

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 6929E
As of April 4, 2024

Subject: Joint Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E-5230

Division Assigned: Energy

Date Filed: 05-01-2023

Date to Calendar: 05-12-2023

Authorizing Documents: E-5230

Disposition:	Signed
Effective Date:	03-21-2024

Resolution Required: Yes

Resolution Number: E-5296

Commission Meeting Date: 03-21-2024

CPUC Contact Information:

edtariffunit@cpuc.ca.gov

AL Certificate Contact Information:

Darrah Morgan

(626) 302-2086

AdviceTariffManager@sce.com

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



To: Energy Company Filing Advice Letter

From: Energy Division PAL Coordinator

Subject: Your Advice Letter Filing

The Energy Division of the California Public Utilities Commission has processed your recent Advice Letter (AL) filing and is returning an AL status certificate for your records.

The AL status certificate indicates:

- Advice Letter Number
- Name of Filer
- CPUC Corporate ID number of Filer
- Subject of Filing
- Date Filed
- Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)
- Effective Date of Filing
- Other Miscellaneous Information (e.g., Resolution, if applicable, etc.)

The Energy Division has made no changes to your copy of the Advice Letter Filing; please review your Advice Letter Filing with the information contained in the AL status certificate, and update your Advice Letter and tariff records accordingly.

All inquiries to the California Public Utilities Commission on the status of your Advice Letter Filing will be answered by Energy Division staff based on the information contained in the Energy Division's PAL database from which the AL status certificate is generated. If you have any questions on this matter please contact the:

Energy Division's Tariff Unit by e-mail to
edtariffunit@cpuc.ca.gov

August 31, 2023

ADVICE 5025-E-A
(Southern California Edison Company - U 338-E)

ADVICE 6929-E-A
(Pacific Gas and Electric Company - U 39-E)

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA
ENERGY DIVISION

SUBJECT: Supplement to Advice 5025-E, Southern California Edison's Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E-5230

PURPOSE

The purpose of this supplemental advice letter is to provide the first portion of the Data Request #1 as it relates to the compliance with Ordering Paragraphs 2 and 3 of Resolution E-5230 regarding the interconnection process necessary for the implementation of Limited Generation Profile projects.

General Order (GO) 96-B, General Rule 7.5.1, authorizes utilities to provide additional information upon the request of the Energy Division through the submittal of a supplemental advice letter. This advice letter does not replace Advice 5025-E, but instead is intended to supplement and provide additional context.

BACKGROUND

On May 1, 2023, the Investor-Owned Utilities (IOUs) consisting of Southern California Edison Company (SCE), Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E) jointly submitted SCE Advice 5025-E, PG&E Advice 6929-E and SDG&E Advice 4215-E1 to comply with Resolution E-5230. As required by Resolution E-5230, the Joint IOUs identified areas of consensus, areas that did not

¹ SCE Advice 5025-E, PG&E Advice 6929-E, SDG&E Advice 4215-E – *Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E-5230*, submitted May 1, 2023.

reach consensus and explanations for lack of consensus, and alternative proposals, if any.

On May 16, 2023, the California Public Utilities Commission (CPUC) Energy Division provided notification that responses and protests would be considered through June 5, 2023.

May 22, 2023, The Public Advocates Office (PAO) submitted a timely protest.

June 5, 2023, Interstate Renewable Energy Council (IREC) submitted a timely protest.

The Joint IOUs provided timely responses to the protests from PAO and IREC.

On June 27, 2023, the CPUC Energy Division issued Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SDG&E 4215-E), due July 28, 2023, by noon.

On July 21, 2023, the CPUC Energy Division issued Update #1 to CPUC Energy Division Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SDG&E 4215-E). Due September 29, 2023, by noon.

On August 14, 2023, the CPUC Energy Division issued Update #2 to CPUC Energy Division Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SDG&E 4215-E). Update #2 to CPUC Energy Division Data Request #1 is provided as Attachment A to this supplemental advice letter.

In its data request (as revised by Updates #1 and #2), the CPUC Energy Division requested that SCE and PG&E provide the following:

- 'Further analysis of certain "sweet spot" LGP configurations to support a statement from PG&E's ICA Map User Guide, for which the CPUC stated 'this text demonstrates that "violations" in the IOUs ICA analysis could in reality indicate a situation in which further engineering review is needed and existing equipment modifications available to eliminate the violation.'

On August 22, 2023, the CPUC Energy Division requested via email to PG&E and SCE that PG&E incorporate its August 11, 2023, and August 25, 2023, data request responses, and that SCE incorporate its August 18, 2023, data request response into a supplemental advice letter to SCE Advice 5025-E/PG&E Advice 6929-E. Accordingly, SCE and PG&E submit this supplemental advice letter as directed by the CPUC Energy Division.

DISCUSSION

As requested by the CPUC Energy Division, SCE and PG&E incorporate PG&E's August 11, 2023, data request response and SCE's August 18, 2023, data request response into the information submitted before the Commission in Advice 5025-E / Advice 6929-E. SCE's response is provided as Attachment B to this supplemental

advice letter. PG&E's response is provided as Attachment C-1 to this supplemental advice letter.

Ahead of the September 26, 2023, deadline, and in response to CPUC Energy Division's request via email on August 22, 2023, SCE and PG&E also provide these partial and preliminary responses to Update #2 to CPUC Energy Division Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SDG&E 4215-E). PG&E's summary of ICA analysis provided on August 25, 2023, is included as Attachment C-2 to this advice letter.

For additional context, Update #2 to Energy Division Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SDG&E 4215-E) is also being provided as Attachment A to this supplemental advice letter.

No cost information is required for this advice letter.

This advice letter will not increase any rate or charge, cause the withdrawal of service, or conflict with any other schedule or rule.

TIER DESIGNATION

This advice letter is submitted with a Tier 3 designation, the same designation as original Advice SCE 5025-E, PG&E 6929-E and SDG&E 4215-E

EFFECTIVE DATE

This advice letter will become effective upon Commission approval.

NOTICE

Anyone wishing to protest this advice letter may do so only electronically. Protests must be received no later than 20 days after the date of this advice letter. Protests should be submitted to the CPUC Energy Division at:

E-mail: EDTariffUnit@cpuc.ca.gov

In addition, protests and all other correspondence regarding this advice letter should also be sent electronically to the attention of:

Connor Flanigan
Managing Director, State Regulatory Operations
E-mail: AdviceTariffManager@sce.com

Tara S. Kaushik
Managing Director, Regulatory Relations
c/o Karyn Gansecki
E-mail: Karyn.Gansecki@sce.com

There are no restrictions on who may submit a protest, but the protest shall set forth specifically the grounds upon which it is based and must be received by the deadline shown above.

In accordance with GO 96-B Section 7.5.1, SCE is serving copies of this advice letter to the interested parties shown on the attached GO 96-B and R.17-07-007 service lists. Address change requests to the GO 96-B service list should be directed to AdviceTariffManager@sce.com or at (626) 302-6838. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov.

All questions concerning this advice letter should be directed to David Schiada by electronic mail at David.Schiada@sce.com.

Southern California Edison Company

/s/ Connor Flanigan
Connor Flanigan

CF:ds:lp
Enclosure



ADVICE LETTER SUMMARY

ENERGY UTILITY



MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Southern California Edison Company (U 338-E)

Utility type:

- ELC GAS WATER
 PLC HEAT

Contact Person: Darrah Morgan
 Phone #: (626) 302-2086
 E-mail: AdviceTariffManager@sce.com
 E-mail Disposition Notice to: AdviceTariffManager@sce.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
 PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 5025-E-A, 6929-E-A

Tier Designation: 3

Subject of AL: Supplement to Advice 5025-E, Southern California Edison's Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E 5230

Keywords (choose from CPUC listing): Compliance

AL Type: Monthly Quarterly Annual One-Time Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: Resolution E-5230

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL:

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? Yes No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? Yes No

Requested effective date:

No. of tariff sheets: -0-

Estimated system annual revenue effect (%):

Estimated system average rate effect (%):

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: None

Service affected and changes proposed¹:

Pending advice letters that revise the same tariff sheets: None

¹Discuss in AL if more space is needed.

Protests and correspondence regarding this AL are to be sent via email and are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

California Public Utilities Commission
Energy Division Tariff Unit Email:
EDTariffUnit@cpuc.ca.gov

Contact Name: Connor Flanigan
Title: Managing Director, State Regulatory Operations
Utility/Entity Name: Southern California Edison Company

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email: AdviceTariffManager@sce.com

Contact Name: Tara S. Kaushik c/o Karyn Gansecki
Title: Managing Director, Regulatory Relations
Utility/Entity Name: Southern California Edison Company

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email: karyn.gansecki@sce.com

CPUC
Energy Division Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102

Clear Form

ENERGY Advice Letter Keywords

Affiliate	Direct Access	Preliminary Statement
Agreements	Disconnect Service	Procurement
Agriculture	ECAC / Energy Cost Adjustment	Qualifying Facility
Avoided Cost	EOR / Enhanced Oil Recovery	Rebates
Balancing Account	Energy Charge	Refunds
Baseline	Energy Efficiency	Reliability
Bilingual	Establish Service	Re-MAT/Bio-MAT
Billings	Expand Service Area	Revenue Allocation
Bioenergy	Forms	Rule 21
Brokerage Fees	Franchise Fee / User Tax	Rules
CARE	G.O. 131-D	Section 851
CPUC Reimbursement Fee	GRC / General Rate Case	Self Generation
Capacity	Hazardous Waste	Service Area Map
Cogeneration	Increase Rates	Service Outage
Compliance	Interruptible Service	Solar
Conditions of Service	Interutility Transportation	Standby Service
Connection	LIEE / Low-Income Energy Efficiency	Storage
Conservation	LIRA / Low-Income Ratepayer Assistance	Street Lights
Consolidate Tariffs	Late Payment Charge	Surcharges
Contracts	Line Extensions	Tariffs
Core	Memorandum Account	Taxes
Credit	Metered Energy Efficiency	Text Changes
Curtable Service	Metering	Transformer
Customer Charge	Mobile Home Parks	Transition Cost
Customer Owned Generation	Name Change	Transmission Lines
Decrease Rates	Non-Core	Transportation Electrification
Demand Charge	Non-firm Service Contracts	Transportation Rates
Demand Side Fund	Nuclear	Undergrounding
Demand Side Management	Oil Pipelines	Voltage Discount
Demand Side Response	PBR / Performance Based Ratemaking	Wind Power
Deposits	Portfolio	Withdrawal of Service
Depreciation	Power Lines	

Attachment A
Update #2 to CPUC Energy Division Data Request #1

**ENERGY DIVISION DATA REQUESTS TO PACIFIC GAS AND ELECTRIC COMPANY,
SOUTHERN CALIFORNIA EDISON, AND SAN DIEGO GAS AND ELECTRIC
COMPANY**

To: Matthew Gonzales
mrgg@pge.com
Regulatory Affairs

Cc: George Zahariudakis
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Regulatory Affairs
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From: Cydnie Golson
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Utilities Engineer
Interconnection and Distribution Engineering Section
Energy Division, California Public Utilities Commission

Jose Aliaga-Caro
Jose.Aliaga-Caro@cpuc.ca.gov
Utilities Engineer
Interconnection and Distribution Engineering Section
Energy Division, California Public Utilities Commission

CC: Justin Regnier
Justin.Regnier@cpuc.ca.gov
Supervisor
Interconnection and Distribution Engineering Section
Energy Division, California Public Utilities Commission

Date: August 14, 2023

Re: **Update #2 to** CPUC Energy Division Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SD&E 4215-E--Joint Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E-5230) filed May 1, 2023

Due Date: ~~September 29, 2023~~ September 26, 2023 by ~~Noon~~ 5PM

Pursuant to General Order 96-B Section 7.5.1, Energy Division is requesting additional information from the utilities. Energy Division requests this information by **Noon-5PM on September 29 September 26, 2023**.

I. GENERAL INSTRUCTIONS

1. In responding to the following requests, please set forth the request and then state the IOUs' response.
2. Unless otherwise noted, all questions are addressed to all the IOUs.
3. The IOUs may respond jointly, otherwise individual responses from each IOU are also acceptable.
4. If the IOUs choose to respond jointly, questions addressed to an individual IOU shall be noted in the response (e.g., PG&E response:).
5. Corresponding results of analysis can be appended as appendices (e.g., Appendix A: PG&E Results of Analysis for Question 1, etc.)
6. Analysis and Results
 1. For each analysis state the months and year of the ICA-SG data used.
 2. "LGP configuration" refers to how the Limited Generation Profile is structured, both at a granular level (i.e., number of values per year) and when certain values are applied (i.e., the hour periods for which those values are applied).
 3. "12LGP" refers to the IOUs' proposed profile of 12 unique LGP values per year—one value per month (the baseline).
 4. Any analysis requested herein should be conducted in a consistent manner across all three IOUs. In all instances where the Energy Division has not specified an approach, the IOUs are expected to confer with each other to arrive at a consistent methodology for the analysis.
 - a. If there is deviation in methodology between the IOUs, it should be clearly described and accompanied by the rationale justifying the deviation.
 5. Any figures or data should be presented in a consistent fashion across all three IOUs. As with the analysis, if there is a deviation in figures or data, clearly describe the deviation and justify the rationale.
 6. Include a "Violation Identification Number" or "Violation ID" when presenting ICA violation results. Where an analysis request applies to more than one IOU, the involved IOUs are expected to confer with each

other to arrive at a consistent methodology for establishing these ID numbers. If there is a deviation in how these are identified, clearly describe the deviation and justify the rationale.

7. For ICA-SG data that contains outlying values, such as zeros, all outlying values must be identified in a table, as shown below. To identify the outlying values, graph the ICA-SG data and visually note any values that significantly deviate from the surrounding data points. If values seem to be on the cusp, include these as outlying values.

ICA-SG Data Set Name (i.e. X Circuit)	Period (e.g., Period 1, Period 2). If outlying value shows in both periods, list both in separate lines.	Time Stamp (split into Day, Hour, etc. as necessary)	Outlying Value	Notes on Potential Source of Outlier (error in computing, outage, etc.) if readily available

8. When calculating ICA violations (thermal, voltage, etc.) due to deviations of hosting capacity in a set Period 1 vs. Period 2 of ICA-SG data, mark points in the data where there are outlying values in such a way that they can be filtered out (i.e., with a separate column that identifies the value as outlying). In presenting results, display both results including and excluding ICA violations caused by outliers.
9. ~~When calculating duration of ICA violations, do not round the data but rather provide it at the level of resolution included in the analysis. For example, if the violation is computed for 77 minutes, it should be reported as that level, not one hour or one hour and fifteen minutes.~~
10. Responses to analysis requests should include graphs and figures, where appropriate.
11. Responses should also include spreadsheets with clearly labeled and sortable data. Combine spreadsheets in related sections into one workbook, unless doing so will create files too large to easily send over email, etc.
12. ~~Please retain the CYME models and any data used for the analysis in anticipation of future data requests.~~

7. Terms.

1. The terms “documents,” “working papers,” “studies,” “reports,” “records,”

“surveys,” “examinations,” “research,” “reviews,” “summaries,” “papers,” “notes,” “memos,” and “analysis” are interchangeable and should not be construed to limit the scope of the material sought by this data request.

2. The terms “data,” “figures,” “information,” “assumptions,” “facts,” “statistics,” “measurements,” “findings,” and “results” are interchangeable and should not be construed to limit the scope of the material sought by this data request.
3. The terms “study,” “analysis,” and “modeling” are interchangeable.
4. The terms “IOUs,” “Large IOUs,” “Joint IOUs,” and “Joint Utilities” are interchangeable and refer to Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E).
5. “Joint AL” and “AL” are interchangeable and, unless otherwise specified, refer to Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SD&E 4215-E--Joint Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E-5230) filed May 1, 2023
6. “LGP” refers to the Limited Generation Profiles.
7. “Sweet Spot LGP Configurations” refer to the following:
 - i. 12LGP: Uses the monthly minimum of ICA-SG to generate a 12-value profile.
 - ii. Block: Divides the year into blocks of 3 months and each day into blocks of 4 hours and uses 90% of the minimum ICA-SG value for each block. Construct the schedule around blocks from July-September and 5pm-9pm. For more information, refer to IREC’s presentation in Workshop 4;
 - iii. 24Hour_fixed: Takes 90% of the minimum ICA-SG values for each hour across the 12 months;
 - iv. 16_21hourly: Uses 90% of ICA-SG for 4PM-9PM, uses 90% of the monthly minimum of ICA-SG for 10PM-3PM for these hours (equivalent to SCE’s 84-value profile from Workshop 4 and Joint AL page 24); and
 - v. 18_23fixed profile: Uses 90% of minimum ICA-SG value for 6PM-11PM for these hours, uses 90% of minimum ICA-SG value for 12AM-5PM for these hours.
8. “ICA-SG” refers to the Integration Capacity Analysis Static Grid.
9. “Period” refers to a year the ICA-SG data is analyzed. “Period 1” and “Year 1” are interchangeable, unless otherwise specified.

10. “Per unit” or “p.u.” format refers to presenting data in a way that normalizes the values with respect to a specified base value. For example, please present p.u. voltages through the following calculation:

V_{pu} = Per Unit Voltage
 V_{actual} = measured voltage
 V_{base} = system nominal voltage

$$V_{pu} = (V_{actual} / V_{base}) * 100$$

If questions arise pertaining to which references to use in calculating p.u. results, please contact the Energy Division for clarification.

11. “Outlying values” refers to values in a data set that visually, once graphed, significantly deviate from surrounding data (e.g., in the data set $[X, Y] = [(1,50), (2,45), (3,0), (4,40), (5,42)]$, $Y=0$ would be considered an outlying value occurring at $X=3$). The terms “outlying values,” “outliers,” and “outlier values” are interchangeable.
12. “Mitigations” and “Low-Cost Mitigations” are interchangeable, and refer to measures including but not limited to those discussed in AL 4941-E et al (at 7), such as:
- Reconfiguring circuits on a permanent basis.
 - Installing or relocating low-cost voltage regulating equipment.
 - Adjusting existing equipment settings.
 - Enabling or disabling existing capacitor banks.
 - If determined to be viable, utilizing Smart Inverter capabilities to adjust generating facility volt/var and volt/watt functions.
- Note: It has been discussed to only use the volt/var function in assessing Smart Inverter capabilities, as volt/watt will limit the LGP power output.**
13. “Upgrades” refers to actions taken to correct safety and reliability concerns not addressable by Low-Cost Mitigations as defined above, including higher-cost system upgrades to switching devices, bus bars, three-phase transformers, or conductors.
14. “ANSI” refers to the American National Standards Institute.
15. To the extent any other terms, or requests, are unclear, please request a meeting with Energy Division to clarify the term or request.

II. DATA REQUESTS

CLARIFYING QUESTIONS AND FURTHER ANALYSIS ON JOINT AL

1. ~~SCE and PG&E: Please use the same methodology as in SCE’s Additional LGP Analysis and PG&E’s Statistical Analysis LGP, Detailed Study Workshop 4 presentations, respectively, to analyze the IREC “Block” proposal. Perform the analysis on the same five nodes/circuits as originally presented. Report on the same metrics as those included in the Joint AL (at 23-27). Create graphs and tables similar to those currently presented in the AL with the Block proposal as one of the LGP configurations. Construct the schedule around blocks from July-September and 5pm-9pm. For more information, refer to IREC’s presentation in Workshop 4.~~

~~**Please include the Block schedule among the LGP configurations when providing answers for the following items.**~~

2. ~~Please provide a detailed breakdown, as specified in the questions below, of the ICA voltage violations that the IOUs articulated in their detailed analyses of five circuits/nodes in Workshop 4 and the Joint AL (at 23-27). Provide results in sortable spreadsheet and narrative form. Include the following information at a minimum:~~

- a. ~~SCE: For each of the 3% voltage variation violations (defined on slide 2 of SCE’s Additional LGP Analysis presentation in Workshop 4), please provide the initial and final voltages that triggered the ICA violation. Additionally, please provide the duration of each violation of this type. Please refer to the General Instructions as they pertain to presenting violation durations.~~

~~Present the spreadsheet results as follows:~~

Table 1: Listing of ICA 3% Voltage Violations

LGP Configuration	Circuit ID	Violation ID	Violation Start Date	Violation Start Time	Violation Duration	Initial Voltage (p.u.)	Final Voltage (p.u.)	Outlying Value? (Y or blank)

- b. ~~SCE and PG&E: For each ICA voltage range violation, list the start time and duration and evaluate the effect of using the LGP customer’s smart inverter’s (SI’s) full VAR capacity[†]. Note whether these violations are of a magnitude that the LGP customer’s smart inverter can mitigate, or whether they are out of range for the SI’s capabilities. For this question, state all calculation assumptions and use the following scenarios:~~
 - i. ~~Assume the DER system is sized such that the smart inverter’s kWac output is rated at the highest LGP value of Year 1 and use the highest allowable VARs injection or absorption level, per IEEE 1547, to mitigate violations due to differences in Year 2’s profile.~~
 - ii. ~~If (i) above does not mitigate the voltage concern, please specify what level of VARs would address the voltage issue, if possible.~~

[†]For the purposes of answering this question, please assume the SI has the 44% capacity specified in IEEE 1547

~~Present the spreadsheet results as follows:~~

~~Table 2: Listing of ICA Voltage Range Violations~~

LGP-Configuration	Circuit-ID	Violation-ID	Violation-Start-Date	Violation-Start-Time	Violation-Duration	Highest-Year-1-LGP-Value-(kWac)	Violation-Mitigated-with-SI-Capabilities-(inverter-sized-at-100%-of-highest-Year-1-LGP-value)?-(Y/N)	Level-of-VARs-Needed-to-Mitigate-Violation-(kVAR-or-blank-if-not-possible)	Outlying-Value?(Y-or-blank)

~~c. For voltage violations that are not attributed to the 3% criteria or cured by the application of SI functions, please provide the magnitude in per unit (p.u.) format and duration of the violation.~~

~~Present the spreadsheet results as follows:~~

~~Table 3: Remaining ICA Voltage Violations Following SI Mitigations~~

LGP-Configuration	Circuit-ID	Violation-ID	Violation-Start-Date	Violation-Start-Time	Violation-Duration	Magnitude-(p.u.)	Outlying-Value?(Y-or-blank)

~~3. Please provide data on the thermal violations presented in Workshop 4 and the Joint AL (at 23-27), with at minimum the following information:~~

~~d. Duration of violations. Refer to the General Instructions for how to calculate and present durations.~~

~~e. Magnitude of ICA violation in % of the rated equipment thermal limits or p.u. format.~~

~~Present the spreadsheet results as follows:~~

~~Table 4: ICA Thermal Violations~~

LGP-Configuration	Circuit-ID	Violation-ID	Violation-Start-Date	Violation-Start-Time	Violation-Duration	Magnitude-(% of thermal-rating or p.u.)	Outlying-Value?(Y-or-blank)

NEW ANALYSIS AND QUESTIONS

4. In PG&E's ICA Map User Guide, the following is stated (at 17):

"3. What does it mean when a location has less capacity than a proposed DER project?

As explained in the question above, the ICA value used for the map display is the minimum of the ICA results for that line section. Red on the map (i.e. an ICA output of zero) does not necessarily mean that there isn't integration capacity at that location - it means an engineer needs to review.

For example, a line section shows an ICA output of zero on the map. In looking at the downloadable ICA data, voltage is found to be the limiting factor. In going through the installation process, the engineer updates equipment settings to eliminate the voltage issue and allow for installation. "

This text demonstrates that "violations" in the IOUs ICA analysis (whether a zero or a value in Period 2 lower than that of Period 1) could in reality indicate a situation in which further engineering review is needed and existing equipment modifications available to eliminate the violation.

With this in mind, the Energy Division seeks further analysis of certain "sweet spot" LGP configurations, going beyond that which was originally presented to assess potential avenues for violation mitigation.

Each IOU should analyze five (5) randomly selected circuits/nodes with geographic diversity. For SCE and PG&E, these circuits/nodes should represent different regions. For SDG&E, geographic diversity can entail circuits/nodes from different climatic zones and/or urban centers vs. lower-population areas. In the response, please explain each IOU's method for complying with this request for geographic diversity.

Deem the most recent, complete data set of 12 months of ICA-SG data as "Period 2" and the previous 12 months of ICA-SG data as "Period 1". Use **the data set from Period 1** ~~these data sets~~ to construct each of the LGP configurations based on values that are 90% of the ICA-SG values for that circuit/node. If deviations need to be made from this method to ensure quality or to use available data, explain the need for these deviations in the response.

Results from prior analysis may be incorporated into this new analysis as long as the calculation methods followed those described herein. Otherwise, new analysis should be conducted to determine ICA violations, and further analysis performed to assess potential mitigations.

Please analyze the relative Energy Export, Power Export, and ICA Violations for

each of the LGP configurations detailed below. Perform the analysis with the 12LGP as the “base” configuration, showing percentage increase/decrease of all outputs with respect to the 12LGP. Other than for the “Block” schedule, please use the PG&E profile names detailed below across all IOU analysis and results for consistency (descriptions adopted from PG&E analysis in Joint AL at page 25).

- vi. Block: Divides the year into blocks of 3 months and each day into blocks of 4 hours and uses 90% of the minimum ICA-SG value for each block. Construct the schedule around blocks from July-September and 5pm-9pm. For more information, refer to IREC’s presentation in Workshop 4;
- vii. 24Hour_fixed: Takes 90% of the minimum ICA-SG values for each hour across the 12 months;
- viii. 16_21hourly: Uses 90% of ICA-SG for 4PM-9PM, uses 90% of the monthly minimum of ICA-SG for 10PM-3PM for these hours (equivalent to SCE’s 84-value profile from Workshop 4 and Joint AL page 24); and
- ix. 18_23fixed profile: Uses 90% of minimum ICA-SG value for 6PM-11PM for these hours, uses 90% of minimum ICA-SG value for 12AM-5PM for these hours.

Please calculate the outputs as follows:

Energy and Power Export:

- i. Energy (kWh) exported over the course of Period 1 ~~and Period 2~~ for each of the LGP configurations ~~(2 distinct values, one from each period)~~. Consider any mitigations of ICA violations, such as impacts from using smart inverter volt/var functionality.
- ii. Maximum instantaneous power exported (kW) over the course of Period 1 ~~and Period 2~~ given the LGP configuration ~~(2 distinct values, one from each period)~~. Consider any mitigations of ICA violations, such as impacts from using smart inverter volt/var functionality.

