



Energy+Environmental Economics

# The Future of Gas in the West

RIF Panel Discussion

May 5, 2020

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# The West's commitment to climate action has deepened and broadened



Gov. Schwarzenegger:  
AB 32 and the LCFS



(Credit: Rich Pedroncelli / Associated Press)

Gov. Brown signed SB 100,  
economy-wide carbon  
neutrality executive order



(Credit: SAUL LOEB/AFP/Getty Images)

Gov. Newsom enters governorship  
in aftermath of wildfires, no less  
committed to further progress



The Northwest has deepened its  
commitments, Govs. Inslee and Brown  
seeking additional measures

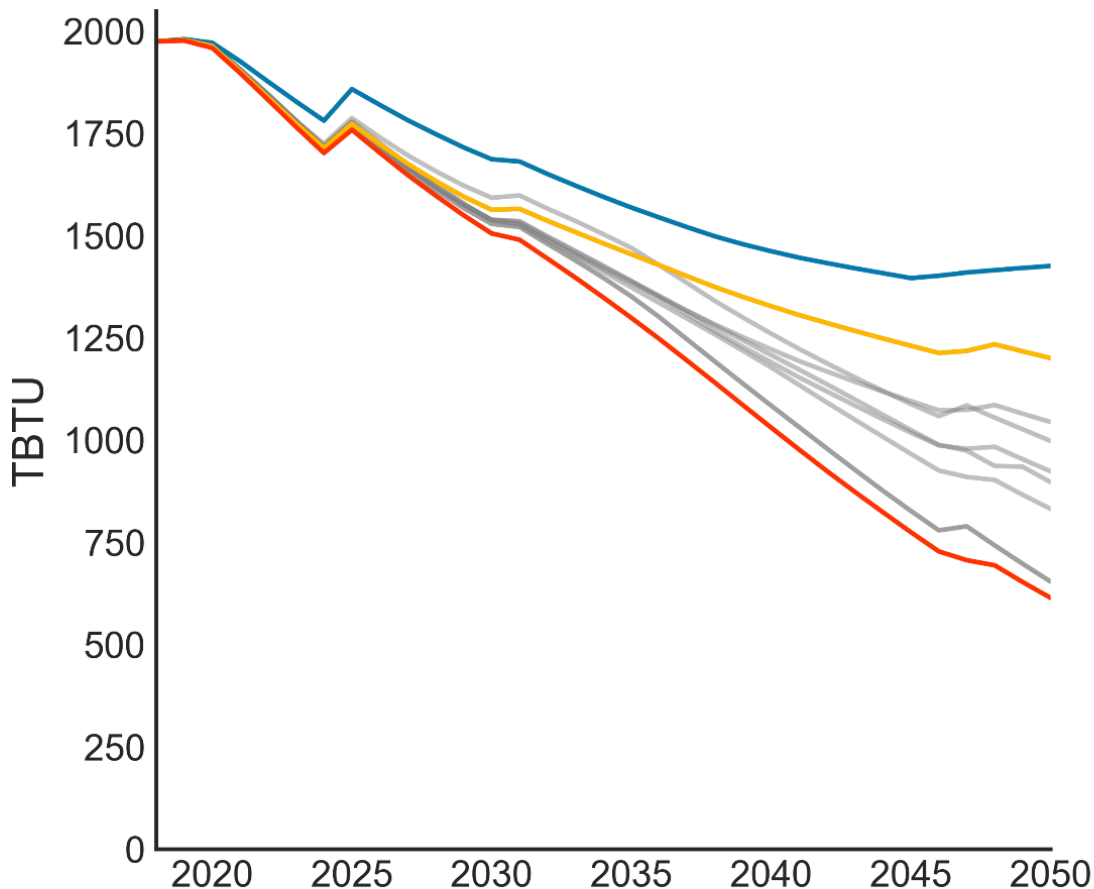


Climate action is accelerating in  
the Mountain region as well, bills  
passed in CO and NM in 2019



# Decarbonization will decrease gas demand in California

## California Natural Gas Demand Scenarios



Gas demand will decrease under **Current Policy** due to SB 100 and energy efficiency

