

WELCOME

TO CALIFORNIA GAS TRANSMISSION'S

BUSINESS MEETING

OCTOBER 2, 2018

AGENDA

GAS OPERATIONS UPDATE

GAS STEWARDSHIP / LEAN MANAGEMENT

2019 GT&S RATE CASE

GETTING READY FOR WINTER

BIOMETHANE

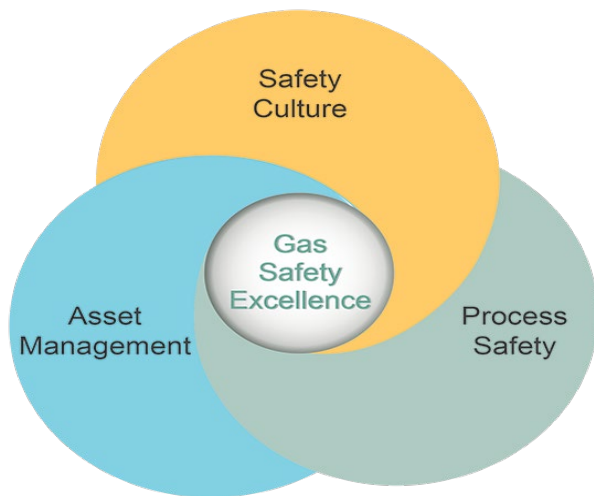
TOPIC 1

UPDATE ON GAS OPERATIONS

OUR STRATEGY: GAS SAFETY EXCELLENCE

We will deliver gas safety excellence by:

- Putting **SAFETY** and people at the heart of everything
- Investing in the **RELIABILITY** and integrity of our gas system
- Continuously improving the effectiveness and **AFFORDABILITY** of our processes



OUR PROGRESS SINCE 2011: RISK REDUCTION



Strength Testing

- 1164 miles

ILI Upgrade

- 837 miles

Pipe Replacement & Valve Automation

- 244 miles transmission pipeline replaced
- 314 valves automated

MAOP & Centerline Survey

- Centerline Surveys
- Validated the MAOP of 6,750 miles of pipe

➔ Completed 11 of 12 NTSB Safety Recommendations

OUR PLANS THROUGH 2021



Strength Testing

- 270 miles

ILI Upgrades

- 1,237 miles

Pipe Replacement & Valve Automation

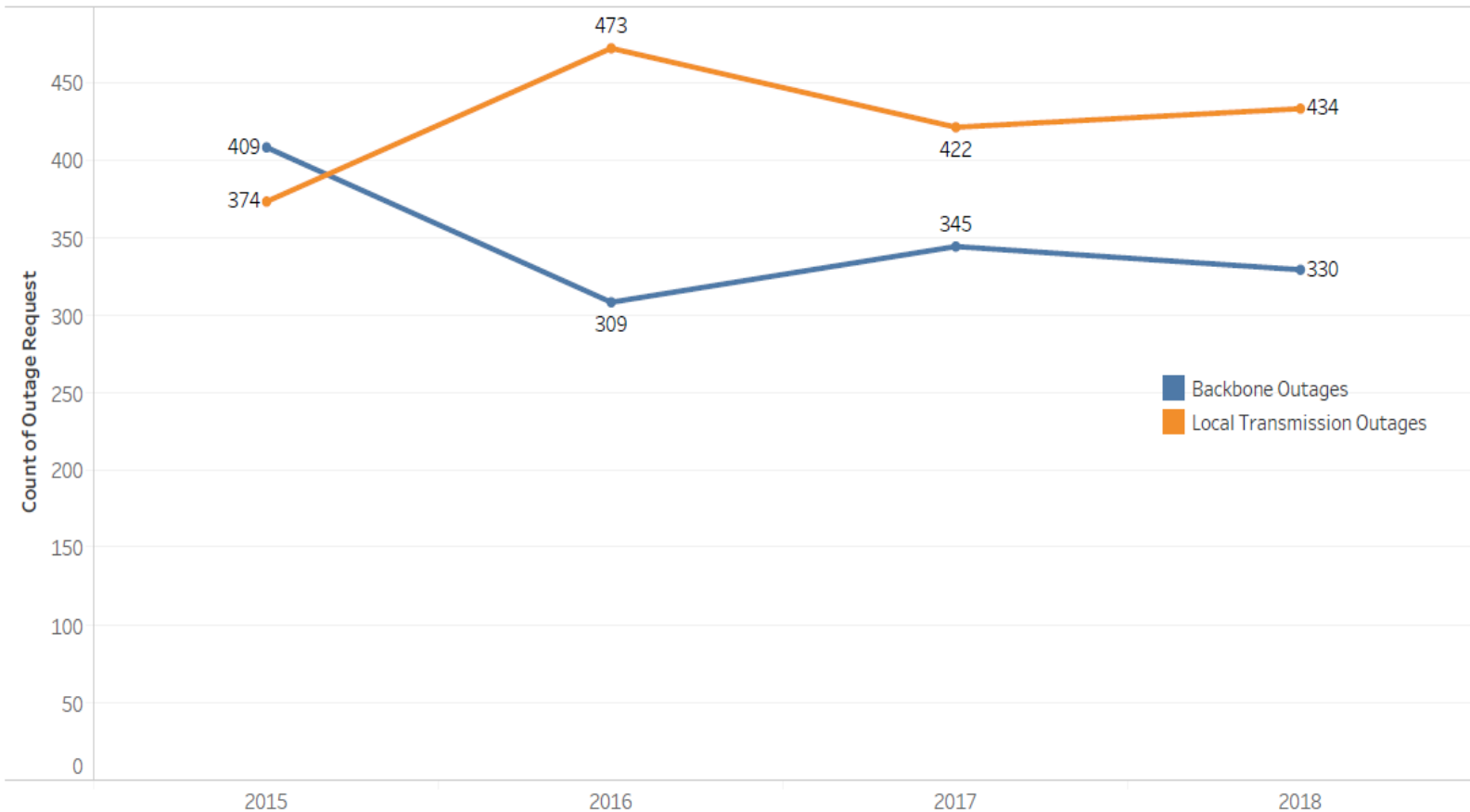
- Replace 9.6 miles of transmission pipeline
- Automate 78 valves