ICA Violations (Adapted from Joint AL at page 24)

- i. Frequency of ICA Violations: Number of hours among the 288 unique ~~LGP ICA-SG~~ values of Period 2 that are less than those in the LGP configuration of Period 1 at the equivalent date and time
- ~~ii. Duration of ICA Violations: Time from start to end of each period in which LGP values of Period 2 are less than the those in the LGP configuration of Period 1 at the equivalent date and time (refer to General Instructions for calculating and presenting durations)~~
- iii. Magnitude of ICA Violations: Magnitude of the difference between 288 unique ~~LGP ICA-SG~~ values of Period 2 and those in the LGP configuration of Period 1 at the equivalent date and time

Provide the limiting criterion for each ICA violation, such as thermal, voltage, or protection constraints.

SCE: For each 3% voltage variation violation (defined on slide 2 of SCE’s Additional LGP Analysis presentation in Workshop 4), please provide the initial and final voltages that triggered the ICA violation.

Present the spreadsheet results as follows:

Table 1: Listing of ICA 3% Voltage Violations

LGP Configuration	Circuit ID	Violation ID	Violation Start Date	Violation Start Time	Initial Voltage (p.u.)	Final Voltage (p.u.)	Outlying Value? (Y or blank)

(Resume application to all IOUs)

For each circuit with violations identified, further analyze what mitigation measures and/or upgrades would be needed to preserve safe and reliable grid operation. Apply the same screening process that would be used for a project seeking grid interconnection; however, modify it (as described below) to uncover grid constraints resulting from circuit load changes after a customer submits their LGP values (reflected by points in which there are ICA violations) and the corresponding utility corrective actions. Use the assumptions listed below. Please otherwise document any assumptions made on how the screens are to be applied, and consult with ED staff if there is uncertainty on the proper application of the screens to a LGP. Please consult with the other IOUs to ensure that the application of screens is uniform across all of the Joint IOUs.

FOR PURPOSES OF THIS ANALYSIS - NOT REFLECTIVE OF ANY COMMISSION DECISION

In applying the screens, perform the analysis as if the LGP configurations from Period 1 are the customer's submitted LGP values (“the requested LGP values”). Treat Period 2 as the "most recent" period of ICA-SG data. For screens such as Screen M where the LGP is compared to the ICA data to ensure that the submitted values fall beneath 90% of the "current" ICA-SG on the circuit, calculate points at which to perform power flow analyses based on whether the LGP exceeds 100% of the ICA-SG data on that circuit for Period 2. This should allow the calculated ICA violations to correspond to the same hours for which additional power flow analyses are needed (such as in Screen N) to identify grid constraints and corrective actions.

If methods to improve the analysis efficiency are discovered, please verify assumptions with ED before applying them and describe them in the response. For instance, the following method has been discussed:

After separating the ICA violations by limiting criterion, “bin” the ICA violations by magnitude and perform the screens on characteristic violations set at the highest magnitude from that bin. For example, if the voltage violations presented magnitudes of 1 – 100 kW, they could be separated into 10 bins. Power flow

analyses could then be performed on a 100 kW violation, then 90 kW, 80 kW, etc. Energy Division would like to know where the switch occurs between needing an Upgrade and being able to resolve the grid constraint with a Low-Cost Mitigation (as defined in the Terms section). If, for example, a mitigation measure(s) is able to resolve the grid constraints starting at 40 kW in magnitude and could similarly resolve the constraints from 1 – 40 kW, the analysis could be simplified to reflect that information rather than performing power flow analyses on characteristic violations from the rest of the bins. An exception is that Energy Division would like to know what magnitude of violations Smart Inverter controls are able to mitigate. Please assess Smart Inverter capabilities for each circuit with violations, even if a mitigation(s) is found that would otherwise resolve violations in the range that the Smart Inverter can mitigate.

Apply the screens as if the maximum steady state value is less than or equal to 1% of the PCS controlled nameplate (as provided in the NRTL testing reports).

Set the facility's Gross Nameplate Rating equal to the Maximum LGP value.

Screen A: Assume that the PCC is not on a Networked Secondary System (pass)

Screen B: Assume use of Certified Equipment (pass)

Screen C: Assume that the Starting Voltage Drop is within acceptable limits (pass)

Screen D: ~~Use the Maximum LGP value~~ Assume the transformer and secondary conductor ratings are not exceeded (pass)

Screen E: Assume that the generator does not cause unacceptable imbalance (pass)

Screen F: Use the Generating Facility's Gross Nameplate Rating

Screen F1: Use the Generating Facility's Gross Nameplate Rating

Screen G: Use the Generating Facility's Gross Nameplate Rating

Screen H: Assume the line configuration is compatible with the Interconnection type. (pass)

Screen I: Assume power will be exported across the PCC (continue to screen J)

Screen J: Assume the Gross Rating of the Generating Facility is not 30 kVA or less (fail)

Screen K: Use the Maximum LGP value

Screen L: ~~Use the Maximum LGP value~~ Assume that the screen passes

Screen M: Use the requested LGP values

Screen N: Use the requested LGP values

Note: in assessing Smart Inverter mitigations, please perform analysis up to the full range of VAR capabilities (44% as specified in IEEE 1547). If applicable, please note in the data the VARs required to mitigate the voltage constraint.

Screen O: Use the requested LGP values

Screen P: Use the Generating Facility's Gross Nameplate Rating for evaluations that use fault current calculations. For other evaluations under Screen P, use the maximum LGP value.

Please define what safety and reliability concerns (e.g. voltage outside of ANSI limits, conductor or transformer overload, etc.) necessitating action arise as a result of the application of these screens.

Please provide information on the resulting utility actions that would be taken to preserve safety and reliability, including whether these actions would be categorized as low-cost mitigations or upgrades. Please refer to the Terms section for a definition of each.

Present the results on ICA violations and proposed corrective actions resulting from application of the Rule 21 screens in a sortable spreadsheet as follows. If multiple actions are needed to mitigate the ICA violation, present them on separate lines. **If the IOUs discover that including additional columns assists in presenting the data, please feel free to do so and note the rationale.**

Table 2 5: ICA Violations and Proposed Corrective Actions

LGP Config.	Circuit ID	Limiting ICA Criterion (thermal, voltage, etc.)	Viol. ID	Viol. Start Date	Viol. Start Time	Dur.	Mag. (% or p.u.)	Safety and Reliability Concern	Screen used to determine corrective action	Proposed Action Category (Mitigation or Upgrade)	Descrip. of Proposed Action (i.e., updating equipment settings)	Outlying Value? (Y or blank)

Please provide visual representations of this data in a format similar to the table and graphs in PG&E’s Joint AL analysis (Table 5, Figures 3 – 6 at 25-27). At minimum, demonstrate how the frequency, ~~duration~~, and magnitude of each type of ICA violation (based on the limiting criterion) changes with the LGP configuration. Show how both the Energy and Power Export and ICA Violations change dependent on the LGP configuration, such as in Table 5 at Joint AL page 25. Keep in mind that results should be presented with the 12LGP as the “base”. Provide two sets of these visual representations (or more if the data contains outlying values, as detailed in the General Instructions section):

- i. Graphs and tables in which any ICA violations that can be resolved via a mitigation measure (or multiple) are excluded.
- ii. Graphs and tables including all ICA violations.

Calculate the Energy and Power Export results considering any mitigations of ICA violations, such as impacts from using smart inverter volt/var functionality. **In the data, present the Maximum Instantaneous Power (kW) and Cumulative Energy (kWh) for Period 1 and Period 2 separately.** Present the results in a sortable spreadsheet as follows:

Table 3 6: Energy and Power Export

LGP Configuration	Period (1 or 2)	Period 1 Maximum Instantaneous Power (kW)	Period 1 Cumulative Energy (kWh)

- i. Please create graphs comparing the following based on the LGP configuration: (1) the Maximum Instantaneous Power (kW) ~~from Period 1 representing the highest overall power export when considering both Period 1 and Period 2,~~ and (2) Cumulative Energy (kWh) ~~from Period 1, representing the annual exported energy value from the period that contained the highest overall power export. Note in the graphs which period the data came from.~~
5. Please comment on the IOU's assessment of the implementation effort required, benefits, and risks relating to allowing LGP customers to customize their LGP within limits, such as proposed by IREC in their Block Schedule analysis in Workshop 4.
6. **SPECIFICATION OF DATA AND DELIVERY**

Please provide the initial responses by ~~Noon 5PM on September 29~~ **September 26, 2023.**

Please reach out as soon as possible if you would like guidance on any of the above questions or if you would like to discuss the data request generally.

Provide both a PUBLIC and, if applicable, a CONFIDENTIAL version and label accordingly. In the confidential version, highlight the confidential information which is redacted from the public version.

Data response is due to Cydnie Golson and Jose Aliaga-Caro in Energy Division, CPUC. Please send the data via the CPUC's secure FTP application <https://kwftp.cpuc.ca.gov> to cydnie.golson@cpuc.ca.gov, jose.aliaga-caro@cpuc.ca.gov, and justin.regnier@cpuc.ca.gov.

Attachment B
SCE's 8/18/23 Data In Response to CPUC Energy Division Data Request #1

SCE's Interim Response to Portions of the LGP Data Request

Update #2 to CPUC Energy Division Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SD&E 4215-E--Joint Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E-5230) filed May 1, 2023 (dated August 14, 2023)

August 18, 2023

Scope of This Interim Response

The following slides contain SCE's interim response to the following portions of 'Update #2 to CPUC Energy Division Data Request #1 on Joint Advice Letter (SCE 5025-E, PG&E 6929-E and SD&E 4215-E--Joint Proposed Modifications to Implement Limited Generation Profiles Pursuant to Ordering Paragraph 3 of Resolution E-5230) filed May 1, 2023' in advance of the **September 26** deadline. The results presented here are preliminary and are subject to change prior to submittal of the complete and final data request response.

Deem the most recent, complete data set of 12 months of ICA-SG data as "Period 2" and the previous 12 months of ICA-SG data as "Period 1". Use the data set from Period 1 these data-sets to construct each of the LGP configurations based on values that are 90% of the ICA-SG values for that circuit/node. If deviations need to be made from this method to ensure quality or to use available data, explain the need for these deviations in the response.

Please analyze the relative Energy Export, Power Export, and ICA Violations for each of the LGP configurations detailed below. Perform the analysis with the 12LGP as the "base" configuration, showing percentage increase/decrease of all outputs with respect to the 12LGP. Other than for the "Block" schedule, please use the PG&E profile names detailed below across all IOU analysis and results for consistency (descriptions adopted from PG&E analysis in Joint AL at page 25).

- vi. Block: Divides the year into blocks of 3 months and each day into blocks of 4 hours and uses 90% of the minimum ICA-SG value for each block. Construct the schedule around blocks from July-September and 5pm-9pm. For more information, refer to IREC's presentation in Workshop 4;
- vii. 24Hour_fixed: Takes 90% of the minimum ICA-SG values for each hour across the 12 months;
- viii. 16_21hourly: Uses 90% of ICA-SG for 4PM-9PM, uses 90% of the monthly minimum of ICA-SG for 10PM-3PM for these hours (equivalent to SCE's 84-value profile from Workshop 4 and Joint AL page 24); and
- ix. 18_23fixed profile: Uses 90% of minimum ICA-SG value for 6PM-11PM for these hours, uses 90% of minimum ICA-SG value for 12AM-5PM for these hours.

Please calculate the outputs as follows:

Energy and Power Export:

- i. Energy (kWh) exported over the course of Period 1 and Period 2 for each of the LGP configurations (~~2 distinct values, one from each period~~). Consider any mitigations of ICA violations, such as impacts from using smart inverter volt/var functionality.
- ii. Maximum instantaneous power exported (kW) over the course of Period 1 and Period 2 given the LGP configuration (~~2 distinct values, one from each period~~). Consider any mitigations of ICA violations, such as impacts from using smart inverter volt/var functionality.

ICA Violations (Adapted from Joint AL at page 24)

- i. Frequency of ICA Violations: Number of hours among the 288 unique LGP ICA-SG values of Period 2 that are less than those in the LGP configuration of Period 1 at the equivalent date and time
- ii. ~~Duration of ICA Violations: Time from start to end of each period in which LGP values of Period 2 are less than the those in the LGP configuration of Period 1 at the equivalent date and time (refer to General Instructions for calculating and presenting durations)~~
- iii. Magnitude of ICA Violations: Magnitude of the difference between 288 unique LGP ICA-SG values of Period 2 and those in the LGP configuration of Period 1 at the equivalent date and time

Provide the limiting criterion for each ICA violation, such as thermal, voltage, or protection constraints.

Findings

- SCE's analysis in response to this portion of the data request identified **24Hour_fixed** to be the LGP configuration with the **lowest risk** and **highest energy** production for 3 out of the 5 nodes
- Conversely, the **24Hour_fixed** LGP configuration had the **highest risk** of all LGP configurations studied for the Citrow 12 kV node. In this case, the 12LGP configuration had the lowest risk and highest energy production
- While geographically diverse, the results of this analysis represent only a small fraction of SCE's service territory.

Region	Circuit & Voltage	Node ID	LGP Configuration with Lowest Risk and Highest Energy
Rurals	Peso 12 kV	TERM_16664551	24Hour_fixed
Desert	Citrow 12 kV	TERM_40720736	12
North Coast	Cottonmouth 16 kV	TERM_20483148	24Hour_fixed
Metro East	Sevaine 12 kV	TERM_51057677	24Hour_fixed
Orange	Tarpon 12 kV	TERM_60437615	16_21hourly

Methodology

Using the most recent, complete ICA-SG data, SCE defined Periods 1 and 2 as follows:

- Period 2: June 2022 through May 2023
- Period 1: June 2021 through May 2022

The following 5 LGP configurations were developed using 90% of the ICA-SG results from Period 1:

- **12LGP:** Uses the monthly minimum of ICA-SG to generate a 12-value profile.
- **Block:** Divides the year into blocks of 3 months and each day into blocks of 4 hours and uses 90% of the minimum ICA-SG value for each block. Construct the schedule around blocks from July-September and 5pm-9pm. For more information, refer to IREC's presentation in Workshop 4;
- **24Hour_fixed:** Takes 90% of the minimum ICA-SG values for each hour across the 12 months;
- **16_21hourly:** Uses 90% of ICA-SG for 4PM-9PM, uses 90% of the monthly minimum of ICA-SG for 10PM-3PM for these hours (equivalent to SCE's 84-value profile from Workshop 4 and Joint AL page 24); and
- **18_23fixed:** Uses 90% of minimum ICA-SG value for 6PM-11PM for these hours, uses 90% of minimum ICA-SG value for 12AM-5PM for these hours.

SCE analyzed the following 5 nodes to satisfy the geographic diversity requirements and to minimize input data gaps:

Region	Circuit & Voltage	Node ID
Rurals	Peso 12 kV	TERM_16664551
Desert	Citrow 12 kV	TERM_40720736
North Coast	Cottonmouth 16 kV	TERM_20483148
Metro East	Sevaine 12 kV	TERM_51057677
Orange	Tarpon 12 kV	TERM_60437615

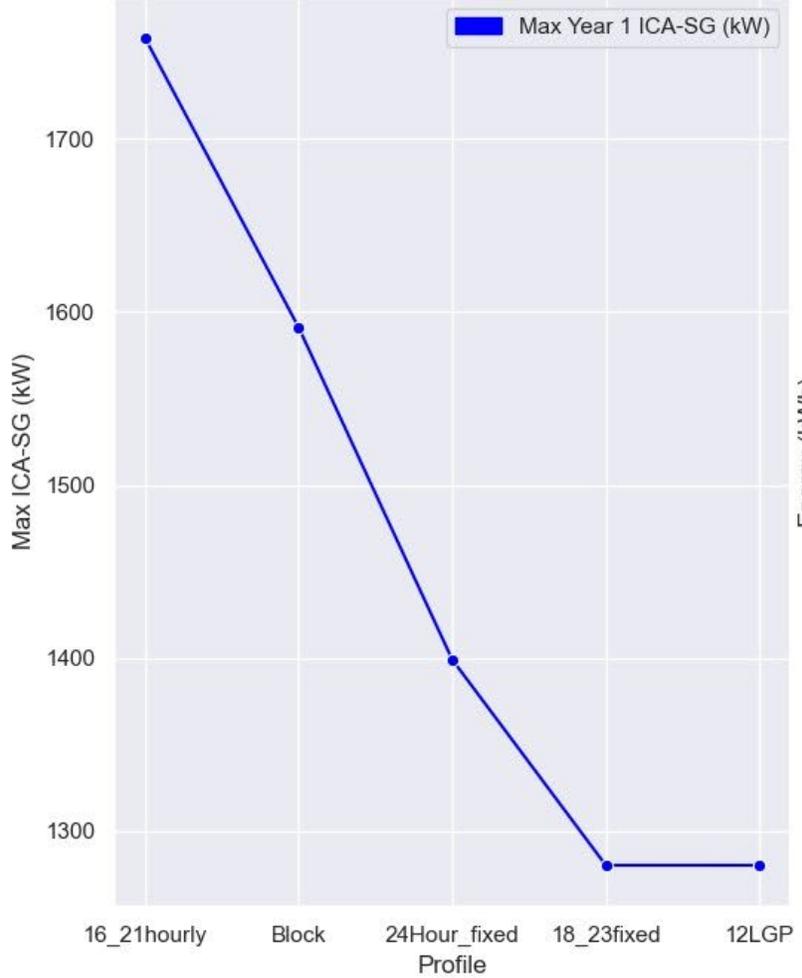
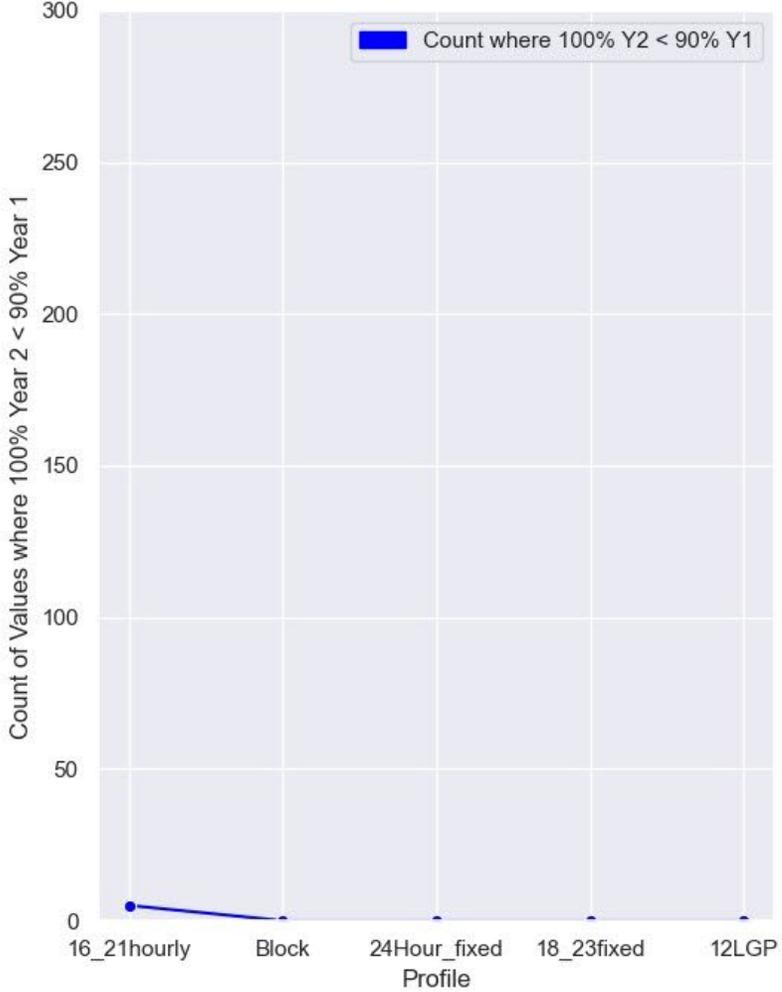
Definitions

ICA Limiting Criteria:

- **Steady State Voltage (SSV):** Amount of generation that can be installed without violating Rule 2 (+/- 5% of nominal, e.g., 114-126 V)
- **Voltage Variation (VV):** Amount of generation that can be installed without causing 3% variation in Voltage
- **Thermal (TH):** Amount of generation that can be installed without causing thermal overloads anywhere in the system

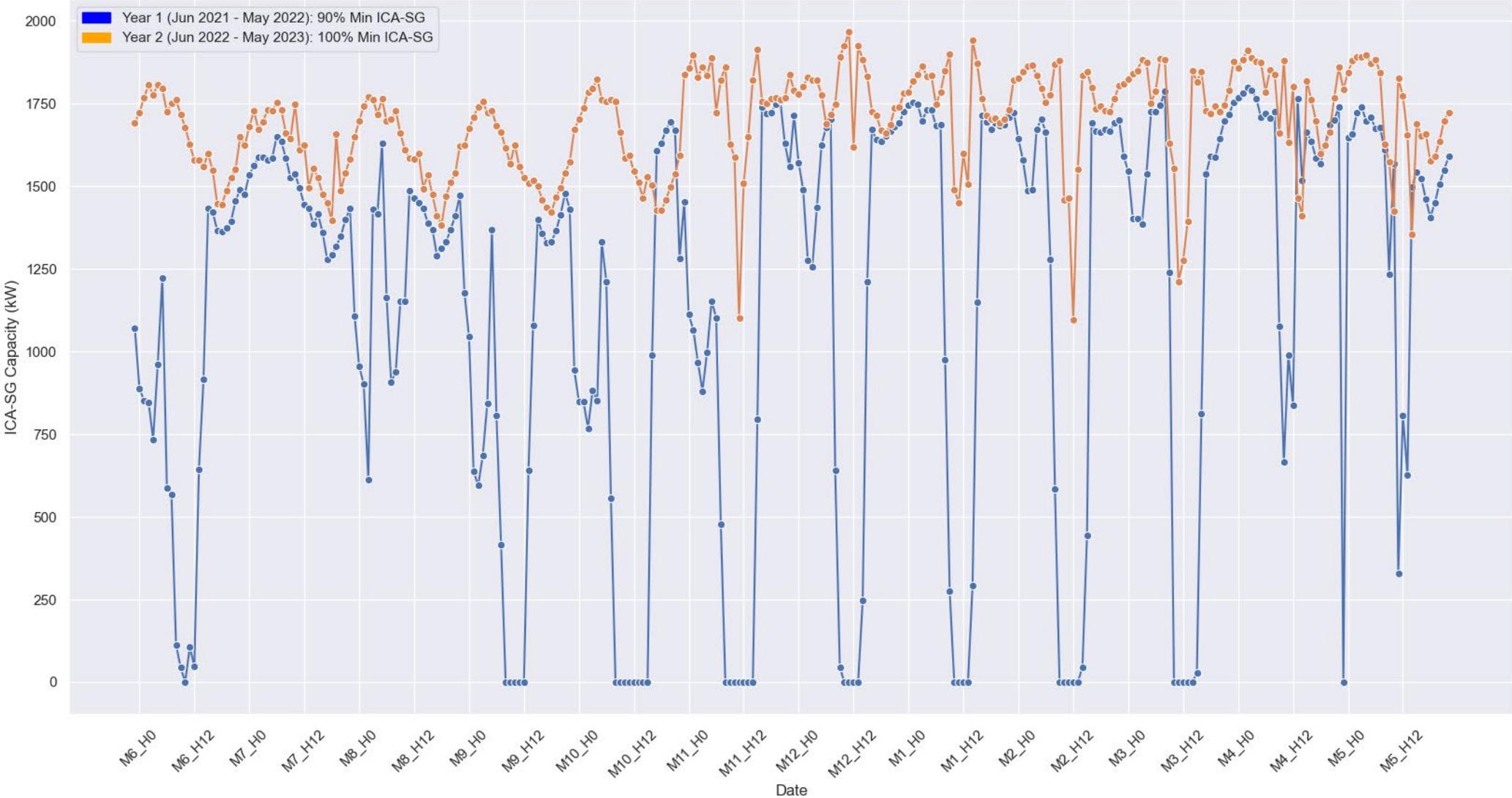
Circuit	Peso 12 kV
Node ID	TERM_16664551
Substation	Tortilla
Region	Rurals

TERM_16664551_PESO

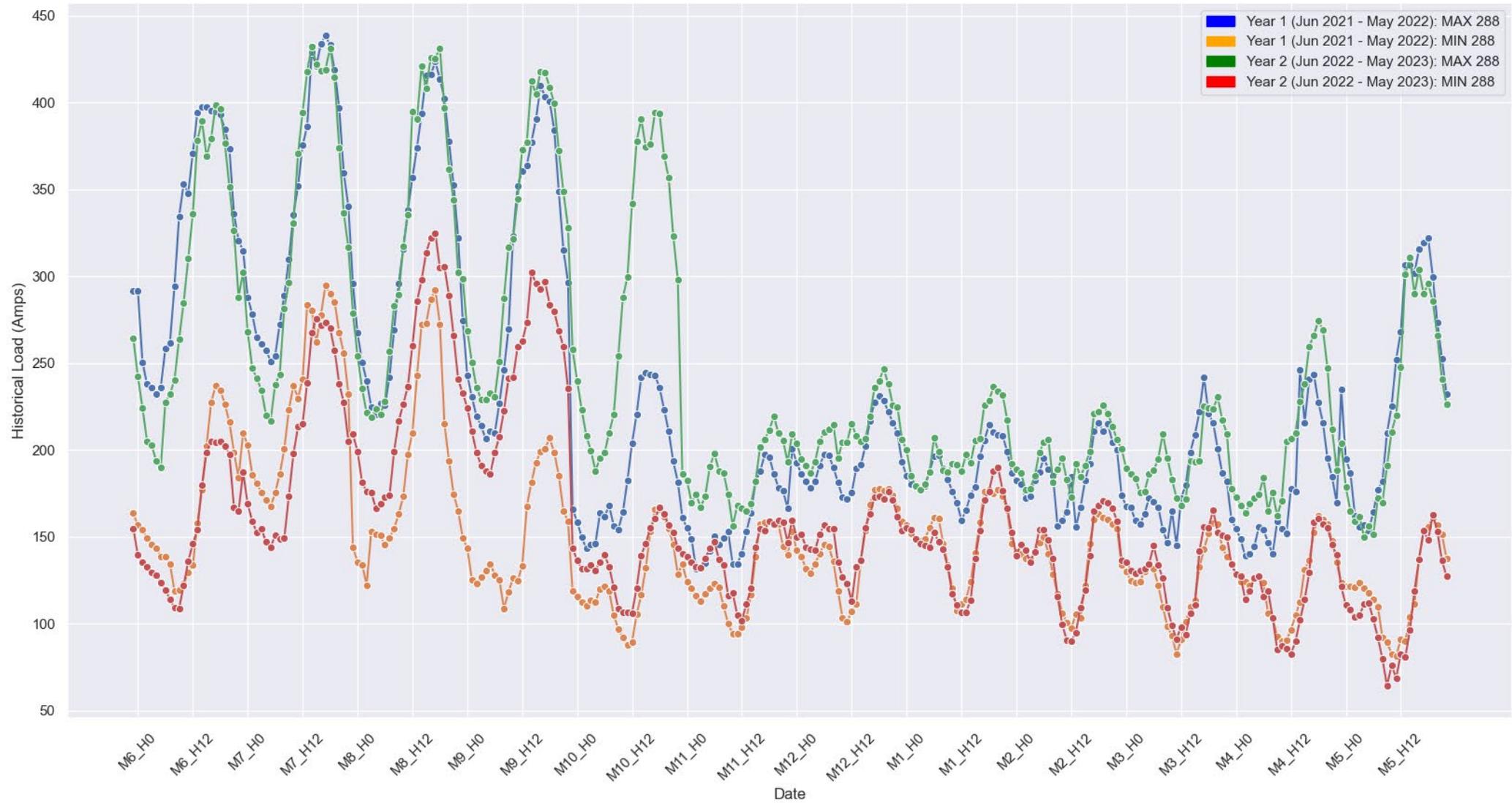


LGP Configuration	16_21hourly	Block	24Hour_fixed	18_23fixed	12
Maximum Deviation Year 2 to Year 1 (kW)	212	0	0	0	0