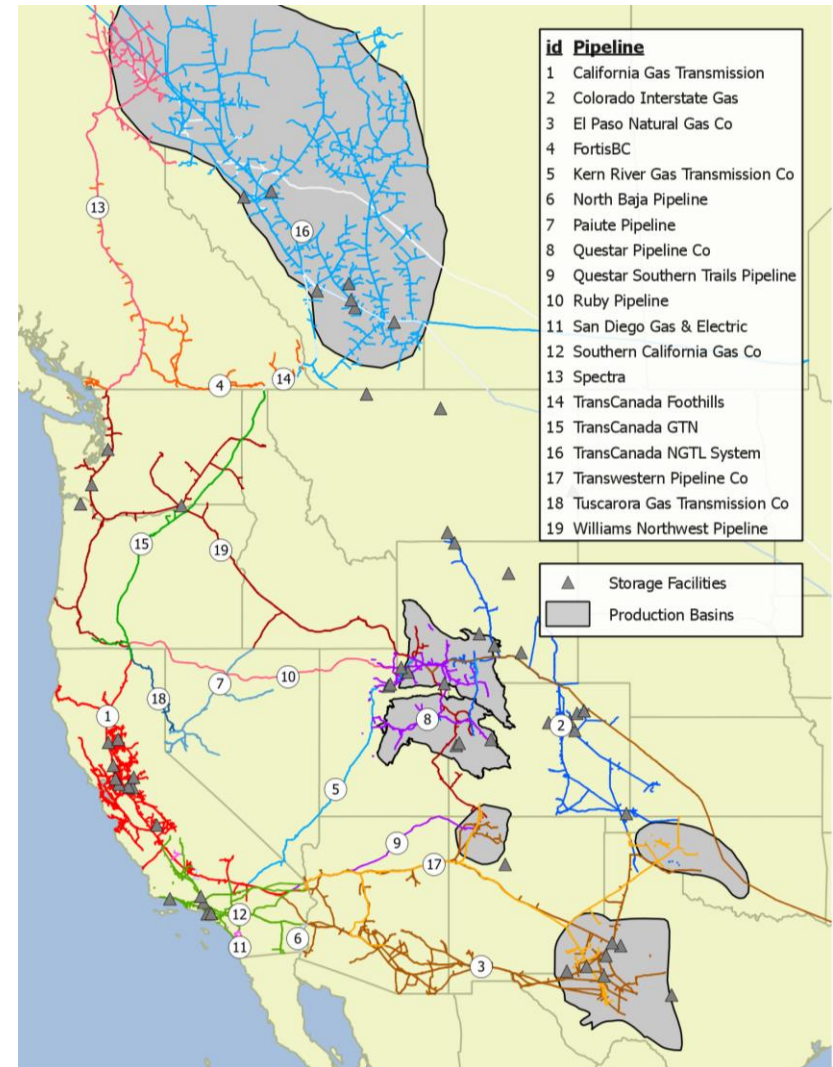
Demands are lower in all “80 by 50” scenarios, due to additional energy efficiency

Gas demand reductions range from 35% in a **Low Electrification Scenario** and 65% in a **High Electrification Scenario**



# But the regional gas system will continue to be important

- + E3 has examined the interface of the Western gas and electricity systems
- + In the 2020s, gas generation is likely to increase as coal and nuclear generation retires
- + Longer-term, gas generation will primarily serve as a capacity resource, providing critical reliability services to high renewables electricity systems
- + However, the reliability of gas generation in the West is contingent on the gas backbone system
- + March 2019 electric price volatility highlighted the impacts of an 'n-2' event on the Western gas system



