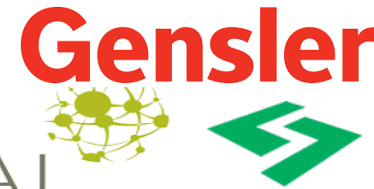
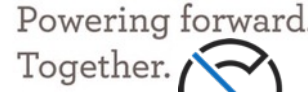





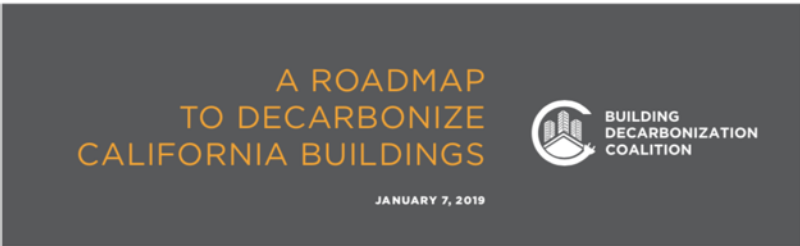



Building Decarbonization  
Coalition Presents:  
*Long-Term Gas Planning Proceeding  
Webinar Series*



## Greenbank Associates



# Figure 1: Decarbonization Targets Within the Building Sector

	R		Commercial
New Buildings	20 B		Zero Emissions ing Code
Retrofits	%		vels from the overall : om building sector om building sector om building sector
<ul style="list-style-type: none"> <li>•Increase the space heating from 50 to 100 % in 2030.</li> <li>•Increase the water heating from 10 to 100 % in 2030.</li> </ul>		  	mps for space 2025 and 100 % in  mps for water 2025 and 100 % in



# Roadmap Goals

Goal 1: Build customer, builder, contractor and policy-maker awareness and interest in decarbonization.

Goal 2: Ensure that customers receive a good value from adopting building decarbonization measures.

Goal 3: Ensure that building decarbonization provides a better value to builders and contractors than fossil-fuel heating.

Goal 4: Prepare supply-chains and ensure delivery agents are ready to meet rising demand for carbon-free building technologies with a quality product.

Goal 5: Align Policy to meet other goals.

# About this webinar series

This BDC Webinar Series will introduce participants to the main issues addressed in the California Public Utilities Commission's long-time gas system planning proceeding (20.01.007), and teach best practices in participating in proceeding discussions.

This proceeding is designed help California plan its gas infrastructure needs as it meets its carbon emissions reductions goals.

- *Seven webinars scheduled from 11 am-12 pm on Wednesdays from October 14 to December 16, 2020*

# Coming gas proceeding webinars

- **Shaping the Future of Gas in a Decarbonized California**
  - Oct. 14 – [Register](#)
  - Speaker: Simon Baker, Deputy Director, Energy Division, CPUC
- **The Present and Future of Gas on the Path to Decarbonization**
  - Oct. 21 – [Register](#)
  - Speakers: Merrian Borgeson, Senior Scientist, Natural Resources Defense Council, and Dan Aas, Managing Consultant, Energy and Environmental Economics
- **The Role of Resource Planning in the CPUC's Long-Term Gas Proceeding**
  - Oct. 28 – [Register](#)
  - Speakers: Katie Wu, Director, Gridworks, and Michael Colvin, California Energy Director, Environmental Defense Fund

*Details of other webinars in this series are at <https://bit.ly/BDCGasWebinars> (case sensitive)*

# Webinar Logistics

- Everyone is muted.
- Please ask your questions via chat and we will ask speakers to answer at the end of remarks.
- This webinar is being recorded.
- Members of the Coalition can access the recording, slide deck, and other resources on the Members-Only website.
  - To learn more about membership and how to access this recording and other decarb benefits, visit [www.buildingdecarb.org](http://www.buildingdecarb.org) or reach out to Ashleigh at [Ashleigh@buildingdecarb.org](mailto:Ashleigh@buildingdecarb.org)

# Today's speakers

- Simon Baker, Deputy Director, Energy Division, California Public Utilities Commission
- Jean Spencer, Supervisor over the Gas Proceeding, Energy Division, California Public Utilities Commission



# CPUC Long-Term Gas Planning and Building Decarbonization Proceedings

Simon Baker

Director of Costs, Rates, and Planning

Energy Division



California Public  
Utilities Commission

“We empower California through access to safe, clean, and affordable utility services and infrastructure.”

