 0 \\ 0 \\ \infty \\ \infty \\ \infty \end{gathered}$ | Bo | $\hat{B}_{\substack{3}}^{\substack{0 \\ \infty \\ \infty \\ \infty \\ \infty \\ \hline}}$ | $\begin{array}{c\|c} 0 \\ 0 \\ 0 \\ n \\ 0 & 0 \\ 0 \\ \\ \end{array}$ | ? | Bo | $\mathfrak{i}$ | $\begin{array}{\|c\|c\|} \hline \stackrel{\rightharpoonup}{0} \\ \infty \\ \mathrm{~m} \end{array}$ |  |  | $\begin{aligned} & \stackrel{\rightharpoonup}{\circ} \\ & \hline \end{aligned}$ |  | $\begin{gathered} \substack { o \\ 0 \\ \begin{subarray}{c}{e \\ n{ o \\ 0 \\ \begin{subarray} { c } { e \\ n } } \\ {\hline} \end{gathered}$ | $\begin{gathered} \underset{\sim}{2} \\ \underset{\sim}{2} \end{gathered}$ |  | $\begin{aligned} & \substack{\circ \\ \infty \\ 0 \\ 0} \end{aligned}$ | $\begin{array}{\|c} \hline \stackrel{0}{0} \\ \mathbf{m} \\ 0 \end{array}$ | $\stackrel{\circ}{\stackrel{\circ}{\lambda}}$ | $\begin{array}{\|c} \hline 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{\rightharpoonup}{0} \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c} \hline 0 \\ 0 \\ 0 \\ 0 \end{array}$ | $\begin{array}{\|c} \hline \stackrel{\rightharpoonup}{0} \\ \mathbf{O} \\ \mathbf{o} \end{array}$ | $\begin{array}{\|l\|} \hline \stackrel{0}{0} \\ \hline \mathbf{C} \\ \hline \end{array}$ | $0$ | $0$ | $\begin{array}{\|c} \hline 0 . \\ 0 . \\ 0 \end{array}$ | $\left.\begin{array}{\|l\|} \hline \stackrel{0}{\circ} \\ 0 \\ 0 \end{array} \right\rvert\,$ | － |
|  | $\stackrel{n}{i}$ | $\underset{\sim}{\sim}$ |  | $\begin{aligned} & \overrightarrow{0} \\ & \underset{N}{i} \end{aligned}$ | $\begin{aligned} & \hline 0 \\ & 0 \\ & 0 \\ & \underset{N}{0} \end{aligned}$ |  | $0$ |  | $\begin{array}{l\|l} v & 0 \\ 0 \\ 0 \\ -i & \underset{7}{7} \end{array}$ | $\mathfrak{c}$ | $\begin{array}{l\|l\|} \hline 0 \\ 0 \\ n \\ n \\ n & 0 \\ 0 \\ n \\ \end{array}$ | $\begin{array}{ll} 1 & 0 \\ \infty \\ 0 \\ 0 \\ 0 \\ 0 \end{array}$ |  |  |  |  | $\begin{gathered} \infty \\ n \\ n \\ n \end{gathered}$ | $\left(\begin{array}{l} \infty \\ \infty \\ \infty \\ \infty \end{array}\right.$ | $\left\{\begin{array}{c} \substack{0 \\ 0 \\ \underset{\sim}{2} \\ \hline} \\ \hline \end{array}\right.$ | $\underset{\sim}{\infty}$ | $\underset{\sim}{\substack{n \\ \underset{f}{2}}}$ | $\stackrel{\substack{\infty \\ \underset{\sim}{\infty} \\ n_{2} \\ \hline}}{ }$ | $\begin{aligned} & 0 \\ & \underset{\sim}{n} \\ & \sim \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{n}{\mathrm{o}} \\ \mathrm{~m} \end{array} \right\rvert\,$ | $\begin{array}{\|l\|} \hline \stackrel{y}{n} \\ \hline \end{array}$ | $\begin{aligned} & \infty \\ & \underset{\sim}{\infty} \\ & \hline \end{aligned}$ | ¢ | $\cdots$ | $\bigcirc$ | $\sim$ | $\wedge$ | $\sim$ | $\stackrel{\circ}{ }$ | $C$ |