Shallow/Exposed Pipe

- 4.3 miles

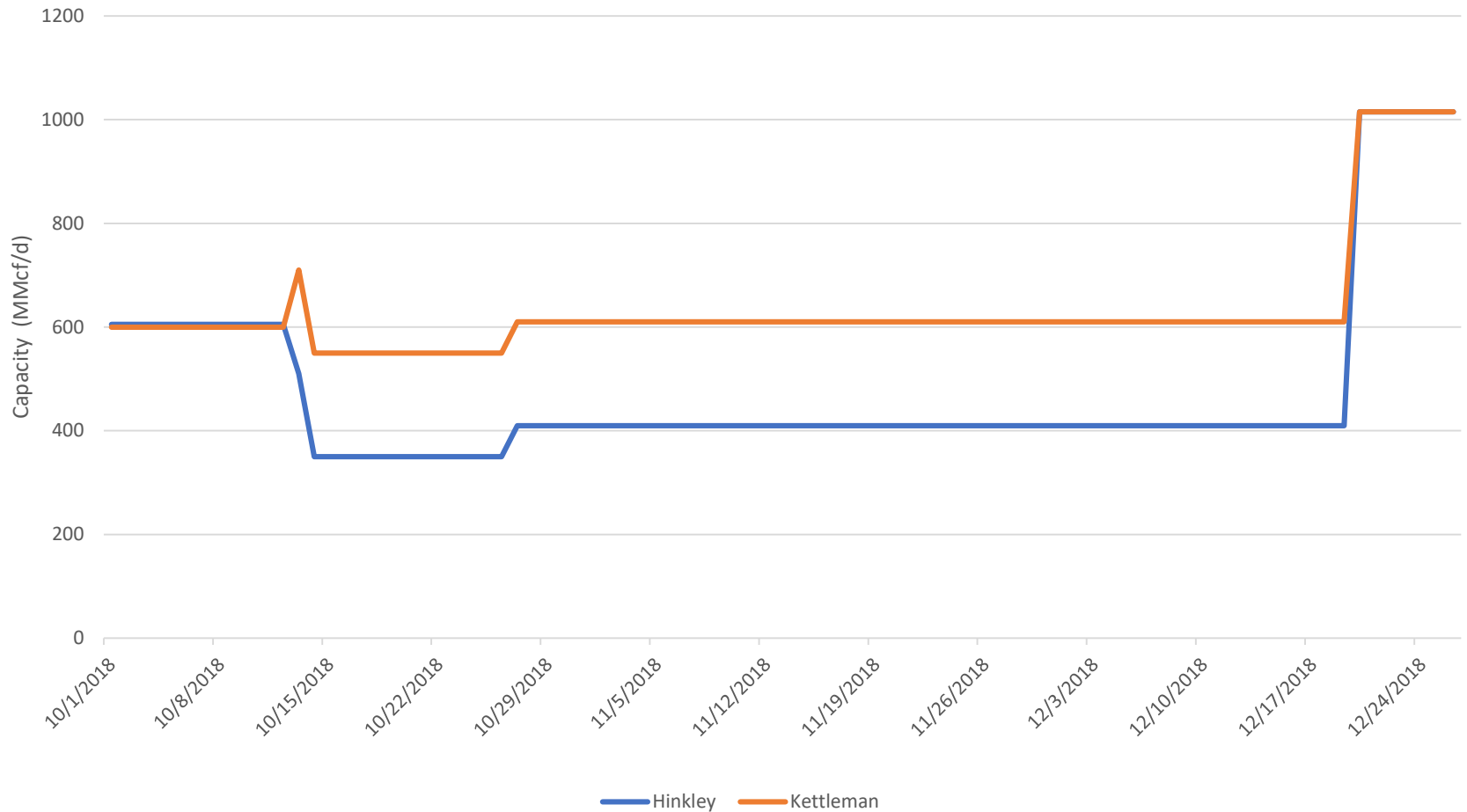
BACKBONE AND TRANSMISSION OUTAGES

Transmission Outage Requests by Year
(Outages with flow impact; excludes SCADA outages)

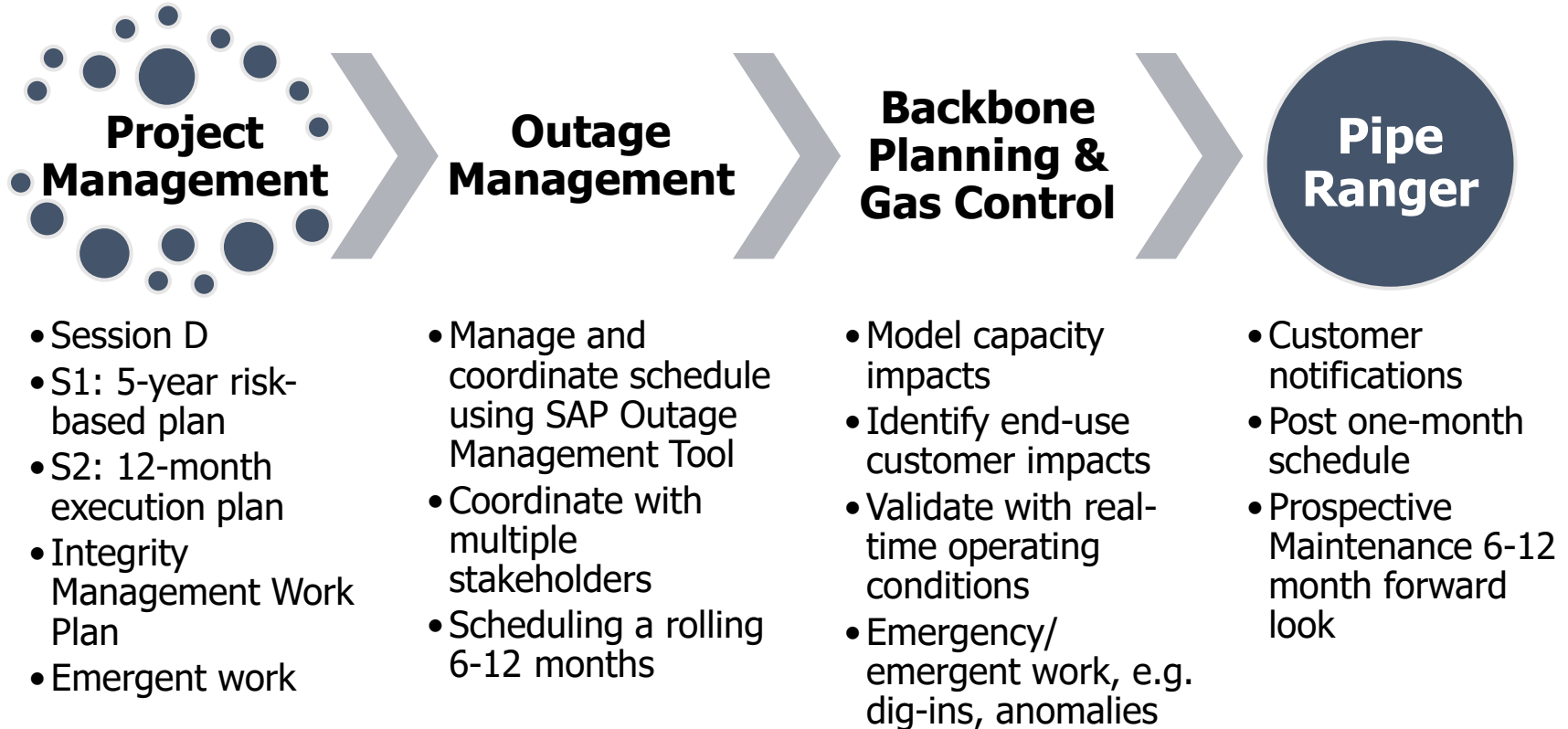


2018 YEAR-END MAINTENANCE

Baja - Prospective Maintenance



OUTAGE MANAGEMENT FRAMEWORK



CONTINUOUS IMPROVEMENT

- In-service of new Burney Compressor Unit
- Long-term planning
- Improve outage management process for all major maintenance types and emergent work streams
 - Bundling work streams: Hydrostatic testing and ILI Upgrades

TOPIC 2

GAS STEWARDSHIP & LEAN MANAGEMENT

MISSION, VISION, CULTURE

Our Mission

To safely and reliably deliver affordable and clean energy to our customers and communities every single day, while building the energy network of tomorrow.

Our Vision

With a sustainable energy future as our North Star, we will meet the challenge of climate change while providing affordable energy for all customers.

Our Culture

We put safety first.

We are accountable. We act with integrity, transparency and humility.

We are here to serve our customers.

We embrace change, innovation and continuous improvement.

We value diversity and inclusion. We speak up, listen up and follow up.

We succeed through collaboration and partnership. We are one team.

GAS OPERATIONS GUIDEPPOSTS

- **Safety as our absolute core value and non-negotiable top priority;** ensure that actions continue our journey to reduce enterprise risk and promote compliance
- Ensure actions do not negatively impact **customer experience**
- Safety and affordability are **not a trade-off; rather, they go hand-in-hand** – the lower our per-unit cost, the more work we can do to reduce risk
- Build a credible, achievable, bankable plan through 2019 to close our cost gap, and deliver upon our rate case commitments – without paralysis by analysis
- Enable **financial stewardship mindset, behavior and accountabilities** that appropriately **position PG&E for the future**
- Be bold and **bring fresh eyes** to everything we do
- Engage all employees in the journey; **build a culture of continuous improvement and celebrate successes**

GAS STEWARDSHIP JOURNEY

- Defining Gas Stewardship
- Seeing success through teamwork and continuous improvement mindset
- Embracing Lean Management to achieve goals
- New Way of Working

TOPIC 3

2019 GT&S RATE CASE

WHAT WE'LL COVER TODAY

- Background
- Timeline
- Case Presentation and Structure
- Directional Nature of our Work
- Next Steps and How to Keep Informed

WHAT IS THE GT&S RATE CASE?

Our GT&S Rate Case sets the rates and revenues that we are allowed to collect from our customers for our gas transmission and storage services.