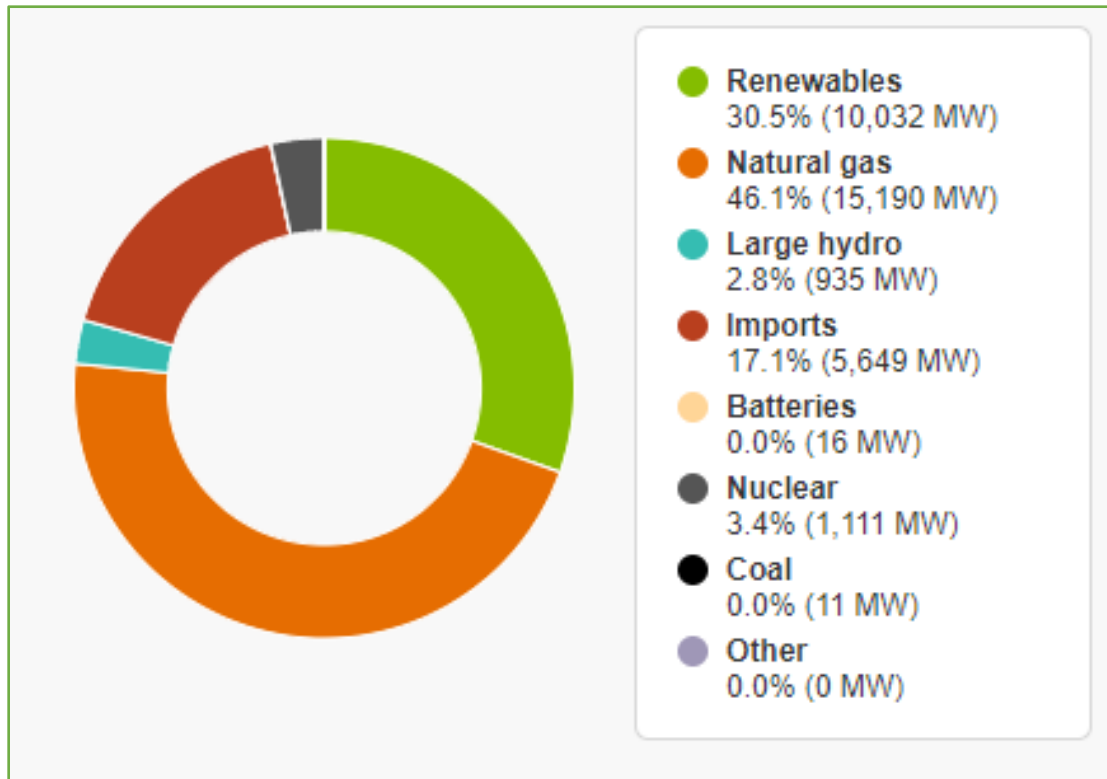
– CPUC’s Mission Statement

## R.20-01-007: Long-Term Gas Planning Rulemaking

### Rationale:

- Most reliability standards established 15+ years ago;
- Several gas system events have occurred since, including:
  - San Bruno explosion
  - Aliso Canyon gas leak
  - Outages on critical SoCalGas transmission pipelines
- Increased use of gas-fired electric generation in the west in the last 15 years;
- Climate change makes weather and demand models based on the past less reliable;
- California's climate goals will cause average gas demand to decline;
  - However, winter peak demand forecasts remain high
- 34 local jurisdictions have adopted all-electric building reach codes new construction.

# R.20-01-007: Long-Term Gas Planning: Context



CAISO electricity supply at 2:00 PM on Oct. 5, 2020.

At least 15% of the electricity in CA comes from gas-fired electric generators at any time.\*

On average, gas-fired electric generation supplies about 40% of annual electricity in CA.

\*Source: CAISO.com, based on the renewable generation record set on 5/5/2020

# The Proceeding Consists of Three Tracks

## 1A

### System Reliability Standards

Establish minimum system requirements and ensure gas utilities consistently meet those standards and provide reliable gas service

## 1B

### Market Structure and Regulations

Mitigate the risk that gas supply shortages pose to gas and electric reliability and prices

## 2

### Long-Term Natural Gas Policy and Planning

Ensure safe, reliable, and affordable energy in a time of declining fossil gas throughput

# Key Points From Track 1A Workshop

- No standard definition of reliability in the gas industry.
- Current standards are based on early 2000s-era practices and system
  - Did not anticipate the role of gas-fired electric generation in complementing renewable generation.
- Extreme heat days are expected to be more frequent and hotter.
- Multiple days of low solar and wind are a concern.
- Steep electric ramps can occur in both the summer **and** winter.
- Overall, there is a trend of decreasing average gas demand combined with peak demand that is essentially unchanged.