PESO_12KV Minimum ICA-SG Trends



PESO_12KV Net Historical Load

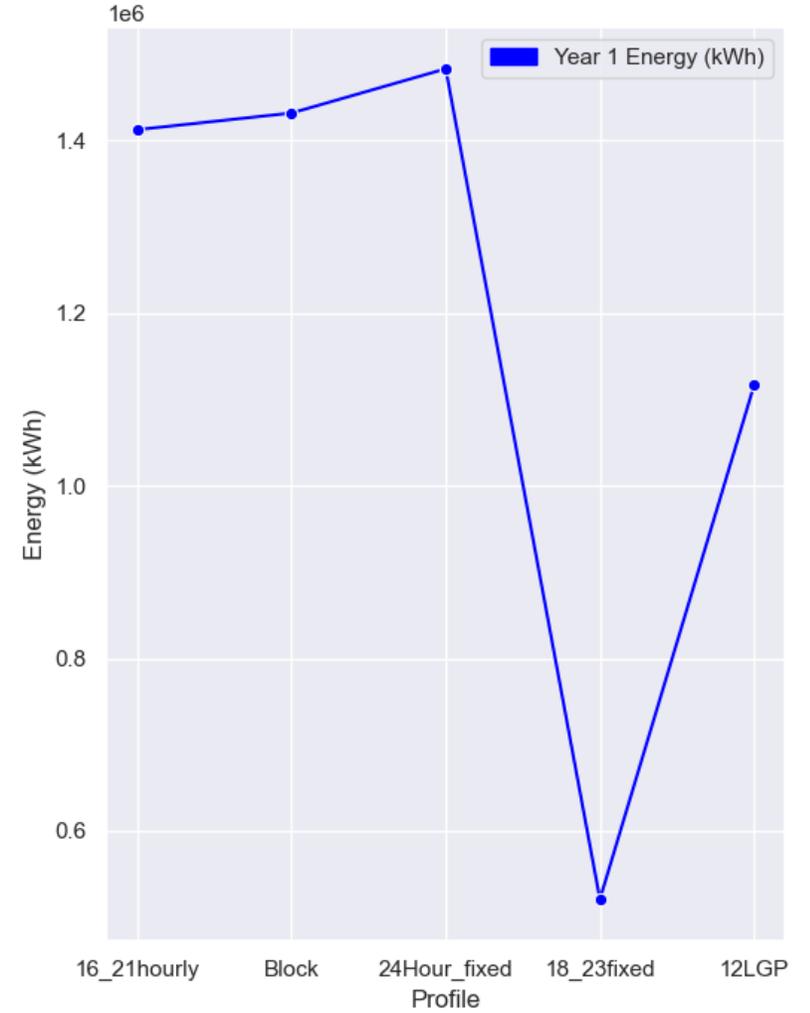
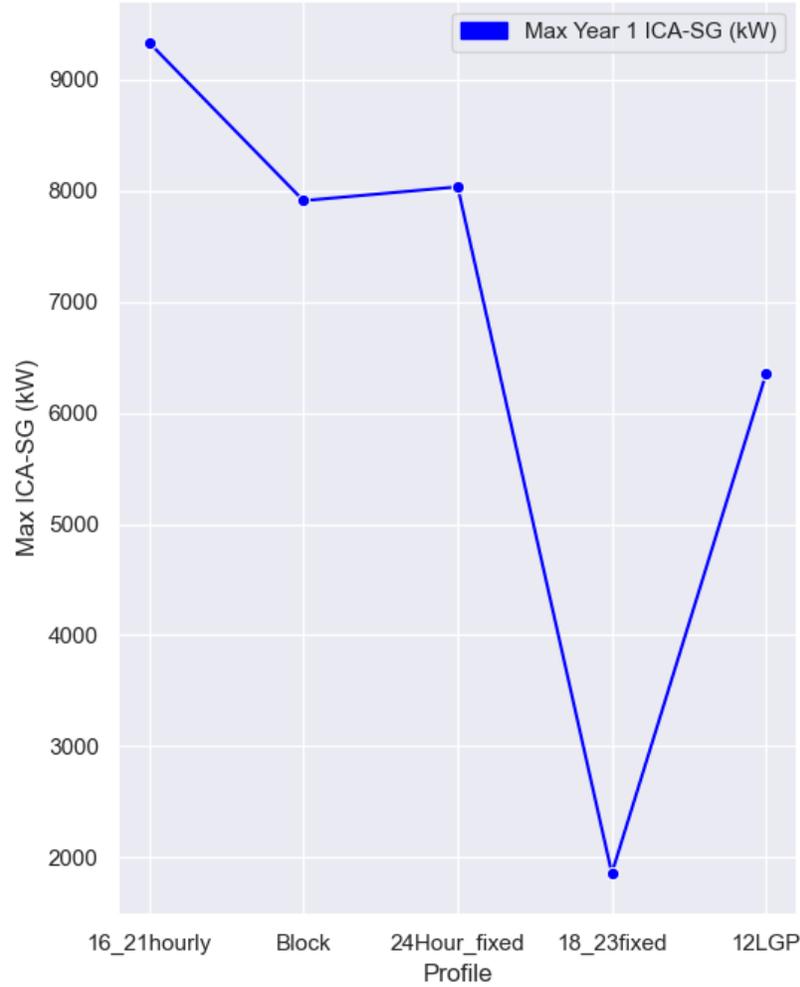
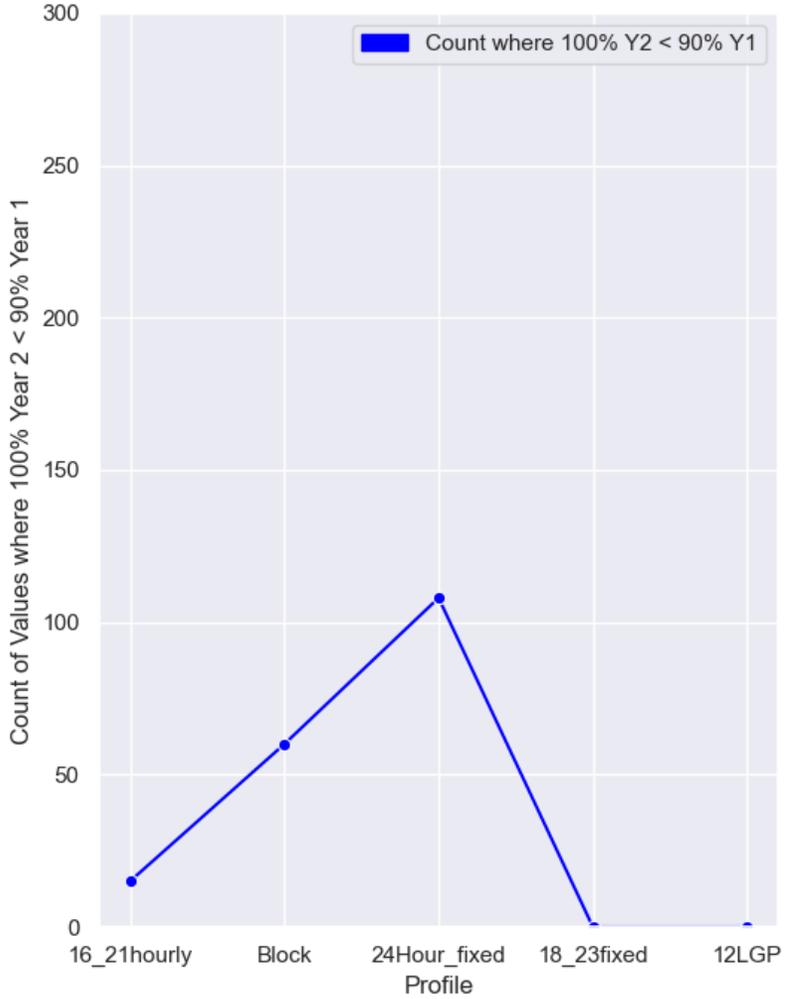


Violation Summary: Peso 12 kV, TERM_16664551

MONTH	HOUR	Year 1: 90% ICA-SG (kW)	Year 2: ICA-SG (kW)	Mag. Difference (kW)	Cause	Violation Seen On Following LGP Profiles:
10	18	1608.39	1429.04	179.35	VV	288 & 16_21hourly
10	19	1630.683	1428.1	202.583	VV	288 & 16_21hourly
10	20	1669.635	1457.51	212.125	VV	288 & 16_21hourly
10	21	1694.826	1499.19	195.636	VV	288 & 16_21hourly
10	22	1668.393	1536.6	131.793	SSV	288
4	14	1765.782	1464.02	301.762	VV	288
4	15	1516.5	1411.52	104.98	SSV	288
4	21	1687.77	1664.26	23.51	VV	288 & 16_21hourly
5	11	1568.16	1425.5	142.66	SSV	288
5	15	1498.932	1355.56	143.372	VV	288

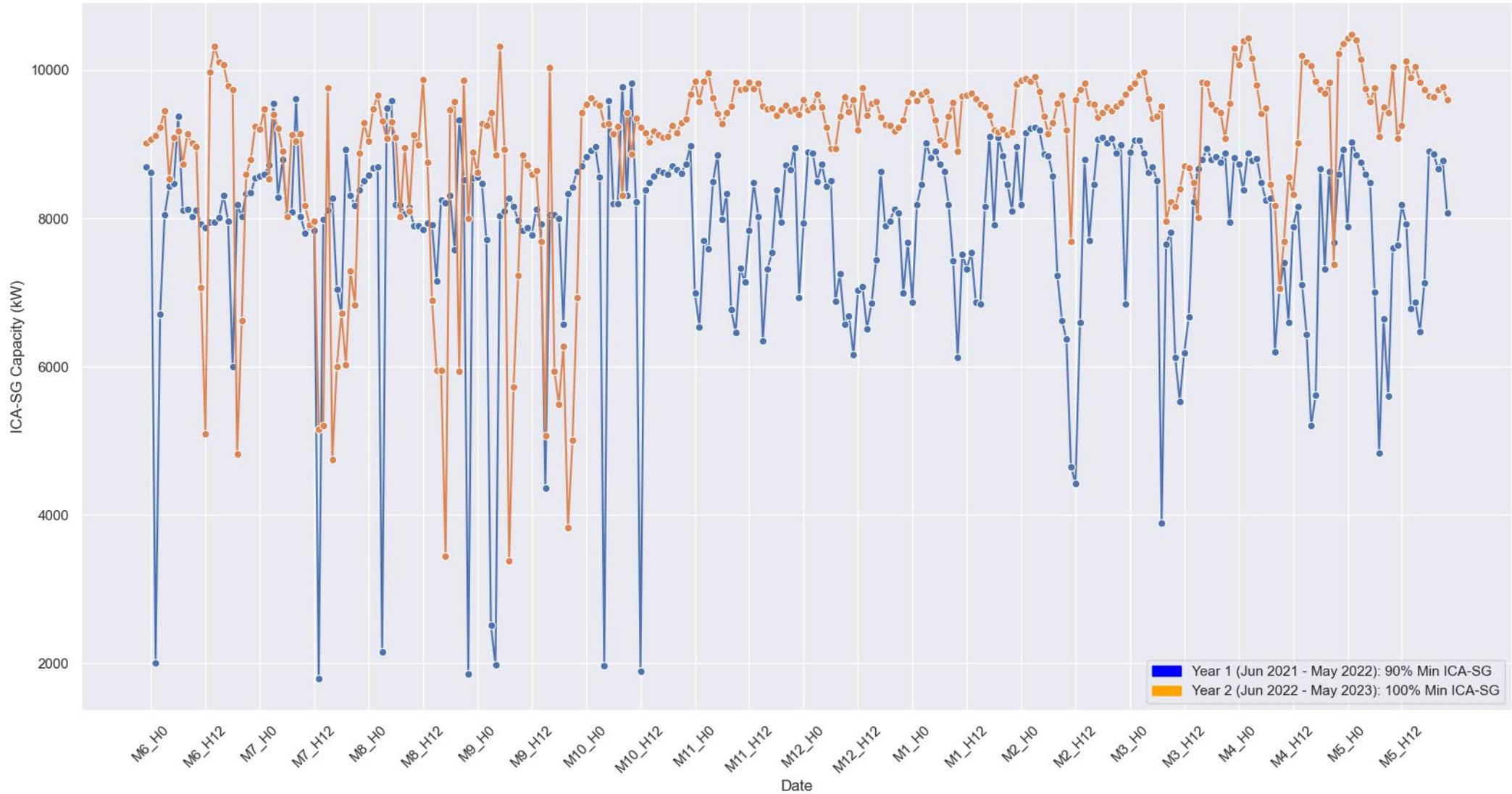
Circuit	Citrow 12 kV
Node ID	TERM_40720736
Substation	Declez
Region	Desert

TERM_40720736_CITROW

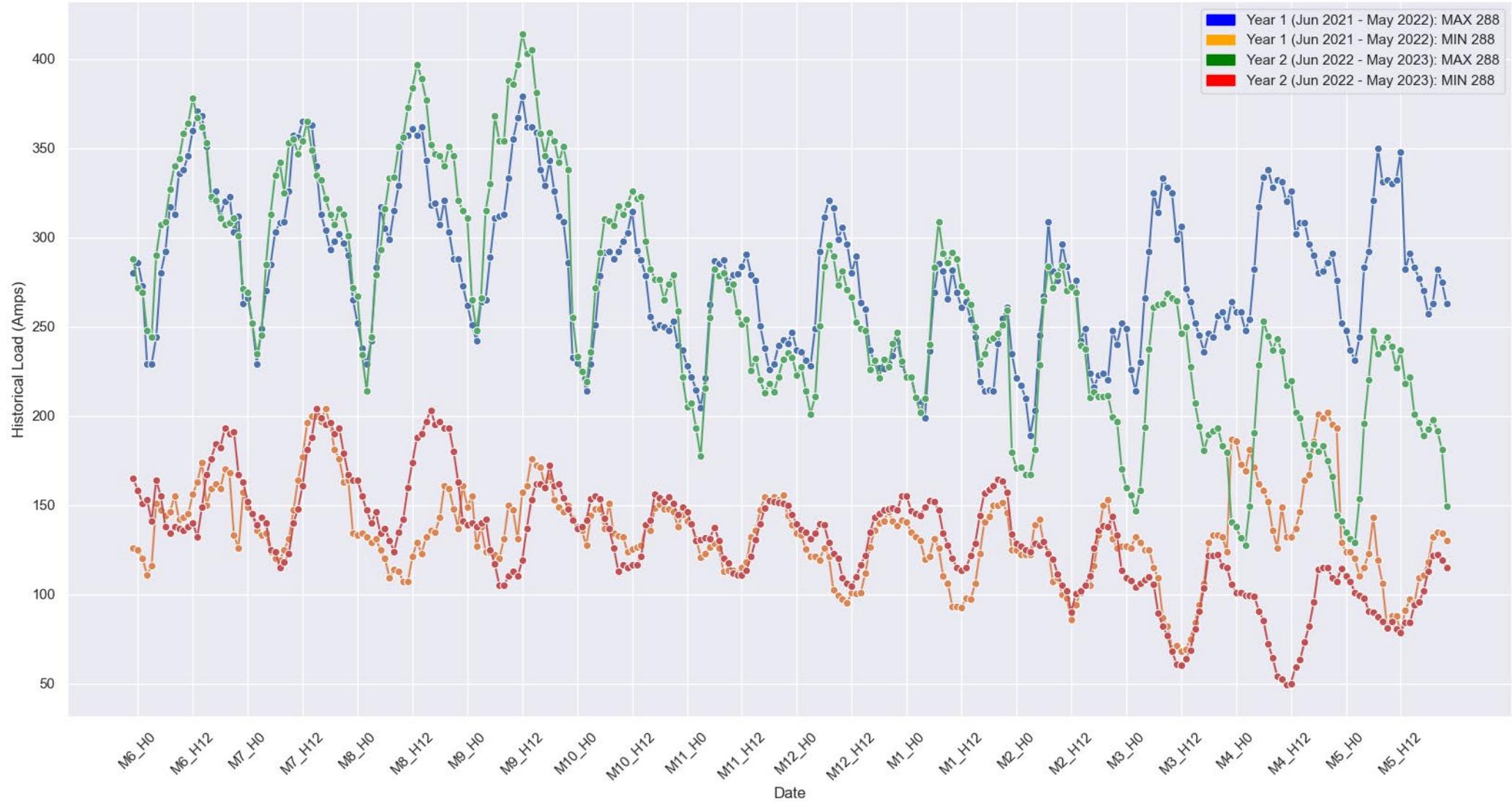


LGP Configuration	16_21hourly	Block	24Hour_fixed	18_23fixed	12
Maximum Deviation Year 2 to Year 1 (kW)	4762	4762	4884	0	0

CITROW_12KV Minimum ICA-SG Trends



CITROW_12KV Net Historical Load



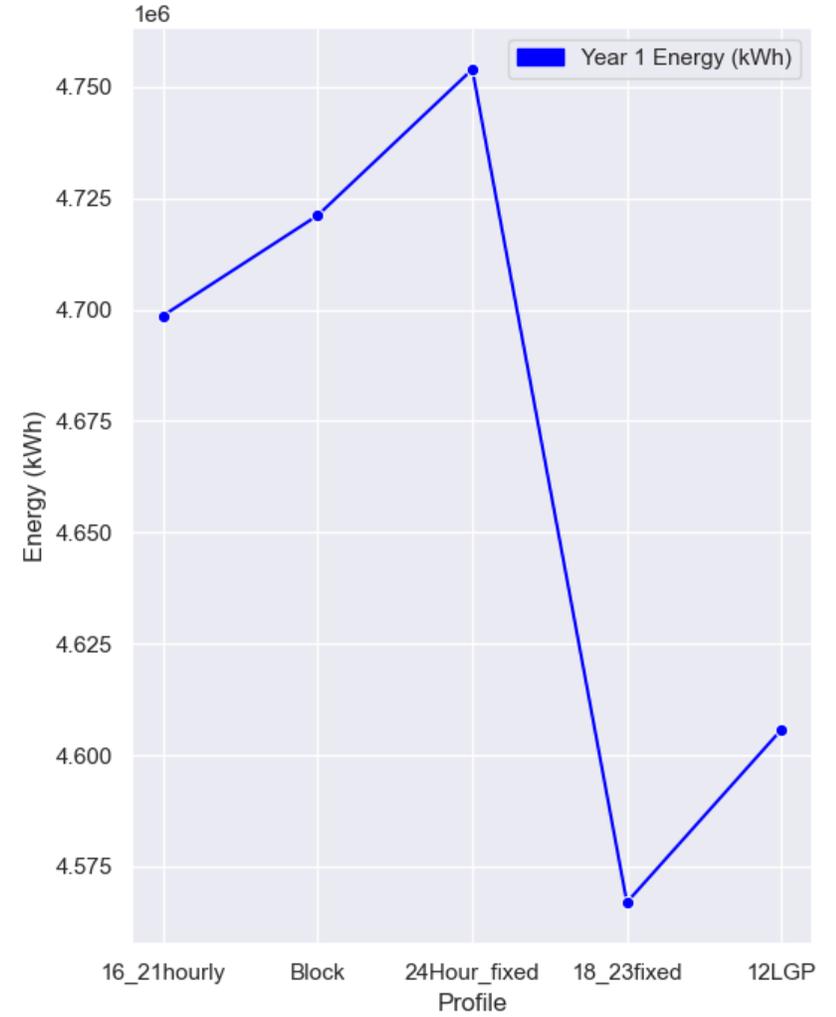
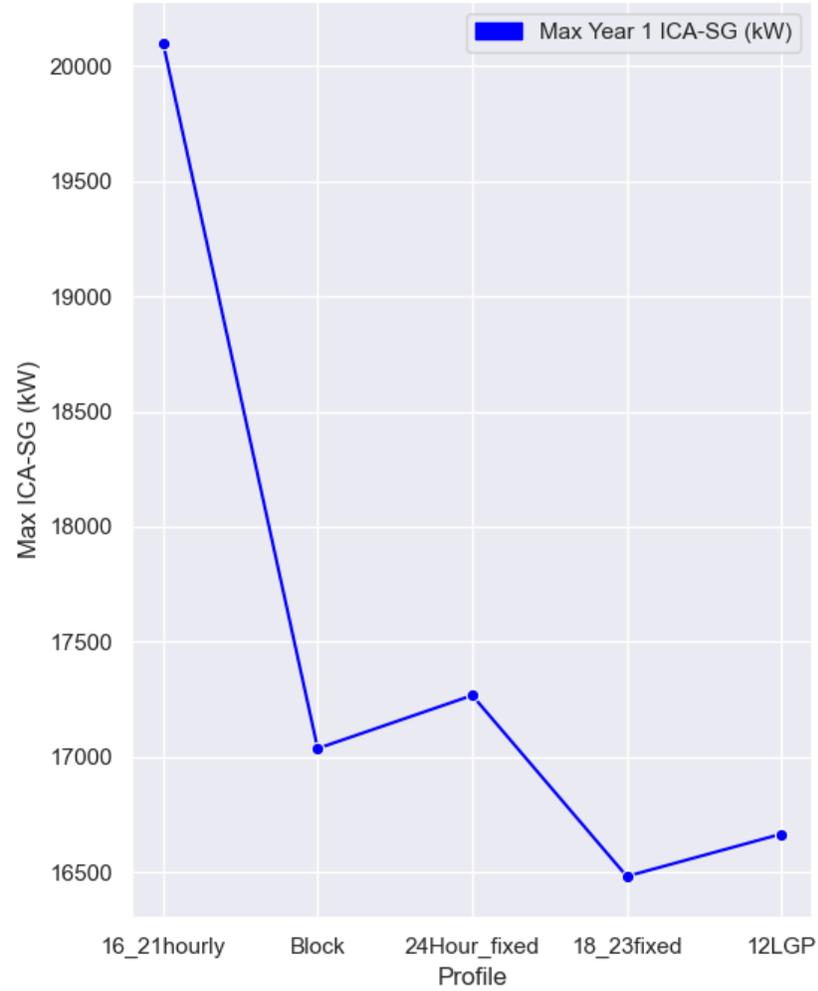
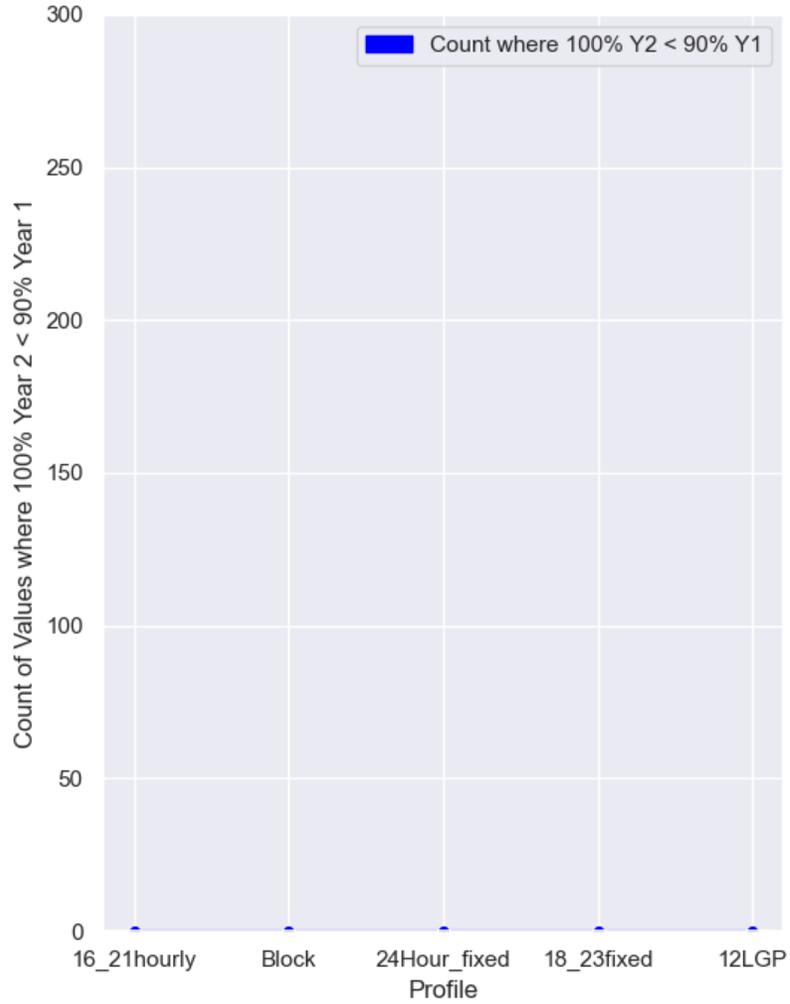
Violation Summary: Citrow 12 kV, TERM_40720736