Pipeline & storage geospatial data obtained from Platts



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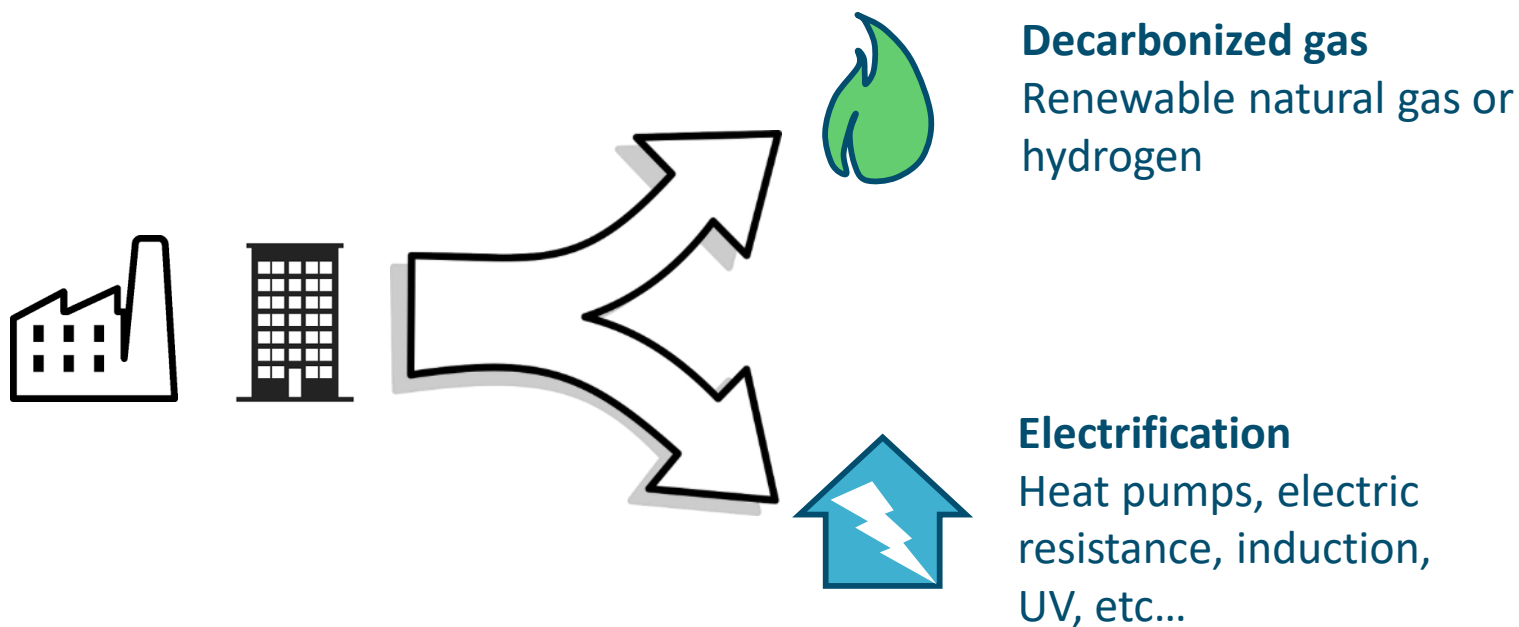






# Long-term tradeoff: electrification vs gas

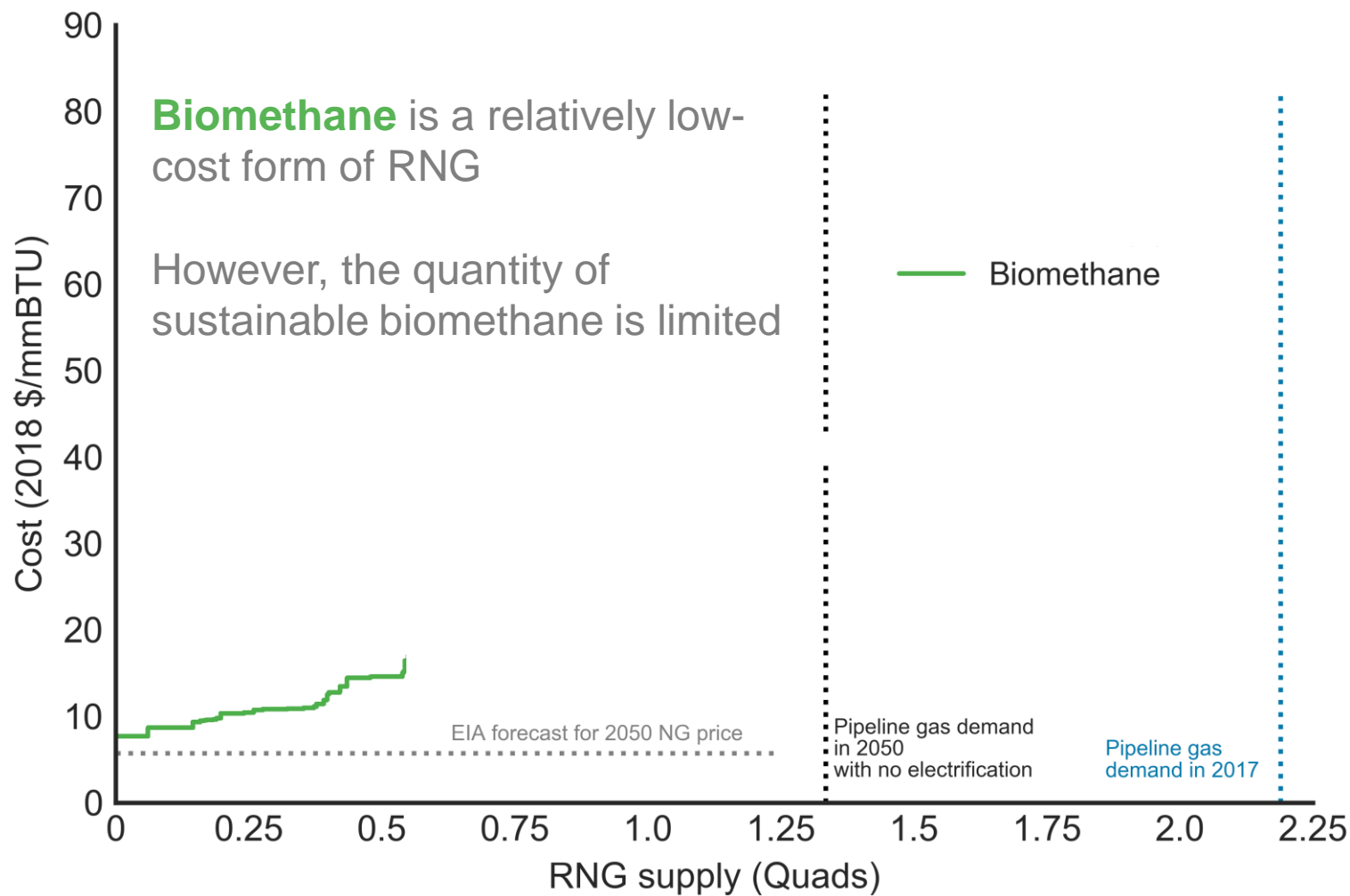
- + All of E3's economy wide decarbonization scenarios include a transformation of direct-use natural gas demand and supply
- + Revenues from direct-use customers pay for the bulk of the investment and operating costs of natural gas systems in the US