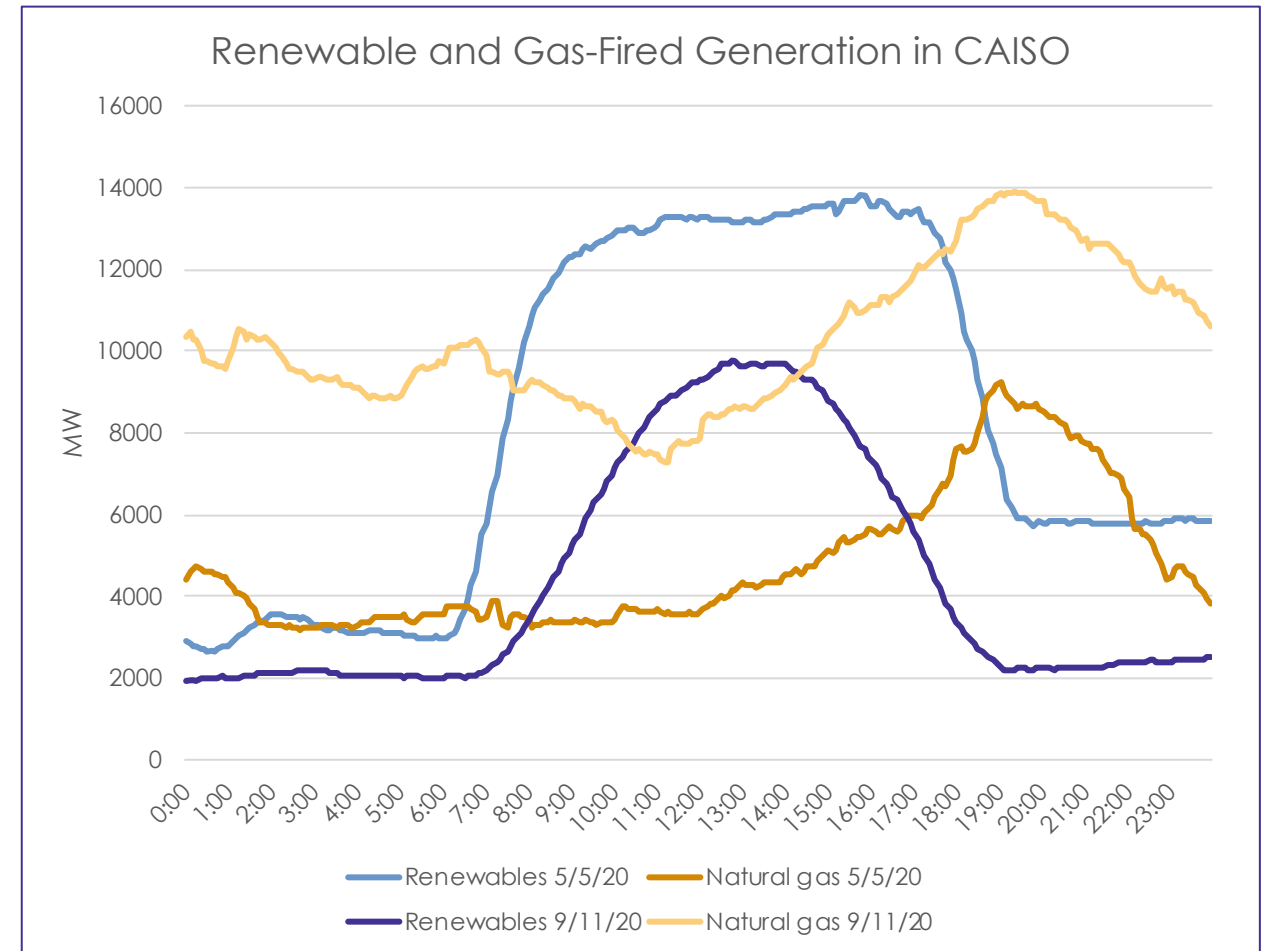


# Key Points From Track 1B Workshop

- In western U.S., ~10,000 MW of coal and nuclear will be retired by 2025.
  - Most of that capacity will be replaced with renewable energy.
  - This transition is likely to reduce the amount of electricity California can import.
- Recent gas system issues were caused by pipeline outages and limitations on the Aliso Canyon gas storage facility.
- California Council on Science and Technology Report on Underground Natural Gas Storage forecasted a decrease in *annual* gas demand by 11 to 22 percent.
  - However, that annual decline doesn't significantly reduce the need for gas storage because it is largely driven by *peak* gas use in the winter.
- Electric generators hourly burn to meet daily ramps often exceeds their hourly deliveries, which stresses the system.
- Renewable gas and hydrogen can play a role in reducing emissions.

# The Role of Gas-Fired Electric Generation: Examples

- The role of gas-fired generators has shifted.
- Rather than serving as a baseload resource, they now ramp up quickly to meet peak demand.
- Gas generators also fill the gap when:
  - There is low snowpack and low hydroelectric generation
  - Wildfires threaten electricity imports
  - Wildfire smoke and/or clouds reduce solar generation
  - Extreme heat reduces wind generation



5/5/20: a day with record renewable generation  
9/11/2020: a day with heavy wildfire smoke

# Track 2

- Track 2 will focus on affordability, reliability, and safety in the context of declining gas throughput.
- The Scoping Memo has not been issued yet.
- The Scoping Memo *may* cover questions such as:
  - How much gas transmission and storage infrastructure is needed in 2030, 2040, and beyond to ensure reliability?
  - How do we balance the need to repair or replace old infrastructure to ensure safety and reliability with the need to avoid stranded costs?
  - How do we "prune" the gas system in the most cost-effective way?
  - How do we protect the remaining gas consumers from paying exorbitant rates?

# Future of Gas – Renewable Gas & Hydrogen

- In addition to the Long-Term Gas Planning OIR, the CPUC is also working to integrate non-fossil gas resources into the system across multiple proceedings and applications.
- R.13-02-008 RNG Proceeding
  - Phase 3 – Finalizing standard RNG interconnection tariffs and agreements
  - Phase 4 – Developing RNG procurement requirements and integration of hydrogen
- R.17-06-015 - Dairy Biomethane Pilots
- A.19-02-015 - Sempra Voluntary RNG Tariff

# Future of Gas – Building Decarbonization

- Building energy efficiency and electrification are projected to reduce residential natural gas demand between 25% and 90% by 2050.
- The CEC's AB 3232 report, due by 1/1/2021, will inform the levels of electrification and system RNG necessary to achieve 40% greenhouse gas reduction below 1990 levels by 2030 in the built environment.
- The Building Decarbonization Proceeding (R.19-01-011) Phase 3 and Phase 4 will explore further policy changes that could, among other things, enable natural gas distribution system pruning, such as obligation to serve.