MONTH	HOUR	Year 1: 90% ICA-SG (kW)	Year 2: ICA-SG (kW)	Mag. Difference (kW)	Cause	Violation Seen On Following LGP Profiles:
6	7	9379.314	9183.17	196.144	VV	288
6	12	7931.529	7069.49	862.039	VV	288
6	13	7882.587	5097.62	2784.967	VV	288 and Block
6	20	8183.673	4821.73	3361.943	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
6	21	8028.981	6617.39	1411.591	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
7	3	8716.185	8531.09	185.095	VV	288
7	4	9555.921	9406.05	149.871	VV	288
7	7	8066.115	8031.48	34.635	VV	288
7	9	9616.752	9048.73	568.022	VV	288, Block, and 24Hour_Fixed
7	15	7992.306	5204.03	2788.276	VV	288 and 24Hour_Fixed
7	17	8278.749	4742.1	3536.649	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
7	18	7048.971	6001.16	1047.811	SSV	288, Block, 24Hour_Fixed, and 16_21Hourly
7	20	8935.92	6030.41	2905.51	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
7	21	8309.619	7287.34	1022.279	VV	288, 24Hour_Fixed, and 16_21Hourly
7	22	8171.469	6837.78	1333.689	VV	288 and 24Hour_Fixed
8	5	9488.151	9078.87	409.281	VV	288
8	6	9591.003	9300.07	290.933	VV	288
8	8	8190.801	8030.93	159.871	VV	288 and 24Hour_Fixed
8	10	8145.396	8102.03	43.366	VV	288 and Block
8	15	7909.695	6900.14	1009.555	VV	288 and 24Hour_Fixed
8	16	7157.169	5956.47	1200.699	SSV	288 and 16_21Hourly

MONTH	HOUR	Year 1: 90% ICA-SG (kW)	Year 2: ICA-SG (kW)	Mag. Difference (kW)	Cause	Violation Seen On Following LGP Profiles:
8	17	8251.272	5946.88	2304.392	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
8	18	8207.109	3445.1	4762.009	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
8	21	9328.716	5933.76	3394.956	VV	288, 24Hour_Fixed, and 16_21Hourly
9	8	8271.504	3387.22	4884.284	VV	288 and 24Hour_Fixed
9	9	8164.485	5727.61	2436.875	VV	288, Block, and 24Hour_Fixed
9	10	7971.642	7234.1	737.542	VV	288 and Block
9	15	7930.89	7692.65	238.24	VV	288 and 24Hour_Fixed
9	18	8054.577	5942.09	2112.487	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
9	19	8001.891	5495.11	2506.781	VV	288, Block, 24Hour_Fixed, and 16_21Hourly
9	20	6576.498	6276.52	299.978	SSV	288, Block, 24Hour_Fixed, and 16_21Hourly
9	21	8341.524	3826.73	4514.794	SSV	288, 24Hour_Fixed, and 16_21Hourly
9	22	8426.007	5003.53	3422.477	VV	288 and 24Hour_Fixed
9	23	8636.886	6928.21	1708.676	VV	288
10	6	9584.298	9276.97	307.328	VV	288
10	9	9780.876	8311.49	1469.386	VV	288 and 24Hour_Fixed
10	11	9828.549	8865.24	963.309	VV	288
3	16	8674.398	8008.4	665.998	SSV	288 & 16_21Hourly
4	22	7678.215	7376.85	301.365	SSV	288, Block, and 24Hour_Fixed

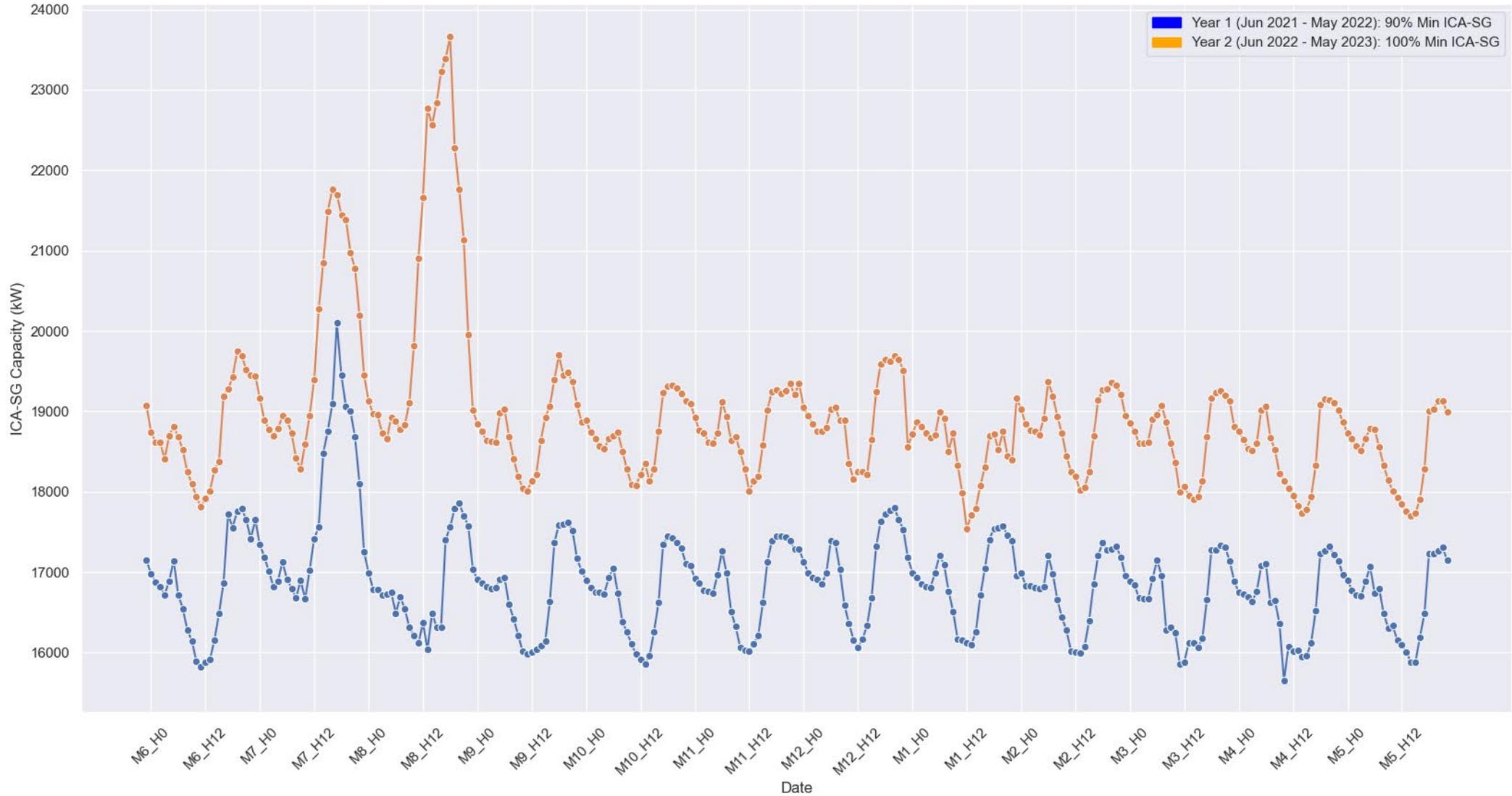
Circuit	Cottonmouth 16 kV
Node ID	TERM_20483148
Substation	North Oaks
Region	North Coast

TERM_20483148_COTTONMOUTH

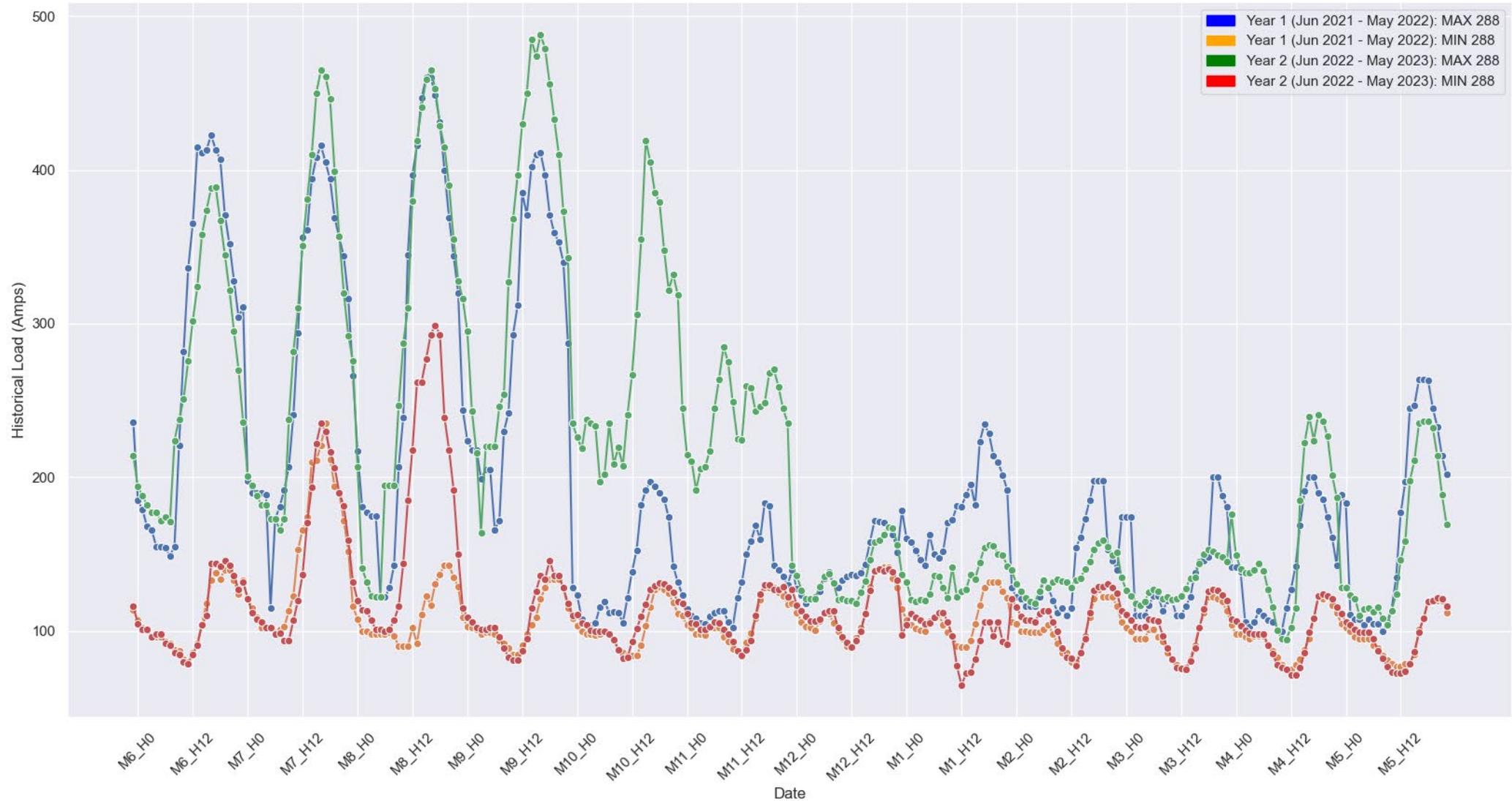


LGP Configuration	16_21hourly	Block	24Hour_fixed	18_23fixed	12
Maximum Deviation Year 2 to Year 1 (kW)	0	0	0	0	0

COTTONMOUTH_16KV Minimum ICA-SG Trends



COTTONMOUTH_16KV Net Historical Load

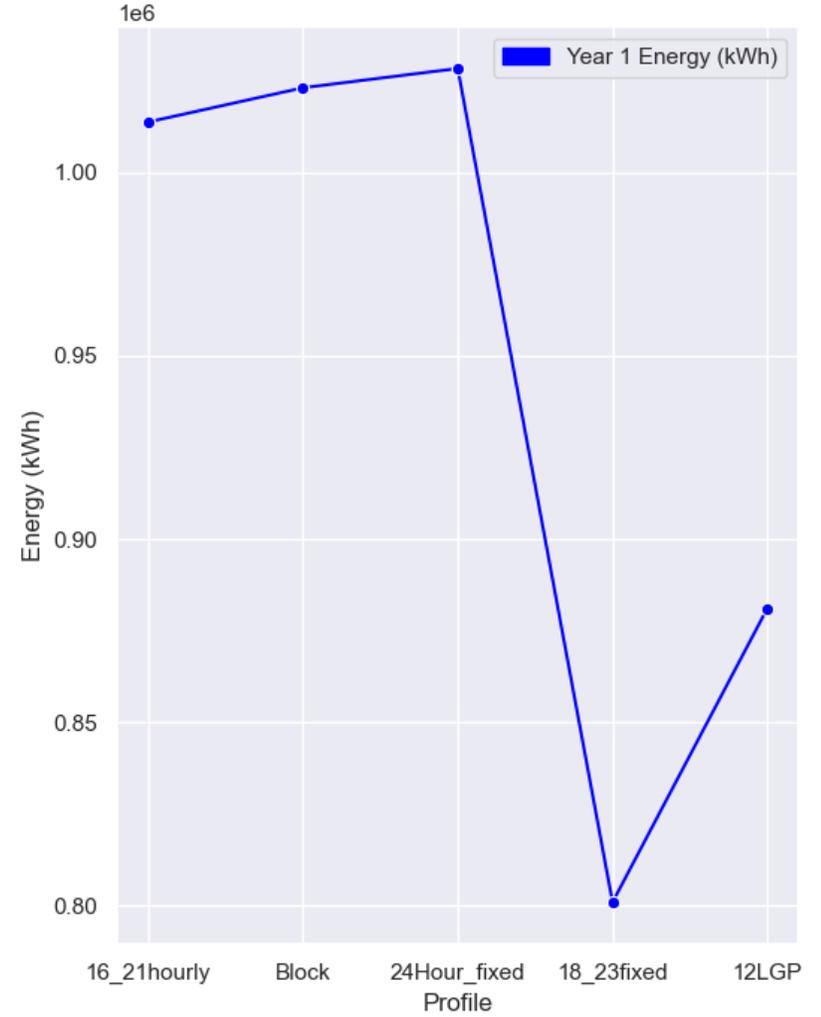
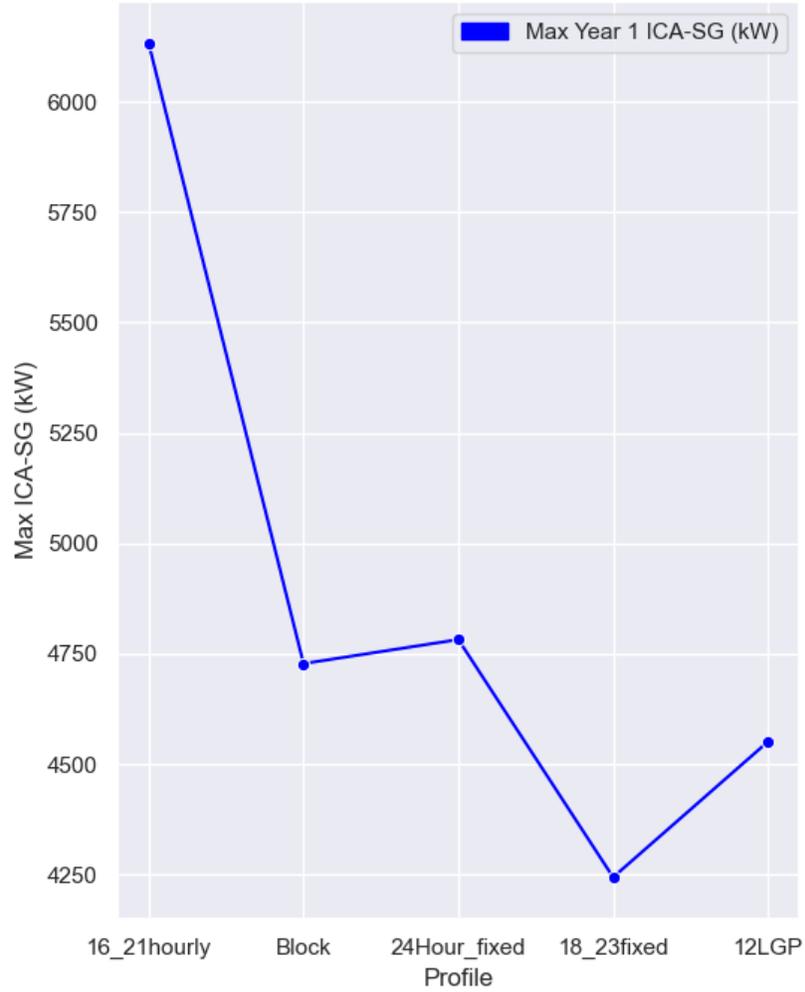
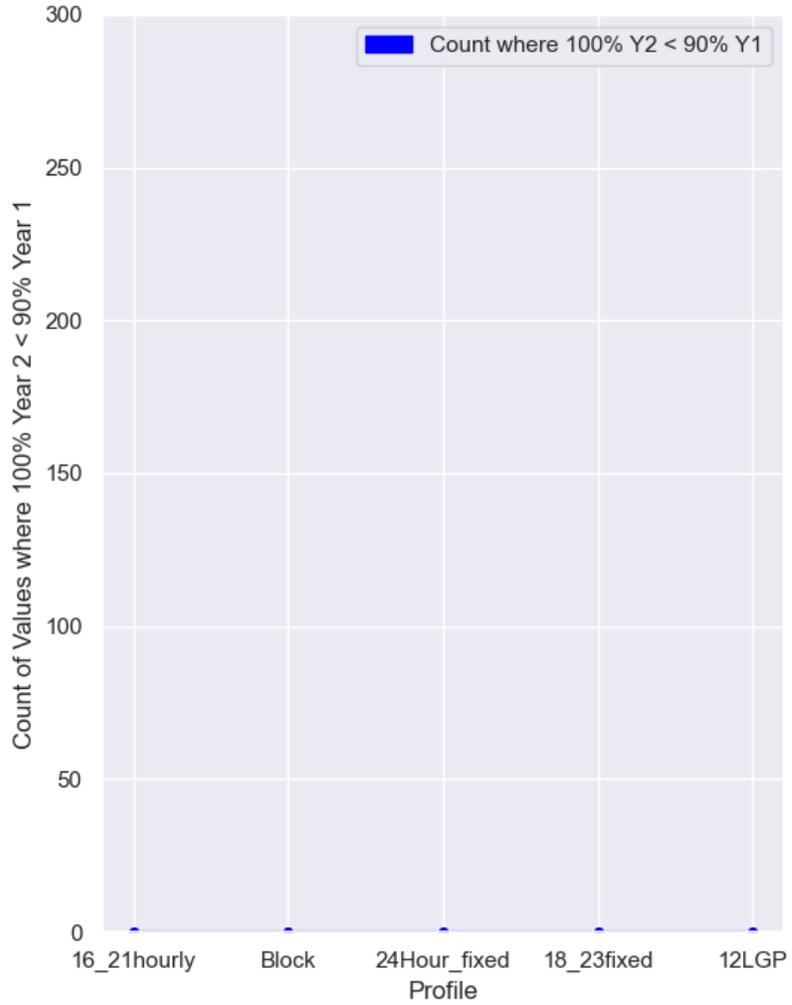


Violation Summary: Cottonmouth 16 kV, TERM_20483148

No violations identified

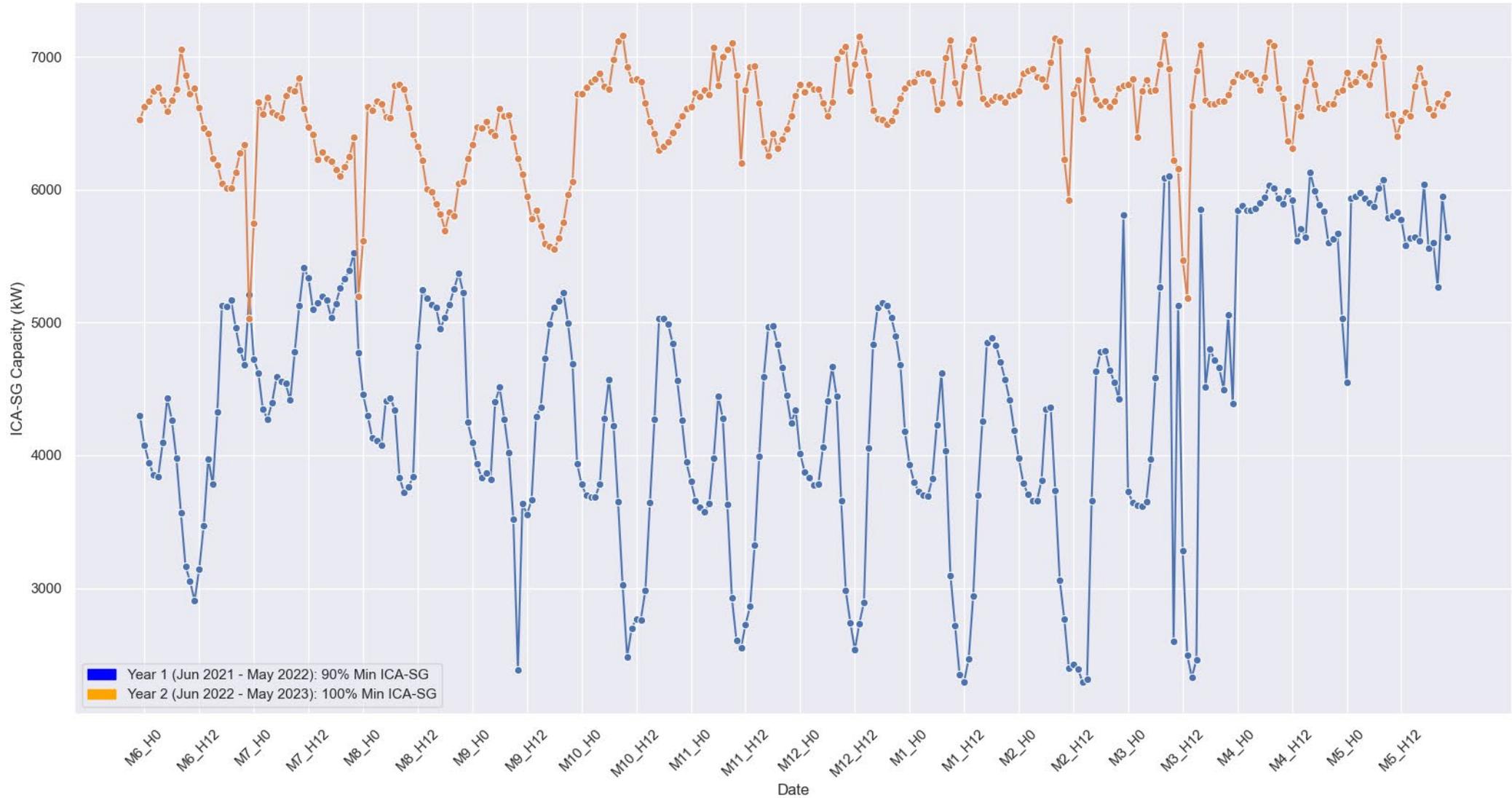
Circuit	Sevaine 12 kV
Node ID	TERM_51057677
Substation	Pedley
Region	Metro East

TERM_51057677_SEVAINE

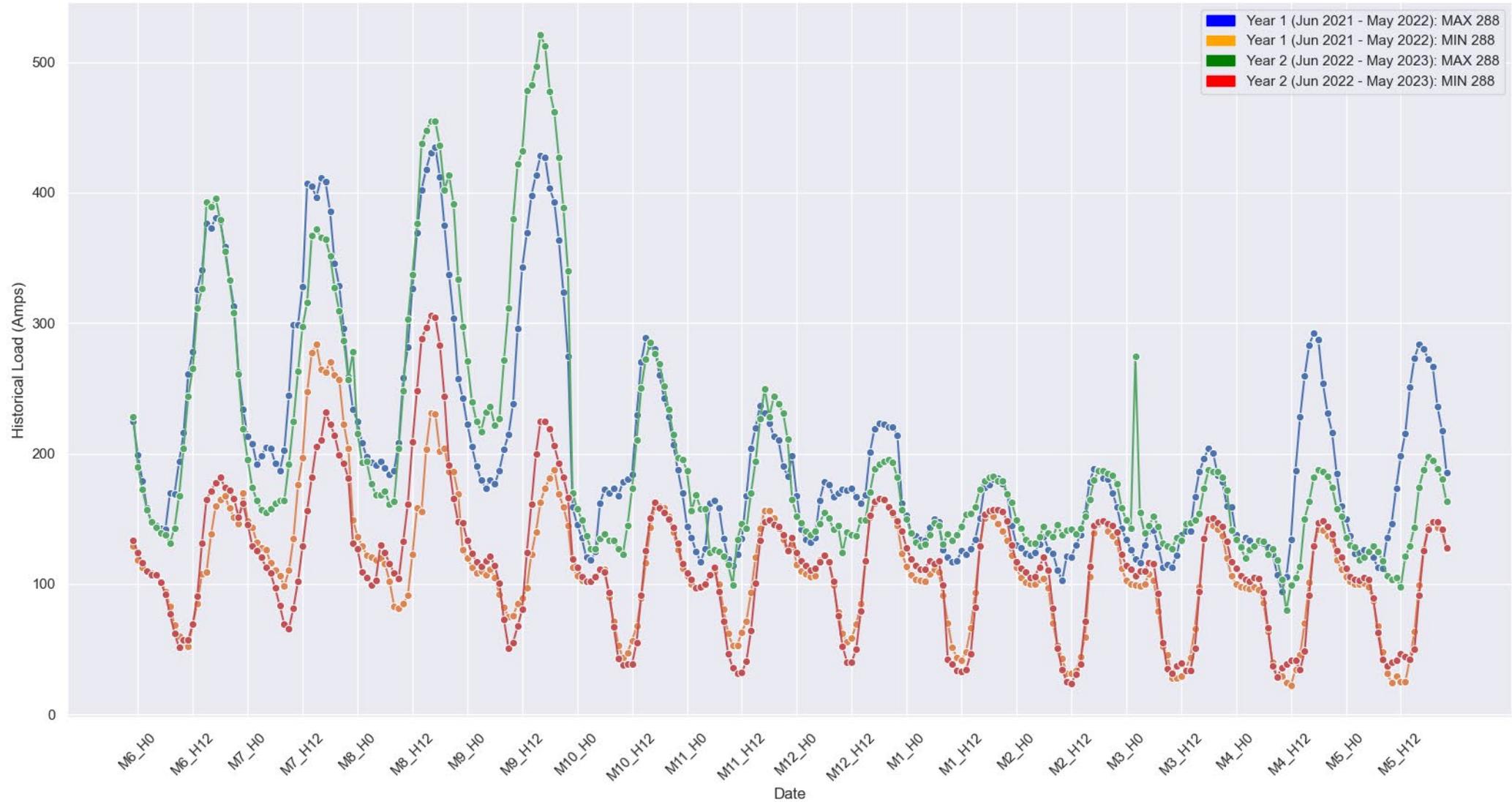


LGP Configuration	16_21hourly	Block	24Hour_fixed	18_23fixed	12
Maximum Deviation Year 2 to Year 1 (kW)	0	0	0	0	0

