GRIDWORKS

Gridworks' mission is to convene, educate and empower stakeholders working to decarbonize electricity grids

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CONTRIBUTING GAS SYSTEM STAKEHOLDERS

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PROBLEM STATEMENT

Given that gas delivery system throughput is likely to decline over time as part of meeting California's GHG reduction goals at the lowest cost, how can the transition be designed and managed to avoid or at least mitigate any adverse impacts on:

a. Rates and the affordability of gas service for the remaining gas customers;
b. The gas workforce;
c. Public and worker safety and gas system reliability;
d. Low-income and disadvantaged communities; and
e. The broader state economy.

And, when should actions to avoid or mitigate adverse impacts be undertaken?

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THE CHALLENGE

From a societal perspective, the least expensive path to achieving GHG goals...

SCENARIO	ACHIEVES 2030 AND 2050 GHG REDUCTION GOALS	ELECTRIC HEAT PUMP TECHNOLOGY IN BUILDINGS	RENEWABLE GAS USE	TRANSPORTATION ELECTRIFICATION	2050 ANNUAL INCREMENTAL SOCIETAL COST RELATIVE TO REFERENCE SCENARIO	PG&E 2050 AVERAGE RESIDENTIAL GAS RATE PER THERM (2018 $)
Current Policy Reference Scenario[41]	NO	limited	limited	5M vehicles by 2030	N/A	$3
High Building Electrification (no transition strategy)	YES	50% of sales by 2030, 100% by 2040	Biomethane and liquid biofuels primarily serve industry and compressed gas trucks	High electrification of Light Duty Vehicles (LDV)	+$13B	$19
Slower Building Electrification	YES	20% of sales by 2030, 68% by 2050	All available biomethane and hydrogen blend	LDV plus medium- and heavy-duty trucks	+$18B	$5.70
No Building Electrification	YES	none	All biomethane, hydrogen blend, synthetic gas, and 56% fossil blend in pipeline	LDV and more zero emission trucks	Ranges from +$19B to +$32B depending on Renewable Gas cost assumed	$5.50

Source: E3

... is the most expensive path from a gas ratepayer perspective.

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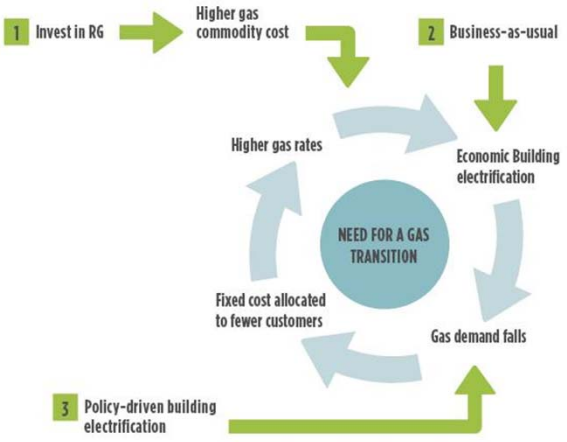
THE CHALLENGE

Gas transition strategy needed for all scenarios, including:

- *Investing in Renewable Gas*
- *Accelerating Electrification*
- *Business as Usual*

FIGURE 2. *Spiraling From Increasing Gas Rates to Economic Electrification.*
Source: E3



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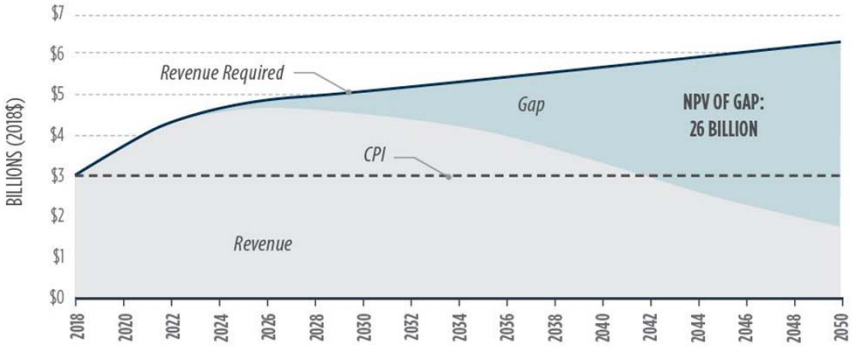
THE CHALLENGE