# RNG Supply Curve: Biomethane

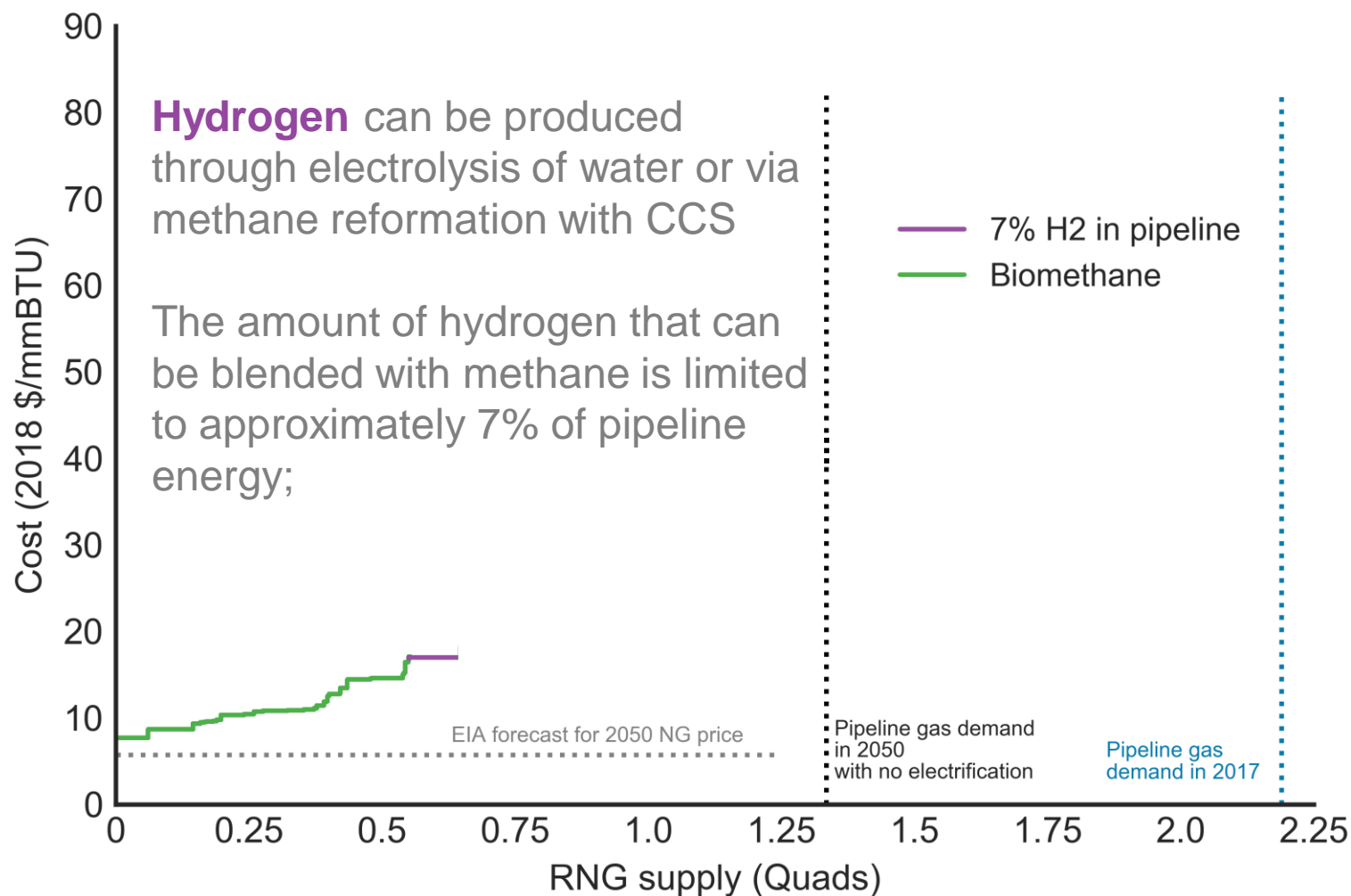
## California Renewable Natural Gas (RNG) Supply Curve, 2050