SEVAINE_12KV Minimum ICA-SG Trends



SEVAINE_12KV Net Historical Load

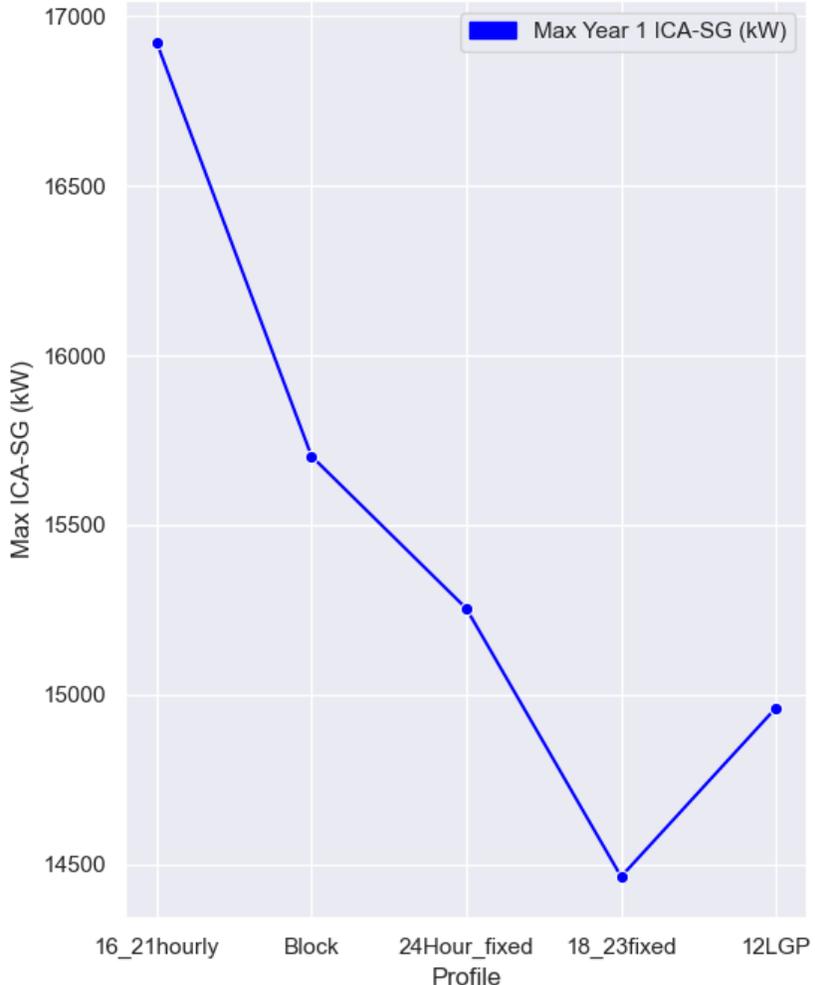
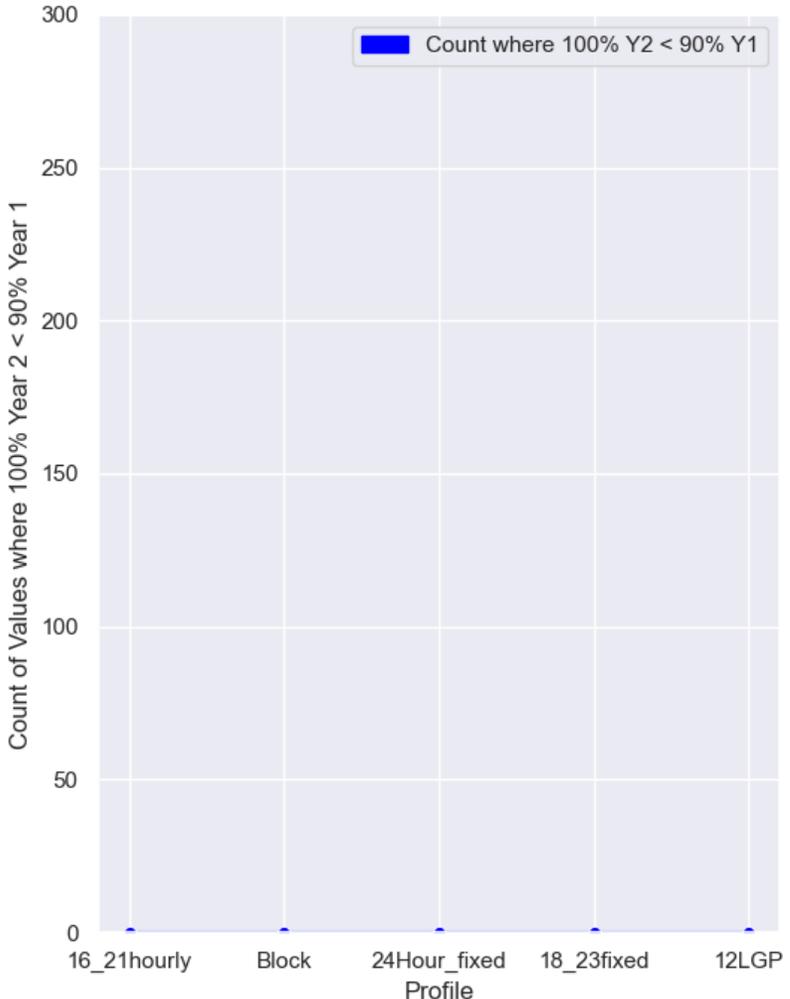


Violation Summary: Sevaine 12 kV, TERM_51057677

MONTH	HOUR	Year 1: 90% ICA-SG (kW)	Year 2: ICA-SG (kW)	Mag. Difference (kW)	Cause	Violation Seen On Following LGP Profiles:
7	0	5211.378	5028.14	183.238	SSV	288

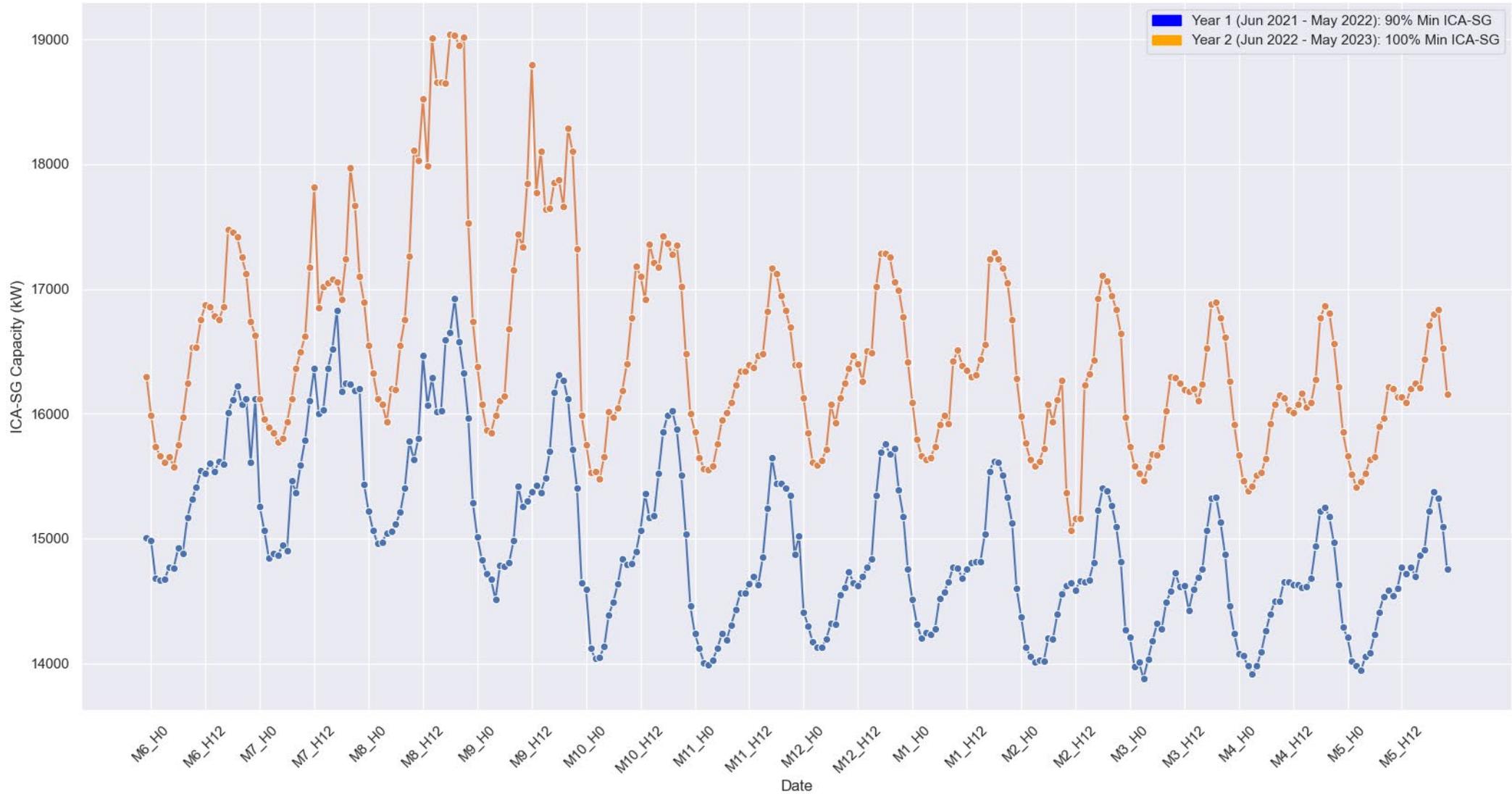
Circuit	Tarpon 12 kV
Node ID	TERM_60437615
Substation	Bayside
Region	Orange

TERM_60437615_TARPON

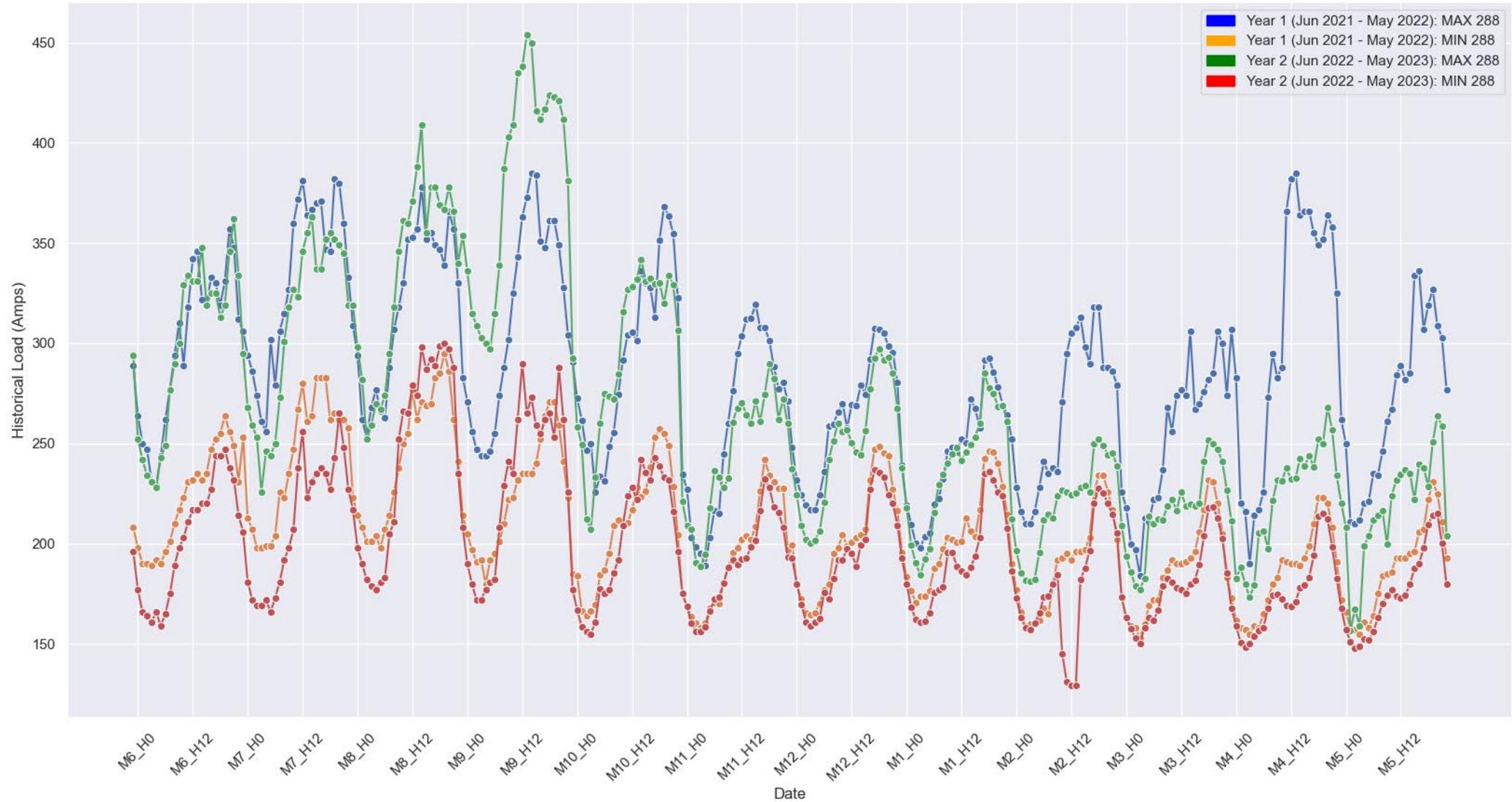


LGP Configuration	16_21hourly	Block	24Hour_fixed	18_23fixed	12
Maximum Deviation Year 2 to Year 1 (kW)	0	0	0	0	0

TARPON_12KV Minimum ICA-SG Trends



TARPON_12KV Net Historical Load



Violation Summary: Tarpon 12 kV, TERM_60437615

No violations identified

Attachment C-1

PG&E's 8/11/23 Data In Response to CPUC Energy Division Data Request #1 (Part 1)

Statistical Analysis Limited Generation Profile (with Block scenario)

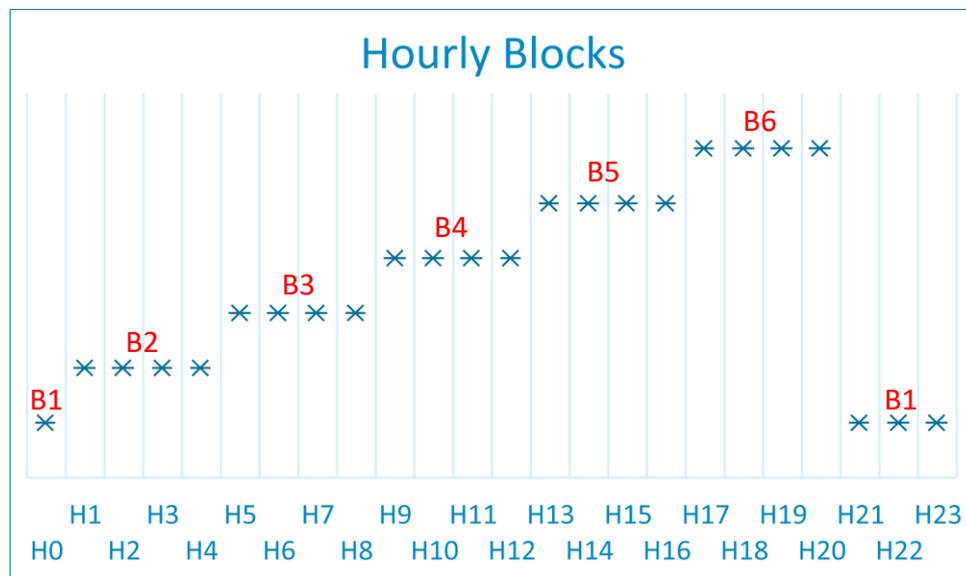
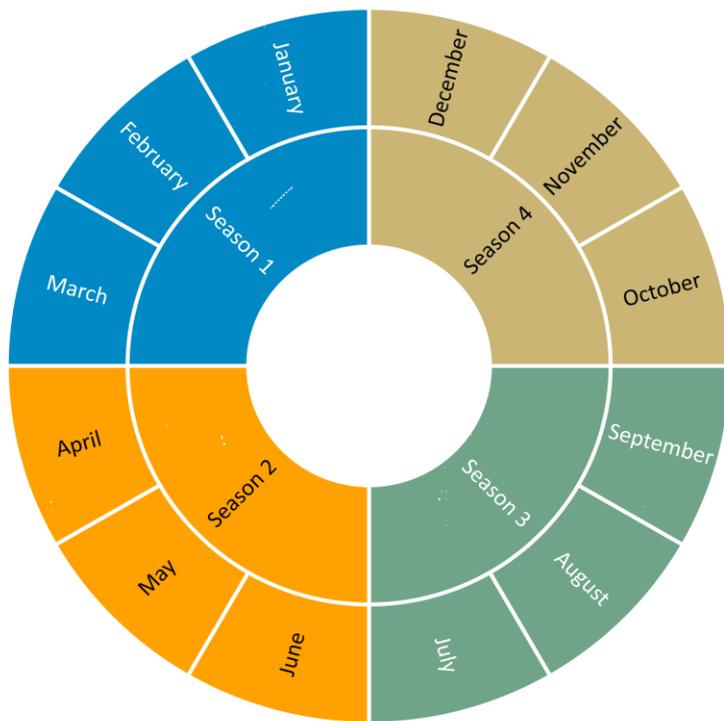


Together, Building
a Better California



Block profile

- There are 4 blocks of months and 6 blocks of hours.
- Example Block: July-September; 5pm-9pm





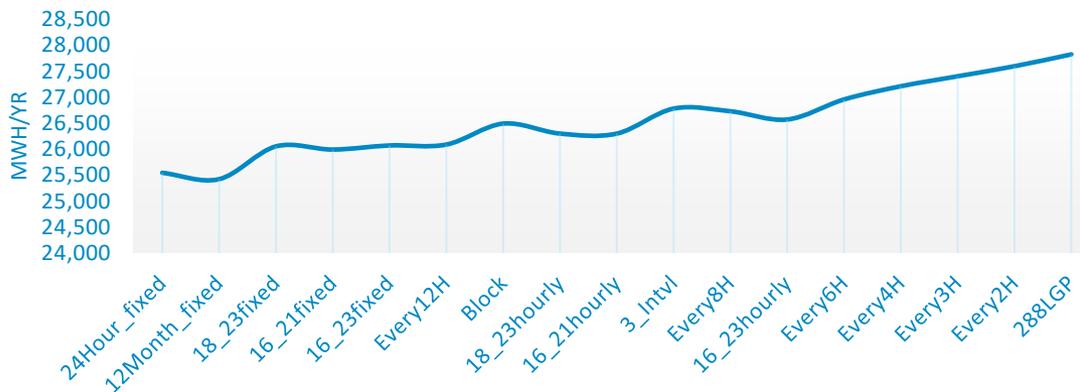
System-wide study

Total section hours: ~ 44 M

Number of violation hours



Energy production per year



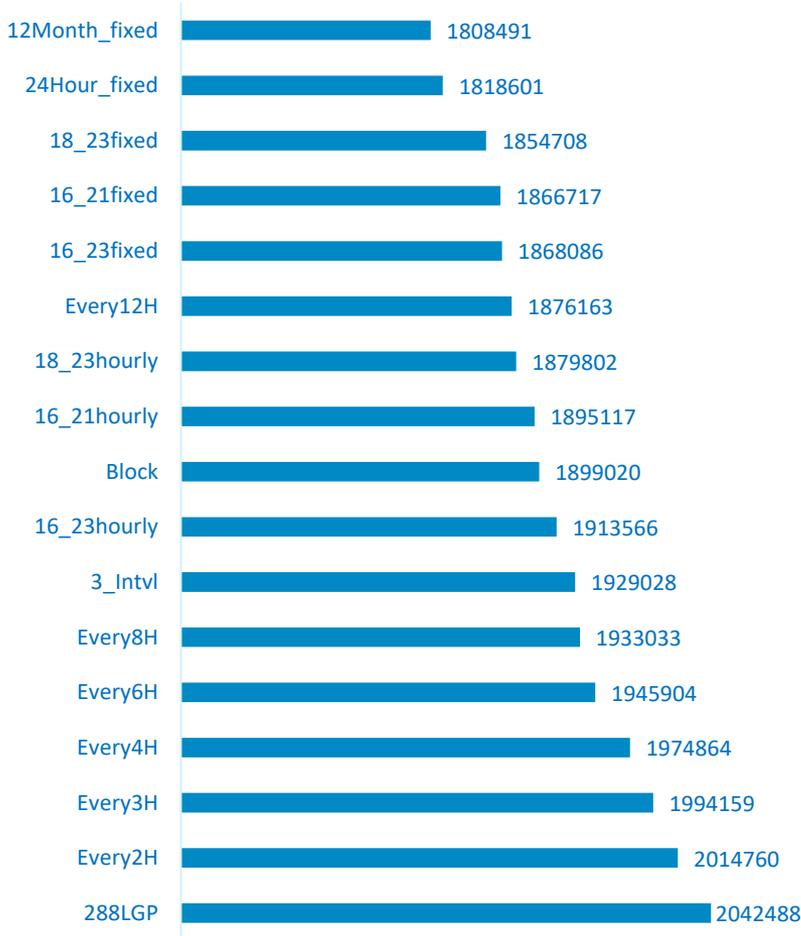
Percent of increase
12Month_fixed is the baseline
(Ranked based on violation)

Scenarios	Granularity	Energy	Violation
288LGP	288	9.4%	40.0%
Every2H	144	8.5%	32.5%
Every3H	96	7.8%	27.6%
Every4H	72	7.0%	23.8%
Every6H	48	6.0%	18.7%
16_23hourly	108	4.5%	17.0%
Every8H	36	5.1%	15.3%
3_Intvl	36	5.3%	15.0%
16_21hourly	84	3.4%	13.8%
18_23hourly	84	3.4%	11.8%
Block	24	4.2%	8.3%
Every12H	24	2.6%	8.2%
16_23fixed	24	2.5%	8.1%
16_21fixed	24	2.2%	7.4%
18_23fixed	24	2.5%	7.4%
12Month_fixed	12	0.0%	0.0%
24Hour_fixed	24	0.5%	-2.7%

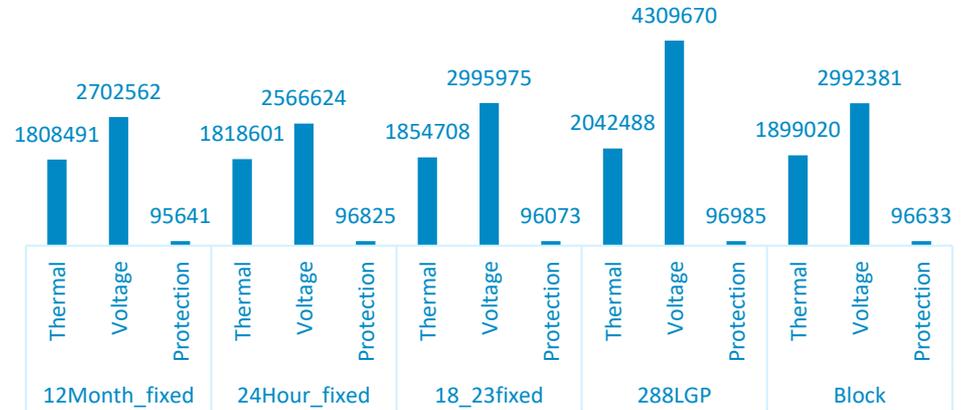


System-Wide study

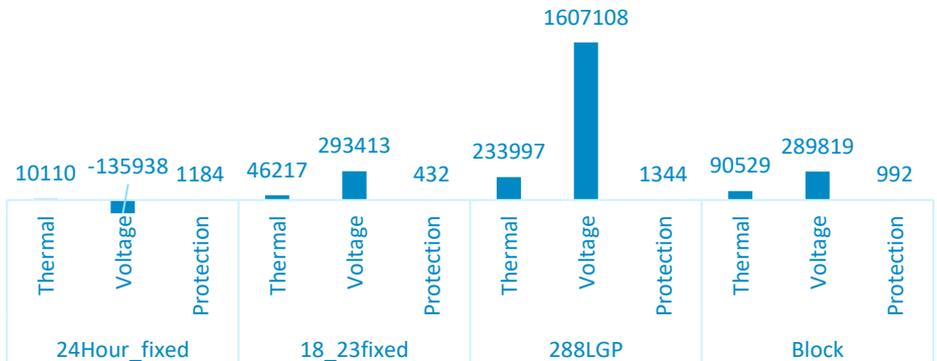
Number of Thermal Violation



Number of section hours per limiting constraint



Number of new violations considering 12Month_fixed as the baseline



Selection of Detail Study Cases

- PG&E has divided its territory to 5 main regions.
- One circuit from each region is selected for detail studies in this presentation.
- Circuits for each region are selected randomly.