- PG&E's last GT&S rate case was filed in 2013. It covers the years 2015-2018 (2018 was added by the CPUC in the final decision)
- The 2019 GT&S Rate Case will cover 2019-2021, with the potential to also cover 2022
- Our gas *distribution* revenues are covered by our General Rate Case (GRC), which takes place every three or four years. The next will be filed for 2020-2022
- CPUC is considering proposal to combine the GT&S Rate Case with the GRC

TIMELINE

- Filed 11/17/17 date
- 6/29/18 - ORA Testimony
- 7/20/18 - Intervenor Testimony due
- 8/20/18 - Concurrent Rebuttal Testimony due
- Settlement discussions
- 9/17/2018 – 10/9/18 Evidentiary hearings
- Q4 – Briefing
- 2019 – Proposed and final decisions

CASE PRESENTATION AND STRUCTURE

- Testimony structure similar to last case
- Focused on asset families: Transmission Pipe, Storage, Facilities (M&C, C&P)
- Risk-informed forecast
- Two high profile issues: (1) Natural Gas Storage Strategy (NGSS); (2) “Deferred Work” subject to 2017 GRC Settlement

DIRECTIONAL NATURE OF WORK

TYPE OF WORK	FORECAST
STORAGE	Up
IN-LINE INSPECTION	Up
"MAKE PIGGABLE"	Up
STRENGTH TESTING	Down
VINTAGE PIPE REPLACEMENT	Down
VALVE AUTOMATION	Down

KEY DRIVERS

- Increase in backbone revenue requirement, driven largely by the ongoing safety work described above
- Increase in storage revenue requirement
- Increase in percentage of storage costs included in backbone rates

NEXT STEPS – HOW TO KEEP INFORMED

- Hearings began on September 17th. They have been webcast, and the webcast has been recorded and is available.
- Two panels requested by Commissioner: (1) Risk (October 5th); and (2) NGSS (October 9th)
- The schedule set forth by the Commission anticipates a proposed decision after January 2019.
- Once a Proposed Decision (PD) is issued, parties have an opportunity to comment on the PD, and the Commission votes on it.

FOLLOWING UP

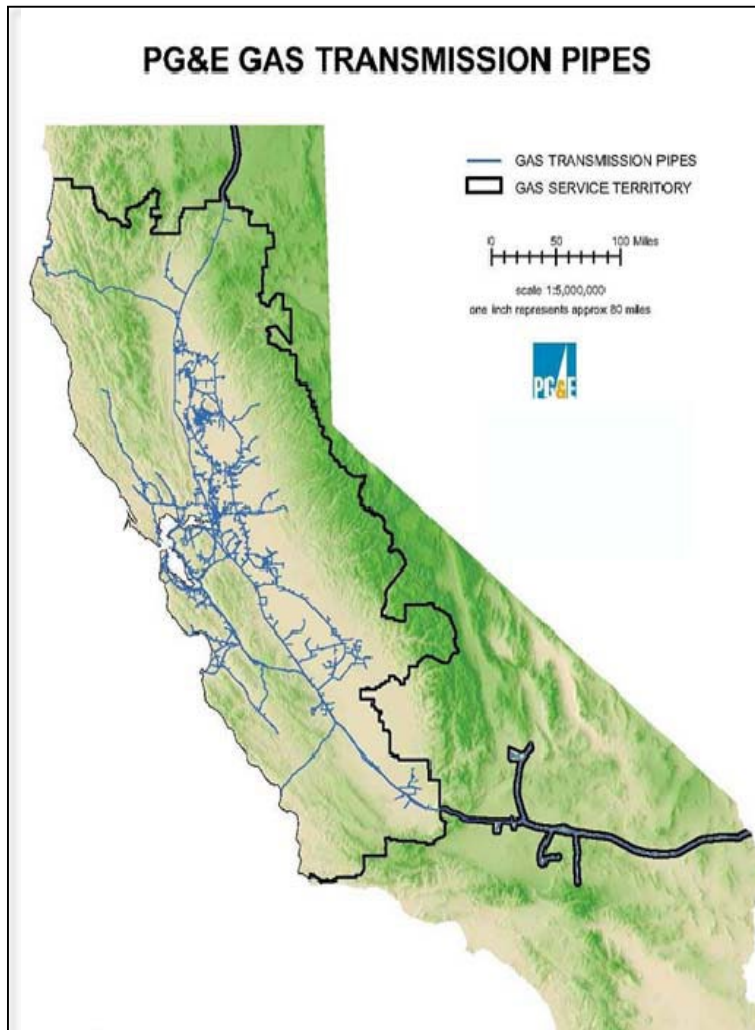
**For more information, head over to
PipeRanger.com**

**If you have more questions, feel free
to reach out to your CGT
representatives**

TOPIC 4

GETTING READY FOR WINTER

PG&E BACKGROUND



- Serves approximately 15 million people throughout a 70,000-square-mile service area
- Operates approximately 6,800 miles of gas transmission pipeline ~ 42,000 miles of gas distribution pipeline
- 4.3 million natural gas customer accounts.
- Deliver 1 Trillion CF/year
- Approximately 105 BCF of gas storage
- Approximately 203,000 HP of compression
- Gas System Operations – Safe and Reliable Operations of Transmission and Distribution 24X7

NATURAL GAS PIPELINE NETWORK



- ➔ ① **Pacific Gas and Electric Company - California Gas Transmission**
- ② Alliance Pipeline L.P.
- ③ Colorado Interstate Gas Company
- ➔ ④ **El Paso Natural Gas Company**
- ⑤ Foothills Pipe Lines Ltd.
- ⑥ FortisBC
- ➔ ⑦ **Kern River Gas Transmission Company**
- ⑧ Kinder Morgan Interstate Gas Transmission
- ⑨ Mojave Pipeline Company
- ⑩ North Baja Pipeline, LLC
- ⑪ Northern Border Pipeline Company
- ⑫ Northwest Pipeline (Williams)
- ⑬ Paiute Pipeline Company
- ➔ ⑭ **Questar Southern Trails Pipeline Company**
- ⑮ Rockies Express
- ➔ ⑯ **Ruby Pipeline**
- ⑰ San Diego Gas & Electric
- ➔ ⑱ **Southern California Gas Company**
- ⑲ Trailblazer Pipeline Company
- ➔ ⑳ **TransCanada - GTN System**
- ㉑ TransCanada - Alberta System
- ㉒ TransCanada - B.C. System
- ㉓ TransCanada - Canadian Mainline
- ➔ ㉔ **Transwestern Pipeline Company**
- ㉕ Tuscarora Gas Transmission Company
- ㉖ Westcoast Pipeline

PG&E WINTER 2018 – 2019 WEATHER OUTLOOK

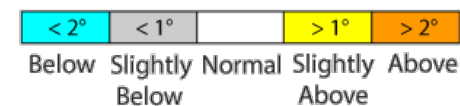
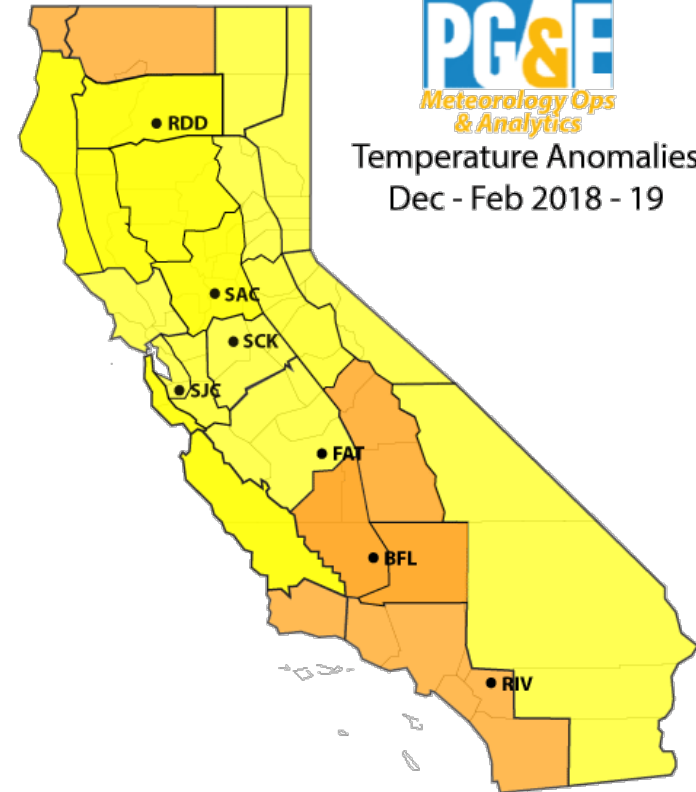
- Weak El Nino conditions (warmer than normal) are favored this winter in the tropical Pacific. Last winter featured a weak La Nina (cooler than normal) in the tropical Pacific
- Winter 2017-18 saw generally above average temperatures December through February and was warmer than previous winter 2016-17 (slightly above normal), but not as warm as 2015-16 (above normal)
- Dec 2018 – Mar 2019 outlook favors more rainfall than Winter 2017-18 and generally average or slightly above normal precipitation. It is not favored to be as wet as the very wet 2016-17 winter season

WINTER SEASON (DJF) 2018-19 TEMPERATURE FORECAST

- On average, slightly above normal (1-2 F) temperatures are favored for most of the territory including all Gas Day 6 cities. Above normal (>2 F) temperatures are forecast for parts of the southern and northern interior.
- Average temperatures for the Dec - Feb period should be slightly colder than the warm winter of 2017-18 and similar or slightly warmer than winter 2016-17 that was normal or slightly above average. **Best chance for Cold Winter Days (CWD) will be in January 2019.**

