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PG&E'S SECURITIZATION 2020

Chapter 11 …… Rebuttal Regarding Load Growth (Janice Berman)

PACIFIC GAS AND ELECTRIC COMPANY

CHAPTER 11

REBUTTAL REGARDING LOAD GROWTH

WITNESS: JANICE BERMAN

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A. Introduction

Mark Ellis, testifying for The Utility Reform Network (TURN), states that he developed an alternative forecast of PG&E's future income "based on the '2019-2030 Baseline Forecast – Mid Demand Case' electric and gas forecasts for PG&E developed for the 2020 Integrated Energy Policy Report Update (weighted average of 0.15%), market-based inflation expectations (1.86%), and modest efficiency gains of -0.16% per year (i.e., profit per kWh increases slightly less than inflation), for a net growth rate of 1.86%/year."[1] The purpose of my testimony is to address the first of these three inputs – the demand for electricity and gas, *i.e.* load growth. The load forecasts provided by TURN in discovery and incorporated into TURN's work papers refer to the California Energy Demand load forecasts adopted by the California Energy Commission (CEC) in connection with the 2019 Integrated Energy Policy Report (IEPR) (the CEC 2019 Forecasts).

TURN cites the CEC 2019 Forecasts to calculate a compound annual growth rate (CAGR) of 0.24 percent for electric load growth and -0.22 percent for gas demand load growth over the 2020 to 2030 period. TURN combines electric and gas load growth into a single figure referred to as a "weighted average of 0.15%" by multiplying the electric load CAGR by 82 percent and the gas load CAGR by 18 percent.

TURN uses that weighted average figure (0.15 percent) as one of three inputs for the growth rate for PG&E's earnings before interest and taxes (EBIT) for the entire period between 2025 and 2050.[2] TURN also uses the assumed

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1 TURN-Ellis, p. 8, lines 8-12 (footnotes omitted). On the afternoon of November 10, 2020, the day before this testimony was due, TURN served revised testimony and workpapers from Mr. Ellis. This testimony is being revised to reflect the changes in that revised testimony.

2 The erroneous assumptions underlying TURN's use of the two other inputs are addressed in PG&E's Rebuttal Testimony, Chapter 6, Customer Credit Trust Mechanism and Investment Returns – Rebuttal (D. Thomason; G. Allen).

CAGR for electric only (.24 percent) through 2050 to argue that PG&E's taxable income forecast is not plausible because of potential future rate impacts.[3]

TURN's reliance on the CEC 2019 Forecasts to support an assumption of nearly zero load growth through 2050 is not reasonable. As described below, there is good reason to anticipate significant electric load growth beyond 2030 as efforts continue to ramp up to meet California's ambitious greenhouse gas (GHG) reduction targets. To the extent that TURN underestimates future load growth, its analysis of the potential implications of load growth for future electricity rates is not accurate.

B. TURN's Assumption of Nearly Zero Load Growth Through 2050 Is Not Reasonable. [Issue 4]

1. The CEC 2019 Forecasts Do Not Address Load Growth Beyond 2030.

As an initial matter, the CEC Forecasts are used by the CEC, the Commission and the California Independent System Operator (CAISO) to inform energy planning and procurement decisions, and policy development. They are not intended for use in evaluating future earnings of utilities. In any event, the CEC 2019 Forecasts reflect anticipated electric and gas load through 2030. They do not forecast load beyond 2030 and cannot reasonably be assumed to reflect longer-term growth rate assumptions. Notably, the CEC has not used the CEC 2019 Forecasts to predict load from 2031 through 2045 in its modeling for the Joint Agency Report that will be issued to the Legislature by January 1, 2021 pursuant to Senate Bill (SB) 100.[4] The CEC 2019 Forecasts do not support TURN's assumption that there will be only a 0.24 percent CAGR for electric load between 2030 and 2050.

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[3] TURN-Ellis, pp. 5-6.