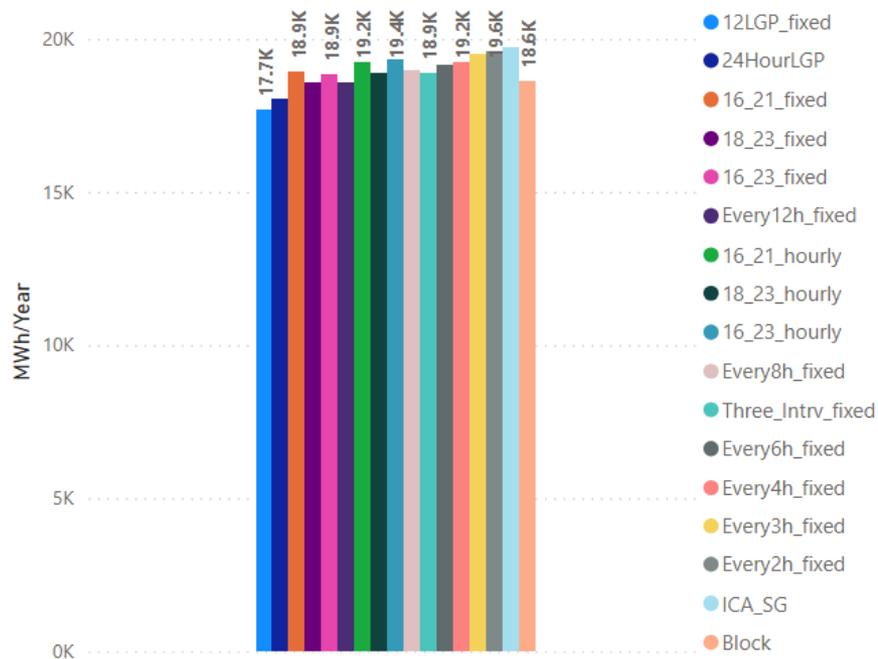




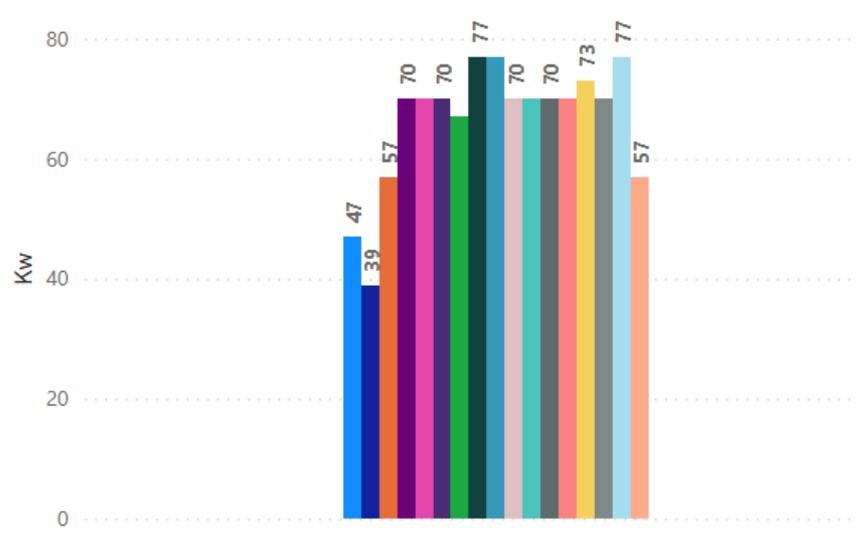
Example 1: North Coast Region

Circuit: 042631110 / Section: 3720501

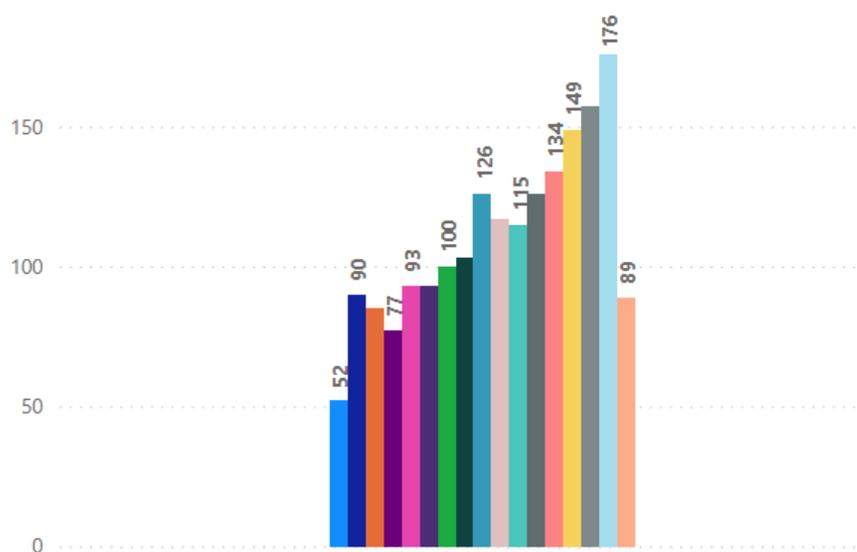
Total Energy (MWh/Yr)



Maximum violation magnitude (kW)



Number of violations



Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of violation
12LGP	17.7k	47	52
288LGP	19.7k	77	176
18-23 fixed	18.6k	70	77
Block	18.6k	57	89

Violation criteria for maximum violation magnitude:

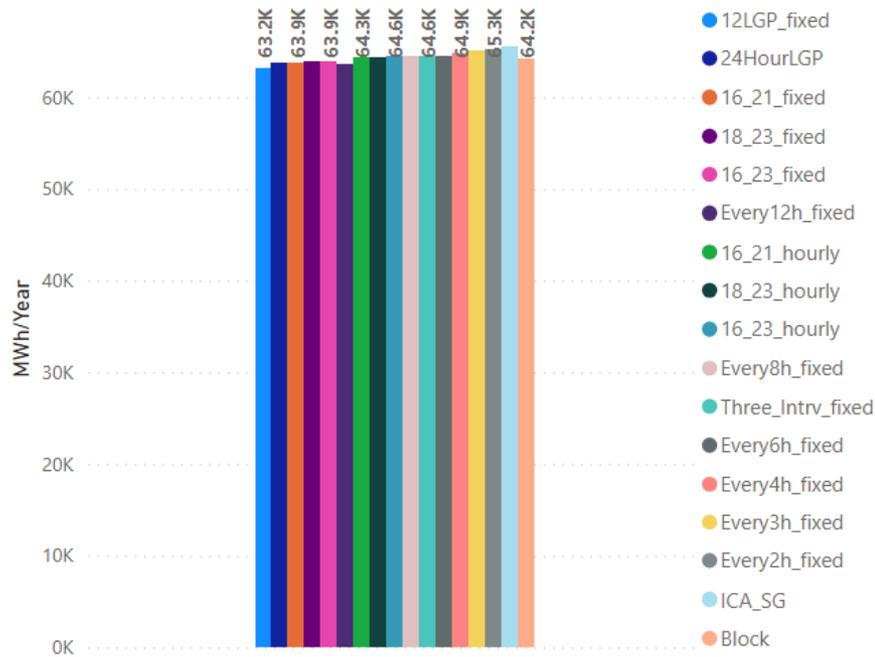
- 12 months thermal



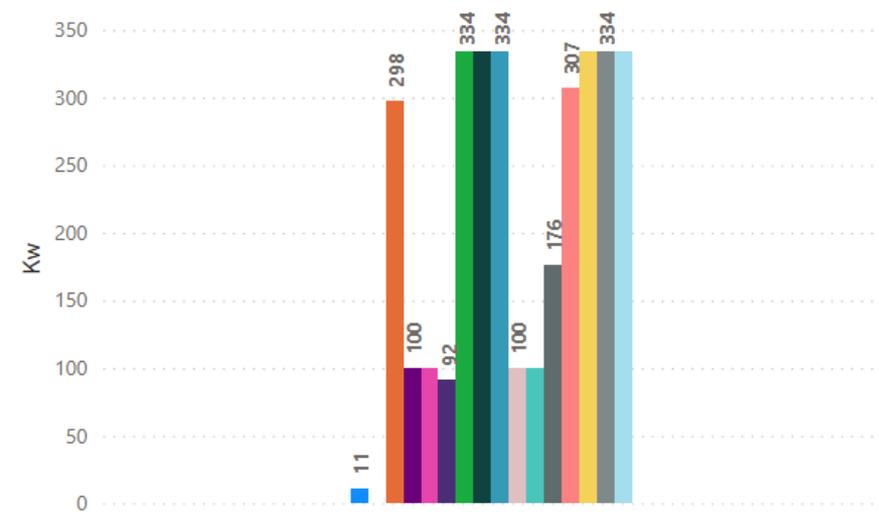
Example 2: North Valley Region

Circuit: 102041101 / Section: 3291545

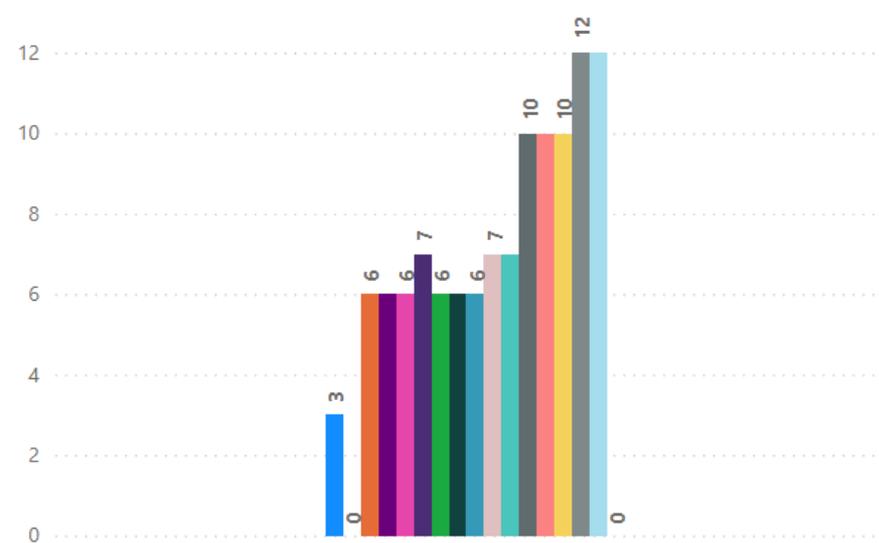
Total Energy (MWh/Yr)



Maximum violation magnitude (kW)



Number of violations



Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of violation
12LGP	63.2k	11	3
288LGP	65.6k	334	12
18-23 fixed	64.0k	100	6
Block	64.2k	0	0

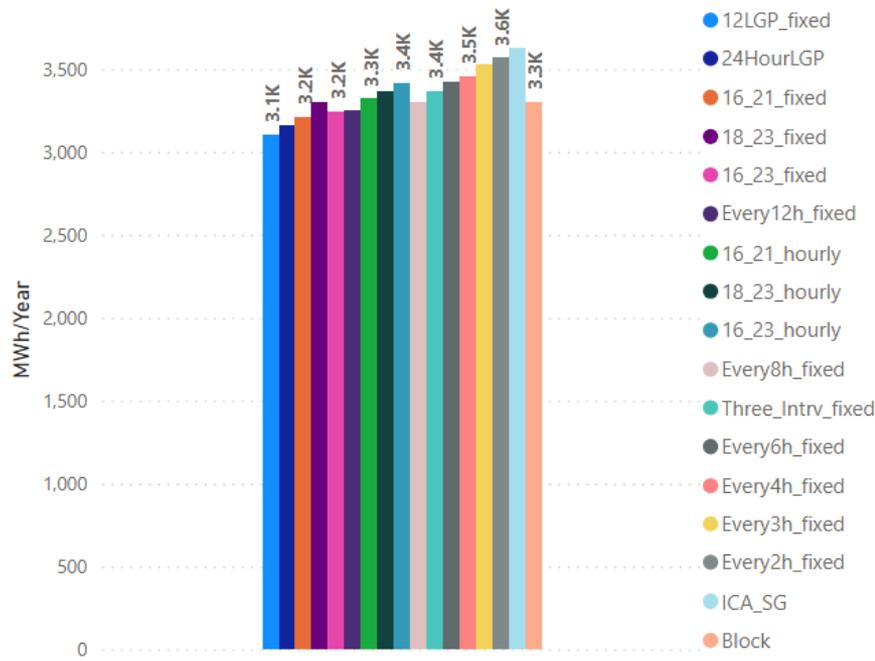
Violation criteria for maximum violation magnitude:
 • 2 months thermal & 1 month voltage



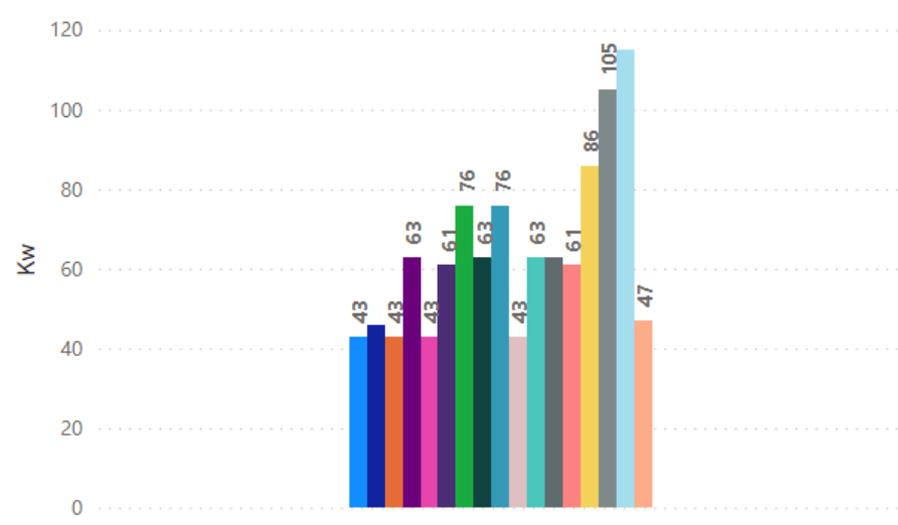
Example 3: Bay Area Region

Circuit: 01311151 / Section: 4045214

Total Energy (MWh/Yr)

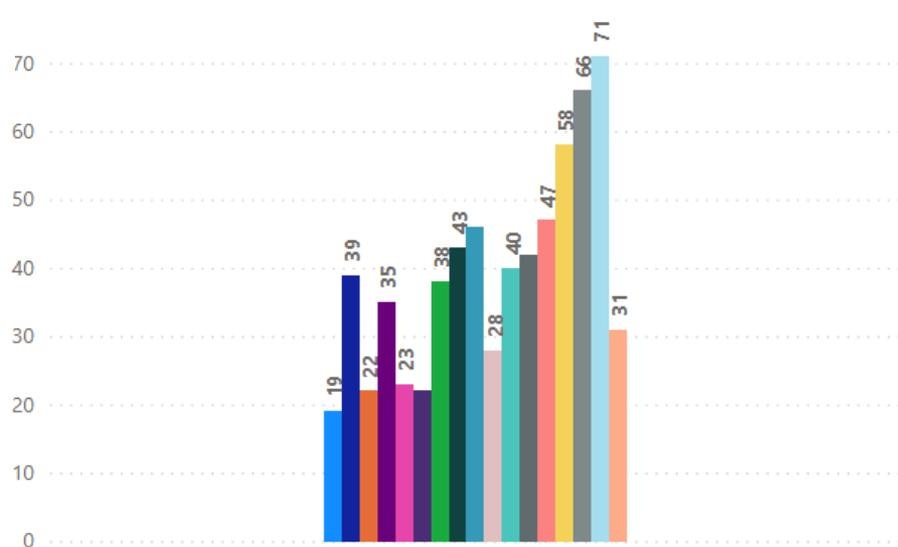


Maximum violation magnitude (kW)



Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of violation
12LGP	3.1k	43	19
288LGP	3.6k	115	71
18-23 fixed	3.3k	63	35
Block	3.3k	47	31

Number of violations



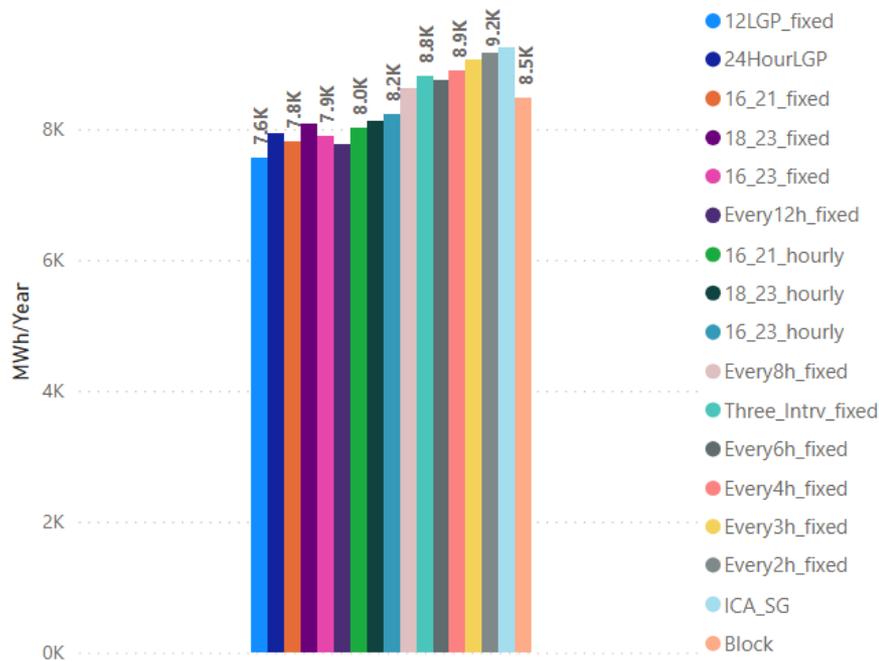
Violation criteria for maximum violation magnitude:
 • 5 months voltage



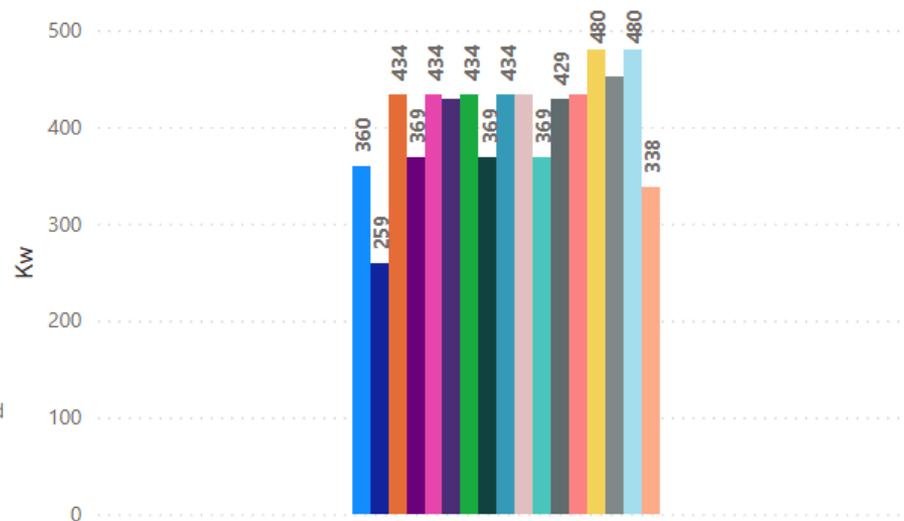
Example 4: South Bay & Central Coast Region

Circuit: 083631108 / Section: 5088282

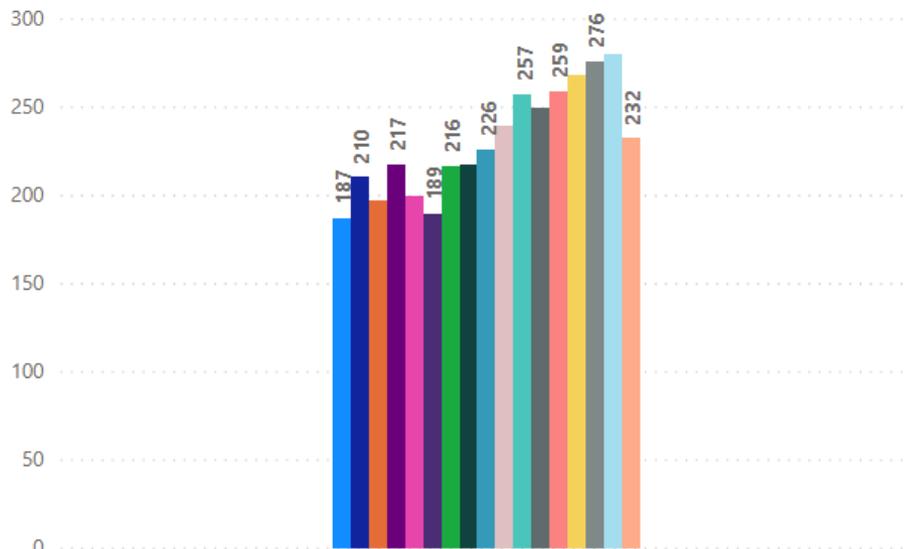
Total Energy (MWh/Yr)



Maximum violation magnitude (kW)



Number of violations



Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of violation
12LGP	7.6k	360	187
288LGP	9.2k	480	280
18-23 fixed	8.1k	369	217
Block	8.5k	338	232

Violation criteria for maximum violation magnitude:

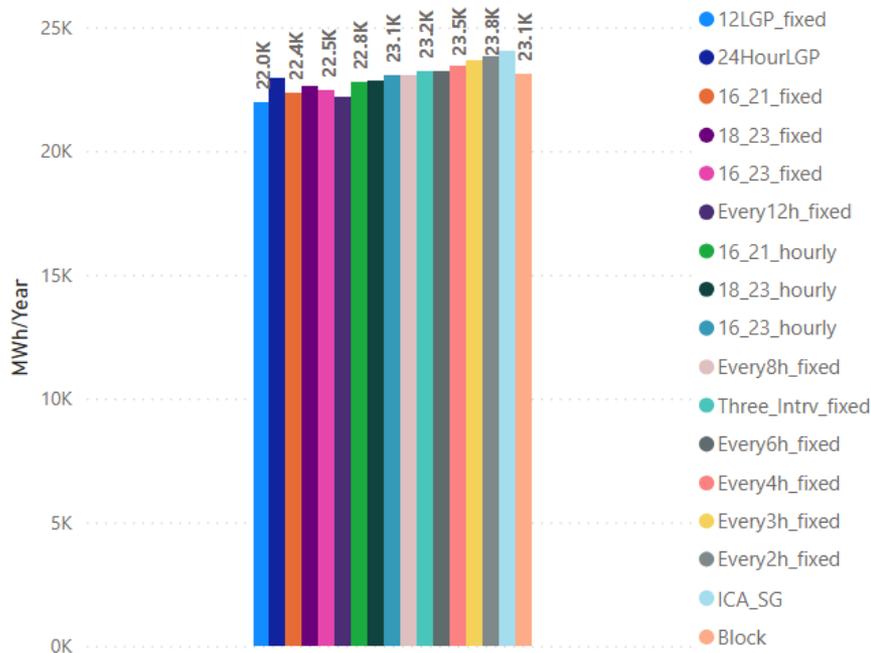
- 11 months thermal & 1 month voltage



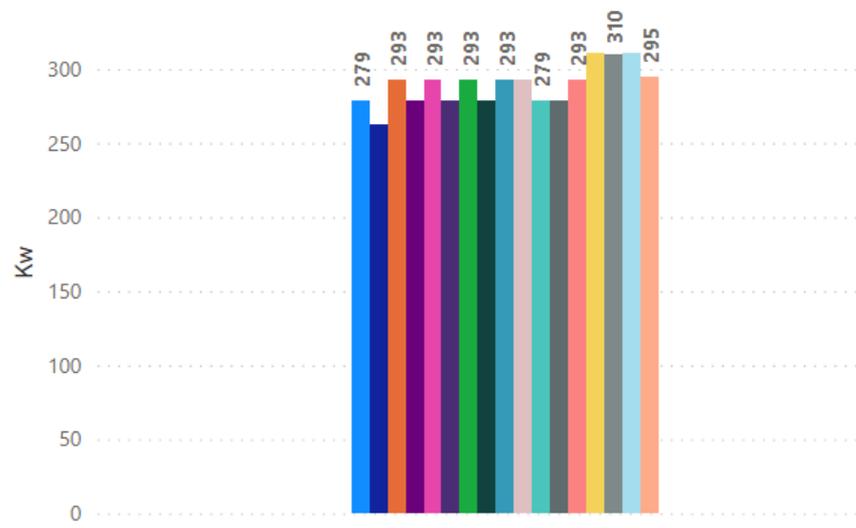
Example 5: Central Valley Region

Circuit: 163301105 / Section: 3307444

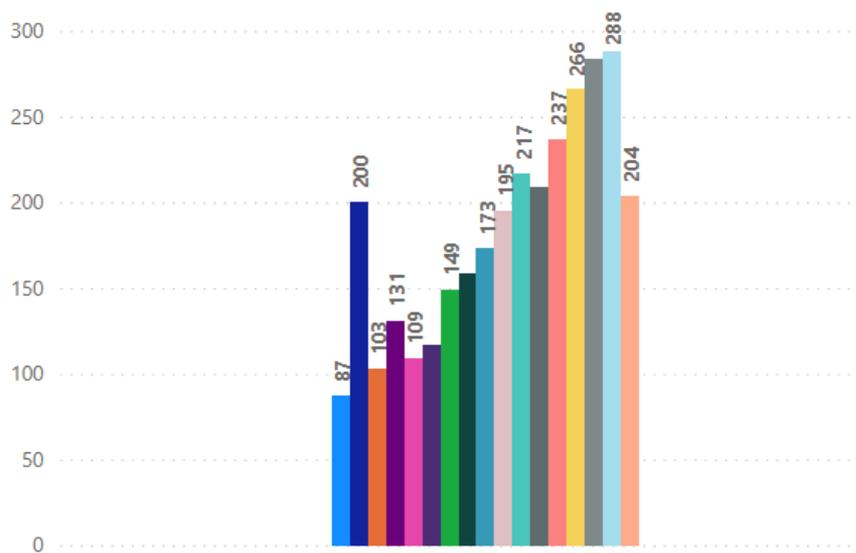
Total Energy (MWh/Yr)



Maximum violation magnitude (kW)



Number of violations



Scenario	Energy (MWh)	Max Violation Magnitude (kw)	Number of violation
12LGP	22.0k	279	87
288LGP	24.0k	311	288
18-23 fixed	22.6k	279	131
Block	23.1k	295	204

Violation criteria for maximum violation magnitude:

- 12 months thermal

Attachment C-2

PG&E's Summary of Data Provided 8/25/23 In Response to CPUC Energy Division
Data Request #1 (Part 2)

PG&E has selected the same 5 feeders that were analyzed in Workshop #4, from its main five regions. Each circuit represents a region for the “sweet spot” LGP analysis. PG&E first analyzed the 5 randomly selected linesections represented in Workshop #4 with the new set of data. However, 2 out of 5 linesections did not show any violations, and 2 out of 5 show few violations, for any one of the LGP scenarios (see Figs 1 to 5). PG&E suspects that this may be an artifact of the changes to the ICA logic/implementation. Since 2022, PG&E has refined some features of its ICA platform, which includes but not limited to Load Tap Changer (LTC) logic that sets the voltage for each hour at the bank level, changes to the voltage variation criteria from 2.5% to 3%, and migration to the newer versions of CYME including CYME 9.2 Rev3 and CYME 9.3 Rev2, etc.

It is worth mentioning that the data presented in Workshop #4 compared the ICA results between January 2022 and January 2023 publications. However, the data presented in this report is based on new ICA runs and compares the August 2023 and 2022 ICA results in its entirety.

PG&E believes that the 5 linesections, independent of how they are selected, do not represent the violations, *statistically*. For a statistical analysis, PG&E recommends interested stakeholders to review PG&E’s statistical analysis included in Attachment C-1 to this supplemental Advice Letter.

Given the objective of the “sweet spot” LGP analysis is to find mitigations options for voltage/thermal violations, PG&E has selected a new set of linesections from the same set of circuits. Therefore, for each circuit, PG&E selected a linesection that has the highest magnitude of violation independent of the type of violation. The results are summarized in Table 1.