|  | $\begin{aligned} & \underset{\sim}{\hat{2}} \\ & \underset{\sim}{2} \\ & \hline \end{aligned}$ | $\underset{n}{n}$ | $\left.\begin{array}{\|c\|} \hline \stackrel{0}{0} \\ \vec{~} \\ \vec{\sigma} \end{array} \right\rvert\,$ | $\begin{aligned} & \mathrm{J} \\ & \mathrm{~N} \\ & 0 \\ & 0 \\ & \hline \end{aligned}$ | $$ |  |  |  |  | $\mathfrak{n} \left\lvert\, \begin{gathered} n \\ n \\ 0 \\ 0 \\ 0 \\ n \\ n \end{gathered}\right.$ |  |  |  | $\left\lvert\, \begin{aligned} & n \\ & \\ & 0 \\ & 0 \\ & \end{aligned}\right.$ | $\begin{aligned} & \underset{\sim}{\infty} \\ & \underset{\sim}{d} \\ & \underset{\sim}{f} \end{aligned}$ | $\begin{aligned} & n \\ & 0 \\ & \underset{\sim}{n} \\ & \end{aligned}$ | on | $\begin{aligned} & 2 \\ & 0 \\ & i \\ & i \end{aligned}$ | $\begin{aligned} & \mathrm{A} \\ & 0 \\ & 0 \\ & 0 \\ & \hline 1 \end{aligned}$ | $\begin{aligned} & \left.1 \begin{array}{l} \text { on } \\ 0 \\ 0 \\ \text { in } \end{array} \right\rvert\, \end{aligned}$ | $\left\lvert\, \begin{gathered} \underset{\sim}{2} \\ \underset{\sim}{\infty} \\ \hline \end{gathered}\right.$ | $\stackrel{\underset{N}{\mathrm{~N}}}{\substack{0}}$ | $\left\lvert\, \begin{gathered} 0 \\ 0 \\ 0 \\ 0 \end{gathered}\right.$ | $\underset{\sim}{c}$ | ic |  | Bn | O－m | $\xrightarrow{\sim}$ | － | \％ | i | $\stackrel{\sim}{\sim}$ | m | ch |
|  | $\begin{array}{\|l\|} \hline 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \hline \end{array}$ |  | $\mathfrak{c}$ | $0 \begin{gathered} 1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 2 \\ 2 \end{gathered}$ | $\begin{gathered} n \\ \\ \vdots \\ 0 \\ 0 \\ n \\ n \\ n \end{gathered}$ |  | $\left\|\begin{array}{l\|} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  |  |  |  |  |  |  | $\mathfrak{c}$ | $\begin{aligned} & n \\ & N \\ & 0 \\ & 0 \\ & 0 \\ & \sim_{n} \end{aligned}$ | $\mathfrak{c}$ |  | $\begin{gathered} n \\ n \\ 0 \\ 0 \\ 0 \\ n \\ 0 \\ 0 \end{gathered}$ |  | $\begin{aligned} & \underset{\sim}{\mathrm{N}} \\ & \sim \\ & \mathrm{~N} \\ & \mathrm{~N} \\ & \mathrm{~m} \end{aligned}$ |  |  | $\mathfrak{c}$ |  | nc | $0$ |  |  | $\mathfrak{c}$ | $\begin{gathered} \tilde{N} \\ \infty \\ \underset{\sim}{n} \\ \underset{\sim}{n} \end{gathered}$ | $\left.\begin{aligned} & \hat{0} \\ & 0 \\ & \hat{0} \\ & 0 \end{aligned} \right\rvert\,$ |  | － |
|  | $\left\|\begin{array}{l} 0 \\ 0 \\ y \\ \vdots \\ 3 \\ 0 \\ 0 \end{array}\right\|$ | $\mathfrak{l}$ | $\left\|\begin{array}{c} 0 \\ r \\ y \\ 0 \\ 0 \\ -1 \end{array}\right\|$ | $\begin{array}{\|c} \substack{0 \\ \tilde{y} \\ y \\ 0 \\ n \\ n} \end{array}$ |  |  | $\mathfrak{n}$ |  |  |  |  | $\begin{aligned} & 2 \\ & \\ & \hline \end{aligned}$ | $0$ | $\left\lvert\, \begin{aligned} & \mathrm{O} \\ & \hat{y} \\ & y \\ & 0 \\ & 0 \end{aligned}\right.$ | $\begin{aligned} & n \\ & \hat{n} \\ & y \\ & 0 \\ & n \end{aligned}$ | $\begin{aligned} & o \\ & 0 \\ & y \\ & y \\ & 0 \\ & n \end{aligned}$ | $\left\lvert\, \begin{gathered} 0 \\ \infty \\ y \\ y \\ 0 \\ 0 \\ \infty \end{gathered}\right.$ | $\left\lvert\, \begin{aligned} & o \\ & 0 \\ & y \\ & \vdots \\ & 0 \\ & \infty \end{aligned}\right.$ |  |  |  |  |  |  | $\mathfrak{c}$ |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & y \\ & \vdots \\ & 0 \\ & n \\ & n \end{aligned}$ |  |  | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & y \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & 0 \\ & 0 \\ & 0 \\ & y \\ & y \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \mathrm{O} \\ & \mathrm{C} \\ & \mathrm{y} \\ & \mathrm{O} \\ & 0 \\ & 0 \end{aligned}$ | $\left\|\begin{array}{l\|} \hline 0 \\ 0 \\ 0 \\ y \\ 0 \\ 0 \\ 0 \end{array}\right\|$ |  |  |