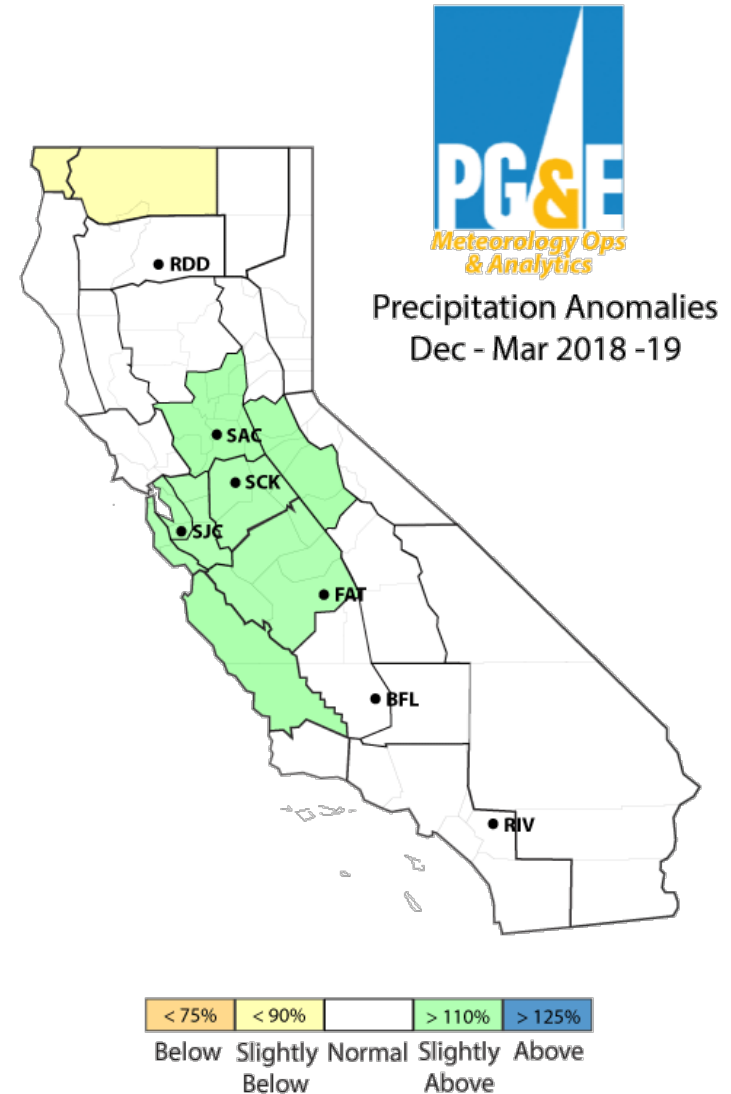


Temperature Anomalies
Dec - Feb 2018 - 19

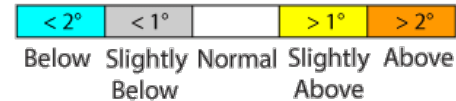
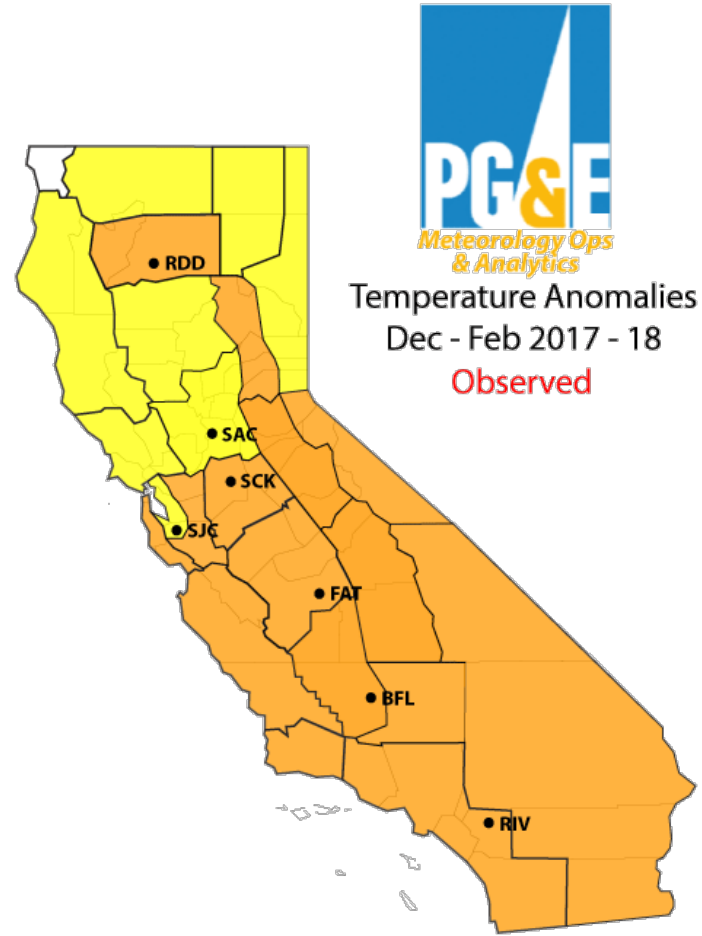
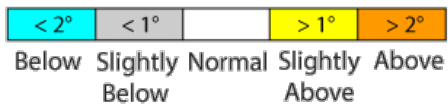
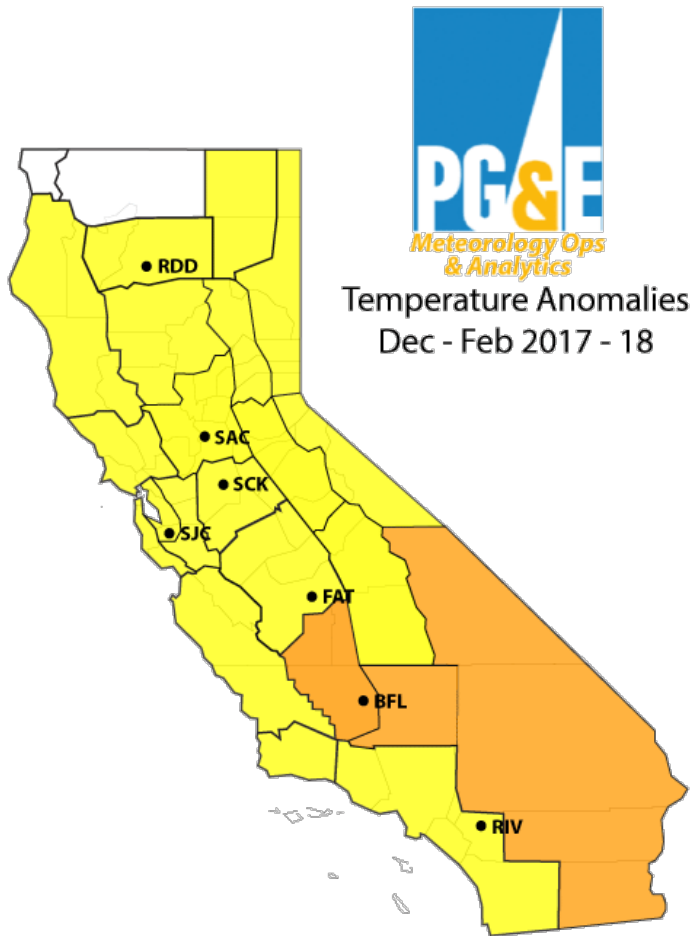