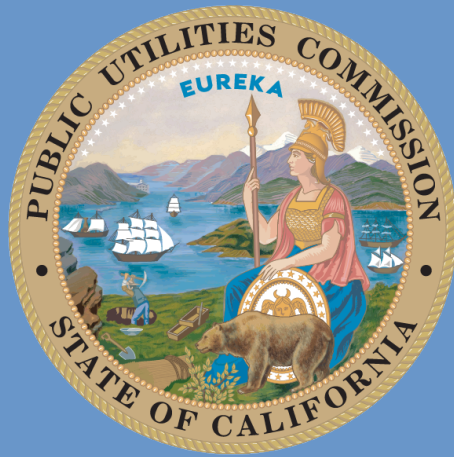
# How to Participate

- Engage with CPUC staff at workshops and other collaborative forums.
- Become a party to the long-term gas-planning proceeding:  
[https://www.cpuc.ca.gov/party\\_to\\_a\\_proceeding/](https://www.cpuc.ca.gov/party_to_a_proceeding/)
- Subscribe to receive documents related to the proceeding:  
<http://subscribecpuc.cpuc.ca.gov/fpss/Default.aspx>



# Questions?





# California Public Utilities Commission

[Simon.Baker@cpuc.ca.gov](mailto:Simon.Baker@cpuc.ca.gov)

# Gas 101

Jean Spencer

Gas Policy & Reliability



California Public  
Utilities Commission

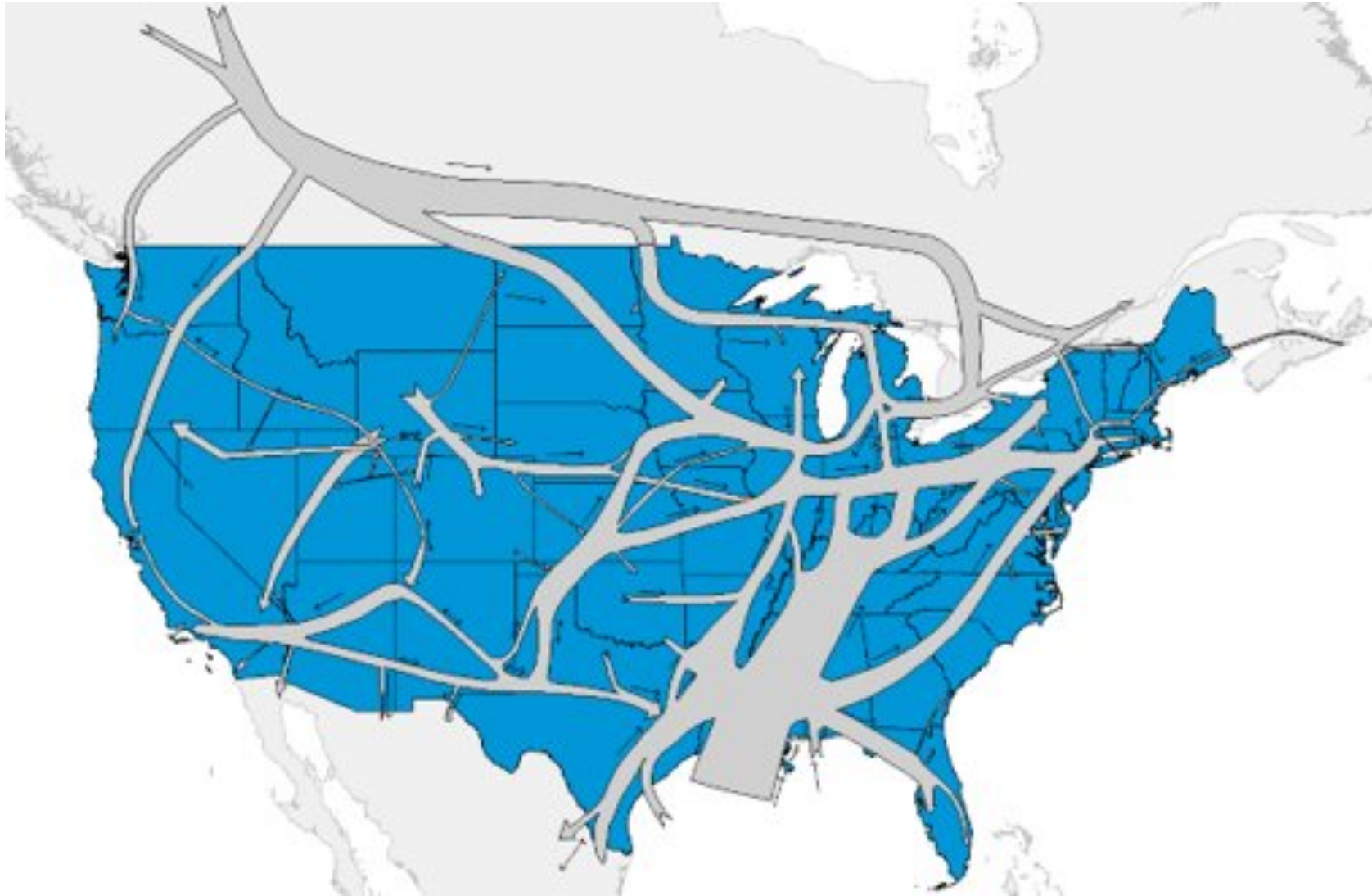
# Gas System FAQ

- Where does California's gas come from?
- How does gas get to customers?
- What is the difference between core and noncore customers?
- What is a design standard and why does it matter?
- Why is storage important?
- How old are our pipelines?
- How much do pipelines cost to build and maintain?
- How do gas markets work?
- How do the gas and electric systems interact?