Bill Impact Run date: 12DEC16

Rate Data Analysis, Pacific Gas and Electric Company
DR5860 E1 vs ETOUC Non-Care Runtime: 12DEC16

|  | terr_cd |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | ALL |  | COOL |  | MODERATE |  | HOT |  | not HOT |  |
|  | source |  | source |  | source |  | source |  | source |  |
|  | E1 Tiered Rate | ETOUC Rate | E1 Tiered Rate | ETOUC Rate | E1 Tiered Rate | ETOUC Rate | E1 Tiered Rate | ETOUC Rate | E1 Tiered Rate | ETOUC Rate |
|  | N | N | N | N | N | N | N | N | N | N |
| 0\% to 1\% | 801,078 | 789,776 | 311,643 | 309,747 | 380,946 | 374,465 | 108,489 | 105,564 | 692,589 | 684,212 |
| 1\% to 2\% | 646,377 | 640,618 | 173,387 | 173,521 | 299,710 | 300,287 | 173,280 | 166,810 | 473,097 | 473,808 |
| 2\% to 3\% | 329,129 | 332,247 | 68,800 | 69,917 | 123,850 | 126,518 | 136,479 | 135,812 | 192,650 | 196,435 |
| 3\% to 4\% | 174,833 | 178,230 | 32,863 | 33,326 | 56,573 | 57,689 | 85,397 | 87,215 | 89,436 | 91,015 |
| 4\% to 5\% | 100,528 | 103,440 | 18,268 | 18,422 | 30,360 | 31,099 | 51,900 | 53,919 | 48,628 | 49,521 |
| 5\% to 6\% | 62,316 | 64,197 | 11,102 | 11,131 | 18,392 | 18,735 | 32,822 | 34,331 | 29,494 | 29,866 |
| 6\% to 7\% | 42,165 | 43,277 | 7,401 | 7,383 | 12,115 | 12,316 | 22,649 | 23,578 | 19,516 | 19,699 |
| 7\% to 8\% | 29,704 | 30,401 | 5,122 | 5,091 | 8,673 | 8,736 | 15,909 | 16,574 | 13,795 | 13,827 |
| 8\% to 9\% | 21,853 | 22,501 | 3,630 | 3,668 | 6,271 | 6,363 | 11,952 | 12,470 | 9,901 | 10,031 |
| 9\% to 10\% | 16,649 | 16,970 | 2,672 | 2,654 | 4,651 | 4,722 | 9,326 | 9,594 | 7,323 | 7,376 |
| 10\% to 15\% | 43,374 | 44,676 | 6,098 | 6,163 | 11,360 | 11,646 | 25,916 | 26,867 | 17,458 | 17,809 |
| Over 15\% | 28,729 | 30,402 | 3,214 | 3,177 | 6,079 | 6,404 | 19,436 | 20,821 | 9,293 | 9,581 |
| TOTAL | 2,296,735 | 2,296,735 | 644,200 | 644,200 | 958,980 | 958,980 | 693,555 | 693,555 | 1,603,180 | 1,603,180 |

