
Creating a Better Energy Future

David Mills,
Senior VP Policy & Energy Supply



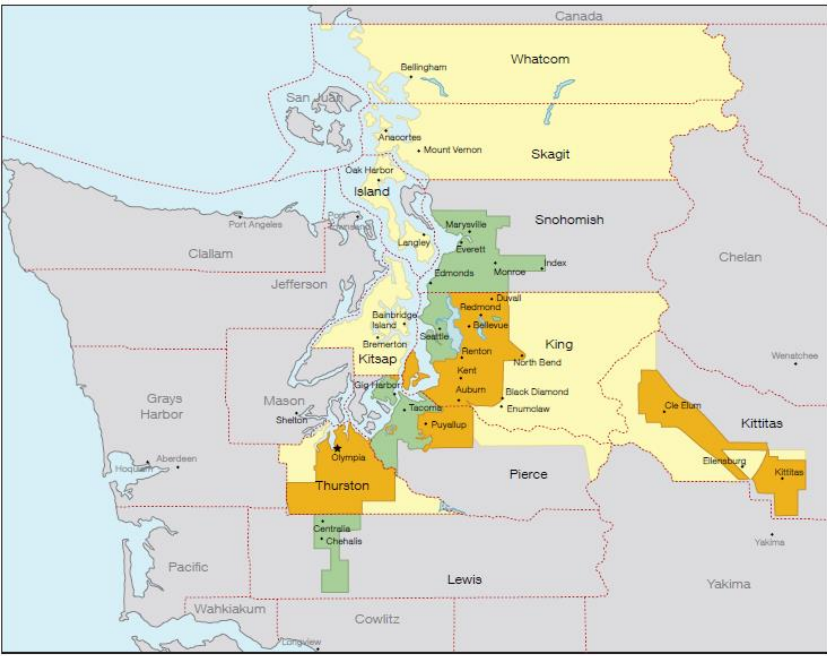
Puget Sound Energy; Washington's Oldest Utility

Employees: 2700

Company founded in 1873

Service Territory:

- 6,000-square mile service area
- 1.1 million electric customers
- **61,332 Bellingham customers served**



Orange: Combined electric and natural gas service
Yellow: Electric service
Green: Natural gas service



PSE Operates Under Regulation of the UTC

LOWEST REASONABLE COST– PSE must meet its system demand with a “lowest reasonable cost mix of energy supply resources and conservation.” (WAC 480-100-238)

FAIRNESS – PSE rates, terms or conditions must be “fair, just, reasonable and sufficient” (WAC 480-54-060)

Environmental benefits are not considered when the UTC judges PSE’s decision-making and performance around utility service.

PSE has been innovative in creating customer-specific solutions such as Green Direct, for customers willing to pay extra for renewable energy, and therefore not impacting rates that other customers pay.

PSE operates as an investor-owned utility, which is a heavily regulated business model overseen by the WA State Utilities and Transportation Commission (UTC).

Key provisions in Washington State utility law drive PSE’s decision-making around energy supply and utility service, and UTC’s approach to utility regulation and enforcement

What's on the Horizon

- PSE has made a commitment to significantly reduce our carbon footprint.
 - Investing in community solar
 - Electric Vehicle Pilot Program
 - All Source RFP
- PSE is working with the WA Legislature on Clean Electricity:
 - No coal in rates after 2025
 - Carbon neutral by 2030
 - Goal of carbon-free by 2045
- PSE Integrated Resource Plan
 - Retiring thermal resources likely replaced by renewables
 - A combination of transmission (to source remote renewables) and DER will likely be needed

A Few Electricity-Related Terms

- “**Energy**” is the total amount of kW or MW delivered over a defined set of cumulative hours, measured in kWh or MWh
- “**Capacity**” is the amount of kW or MW delivered on an instantaneous (hourly) basis, measured in kW or MW
- “**Capacity Factor**” is the average percentage of time a generating resource will generate electricity

Capacity	X	Time	=	Energy
<i>10MW</i>	<i>X</i>	<i>8760 hours</i>	<i>=</i>	<i>87,600MWh</i>

Typical Capacity Factors:

Wind = 29 percent
Solar = 30 percent
CCCT = 70 percent
Hydro = 70-80 percent

City of Bellingham Electricity Demand

61,332 PSE customers in Bellingham (53k res, 8k com, 200 industrial)

- *5,660 Bellingham customers are PSE Green Power customers*
- *Bellingham has 11% of our total Green Power Customers*

951,432 MWh consumed in 2018 (109 aMW)

130 MW peak demand in Feb 2018

Top employers:

- City of Bellingham, *Green Direct Customer*
- Western Washington University, *Green Direct Customer*
- Peace Health's St. Joseph Medical Center
- Bellingham School District



100% Clean Electricity Supply



PSE is working to reduce emissions without impacting reliability and affordability for our customers.