## Bonus

- What are some challenges to pruning the gas system?
- What about hydrogen and RNG?

# Where does California's gas come from?



# Where does California's gas come from?





# How does gas get to customers?

- **Gathering lines** take gas from the well head to transmission pipelines
- **Transmission lines** bring large amounts of gas long distances under high pressure
- **Distribution lines** bring gas from the transmission lines to the customer at relatively low pressure

Miles of Pipeline in California, 2019 (PHMSA)

Line Type	Miles
Gathering	142
Transmission	12,129
Distribution	204,149
Total	216,420

# What is the difference between core and noncore customers?

- Core customers:
  - Residential and small commercial customers
  - The utility procures and transports their gas
  - Pay a premium for more reliable service
  - Primary users of distribution lines
- Noncore Customers
  - Large commercial and industrial customers
    - Examples: Electric generators, refineries, factories, hospitals
  - Procure their own gas supply and inter- and intrastate transportation services
  - Exposed to more market and reliability risk
  - In Southern California, electric generators are the first to be curtailed

# What is a design standard and why does it matter?

- Gas system infrastructure is designed to serve peak day demand.
- There are many design standards currently in use in California.
  - SoCalGas Example:
    - 1-in-10 cold day: All customers served
    - 1-in-35 cold day: All core customers served; all noncore customers curtailed
- In a context of climate change, forecasts show average temperatures going up but variability and extreme weather also increasing.
- This means less overall throughput but the same amount of infrastructure
  - Unless we are willing to accept less reliability, e.g., 1-in-5

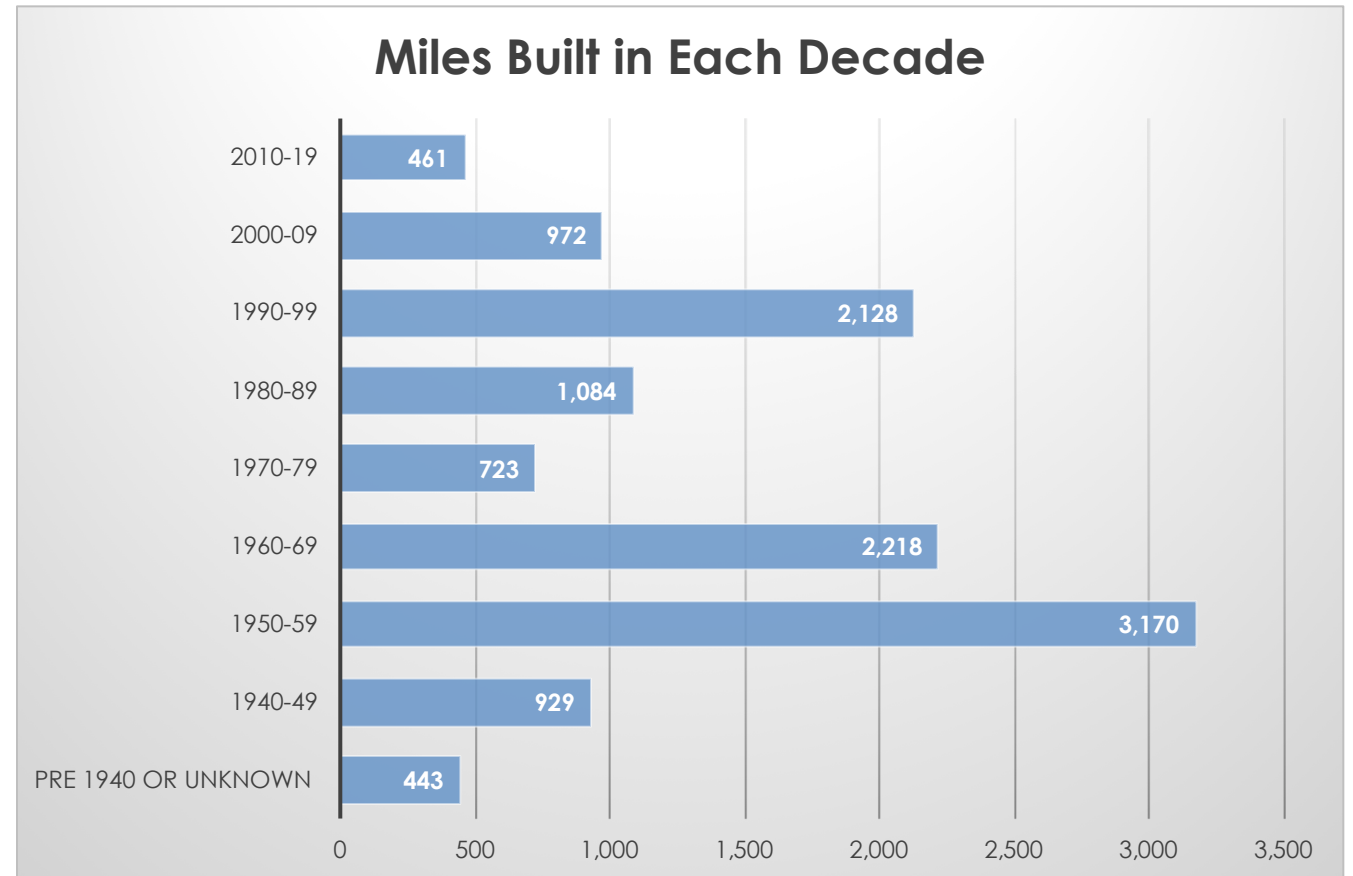
# Why is storage important?