[4] *See* CEC, *Inputs & Assumptions: CEC SB100 Joint Agency Report* (June 2020), p. 7 (Inputs & Assumptions) (explaining that "[t]he CEC's 2018 Deep Decarbonization in a High Renewable Future report, as well as the CPUC [Integrated Pro] PATHWAYS modeling, are [] used to provide long-term forecasts out to 2045"), available at https://efiling.energy.ca.gov/getdocument.aspx?tn=234532. SB 100 established a target of 100 percent carbon-free electricity in California by 2045. The CEC, the Commission, and the California Air Resources Board (CARB) will shortly submit a joint report to the Legislature evaluating the 100 percent zero-carbon electricity policy.

2. California's Policies Support Electric Load Growth Over the Long Term.

California has a strong policy of reducing GHG emissions, as evidenced by Assembly Bill (AB) 32 (2006) and SB 32 (2016). AB 32 established an economy-wide GHG emissions reduction target of 1990 emission levels by 2020, and SB 32 established a target of 40 percent below 1990 emission levels by 2030. An Executive Order signed in 2005 specified a goal to reduce emissions to 80 percent below 1990 emission levels by 2050.[5] This was followed in 2018 by an even more aggressive Executive Order setting the objective for the State to be carbon neutral by 2045.[6]

To achieve these ambitious GHG emission reductions, the State has adopted policies that are anticipated to increase electric load over the longer term. For example, SB 350 (2015) seeks to accelerate widespread transportation electrification. AB 3232 (2018) directs the CEC to assess the feasibility of reducing GHG emissions in residential and commercial buildings to 40 percent below 1990 levels by 2030. And, just weeks ago, the Governor signed an Executive Order setting as goals "that 100 percent of in-state sales of new passenger cars and trucks will be zero emission by 2035" and that "100 percent of medium- and heavy-duty vehicles in the State be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks."[7]

The State's policies are rapidly and significantly impacting the State's energy system. As recognized by the CEC, "[t]he decarbonization of California's economy will drive significant new load onto the electric grid, primarily from electric vehicles and substitution of compressor-driven heating systems in place of direct combustion. New loads will drive the addition of clean, renewable energy generation resources well beyond what

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5 Executive Order S-03-05 (June 1, 2005).

6 Executive Order B-55-18 (Sept. 10, 2018).

7 Executive Order N-79-20 (Sept. 23, 2020).

would be required for simple replacement of retiring, end-of-life fossil generation."[8] The studies described below illustrate this trend.

3. Studies Project Significant Electric Load Growth Over the Long Term as a Result of Electrification.

Transportation electrification and building electrification are key pathways to achieving the State's GHG emission reduction targets. The CEC recognizes these as rapidly developing areas that will impact electric demand in the future. Although the CEC has indicated that certain electrification scenarios being explored are too uncertain to build into official forecasts today, there is good reason to expect significant electric load growth in the coming years as a result of electrification.

For example, the growing number of electric vehicles in the State will continue to increase electric load growth. The recent Executive Order setting ambitious goals for zero-emission vehicles can be expected to accelerate this trend. CEC modeling and studies commissioned by the CEC and others project significant growth in electric demand between 2030 and 2050 as a result of increased electrification.

a. CEC Modeling for SB 100 Joint Agency Report

The CEC recently presented long-term electric forecast inputs for the modeling for the Joint Agency Report that will be issued to the Legislature by January 1, 2021 pursuant to SB 100.[9] The forecasts for California's electric load go out to 2045 and include a Reference forecast, as well as forecasts for High Biofuels, High Electrification, and High Hydrogen scenarios. The modeling starts with the 2019 CEC Forecasts to determine a baseline consumption forecast, and then develops electric load forecasts through 2045 for each of the specified scenarios.[10]

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8 CEC Final Staff Report, *2019 California Energy Efficiency Action Plan* (Nov. 2019), p. 19, available at https://ww2.energy.ca.gov/business_meetings/2019_packets/2019-12-11/Item_06_2019%20California%20Energy%20Efficiency%20Action%20Plan%20(19-IEPR-06).pdf.