100% clean electricity has its challenges.

Affordability

Reliability

Resource Adequacy

Holistic & Regional Approach

PSE is currently engaged with utilities and environmental partners across the state analyzing a regional approach to reduce GHG emissions across the electric grid

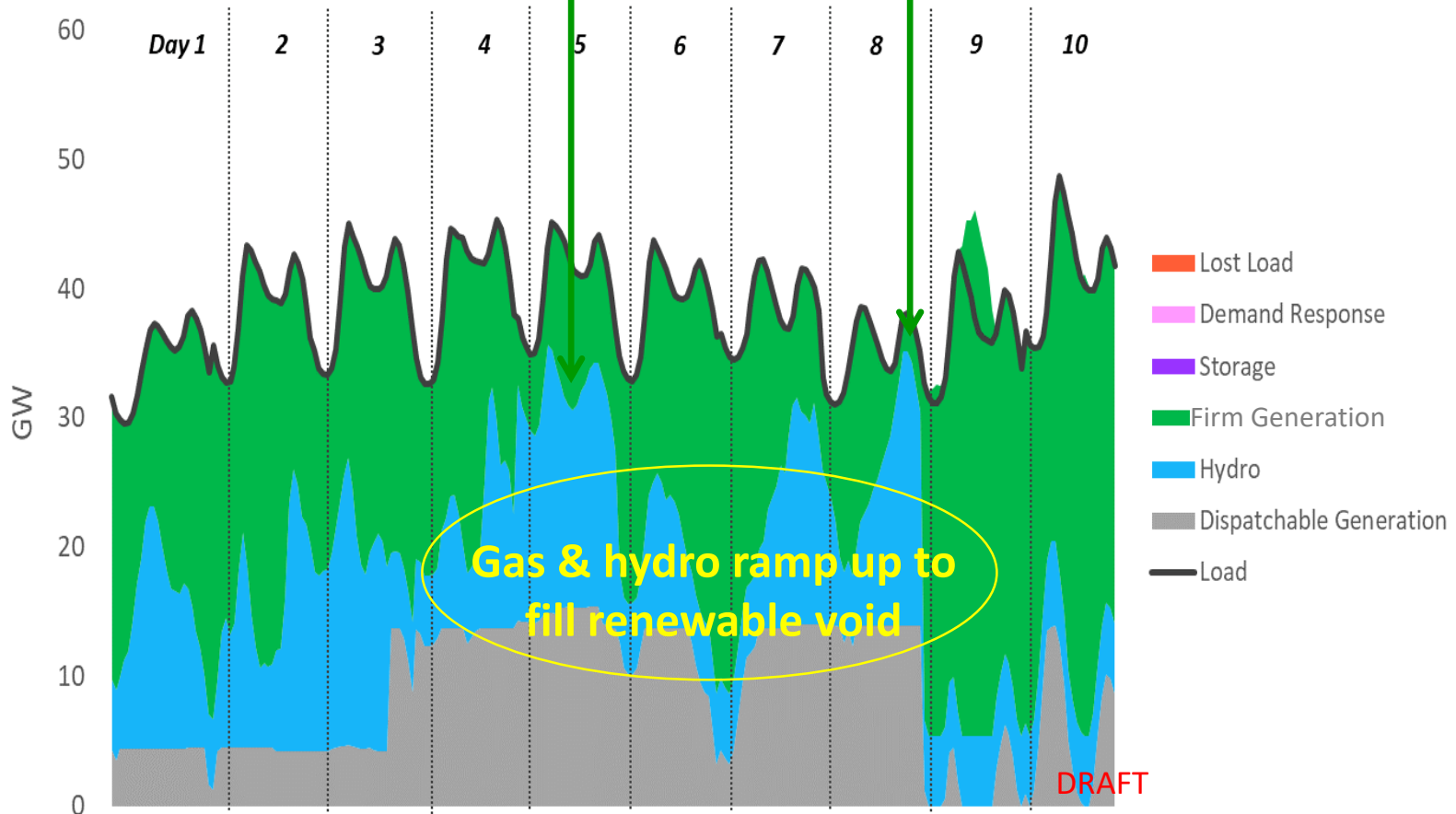


Natural Gas and Hydro Resources Deliver Dispatch-able and Reliable Capacity

80% GHG-Free Case

10 Day Cold Stretch In January →

Despite 60 GW of installed renewable capacity in the 80% reduction scenario, gas and hydro are needed during low generation periods