- Storage allows customers to:
  - Purchase gas in the summer for use in winter;
  - Hedge against short-term high prices; and
  - Move gas quickly to where it is needed.
- Growth in renewables increases the importance of storage because of the need to quickly ramp up gas-fired electric generators.
  - Gas travels 20-30 miles per hour.
  - Storage fields are more useful when they're closer to demand centers.

# How old are our pipelines?

- 56% of CA transmission pipelines are at least 50 years old.
- Some are nearing the end of their useful lives.
- OIR is a chance to create a framework for weighing the trade-offs between cost and the need for repair and replacement in a context of declining throughput.

Miles of California Gas Transmission by Decade Installed, 2019 (PHMSA)



# How much do pipelines cost to build and maintain?

## Build and Replace:

- Examples from the SoCalGas/SDG&E North-South proceeding (2016):
  - \$4.2 million to \$6.8 million/mile (transmission)
- Replacement pipeline (PSEP)
  - Two sample projects: \$4 to \$8.5 million/mile (distribution)

## Maintenance

- PSEP: Recent hydrotest costs have averaged \$3.7 million/mile
- In-Line Inspection (2016 numbers):
  - \$3.3 million/project



# How do gas markets work?

- Gas commodity prices are very volatile
- In the short term, gas prices fluctuate due to:
  - Local and national weather;
  - Infrastructure failures; and
  - Unforeseen disruptions.
- In the long term, prices vary due to supply and demand.
- Dramatic changes in production and demand over the last 20 years.

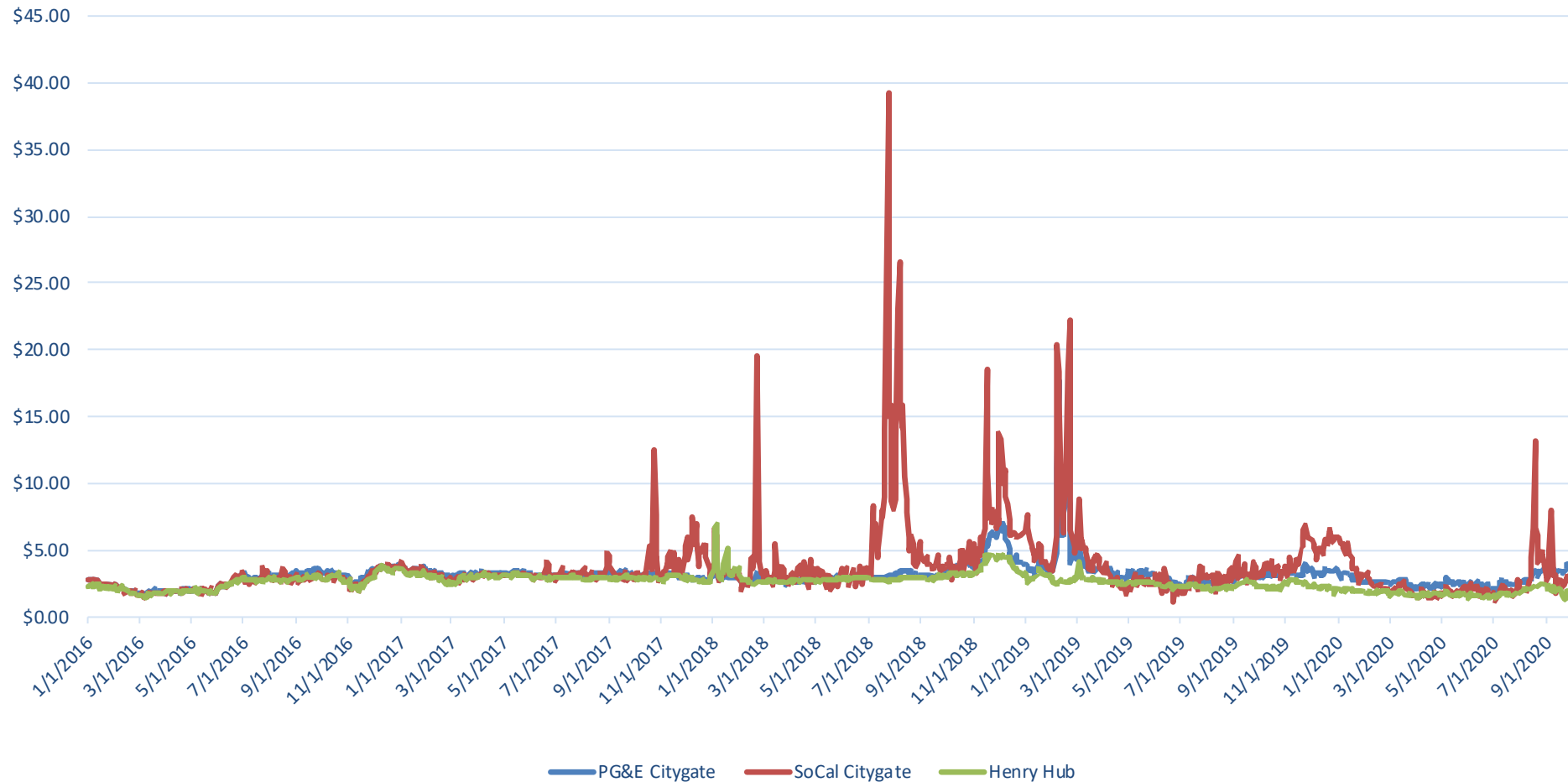
# How do gas markets work?