WINTER SEASON (DJF) 2018-19 PRECIPITATION FORECAST

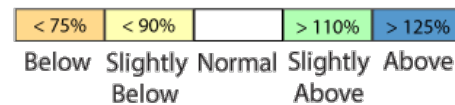
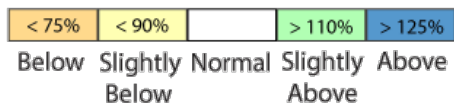
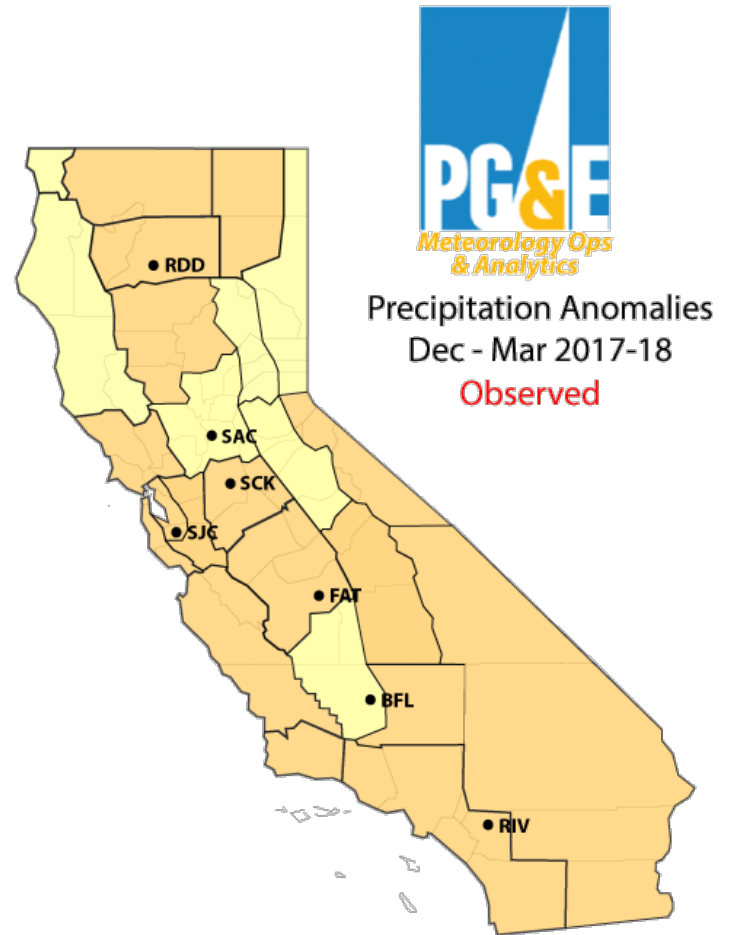
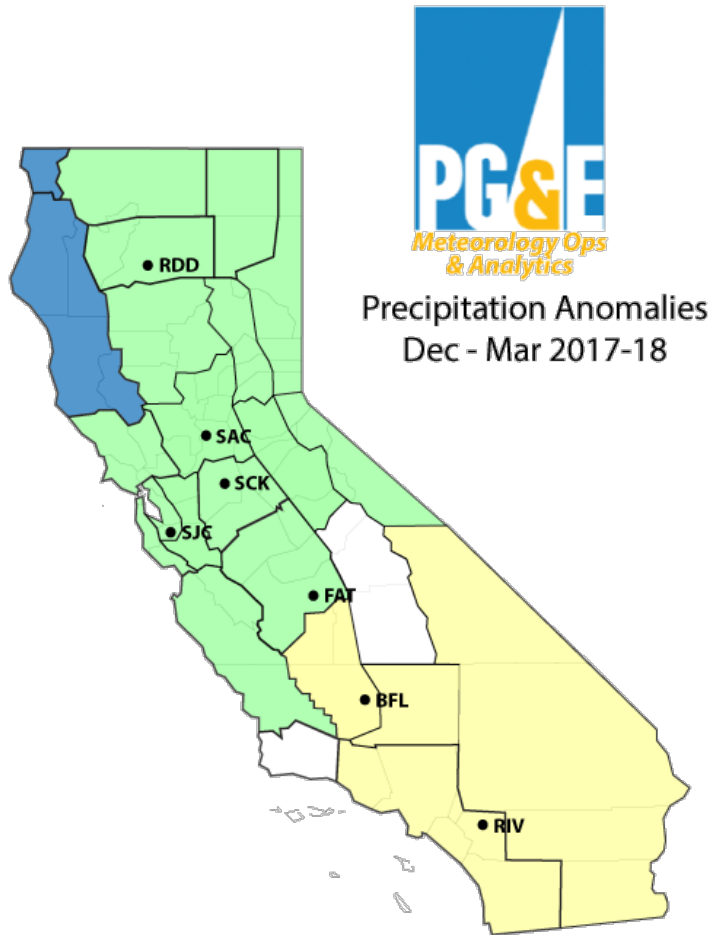
- On average, precipitation during this 4-month period is favored to be slightly above normal across Central CA and generally near average elsewhere.
- Precipitation totals are favored to be larger than last season that saw below average precipitation across the state. Overall, precipitation should result in near average snowpack in the higher Sierra next spring and slightly below normal depths at mid-elevations (not too many cold storms).