9 Inputs & Assumptions, pp. 11-13.

10 *Id.*, at p. 7.

Table 11-1 reflects the total electric load from 2027 through 2045 for each of the scenarios as set forth in Tables 9 through 12 in the CEC's presentation "Inputs & Assumptions: CEC SB100 Joint Agency Report," as well as PG&E's CAGR calculation for each scenario. Each forecast projects significantly increasing electric load from 2030 through 2045 as a result of electric vehicles, other transport electrification, and building electrification.

TABLE 11-1
LOAD FORECASTS USED BY CEC IN MODELING FOR SB 100
JOINT AGENCY REPORT (GWH)

Scenario	2027	2030	2035	2040	2045	CAGR
Reference	296,004	303,560	323,629	348,542	374,988	1.32%
High Biofuels	298,000	313,810	349,679	390,656	429,010	2.05%
High Electrification	297,970	314,232	354,547	399,828	440,352	2.19%
High Hydrogen	299,364	317,949	372,913	463,962	535,511	3.28%

In all of the scenarios studied, including the reference scenario, the resulting CAGRs from 2027 to 2045 far exceed the 0.24 percent assumed by TURN. It is worth noting that building electrification accounts for less than half of the overall increase in load growth forecast; load increases resulting from electric vehicles, other transport electrification, and (in one scenario) hydrogen production, combined, are a more significant source of future electric load growth.[11]

b. CEC PATHWAYS Study

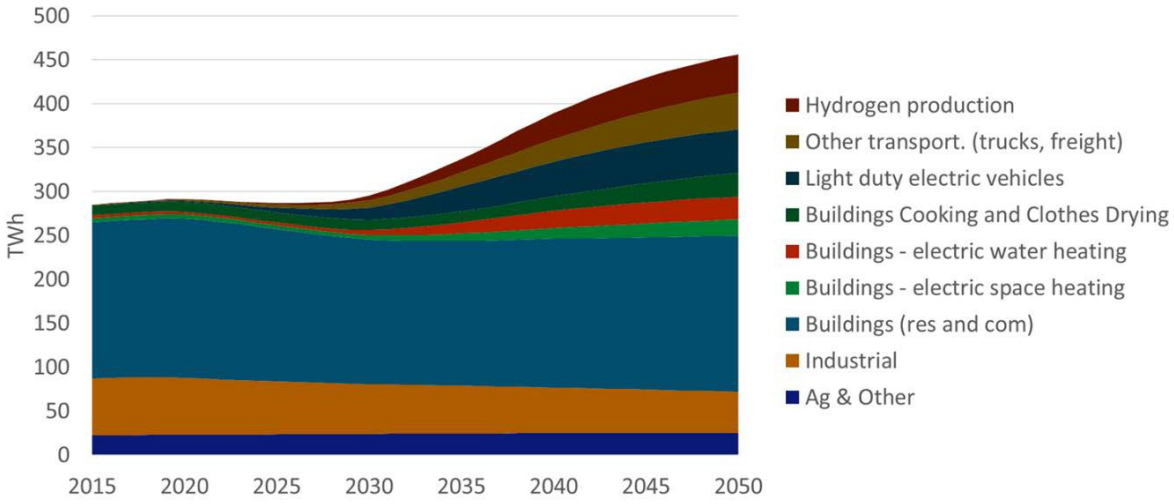
In a study commissioned by the CEC's Energy Research and Development Division to evaluate long-term energy scenarios through 2050 using the PATHWAYS model, the "High Electrification" scenario was found to be one of the lower-cost and lower-risk mitigation scenarios to achieve the State's GHG reduction targets. The study

11 *See id.,* at pp. 11-13, Tables 9-12.

noted, "[e]nergy efficiency savings could largely offset the increase of new electrification loads in the 2030 timeframe, but by 2050, electrification loads are expected to increase California's electricity demand by approximately 60% (Figure 13 [11-1 below]). This means that the electricity sector will be providing the majority of the energy in the state, displacing fossil fuel use as the state's largest source of energy today."[12]

Figure 11-1 (replicating Figure 13 included in CEC's study) demonstrates the fallacy of projecting electric load from 2030 to 2050 based on load growth from 2020 to 2030. While electric load growth remains fairly flat from 2020 to 2030, growth rises dramatically from 2030 to 2050. The figure also shows the relative impact of the transportation sector in driving future load growth.