Table 1: Circuits and Line-sections selected with highest magnitude of violations (Newly Selected Linesections)

Circuit ID	Section ID	ICA SG Max Difference (kW)	Violation Type
013111151	3525305	5880	Thermal
042631110	4428119	164	Thermal
083631108	4310786	910	Voltage
102041101	4078583	2084	Thermal
163301105	4505362	305	Thermal

The average of generation hosting capacity, violation magnitude, and number of violations are presented in Figs 6 to 10 for the line-sections presented in Table 1. Fig. 11 shows a summary of the type of violations for the newly selected line sections. Figures 12 shows the 2022 ICA-SG profiles in comparison with the minimum value of ICA-SG for all linesections.

Old Linesection

Circuit: 042631110 Section: 3720501

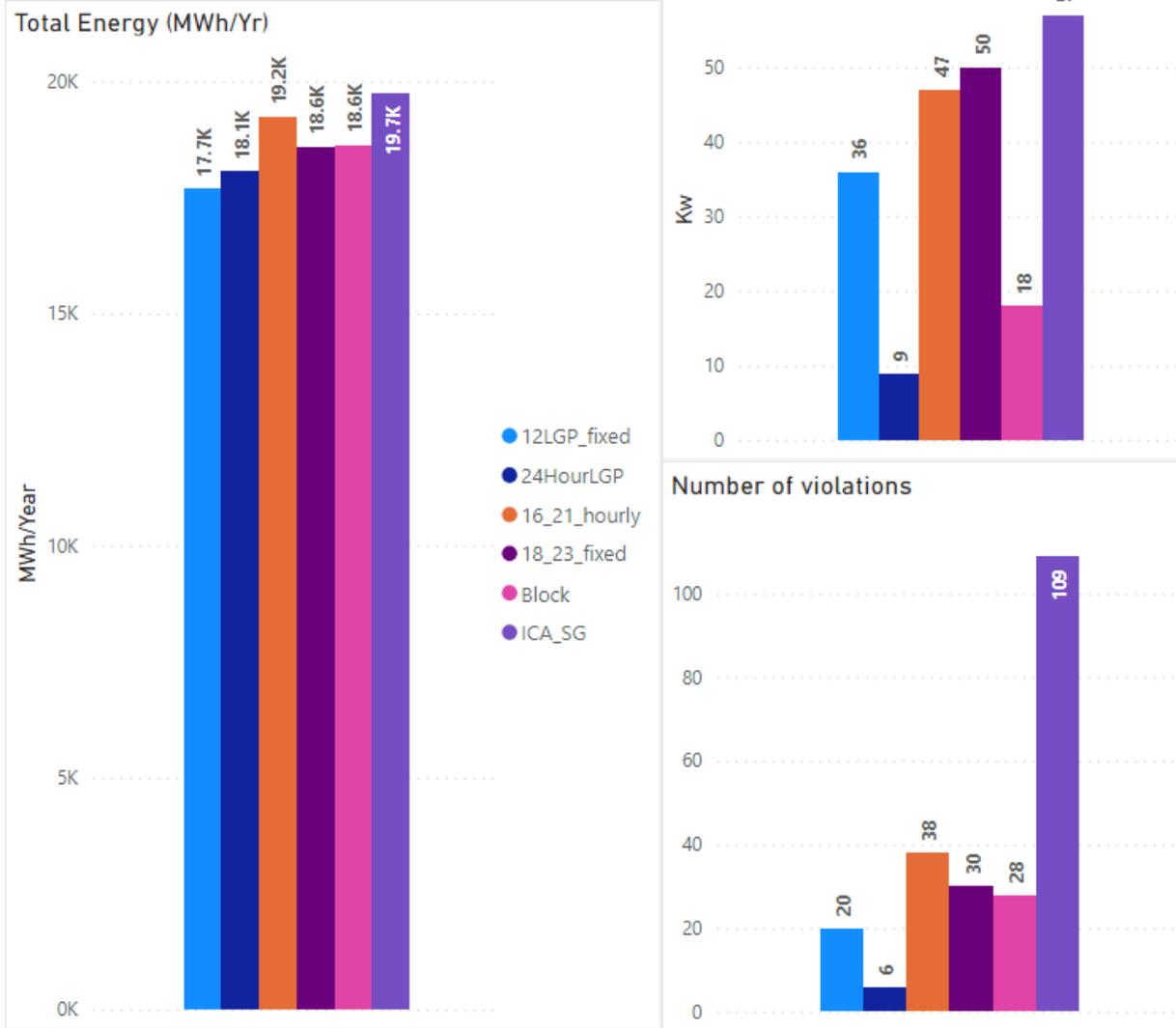


Fig. 1: North Coast Region, Circuit: 042631110 / Section: 3720501 (Selected for Workshop #4)

Old Linesection

Circuit: 102041101 Section: 3291545

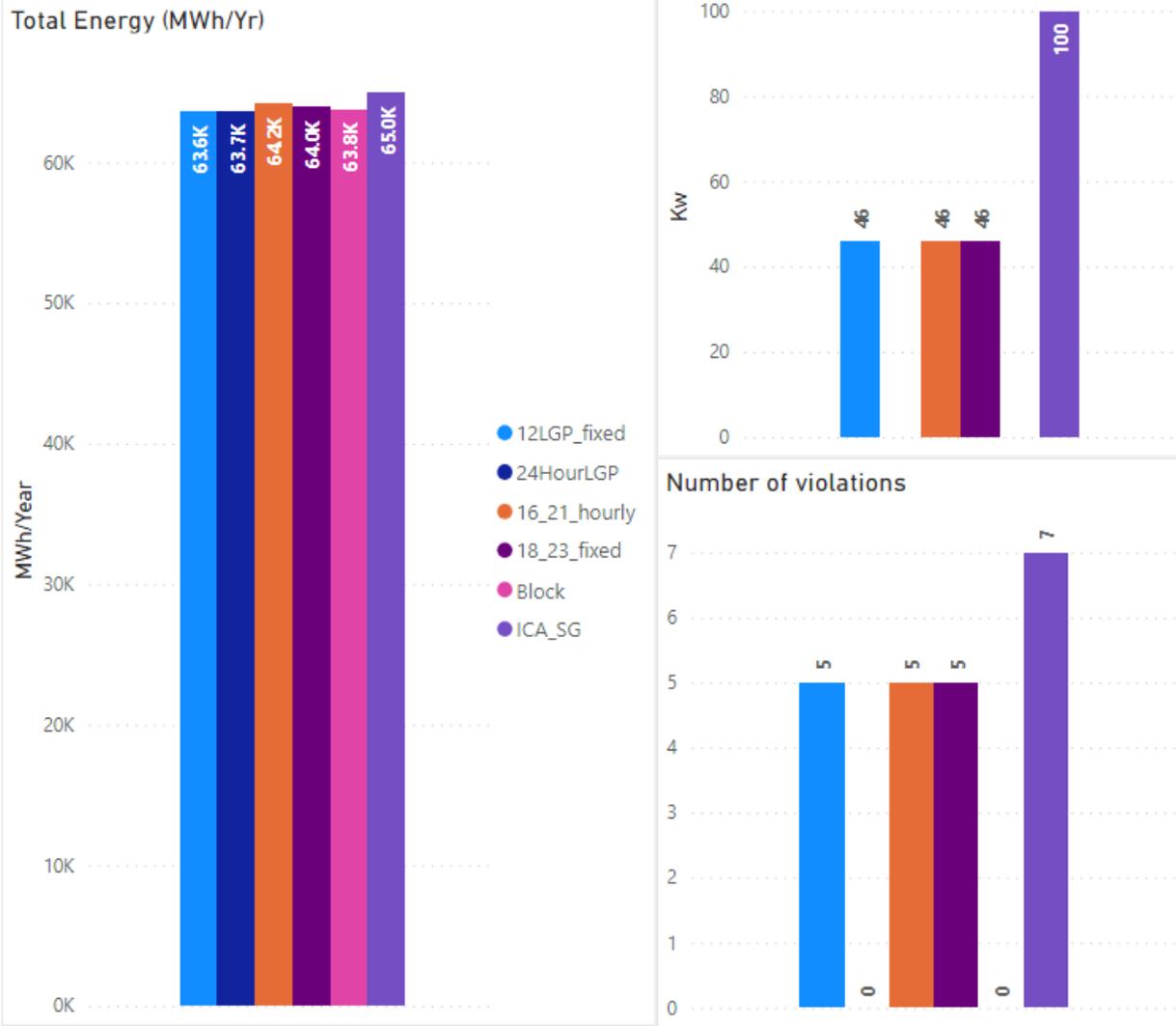


Fig. 2: North Valley Region, Circuit: 102041101 / Section: 3291545 (Selected for Workshop #4)

Old Linesection

Circuit: 013111151 Section: 4045214

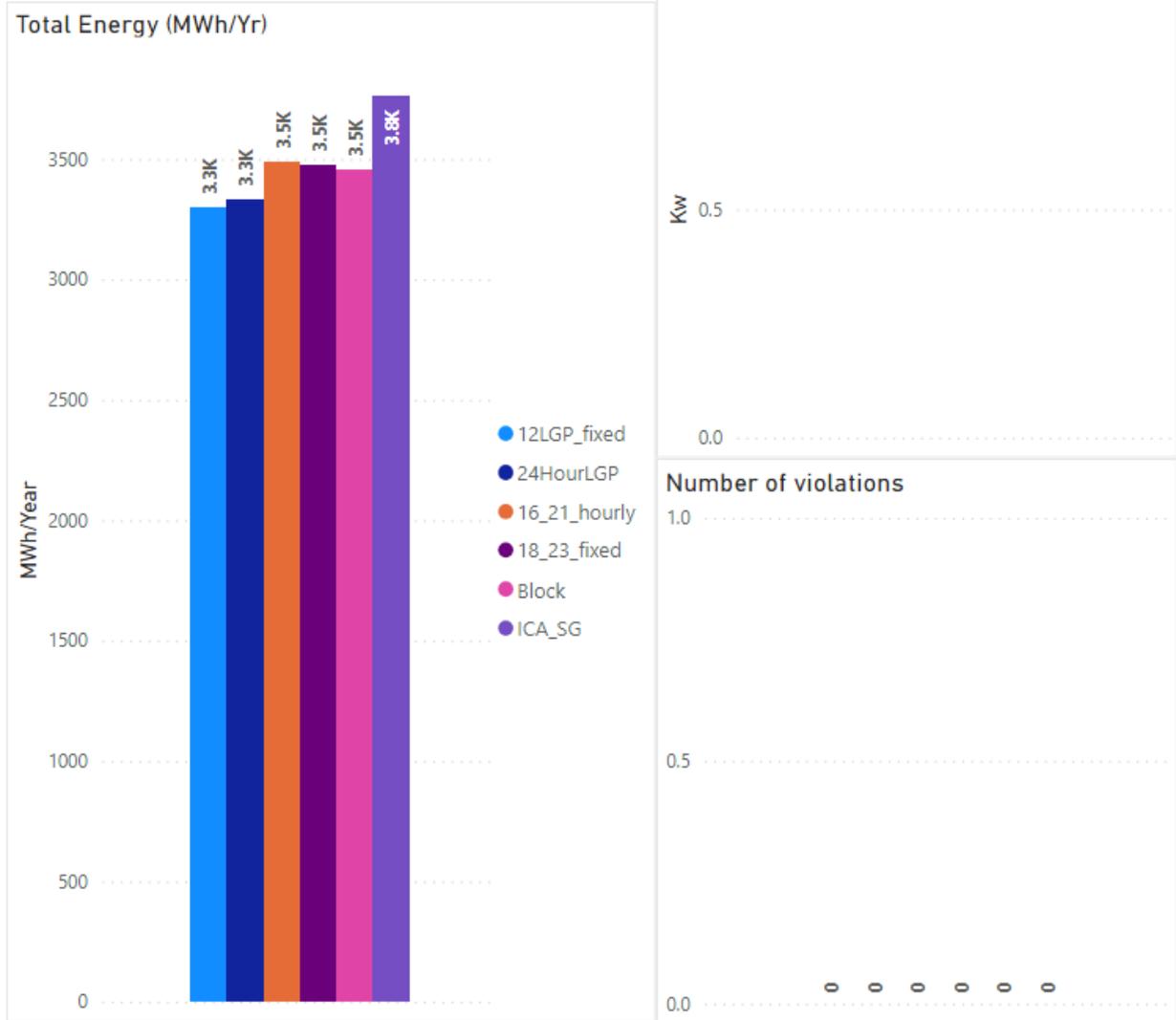
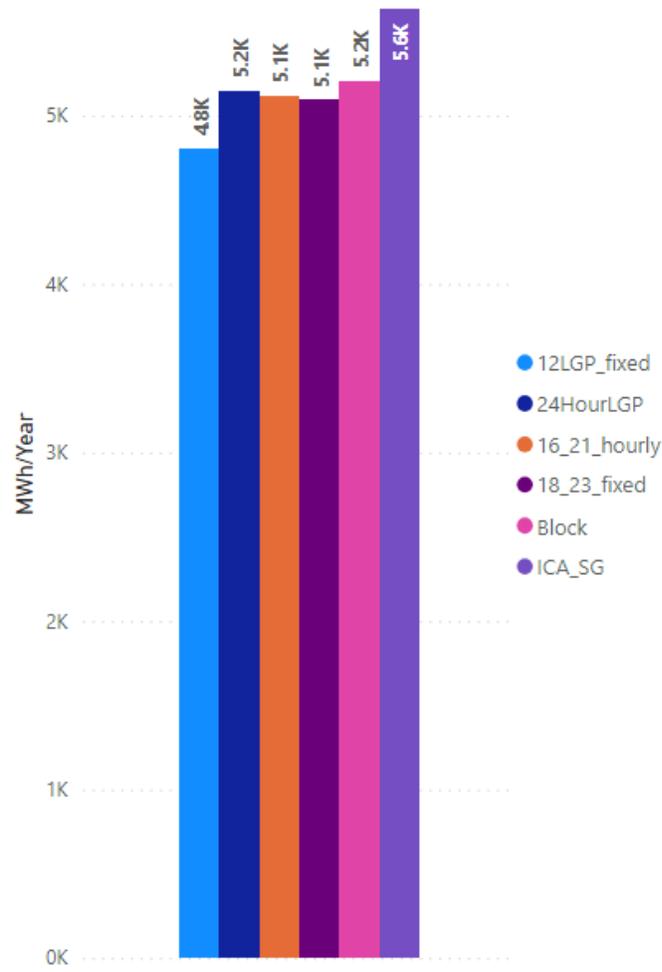


Fig. 3: Bay Area Region, Circuit: 013111151 / Section: 4045214 (Selected for Workshop #4)

Old Linesection

Circuit: 083631108 Section: 5088282

Total Energy (MWh/Yr)



Maximum violation magnitude (kW)



Number of violations

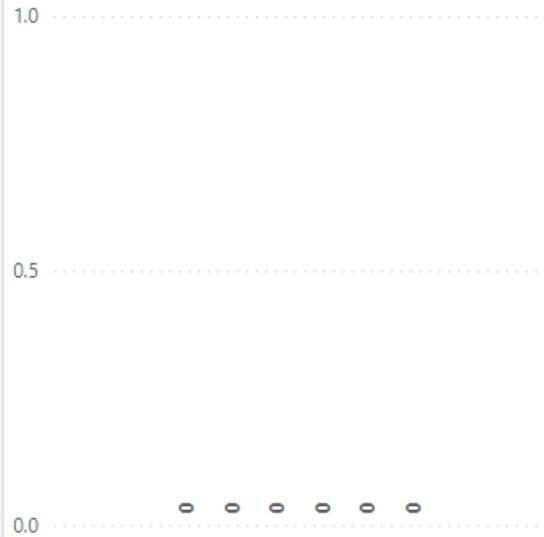
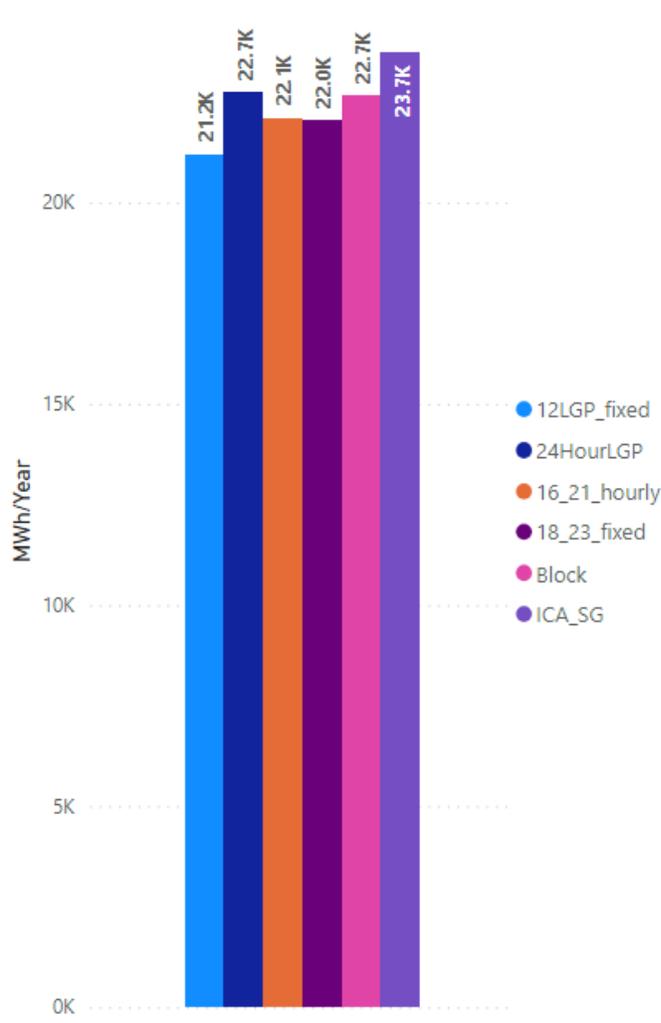


Fig. 4: South Bay & Central Coast Region, Circuit: 083631108 / Section: 5088282 (Selected for Workshop #4)

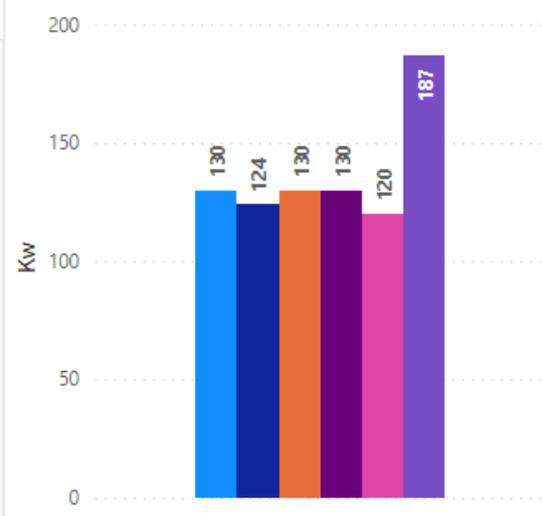
Old Linesection

Circuit: 163301105 Section: 3307444

Total Energy (MWh/Yr)



Maximum violation magnitude (kW)



Number of violations

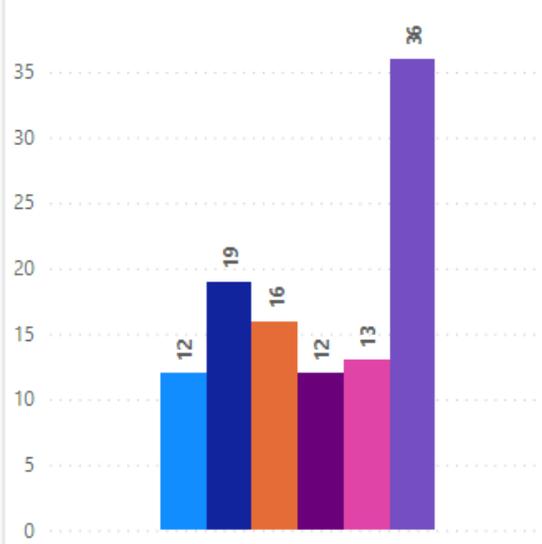


Fig. 5: Central Valley Region, Circuit: 163301105 / Section: 3307444 (Selected for Workshop #4)

New Line section

Circuit: 042631110 Section: 4428119

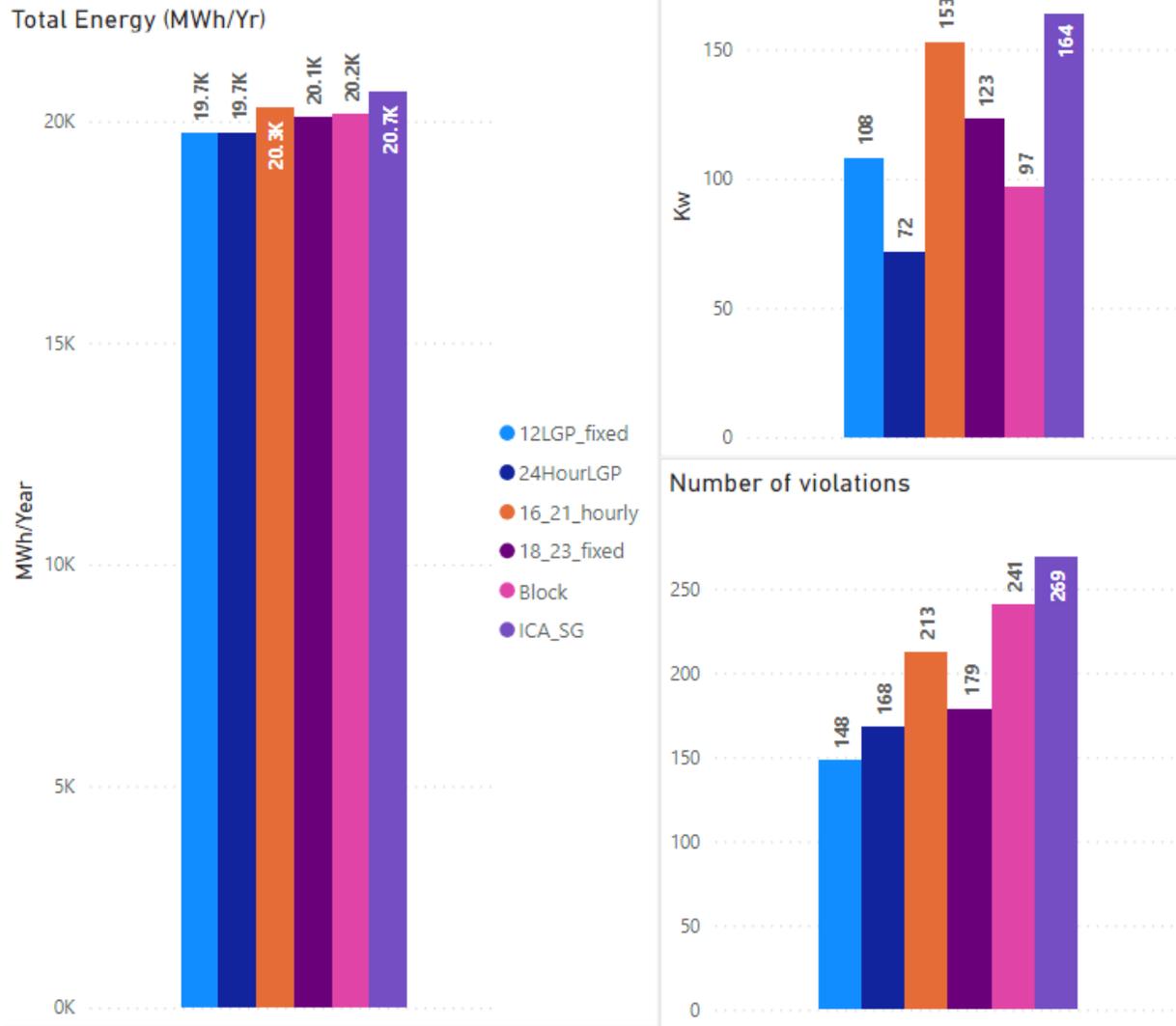


Fig. 6: North Coast Region, Circuit: 042631110 / Section: 4428119 (Newly Selected)