Rate Data Analysis, Pacific Gas and Electric Company DR5860 E1 vs ETOUC Care Runtime: 12DEC16

|  | terr_cd |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | ALL |  | COOL |  | MODERATE |  | HOT |  | not HOT |  |
|  | source |  | source |  | source |  | source |  | source |  |
|  | Rate | ETOUC Rate | Rate | ETOUC Rate | Rate | ETOUC Rate | Rate | ETOUC Rate | Rate | ETOUC Rate |
|  | N | N | N | N | N | N | N | N | N | N |
| 0\% to 1\% | 254,160 | 255,580 | 83,847 | 85,354 | 94,866 | 96,217 | 75,447 | 74,009 | 178,713 | 181,571 |
| 1\% to 2\% | 235,422 | 233,388 | 47,755 | 47,496 | 61,118 | 60,779 | 126,549 | 125,113 | 108,873 | 108,275 |
| 2\% to 3\% | 130,678 | 130,607 | 20,472 | 20,200 | 25,411 | 25,205 | 84,795 | 85,202 | 45,883 | 45,405 |
| 3\% to 4\% | 74,682 | 74,969 | 11,093 | 10,903 | 13,467 | 13,332 | 50,122 | 50,734 | 24,560 | 24,235 |
| 4\% to 5\% | 45,940 | 46,123 | 6,658 | 6,485 | 8,071 | 7,896 | 31,211 | 31,742 | 14,729 | 14,381 |
| 5\% to 6\% | 30,731 | 30,713 | 4,259 | 4,123 | 5,268 | 5,184 | 21,204 | 21,406 | 9,527 | 9,307 |
| 6\% to 7\% | 21,905 | 21,804 | 2,910 | 2,806 | 3,523 | 3,358 | 15,472 | 15,640 | 6,433 | 6,164 |
| 7\% to 8\% | 15,782 | 15,836 | 1,887 | 1,799 | 2,371 | 2,336 | 11,524 | 11,701 | 4,258 | 4,135 |
| 8\% to 9\% | 12,020 | 12,006 | 1,416 | 1,401 | 1,569 | 1,532 | 9,035 | 9,073 | 2,985 | 2,933 |
| 9\% to 10\% | 9,303 | 9,285 | 1,053 | 981 | 1,191 | 1,137 | 7,059 | 7,167 | 2,244 | 2,118 |
| 10\% to 15\% | 24,700 | 24,720 | 2,051 | 1,929 | 2,303 | 2,230 | 20,346 | 20,561 | 4,354 | 4,159 |
| Over 15\% | 12,809 | 13,101 | 566 | 490 | 662 | 614 | 11,581 | 11,997 | 1,228 | 1,104 |
| TOTAL | 868,132 | 868,132 | 183,967 | 183,967 | 219,820 | 219,820 | 464,345 | 464,345 | 403,787 | 403,787 |