FIGURE 11-1
ELECTRICITY DEMAND BY SECTOR IN THE HIGH ELECTRIFICATION SCENARIO



Source: E3, CEC Energy Research and Development Division, Final Project Report, *Deep Decarbonization in a High Renewables Future, Updated Results from the California PATHWAYS Model* (June 2018)

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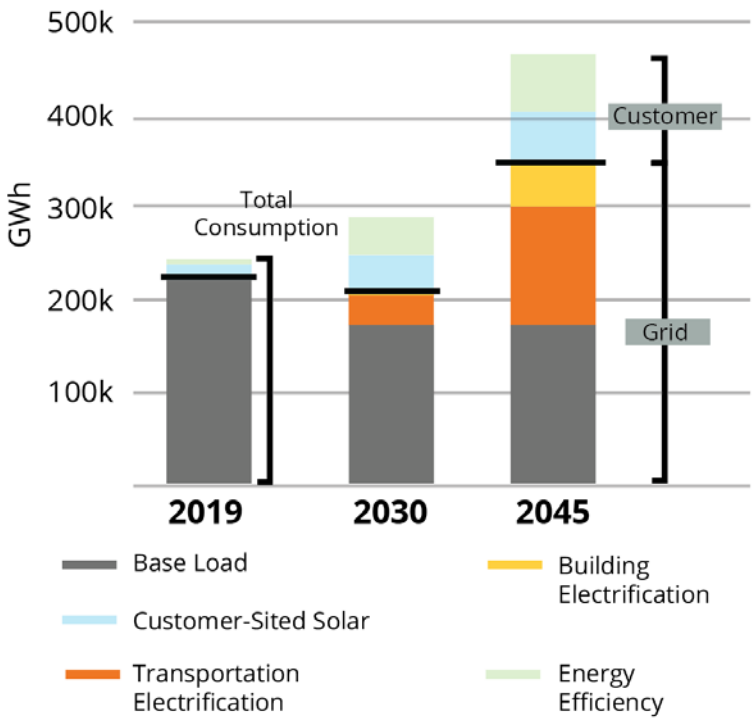
12 CEC Energy Research and Development Division Final Project Report, *Deep Decarbonization in a High Renewables Future, Updated Results from the California PATHWAYS Model* (June 2018), p. 37, Figure 13, available at https://ww2.energy.ca.gov/2018publications/CEC-500-2018-012/CEC-500-2018-012.pdf.

c. Southern California Edison Study

A study by Southern California Edison (SCE) using the PATHWAYS model concluded, "[s]hifting energy demand from more carbon-intensive sectors to electricity will significantly increase electricity demand. By 2045, a greater reliance on electricity, combined with population and economic growth, will result in a 60% increase in grid-served electricity consumption (Figure 5 [11-2 below]) and a 40% increase in peak load. This load growth is a considerable departure from the past two decades of relatively flat demand."[13]

Figure 11-2 (replicating Figure 5 included in SCE's report) projects significant growth in electric demand between 2030 and 2045. Like the CEC Pathways study, the SCE analysis found that electric load growth accelerates post 2030.