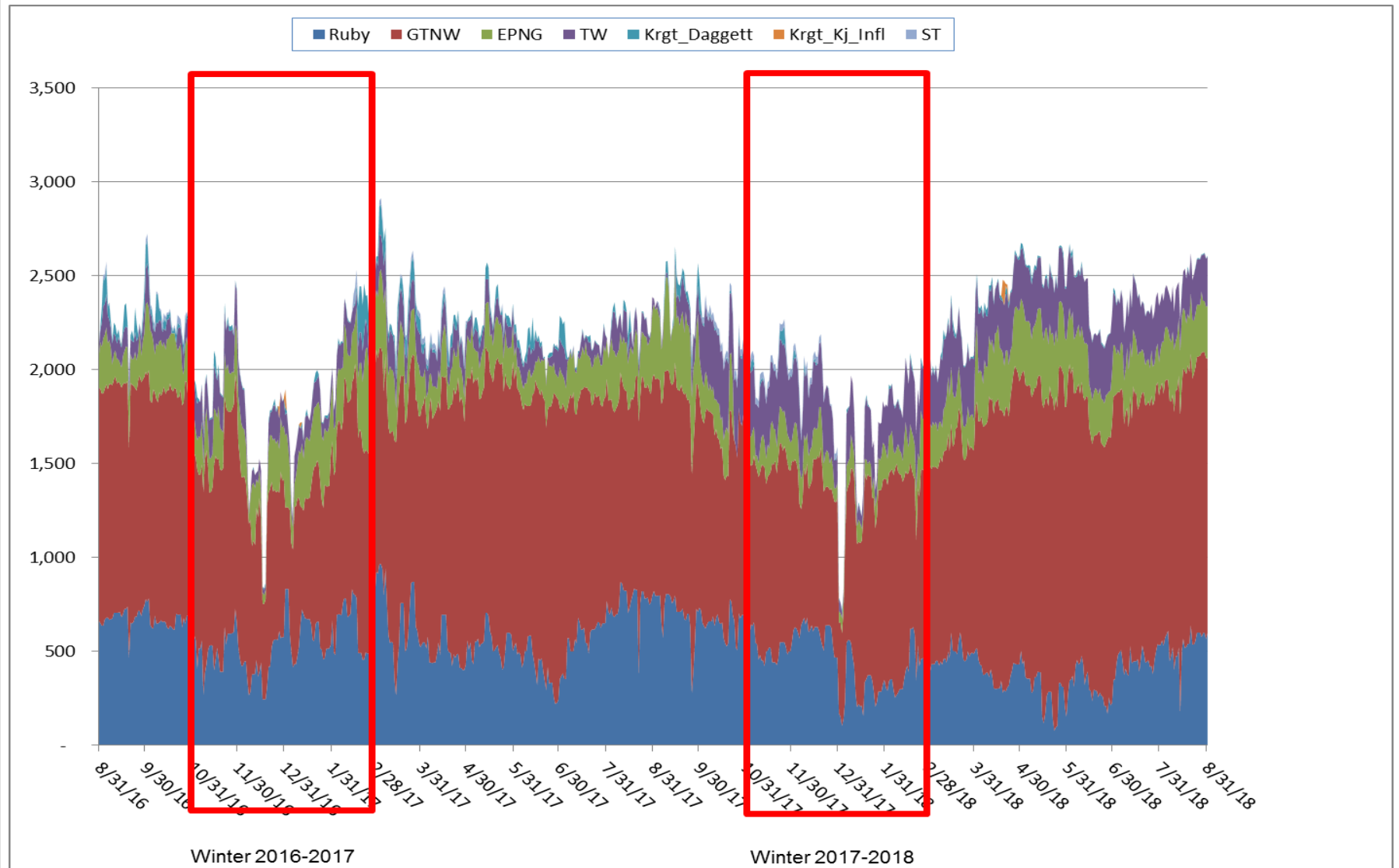
WINTER SEASON 2017-18 TEMPERATURES PG&E FORECAST VERSUS OBSERVED DEPARTURES



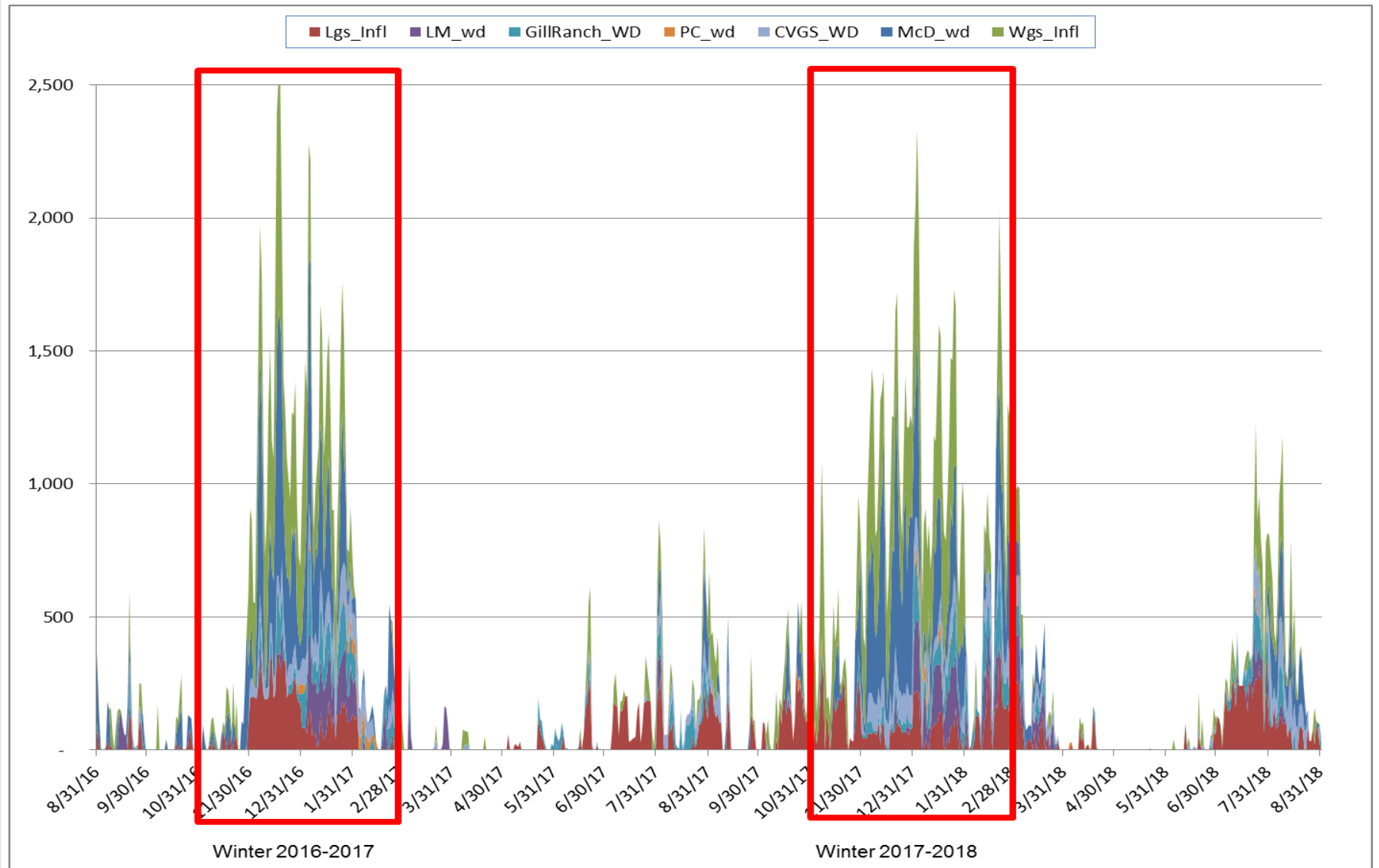
WINTER SEASON 2017-18 PRECIPITATION PG&E FORECAST VERSUS OBSERVED DEPARTURES



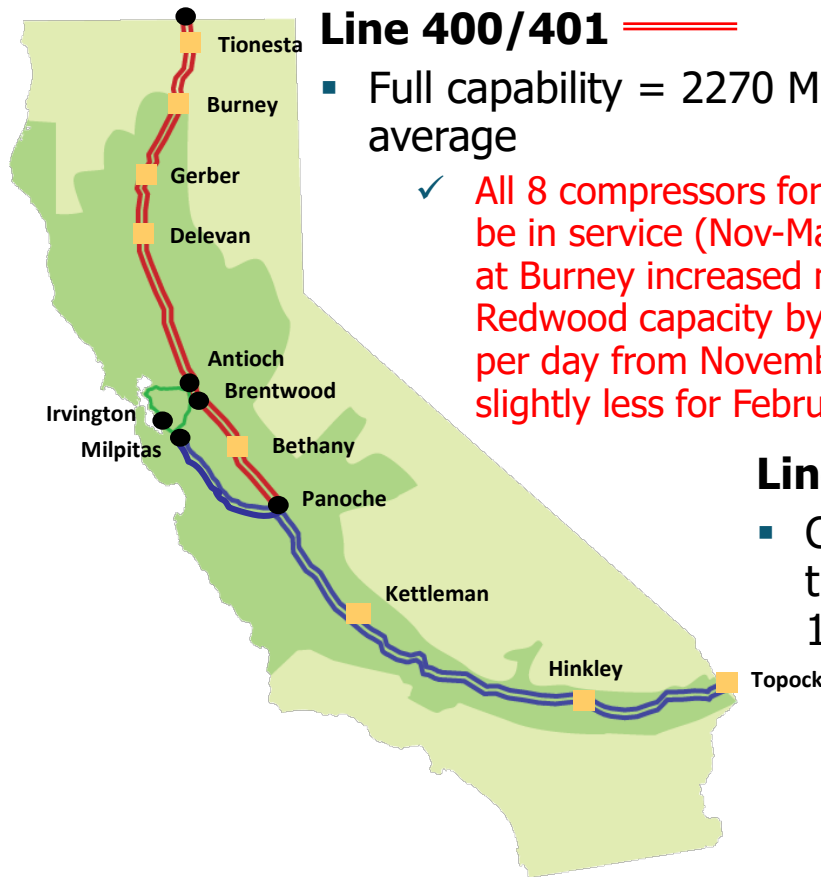
INTERCONNECT SUPPLY BREAKDOWN



ALL STORAGE W/D BREAKDOWN



WINTER PREPAREDNESS - BACKBONE



Line 400/401

- Full capability = 2270 MMcf winter average
 - ✓ All 8 compressors forecasted to be in service (Nov-Mar). New unit at Burney increased monthly Redwood capacity by 140 MMcf per day from November – January slightly less for February – March.



Line 300

- Capability from 410 MMcf - 615 MMcf - through December 19, 2018; increases to 1015 MMcf for the rest of the winter
 - ✓ All 3 compressor stations available
 - ✓ Various hydro-test and pipe replacement jobs during winter

WINTER PREPAREDNESS – STORAGE ON 9/24/18

PG&E Storage Capacity



- McDonald Island
- Los Medanos
- Pleasant Creek
- Gill Ranch (25%)

Total

**Vol
(Bcf)**

76.2

**Withdrawal
(MMcf/d)**

1,390



Independent Storage Providers (ISP)

- Wild Goose
- Lodi Storage
- Central Valley Storage
- Gill Ranch Storage (75%)