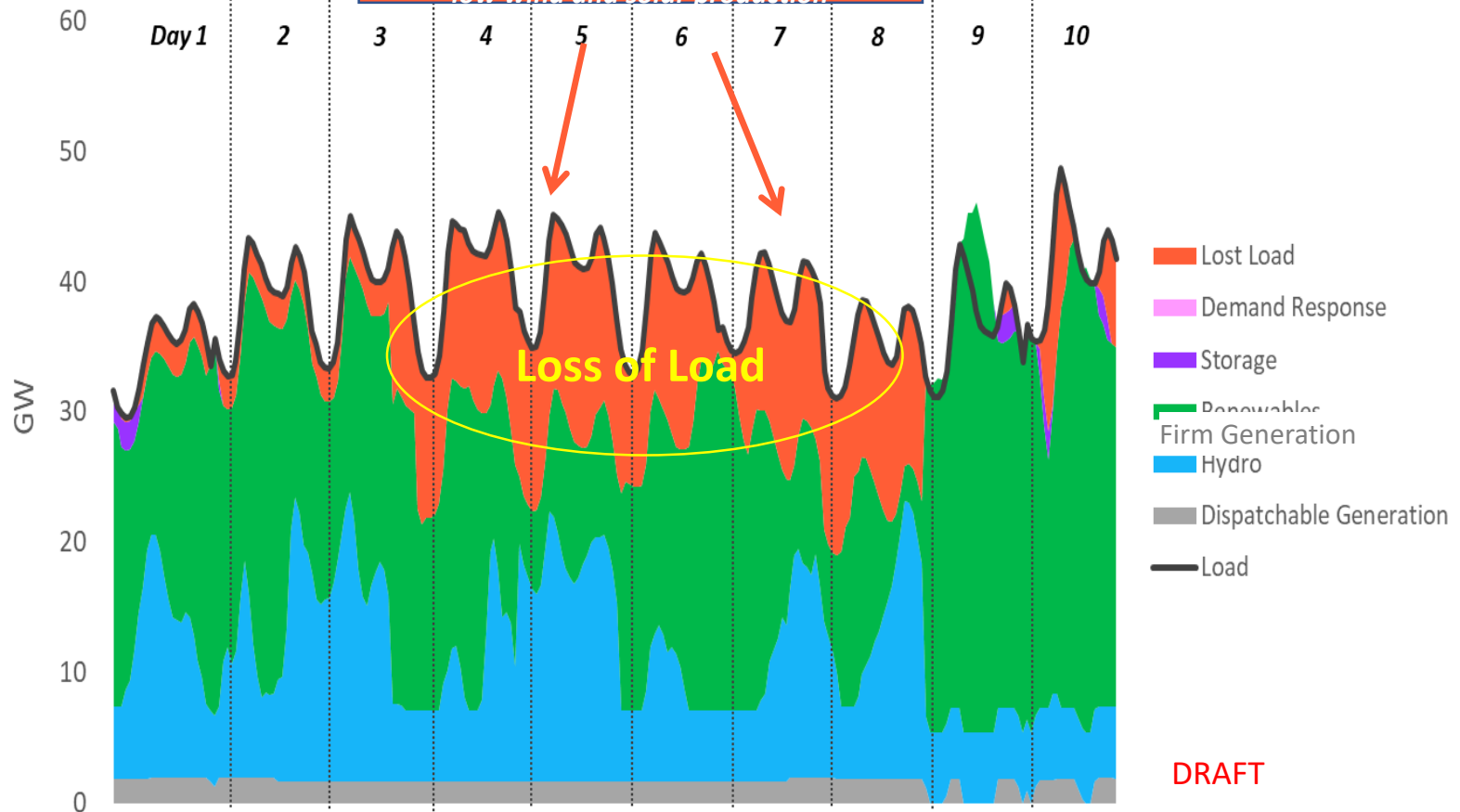


Removing Natural Gas Generation Creates a Capacity Deficit

80% GHG-Free Case No Gas

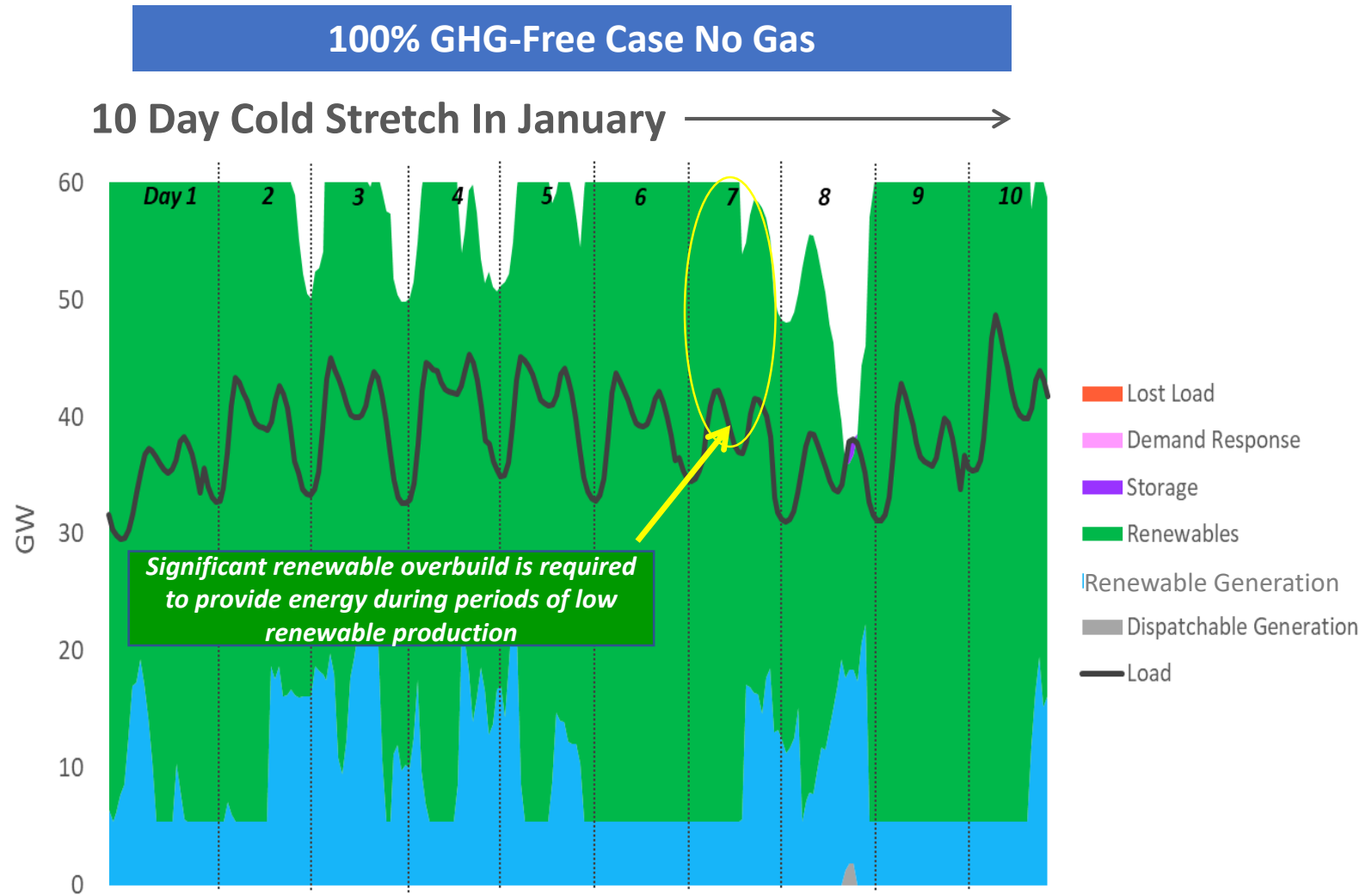
10 Day Cold Stretch In January →

Without gas, the system is capacity deficient during prolonged stretches of low wind and solar production