FIGURE 11-2
INCREASED DEMAND IS MET THROUGH GRID AND CUSTOMER-SITED (DISTRIBUTED) RESOURCES



Source: SCE, *Pathway 2045, Update to the Clean Power and Electrification Pathway* (Nov. 2019)

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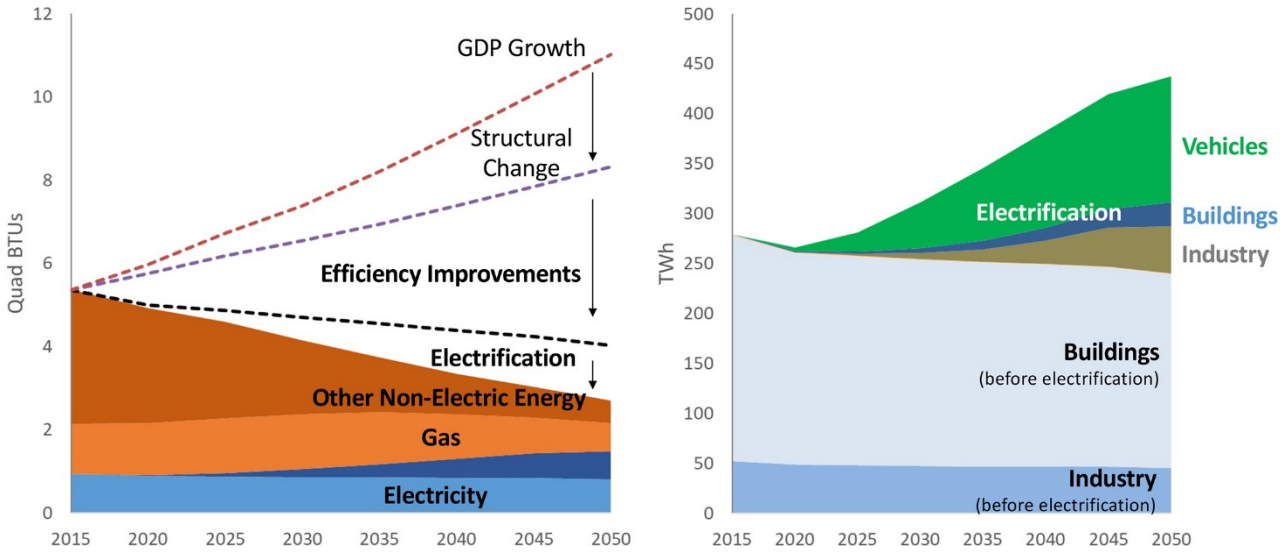
13 SCE, *Pathway 2045, Update to the Clean Power and Electrification Pathway* (Nov. 2019), p. 5, Figure 5, available at www.edison.com/pathway2045.

d. Electric Power Research Institute Study

A study by the Electric Power Research Institute (EPRI) to evaluate the impacts of electrification on the energy system and air quality concluded, "[e]lectrification can lower energy system costs, emissions, and final energy (Figure 3 [11-3 below], left panel). Economy-wide climate policies like those in California further amplify electrification trends and, despite countervailing energy efficiency effects, lead to growing load, especially for transportation and industry (Figure 11-3 [11-3 below], right panel). The electric share of final energy in California reaches 55% by 2050 (increasing from 18% in 2015)."[14]

Figure 11-3 (replicating Figure 3 included in EPRI's study) projects significant increased electric demand between 2030 and 2050 as a result of electrification. As set forth in the study, "[l]oad growth is led by the transport sector, especially passenger vehicles."[15]

FIGURE 11-3
CALIFORNIA FINAL ENERGY DEMAND BY FUEL (LEFT PANEL) AND ELECTRICITY DEMAND BY SECTOR (RIGHT PANEL).



Source: EPRI, *Efficient Electrification in California: Assessment of Energy System and Air Quality Impacts* (May 21, 2020)

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14 EPRI, *Efficient Electrification in California: Assessment of Energy System and Air Quality Impacts* (May 21, 2020), at p. 4, Figure 3, available with free registration at https://www.epri.com/research/products/3002019494.

15 *Id.*

These studies contradict TURN's assumption of nearly zero load growth through 2050 and show there is good reason to expect significant electric load growth beyond 2030.