New Linesection

Circuit: 102041101 Section: 4078583

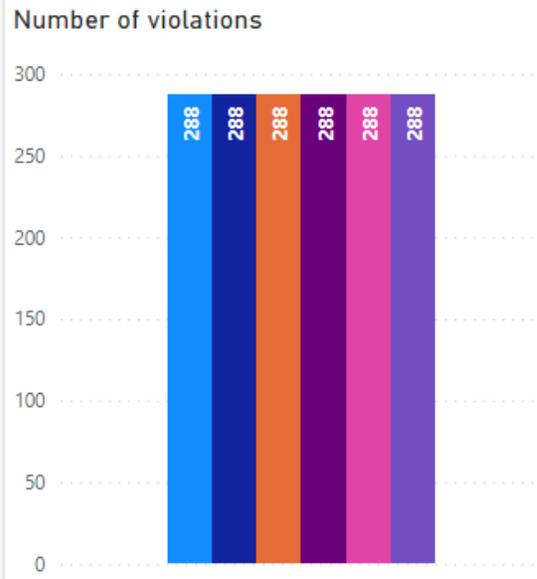
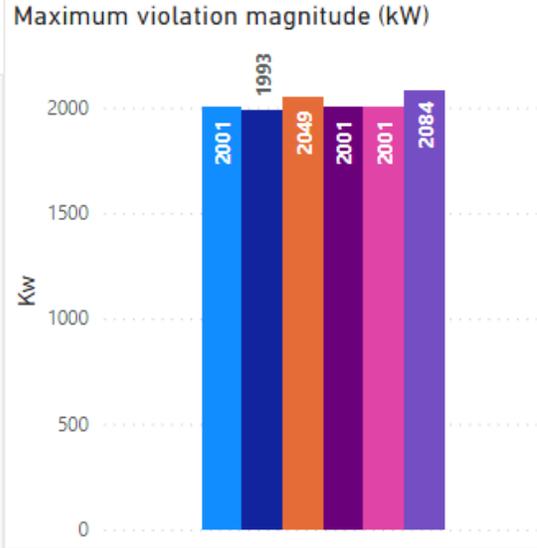
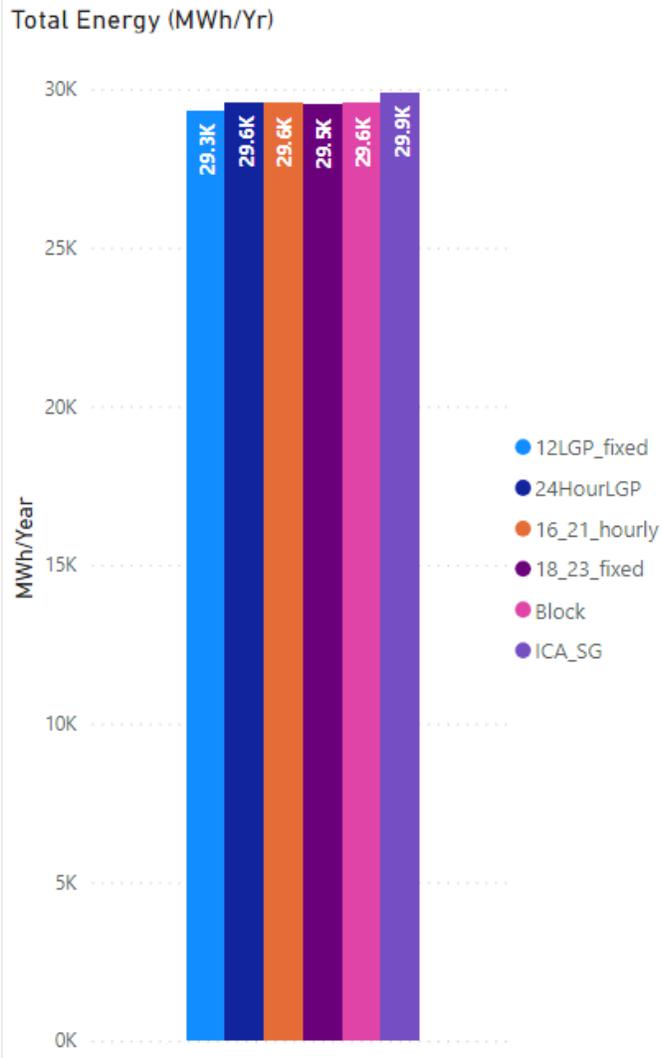
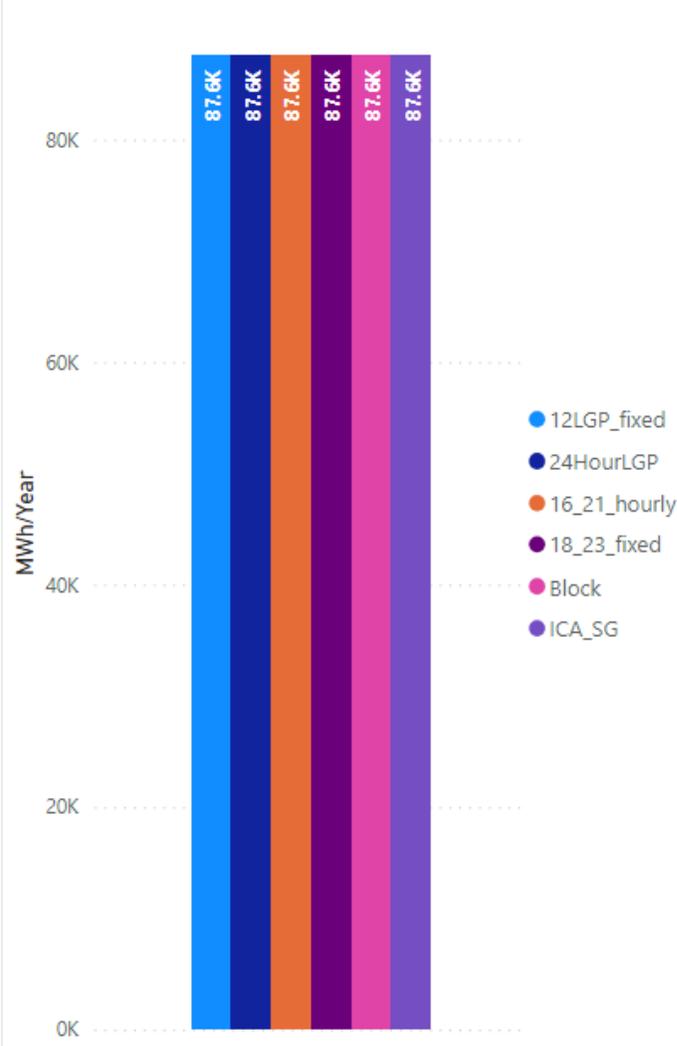


Fig. 7 North Valley Region, Circuit: 102041101 / Section: 4078583 (Newly Selected)

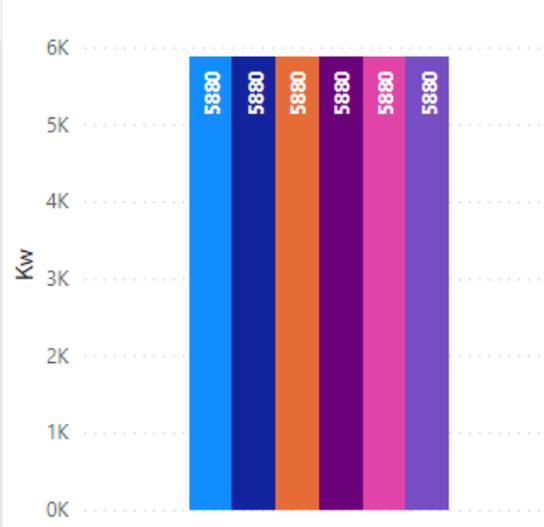
New Linesection

Circuit: 013111151 Section: 3525305

Total Energy (MWh/Yr)



Maximum violation magnitude (kW)



Number of violations

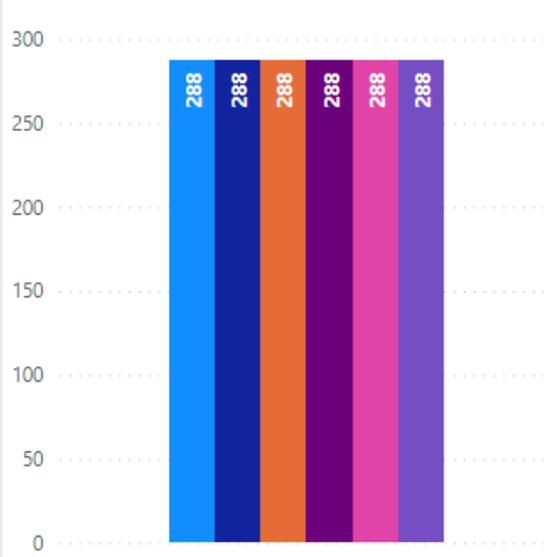


Fig. 8 : Bay Area Region, Circuit: 013111151 / Section: 3525305 (Newly Selected)

New Linesection

Circuit: 083631108 Section: 4310786

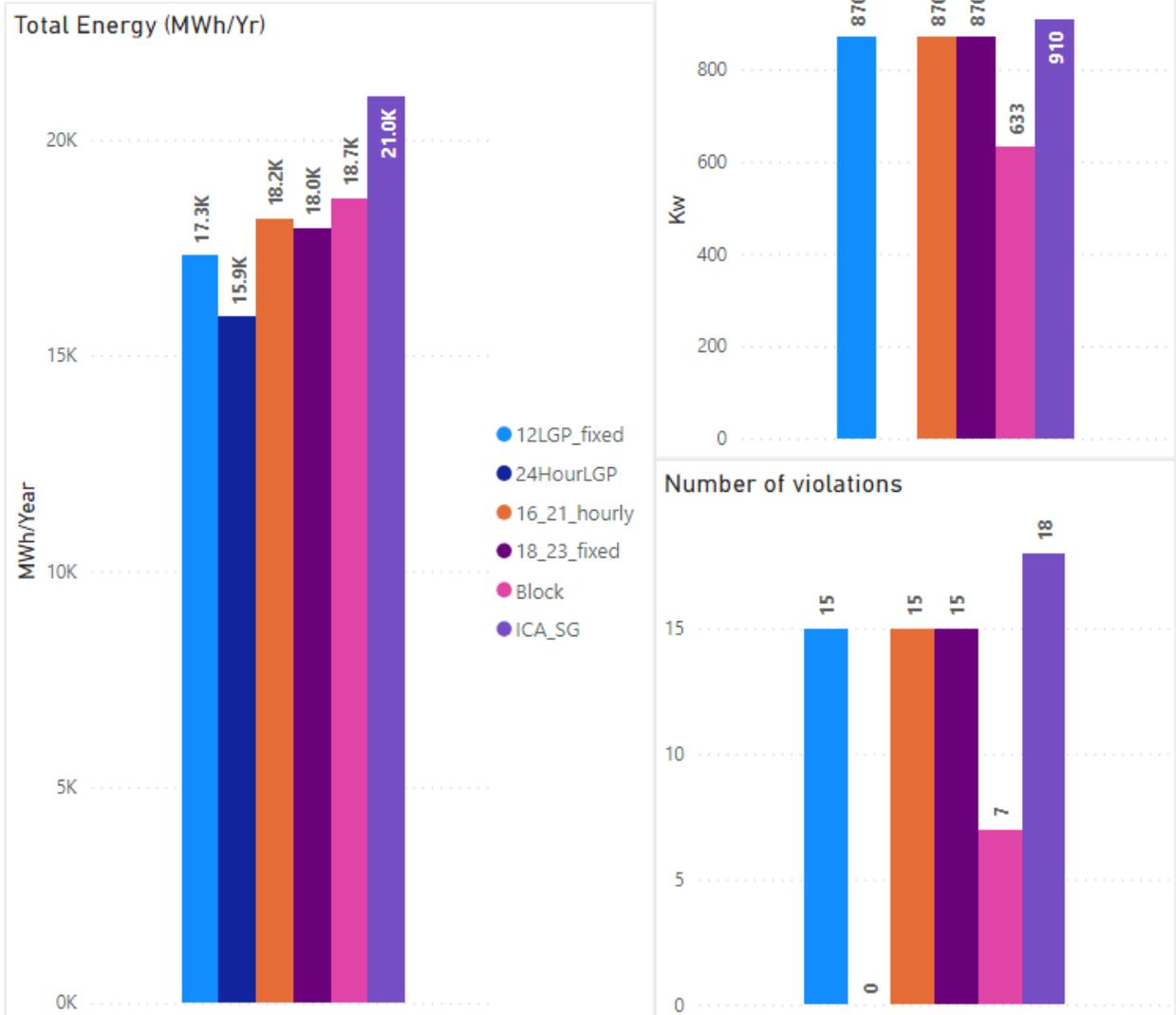


Fig. 9: South Bay & Central Coast Region, Circuit: 083631108 / Section: 4310786 (Newly Selected)

New Linesection

Circuit: 163301105 Section: 4505362

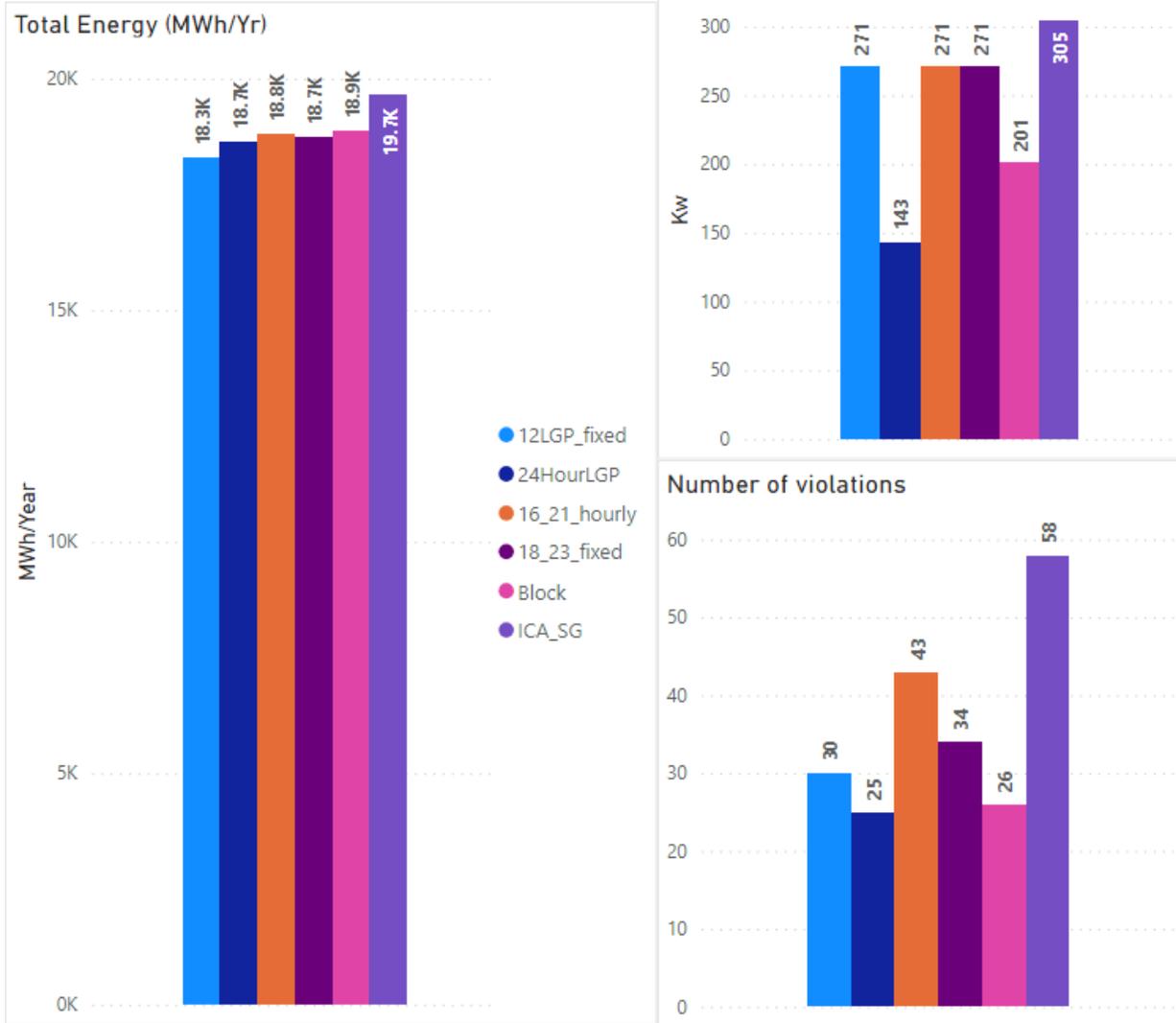


Fig. 10: Central Valley Region, Circuit: 163301105 / Section: 4505362 (Newly Selected)

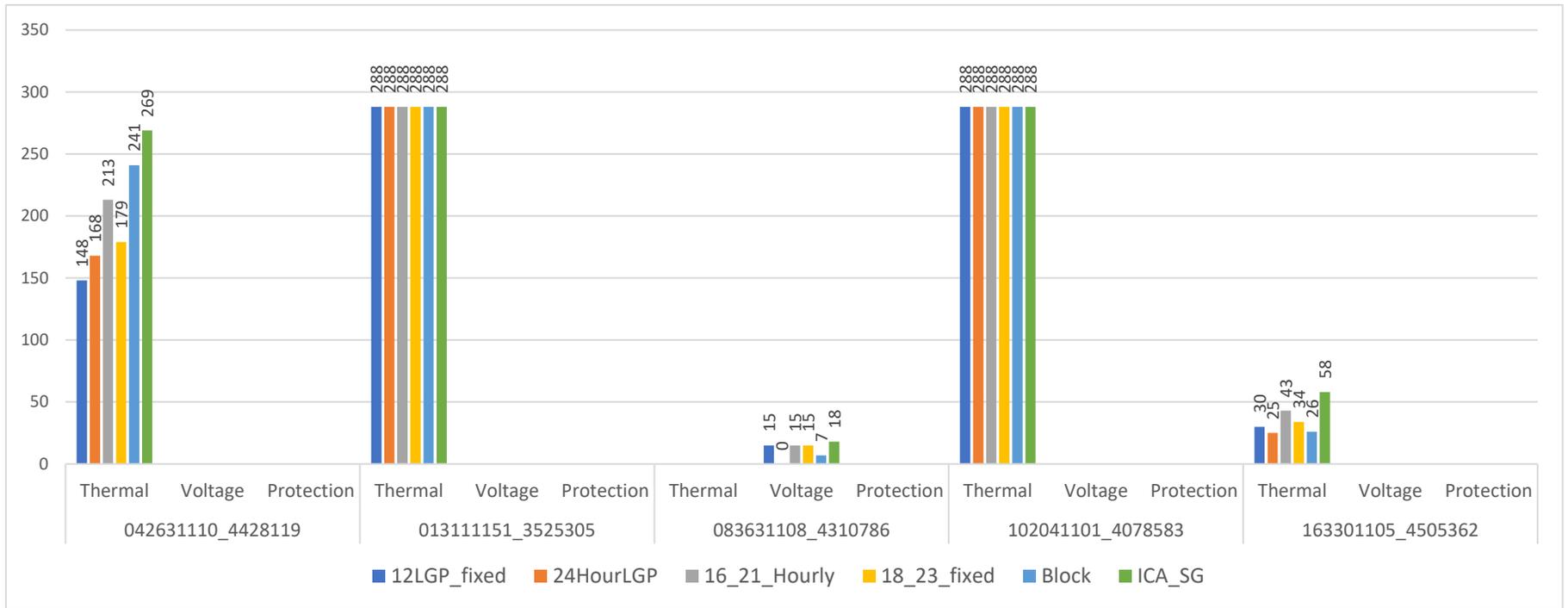


Fig. 11: Type of violation for the newly selected line sections

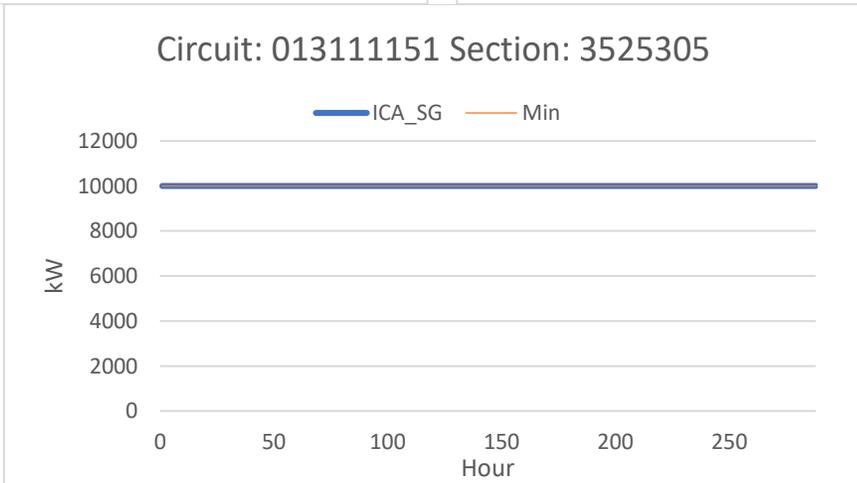
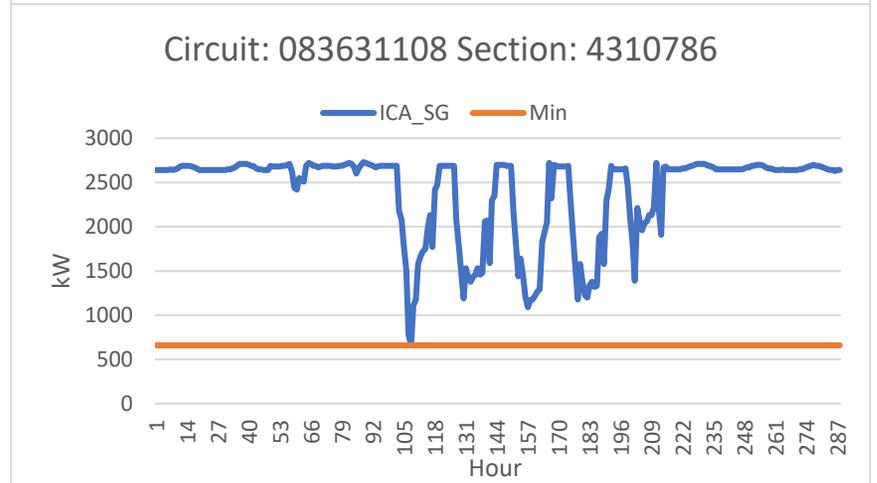
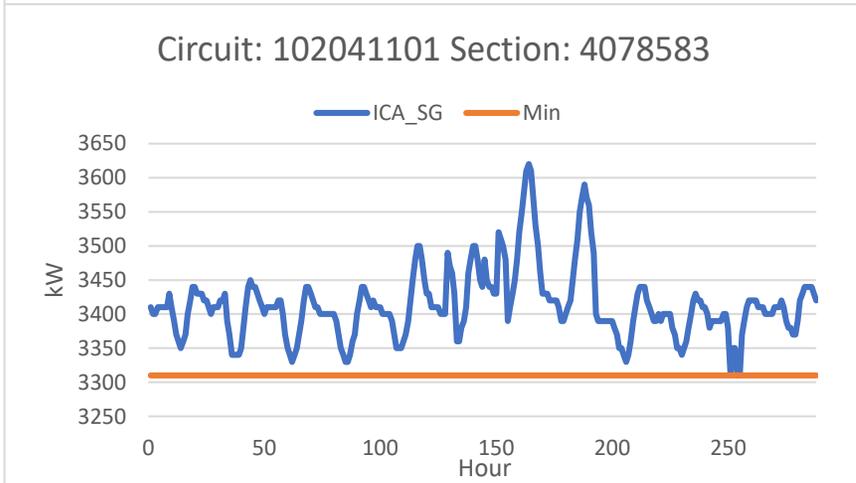
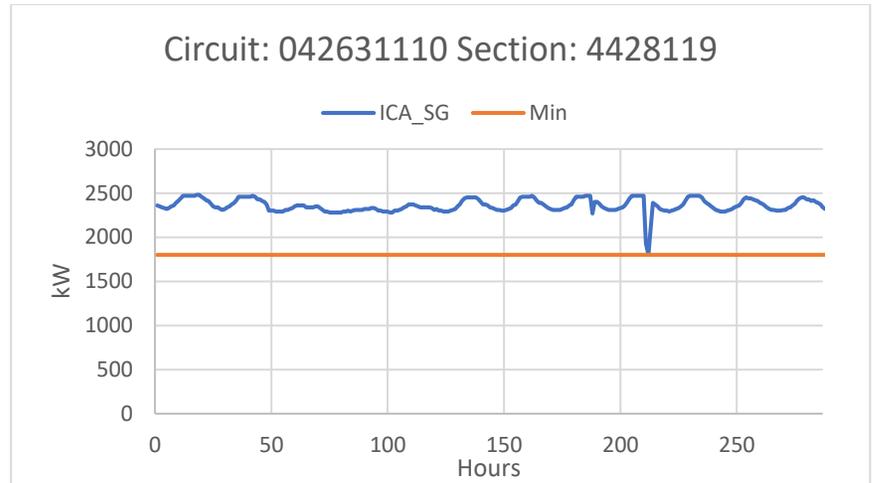
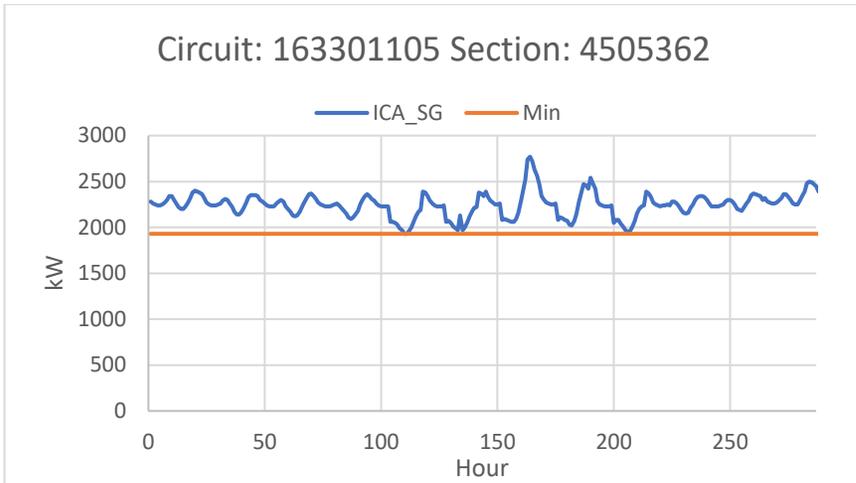


Fig. 12: Comparison of ICA-SG with the minimum value of ICA-SG

**PG&E Gas and Electric
Advice Submittal List
General Order 96-B, Section IV**

AT&T
Albion Power Company

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
Braun Blaising Smith Wynne, P.C.
California Community Choice Association
California Cotton Ginners & Growers Assn
California Energy Commission

California Hub for Energy Efficiency
Financing

California Alternative Energy and
Advanced Transportation Financing
Authority
California Public Utilities Commission
Calpine

Cameron-Daniel, P.C.
Casner, Steve
Center for Biological Diversity

Chevron Pipeline and Power
City of Palo Alto

City of San Jose
Clean Power Research
Coast Economic Consulting
Commercial Energy
Crossborder Energy
Crown Road Energy, LLC
Davis Wright Tremaine LLP
Day Carter Murphy

Dept of General Services
Don Pickett & Associates, Inc.
Douglass & Liddell
Downey Brand LLP
Dish Wireless L.L.C.

East Bay Community Energy Ellison
Schneider & Harris LLP

Electrical Power Systems, Inc.
Fresno
Engineers and Scientists of California

GenOn Energy, Inc.
Green Power Institute
Hanna & Morton
ICF

iCommLaw
International Power Technology
Intertie

Intestate Gas Services, Inc.

Johnston, Kevin
Kelly Group
Ken Bohn Consulting
Keyes & Fox LLP
Leviton Manufacturing Co., Inc.

Los Angeles County Integrated
Waste Management Task Force
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McClintock IP
McKenzie & Associates

Modesto Irrigation District
NRG Solar

OnGrid Solar
Pacific Gas and Electric Company
Peninsula Clean Energy

Pioneer Community Energy

Public Advocates Office

Redwood Coast Energy Authority
Regulatory & Cogeneration Service, Inc.

Resource Innovations

SCD Energy Solutions
San Diego Gas & Electric Company

SPURR
San Francisco Water Power and Sewer
Sempra Utilities

Sierra Telephone Company, Inc.
Southern California Edison Company
Southern California Gas Company
Spark Energy
Sun Light & Power
Sunshine Design
Stoel Rives LLP

Tecogen, Inc.
TerraVerde Renewable Partners
Tiger Natural Gas, Inc.

TransCanada
Utility Cost Management
Utility Power Solutions
Water and Energy Consulting Wellhead
Electric Company
Western Manufactured Housing
Communities Association (WMA)
Yep Energy