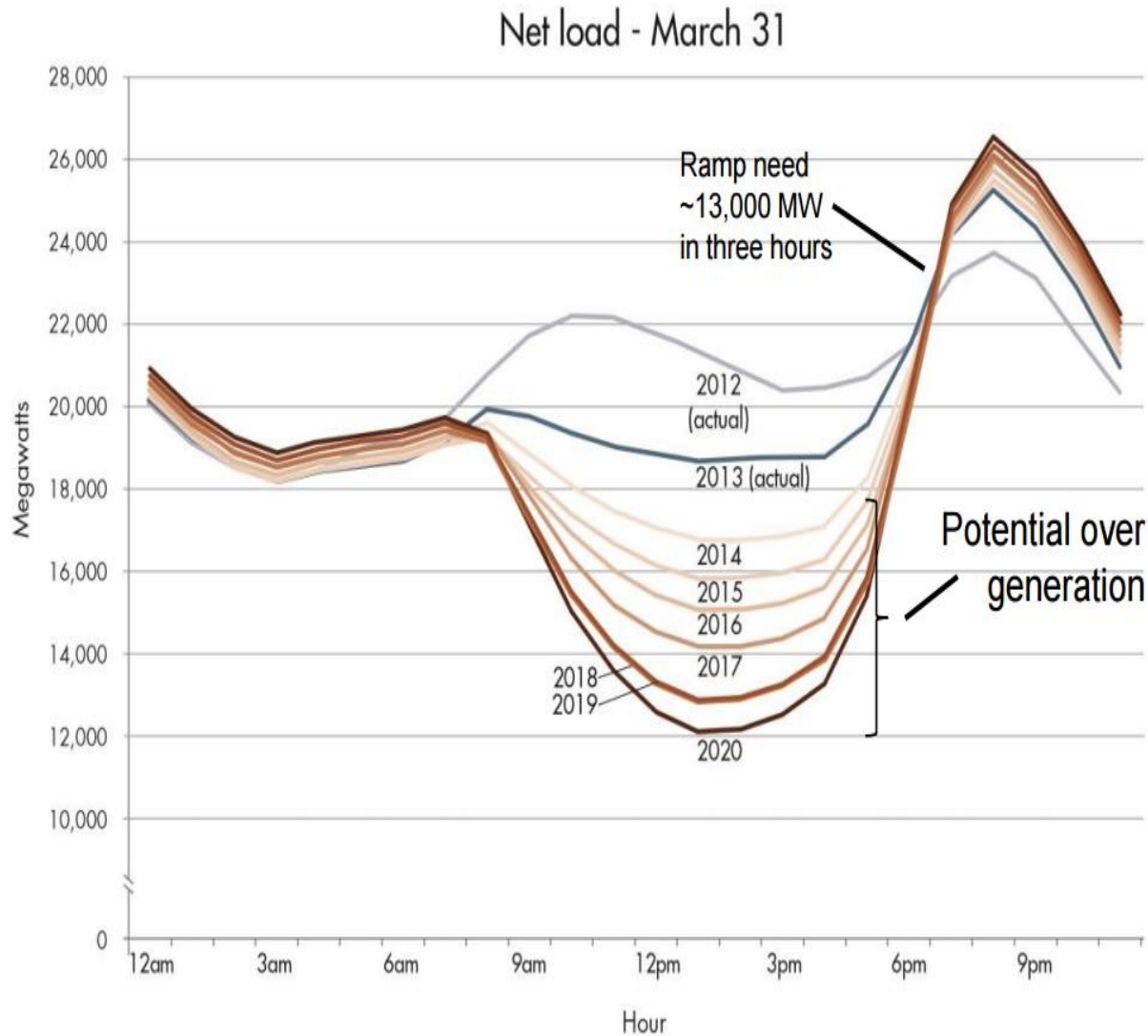
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Mitigating that Capacity Deficit Requires Significant Overbuilding Renewable Resources