## PG\&E Gas and Electric

Advice Filing List General Order 96-B, Section IV

| AT\&T | Division of Ratepayer Advocates | Office of Ratepayer Advocates |
| :---: | :---: | :---: |
| Albion Power Company | Don Pickett \& Associates, Inc. | OnGrid Solar |
| Alcantar \& Kahl LLP | Douglass \& Liddell | Pacific Gas and Electric Company |
| Anderson \& Poole | Downey \& Brand | Praxair |
| Atlas ReFuel | Ellison Schneider \& Harris LLP | Regulatory \& Cogeneration Service, Inc. |
| BART | Evaluation + Strategy for Social Innovation | SCD Energy Solutions |
| Barkovich \& Yap, Inc. | G. A. Krause \& Assoc. | SCE |
| Bartle Wells Associates | GenOn Energy Inc. | SDG\&E and SoCalGas |
| Braun Blaising McLaughlin \& Smith, P.C. | GenOn Energy, Inc. | SPURR |
| Braun Blaising McLaughlin, P.C. | Goodin, MacBride, Squeri, Schlotz \& Ritchie | San Francisco Water Power and Sewer |
| CENERGY POWER | Green Charge Networks | Seattle City Light |
| CPUC | Green Power Institute | Sempra Energy (Socal Gas) |
| California Cotton Ginners \& Growers Assn | Hanna \& Morton | Sempra Utilities |
| California Energy Commission | ICF | SoCalGas |
| California Public Utilities Commission | International Power Technology | Southern California Edison Company |
| California State Association of Counties | Intestate Gas Services, Inc. | Southern California Gas Company (SoCalGas) |
| Calpine | Kelly Group | Spark Energy |
| Casner, Steve | Ken Bohn Consulting | Sun Light \& Power |
| Center for Biological Diversity | Leviton Manufacturing Co., Inc. | Sunshine Design |
| City of Palo Alto | Linde | Tecogen, Inc. |
| City of San Jose | Los Angeles County Integrated Waste Management Task Force | TerraVerde Renewable Partners |
| Clean Power | Los Angeles Dept of Water \& Power | TerraVerde Renewable Partners, LLC |
| Clean Power Research | MRW \& Associates | Tiger Natural Gas, Inc. |
| Coast Economic Consulting | Manatt Phelps Phillips | TransCanada |
| Commercial Energy | Marin Energy Authority | Troutman Sanders LLP |
| Cool Earth Solar, Inc. | McKenna Long \& Aldridge LLP | Utility Cost Management |
| County of Tehama - Department of Public Works | McKenzie \& Associates | Utility Power Solutions |
| Crossborder Energy | Modesto Irrigation District | Utility Specialists |
| Crown Road Energy, LLC | Morgan Stanley | Verizon |
| Davis Wright Tremaine LLP | NLine Energy, Inc. | Water and Energy Consulting |
| Day Carter Murphy | NRG Solar | Wellhead Electric Company |
| Defense Energy Support Center | Nexant, Inc. | Western Manufactured Housing Communities Association (WMA) |
| Dept of General Services | ORA | YEP Energy |


[^0]:    ${ }^{1}$ D.15-07-001, mimeo, p. 166.
    ${ }^{2}$ PG\&E filed Advice Letter 4764-E on December 24, 2015 for the opt-in TOU pilot design. The Commission issued Resolution E-4762 approving the pilot on February 25, 2016.

[^1]:    ${ }^{3}$ PG\&E filed AL 4672-E on July 22, 2015, which was approved by Energy Division Disposition on August 19, 2015 with an effective date of July 22, 2015.

[^2]:    6 Nexant is the consulting firm selected by the TOU Working Group in September 2015 to lead the development of both Opt-In and Default Pilot designs for PG\&E, SDG\&E and SCE.

[^3]:    See D.15-07-001, mimeo, p. 134, FN. 284.
    See D.15-07-001, mimeo, pp. 135-136.
    See D.15-07-001, mimeo, p. 278.
    See D.15-07-001, mimeo, p. 236.

[^4]:    71 Time-of-Use Pricing Default Pilot Plan, Final Report, Nexant, Table 1-1: Default Pilot Treatments, p. 4.

[^5]:    ${ }^{1}$ CPUC Decision on Residential Rate Reform for Pacific Gas and Electric Company (PG\&E), Southern California Edison Company (SCE), and San Diego Gas \& Electric Company (SDG\&E) and Transition to Time-of-Use Rates, July 3, 2015, Decision (D.)15-07-001).

[^6]:    2 Assumes the Commission makes decisions in time to allow 6 month lead time - may be shorter for default pilot if decisions are delayed

[^7]:    ${ }^{3}$ CPUC Decision on Residential Rate Reform for Pacific Gas and Electric Company (PG\&E), Southern California Edison Company (SCE), and San Diego Gas \& Electric Company (SDG\&E) and Transition to Time-of-Use Rates, July 3, 2015, Decision (D.)15-07-001).

    4 http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M157/K701/157701174.PDF

[^8]:    ${ }^{5}$ See the evaluation plan at https://public.3.basecamp.com/p/9GcXHfW8ySwTqdiDi3YxJEgE
    ${ }^{6}$ California Public Utilities (Pub. Util.) Code Section 745(c)(2) (Section 745).