Volatility: Change in Supply and Demand, Prices 2003-2016



# How do gas markets work?

Volatility: Disruptions Due to Infrastructure, Prices 2016-2020



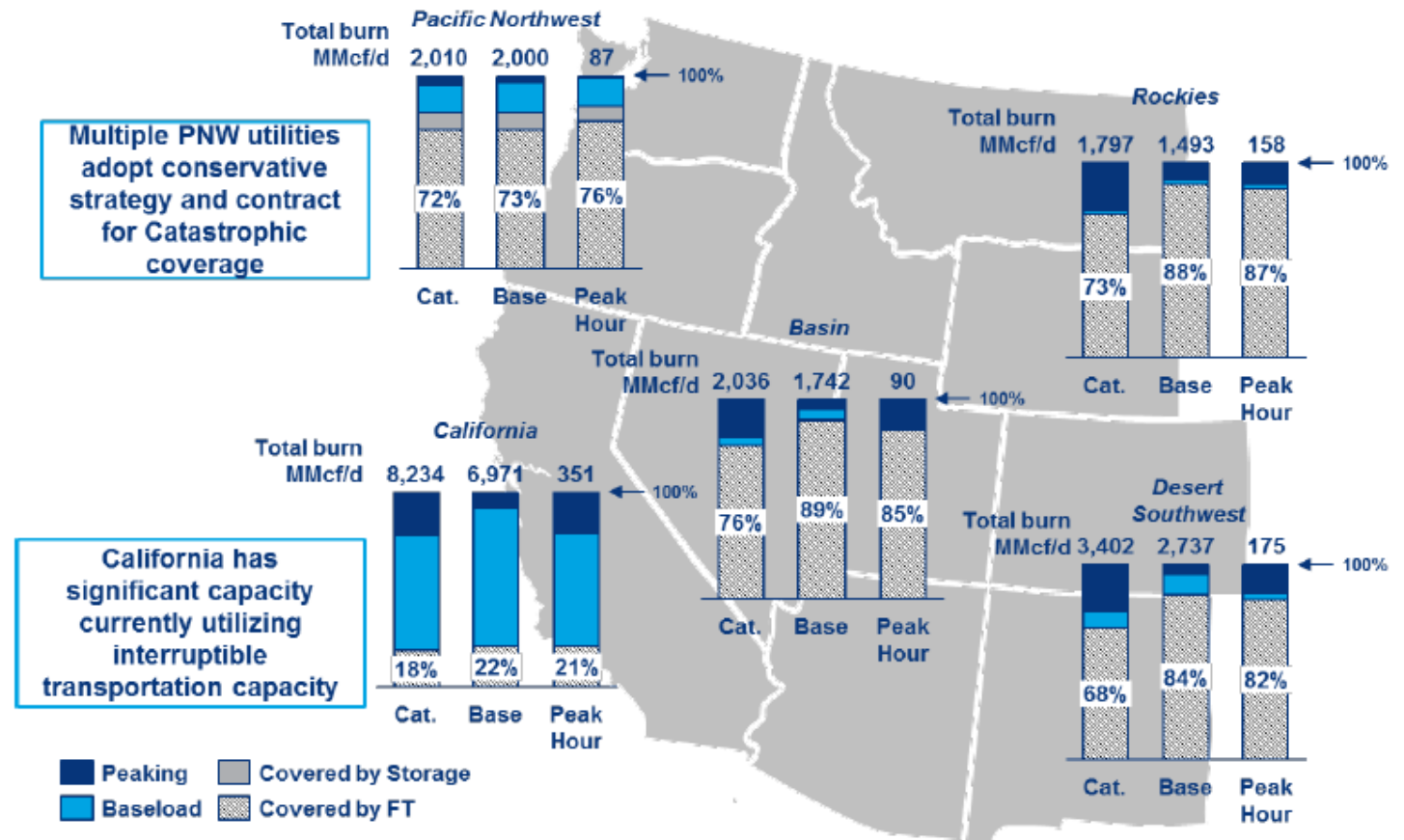
# How do gas markets work?