# RNG Supply Curve: Hydrogen

## California Renewable Natural Gas (RNG) Supply Curve, 2050

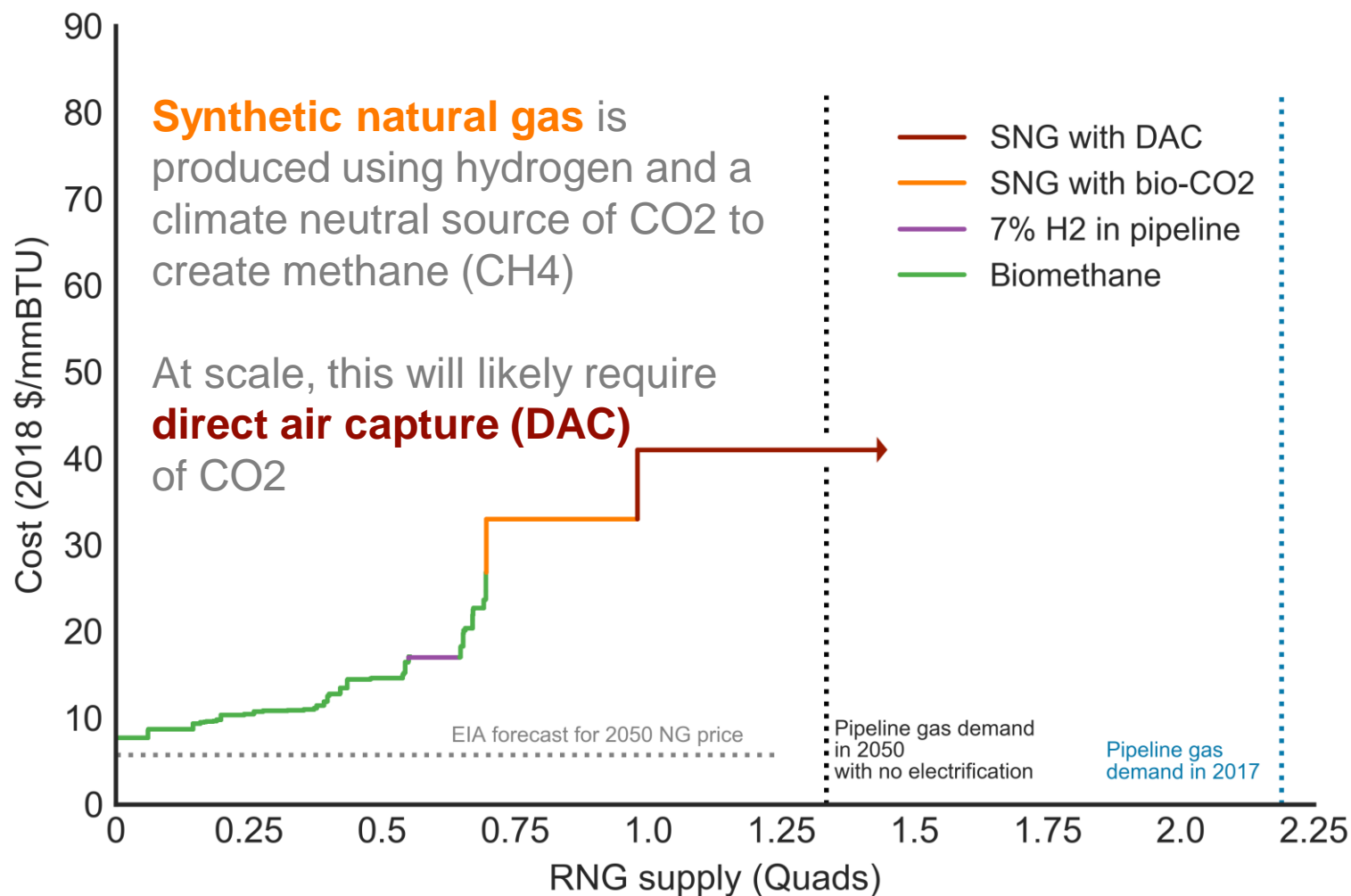