[^9]:    ${ }^{7}$ While the primary focus of the opt-in pilots has been on determining whether unreasonable hardship exists for seniors or CARE/FERA-eligible customers in hot climate zones (under Section 745(c)(2)), the Commission has discretion to exclude other groups under Section 745(c)(1), which states that the exclusion list can include "other customers designated by the commission in its discretion" who, like the designated groups, "shall not be subject to default time-of-use rates without their affirmative consent."

[^10]:    8 E-TOU-A was adopted as part of the Settlement approved by the CPUC in PG\&E's 2015 Rate Design Window (RDW) proceeding (D.15-11-013). PG\&E's other currently-available residential TOU rate (also adopted in the 2015 RDW decision) is E-TOU-B. However, because E-TOU-B does not have a baseline credit it does not meet the requirements for default TOU.

[^11]:    9PG\&E AL 4949-E, SCE AL 3500-E and SDG\&E AL 2992-E.
    10 Executive Summary: http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451679
    Full Report: http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442451678

[^12]:    ${ }^{11}$ The customer-facing names for this bill management tool vary across the three IOUs (e.g., PG\&E's is called the Budget Billing Plan). The term level pay plan (LPP) will be used generically here as referring to all three IOUs' tools.

    12 http://eec.ucdavis.edu/files/How_people_use_thermostats_in_homes.pdf
    ${ }^{13}$ A programmable thermostat can be programmed so that different temperatures are automatically set at different times of the day. A smart thermostat can also be programmed like a programmable thermostat but has additional features like a touch screen, smartphone app, connection to your home's Wi-Fi, or automatic temperature adjustment based on whether someone is home.

[^13]:    ${ }^{14}$ For guidance on how to conduct scientific survey research, see Don Dillman and Jolene Smith. Internet Mail and Mixed-

[^14]:    ${ }^{15}$ This second stage calculation relies on an assumption that decliners were not influenced by the fact that an offer was made. If, for example, decliners shifted load simply because they received an offer to go on a TOU rate, load impact estimates for non-decliners determined in the second stage calculation would be biased upward.

[^15]:    16 http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M157/K701/157701174.PDF

[^16]:    ${ }^{17}$ Sample sizes needed to estimate impacts using a RED with a given level of statistical precision are a function of not only the expected size of the impact of interest but also the expected opt-out rate for the segment of interest. If, say, $50 \%$ of the encouraged group are expected to opt-out, the required sample size needed to estimate load impacts for a given level of precision is twice as large as it would be if the opt-out rate was zero.

[^17]:    ${ }^{18}$ This analysis is based on current customers and their usage over the prior 12 months with bills calculated using projected 2018 rates. Impacts may vary some when bill impacts are run with finalized revenue requirement adjustments or once the default pilot population is selected. However these changes are not expected to change from the general attributes discussed here.

[^18]:    19 Depending on how long after enrollment the welcome information is distributed and how much lead time is needed to produce the direct mail materials, there may still be some uncertainty regarding total enrollment in each test cell at the time that PG\&E must develop its sampling plan for this set of tests.

[^19]:    ${ }^{20}$ It should be noted, however, that information from such tests could be available in time to influence what PG\&E and the other utilities would actually do following enrollment in late 2019. Both SCE and SDG\&E are conducting some tests of post enrollment communication and tools in addition to level pay plan programs.

[^20]:    ${ }^{21}$ Whether or not it will be possible to estimate differential load impacts for the LPP test using a RED analysis will depend on the size of the subpopulation that SCE plans to include in this test and the enrollment rate among that population. If the enrollment rate is small (and especially if the population is also small), it may not be possible to detect a difference in impacts using a RED analysis. If this were to occur, it might be possible to estimate differential load impacts using a control group developed through statistical matching.

[^21]:    23 http://eec.ucdavis.edu/files/How_people_use_thermostats_in_homes.pdf
    24 The number of customers shown in each test cell in Figure 6-5 assumes CAC households and non-CAC households optout (or stay on) in equal proportions, which is unlikely but unknown.

[^22]:    A Percentage difference which falls on a column boundary is included in the higher column

[^23]:    A Percentage difference which falls on a column boundary is included in the higher column

[^24]:    A Percentage difference which falls on a column boundary is included in the higher column