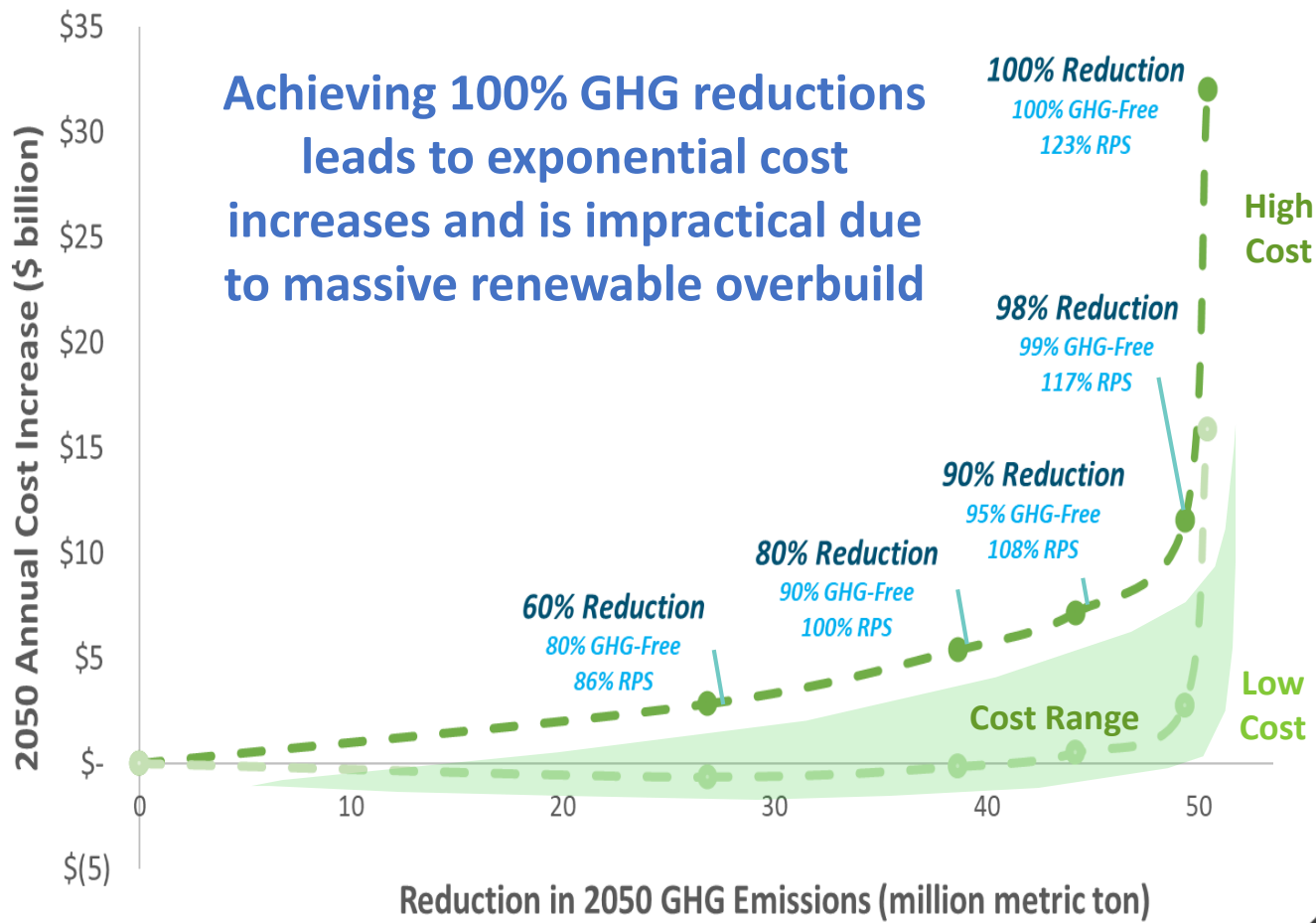


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California is already experiencing the effects of over-build of renewables



Significant GHG Reductions Can be Achieved at Reasonable Cost



Customer Renewable Options

Retail Renewable Energy



GREEN POWER SCH 135, 136

- PNW REC purchases
- 40,000 customers
- Residential, commercial, municipal



SOLAR CHOICE SCH 135

- Solar RECs WA and ID
- 2700 customers
- Residential and small commercial



NET METERING SCH 150

- Up to 100 kW
- Full retail compensation
- ~6,000 customers
- Residential, commercial, municipal, community solar



BULK REC PURCHASES

- Excess PSE wind RECs
- 10,000,000 kWh
- Large business



GREEN DIRECT SCH 139

- Long-term partnership with PSE for dedicated energy resources
- Launched 2017
- Large commercial, municipal



SMALL POWER PRODUCERS SCH 91, 152

- 100 kW – 5 MW
- 15 year pricing based on avoided cost
- Small developers

Questions