# RNG Supply Curve: SNG

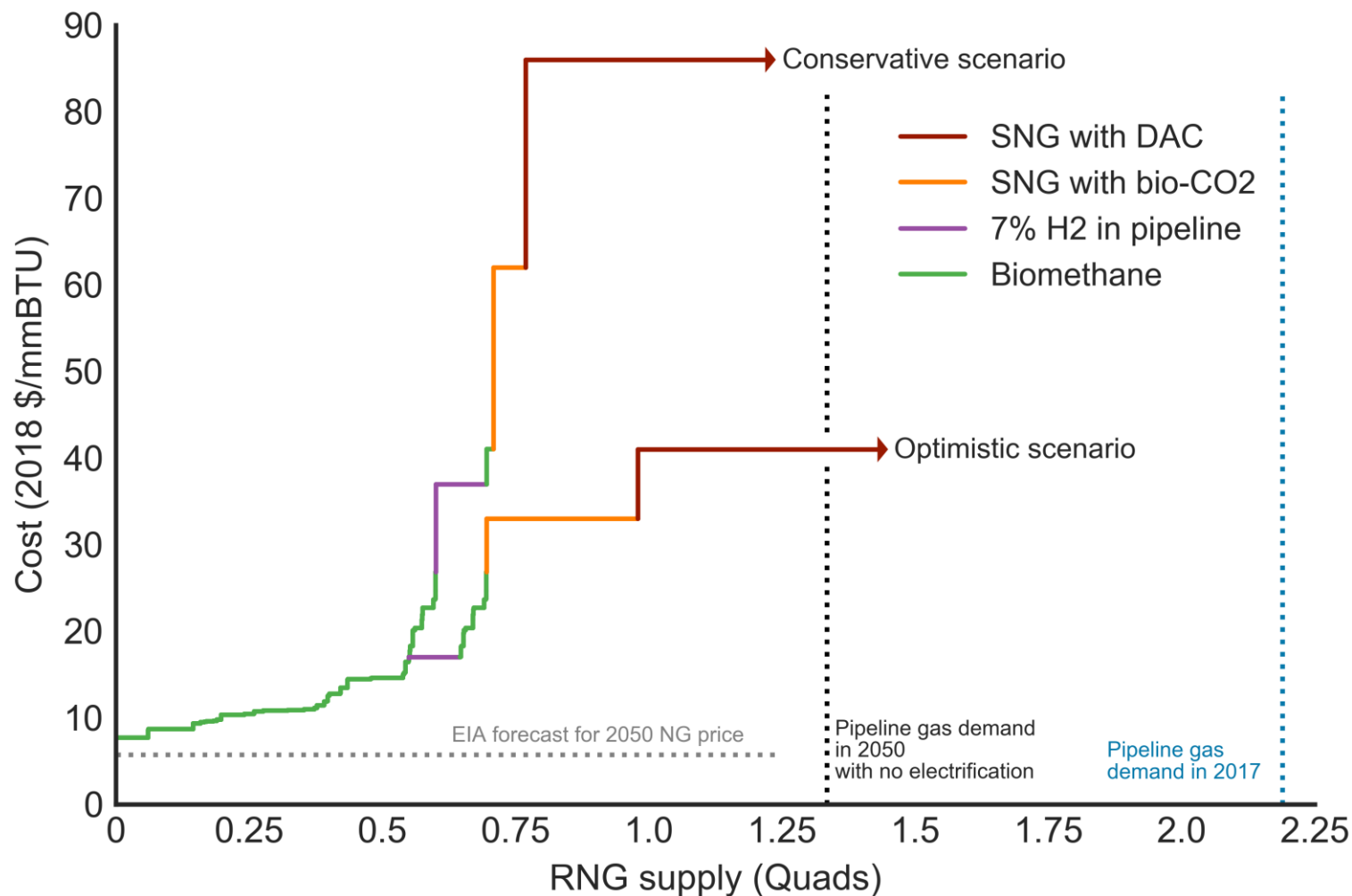
## California Renewable Natural Gas (RNG) Supply Curve, 2050