FIGURE 5. *Net Present Value of Revenue Gap Between Reference and High Electrification Scenarios with No Gas Transition*
Source: E3



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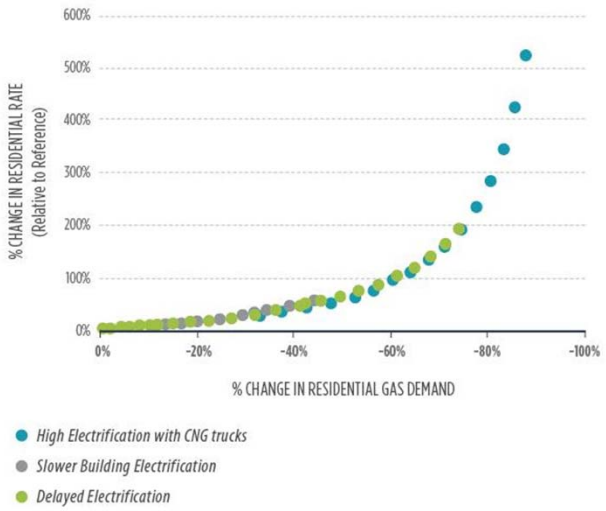
THE CHALLENGE

If demand falls 40% residential rates start to increase rapidly

Rate change impacts not significantly different for high-, slower-, or delayed-electrification

FIGURE 4. *Impacts of Decline in Gas Demand on Rates*
Source: E3



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RECOMMENDATIONS

1. Initiate interagency, **integrated long-term planning** for gas demand, infrastructure, and the transition of the delivery system.
2. Consider requiring **all new residential and commercial construction to be all-electric**.
3. Identify **alternatives to significant new investments** in the gas delivery system.
4. Anticipate and organize a **just transition for the gas delivery system workforce**.
5. Develop a comprehensive strategy to **ensure low-income and disadvantaged communities are empowered.**
6. Clarify that a gas utility's **"obligation to serve" could be met with alternative fuels**.
7. Consider **aligning financial recovery** of new gas infrastructure investments with the time horizons determined in the integrated long-term gas infrastructure plan.
8. Consider **ratemaking adjustments** to cushion the impact of the transition on customers.
9. Explore **external funding** sources to recover gas transition costs from sources beyond gas utility customers.

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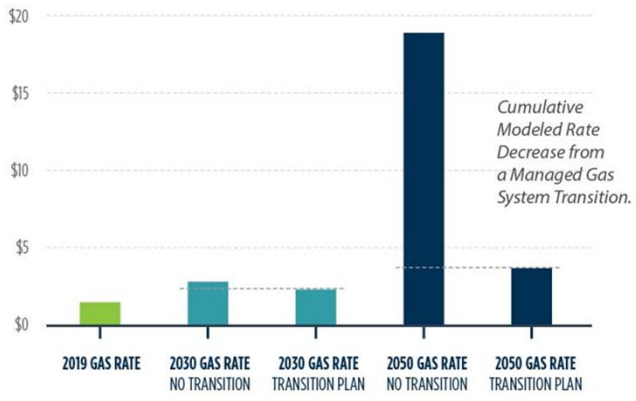
FIGURE ES1. *2050 Gas Rate Reductions Resulting from Proposed Solutions*

Source: E3



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CALIFORNIA'S GAS SYSTEM
IN TRANSITION
EQUITABLE, AFFORDABLE,
DECARBONIZED AND SMALLER
GRIDWORKS