Total

**Vol
(Bcf)**

75.7 Bcf*

**Withdrawal
(MMcf/d)**

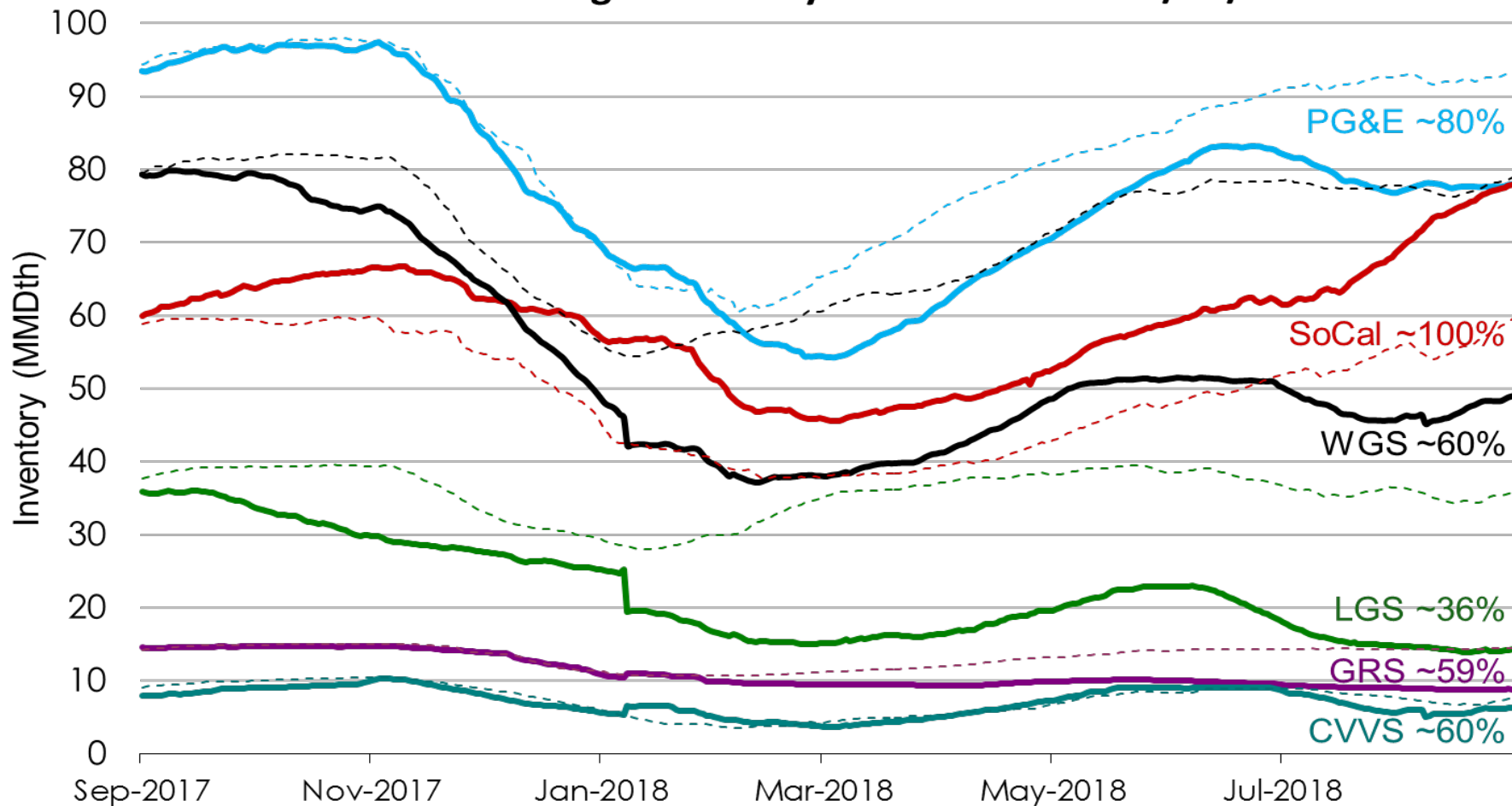
950
850
300
300

2,400

*Estimated 53% of highest inventory level in the last two years.

AS OF 9/24/2018

California Gas Storage Inventory Estimates as of 09/24/18



Solid line is this year's inventory level.

Dotted line represents last year's inventory level

% represents current inventory level vs highest inventory level over the last two years.

SUPPLY AND CAPACITY SHORTAGES

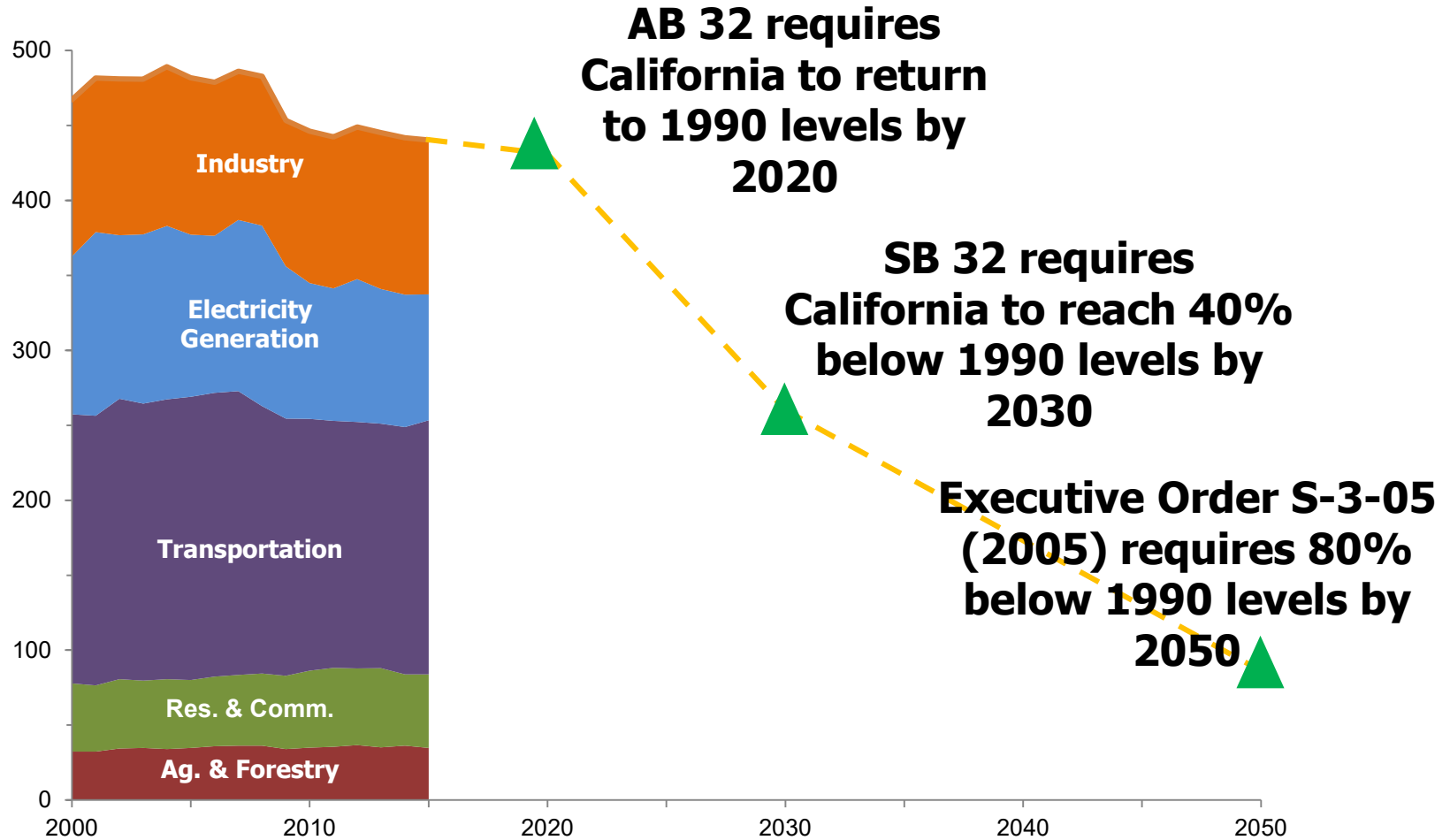
- **Operational Flow Orders (OFO):** An Operational Flow Order (OFO) is used to protect the operational integrity of the pipeline. PG&E may issue and implement a System-Wide or Customer-Specific OFO in the event of high or low pipeline inventory. A simultaneous High and Low OFO may be called under certain pipeline inventory conditions. The OFO requires shippers to take action to balance their supply with their customers' usage on a daily basis within a specified tolerance band.
- **Emergency Flow Orders (EFO):** An Emergency Flow Order (EFO) is used when actual or forecast supply and/or capacity shortages threaten deliveries to end-use customers. During an EFO, end-use customers' usage must be less than or equal to supply.
- **Local Curtailment:** Local curtailments are used to resolve capacity constraint issues in localized sections of PG&E's pipeline system. A Local Curtailment may be implemented when local system temperatures are expected to drop below Cold Winter Day temperatures. Local noncore customers may be required to curtail gas usage to ensure local core demands are met.
- **Cold Winter Day:** Cold Winter Day (CWD) is a design day criteria used to ensure reliable gas service for core and noncore customers. Gas systems are designed to meet all expected core and noncore demand during a CWD. The CWD design temperature is defined as the coldest temperature that may be exceeded one in every two years, on average. The system weighted mean temperature for CWD is about 37 degrees Fahrenheit; however, a specific local CWD design temperature is used for local areas. On a system wide basis, CWD conditions create a demand scenario roughly equal to 75 percent of core customers projected Abnormal Peak Day daily load, plus expected noncore customer demand.