# The long-run cost of RNG is uncertain because it is not widely commercialized

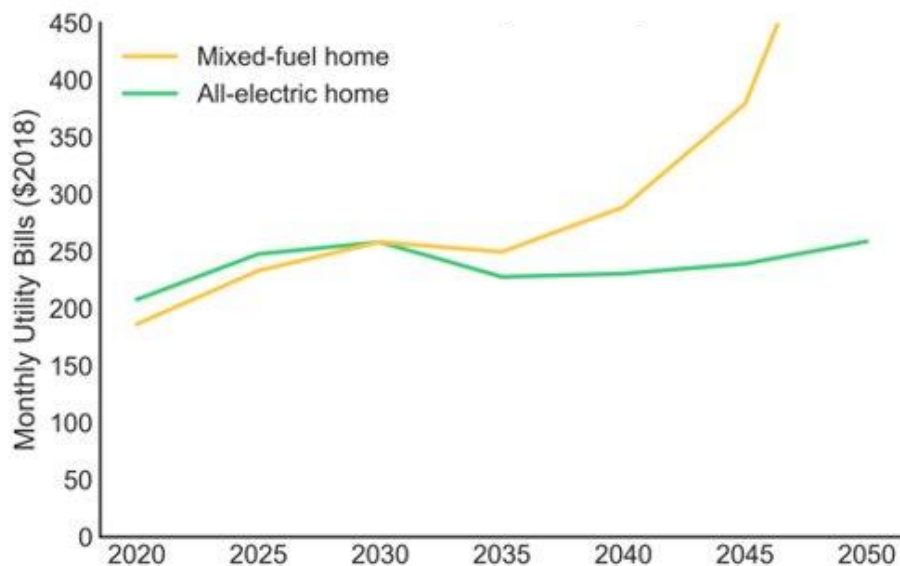
## California Renewable Natural Gas (RNG) Supply Curve, 2050