- Contracts can be:
  - Spot
    - Gas can be bought in the daily market at the going rate
    - Allows companies to manage demand variability
    - Prices can skyrocket due to weather or pipeline problems
    - In extreme cases, gas may be unavailable at any price
  - Monthly
    - Provide some flexibility and price insurance
  - Long-Term
    - Protects against future price increases but locks in current rates if prices fall
    - If a customer's demand drops, it still must purchase the gas
  - Firm
    - The customer is last to be curtailed if there are any shortages
  - Interruptible
    - The customer is first to be curtailed if there are any shortages

# How do gas markets work?

- Interstate pipeline operators don't build pipelines if they don't have enough firm, long-term contracts
- WECC raised long-term reliability concerns about lack of incentive to invest

Figure 3.2: Contracting Analysis by Region for Gas-fired Generation Capacity

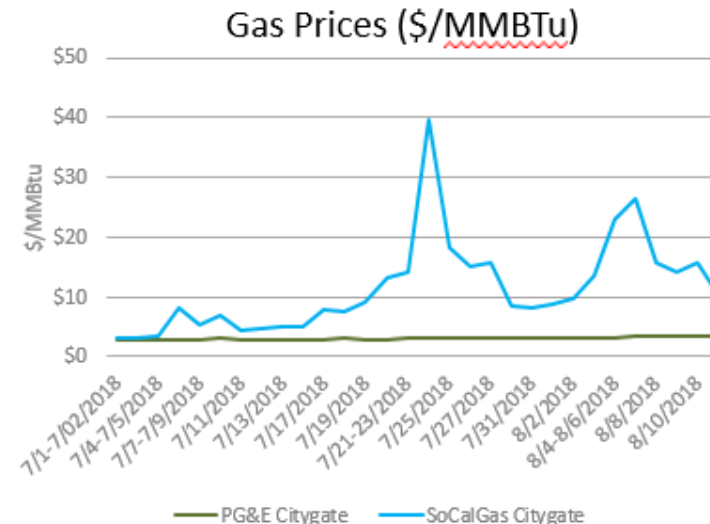


# How do the gas and electric systems interact?

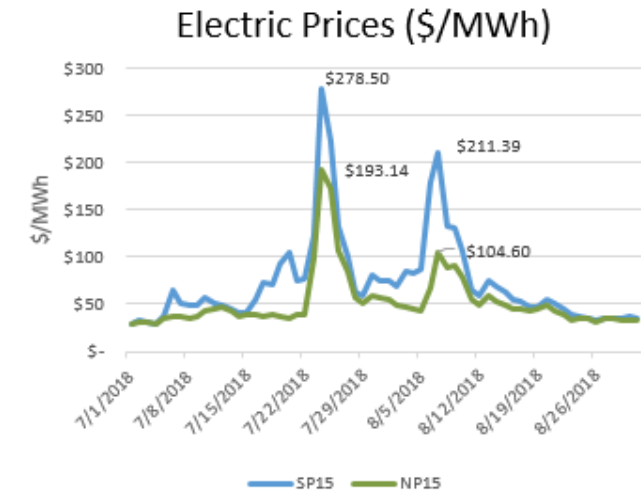
- Gas-fired electric generation powers the grid when the sun goes down and the wind stops blowing
  - This role is particularly critical during long periods of low wind and solar generation in the winter
- Pipelines deliver gas at a “ratable” rate, the same amount every hour
- Gas-fired generators use gas suddenly and intensively to meet the evening ramp and unexpected drops in renewable generation
- This variable and uncertain usage is difficult for the gas system to support, particularly without storage

# How do the gas and electric systems interact?

- Summer 2018
  - Hot weather in July and August
  - Gas prices peaked at \$39/MMBtu on July 23
  - Electric prices hit \$278.50 /MWh in SP15 and \$193.14 in NP15.
  - Price spikes led to an \$825M overrun in electric costs for SCE customers



Data source: NGI



Data source: CAISO OASIS

# Questions?





# What are some challenges to pruning the gas system?

- Discussions about pruning are typically focused on gas distribution lines.
- Utilities have a legal obligation to serve customers who wish to receive gas service
  - Legislation may be required to clarify whether the obligation to serve can be met with an alternative fuel source, i.e., electricity instead of gas.
- Cities that have passed electrification codes are not necessarily the places where there are old pipelines that need to be replaced.
- Some neighborhoods that seem like good candidates for pruning may be near critical infrastructure that requires a pipeline, e.g., an electric generator
- As customers leave and demand goes down, infrastructure costs are spread over fewer customers.

# What about hydrogen and RNG?

- California needs to solve the problem of long-term energy storage
  - Batteries do not hold enough charge to handle long periods of low wind and solar in the winter
- Currently, gas-fired electric generation is the only feasible option
- Hydrogen and renewable natural gas may provide a way to decarbonize this electric generation
  - Concerns about the cost and availability of these sources need to be addressed
  - The CPUC is funding a hydrogen study and RNG pilot projects to gain more information about their future potential

# Contact

## **Our Speakers today:**

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Jean Spencer, CPUC at [jean.spencer@cpuc.ca.gov](mailto:jean.spencer@cpuc.ca.gov)

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## **Learn about membership with the BDC**

Ashleigh Spurgeon, Building Decarbonization Coalition at [ashleigh@buildingdecarb.org](mailto:ashleigh@buildingdecarb.org)



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