TOPIC 5

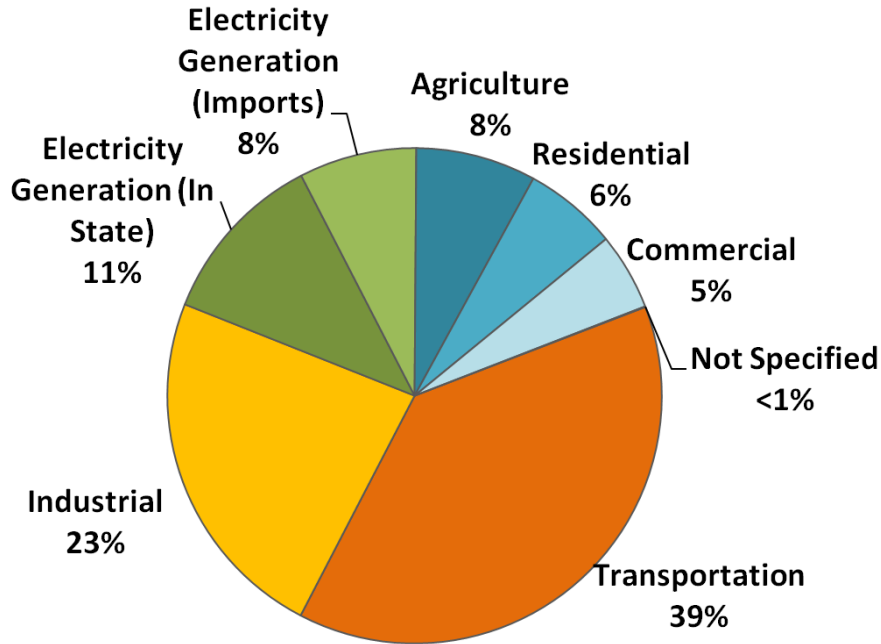
BIOMETHANE

CALIFORNIA GHG EMISSIONS

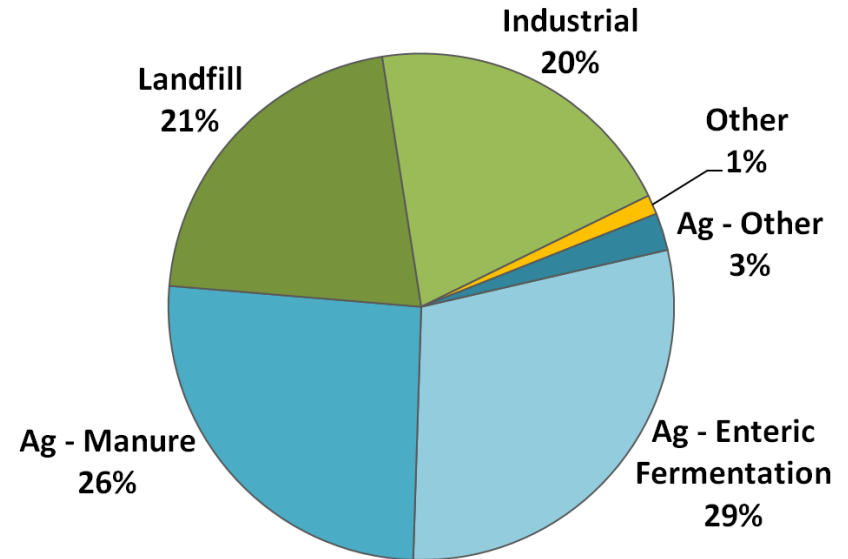
California Greenhouse Gas Reduction Goals and Historic Emissions
Million metric tons CO₂e



CALIFORNIA GHG EMISSIONS



2015 Total CA Emissions: 440.4 MMTCO₂e



2015 Total CH₄ Emissions: 39.6 MMTCO₂e

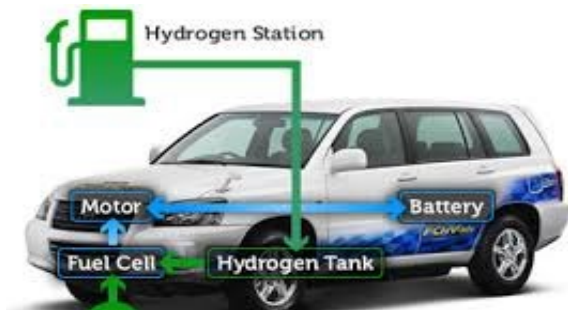
HOW WILL THIS HAPPEN?



**Renewable Natural Gas
/ Biomethane**



**Heavy Duty
Transportation**

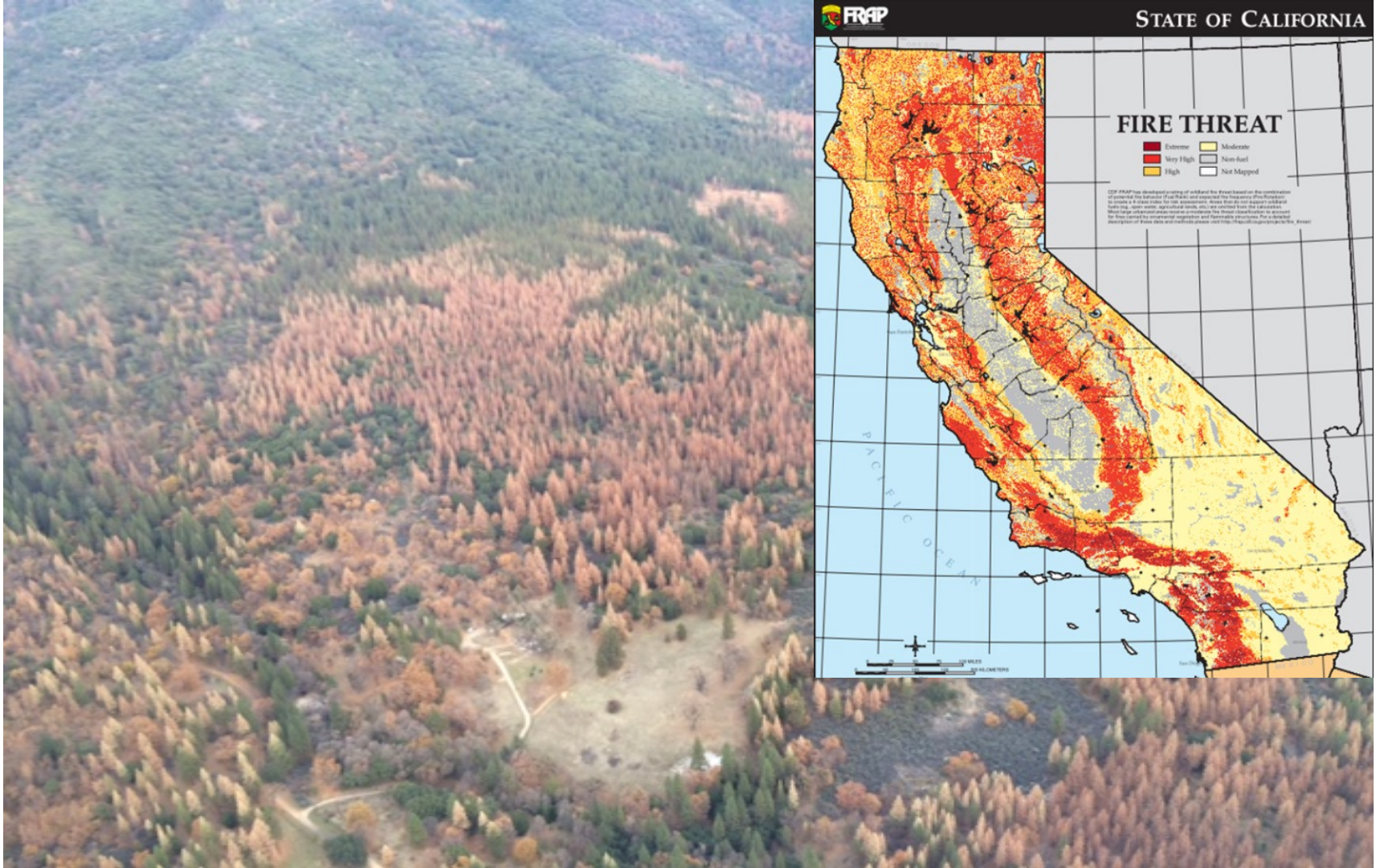


**Hydrogen / Power-to-
Gas**

RENEWABLE NATURAL GAS



BIOMASS GASIFICATION



HEAVY DUTY TRANSPORTATION



Cummins **Westport**



- Lower emissions
- Comparable range to diesel
- Proven technology
- Compatible with existing trucks

HYDROGEN / POWER-TO-GAS



- Store renewable energy in the form of hydrogen or methane
- Cost effective when electric prices are low – overgeneration
- Enables greater renewable penetration



INTEGRATED ENERGY SYSTEM