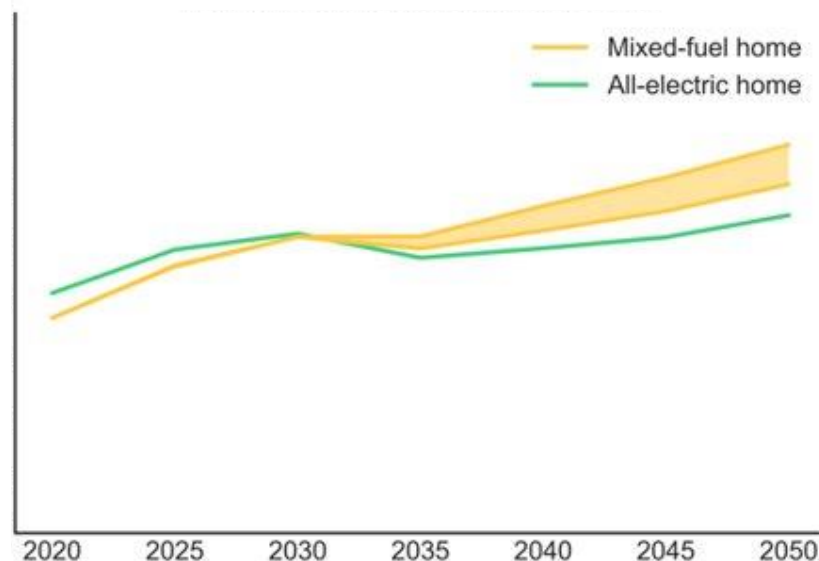


# CA residential customer bill impacts in decarbonization scenarios

## 90% of CA Buildings Electrified



## No Electrification, 50% RNG Blend

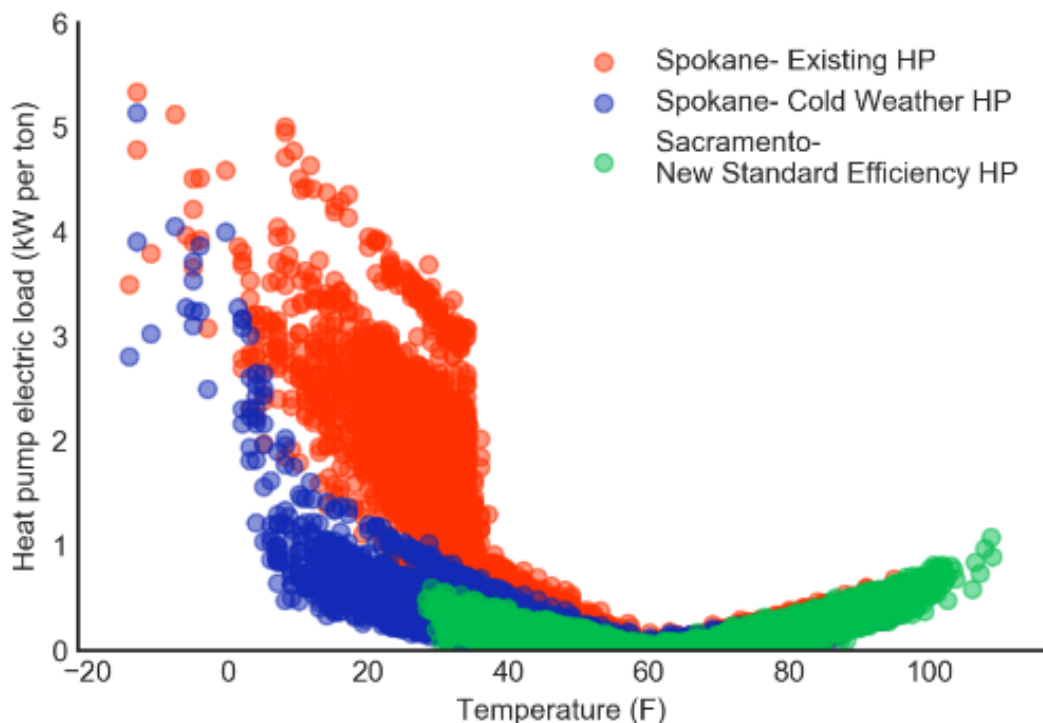


- + Gas bills increase markedly in building electrification scenarios due to distribution system costs being spread over declining customer counts
- + Gas bills increase if there is no electrification due to the cost of RNG
- + Residential customers are incentivized to electrify in both scenarios, this could cause an unstructured transition that results in several negative outcomes (e.g. equity impacts, stranded costs)



# Conclusions from California may not hold elsewhere in the West

## Heat Pump Loads and Outdoor Air Temperatures



**E3 analyzed the electric system impacts of building electrification in the PNW and found that peak loads could increase by between 50% and 100%**

**This made the costs of a scenario with limited RNG use (25% blend) comparable to electrification scenarios**

- + Serving “Peak Heat” in the West will affect the capacity requirements of region’s electricity and gas systems**
- + There are also important deliverability considerations for key load pockets (e.g. West of Cascades, LA Basin) that warrant study**



# Hypotheses about the West's gas system in a decarbonized future

- + Gas throughput in the West will decline if the region is on pace to achieve state climate policy objectives.
- + The regional gas system will nonetheless continue to be valuable given its ability to reliably store and deliver energy. That system can be used to deliver RNG and hydrogen to hard-to-electrify sectors of the economy.
- + In buildings, consumer economics likely favor electrification over RNG. However, in colder climates building electrification may require a large expansion of electric peak capacity.
- + Gas LDCs, their regulators and policy-makers will need to think long-term about the role of the gas distribution system, including potential transition strategies.
- + In warmer climates (e.g.), transition strategies will need to reckon with cost recovery and equity challenges as customer counts decline
- + In colder climates, new roles for gas distribution systems should be explored, including “hybrid electrification”