

PG&E HEARING EXHIBIT PGE-52

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PG&E'S SECURITIZATION 2020

Prepared Testimony of Mark Ellis on behalf of The Utility Reform Network
(Revised Oct. 20, 2020)



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**PREPARED TESTIMONY OF
MARK ELLIS**

PUBLIC VERSION

**ADDRESSING RATEPAYER-NEUTRALITY ISSUES RELATING TO
THE PROPOSAL BY PACIFIC GAS AND ELECTRIC COMPANY
TO SECURITIZE \$7.5 BILLION OF WILDFIRE LIABILITIES**

Submitted on Behalf of

THE UTILITY REFORM NETWORK

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1 **I. Summary of Findings and Recommendations**

2 PG&E’s proposed securitization does not satisfy the standard of being “neutral, on
3 average, to the ratepayers of the electrical corporation” and is therefore a very bad deal for
4 customers.¹ TURN reaches this conclusion on two main grounds:

- 5
- 6 • The Customer Credit Trust is significantly underfunded. The value of the assets
7 PG&E has pledged to the Trust is scarcely one-half of the value of the Recovery
8 Bonds customers are being asked to guarantee.
 - 9
 - 10 • Consequently, the Trust is far riskier, in terms of the probability of fully funding
11 the Customer Credit in each billing period over the life of the securitization, than
12 PG&E’s analysis suggests.
- 13

14 The valuation gap and risk become clear after properly accounting for the uncertainty in
15 PG&E’s Additional Shareholder Contributions and for more realistic expected returns on the
16 Trust’s investments. PG&E’s income growth forecast, which determines the timing of the
17 Additional Shareholder Contributions, is implausibly high, implying rate base growth that would
18 result in electricity rates nearly four times the national average by the end of the Trust’s life. It is
19 also far more uncertain than the smooth forecast assumed by PG&E, due to both the normal
20 variability of utility income and PG&E’s three-decade track record of periodic income shocks.
21 PG&E’s assumptions for the Customer Credit Trust’s returns are similarly overly optimistic –
22 120 basis points (22%) higher than the median forecast of over twenty reputable investment
23 management firms.

24 Adjusting PG&E’s analysis accordingly reveals the proposed Customer Credit Trust
25 would be underfunded by \$4.10 billion, resulting in a 44% probability of being unable to fully
26 fund the Customer Credit over its entire life.

¹ California Public Utilities Code §3292(b)(1)(D).

1 TURN concludes that the cost and risk to customers of PG&E’s proposal are
2 unacceptably high and therefore recommends the CPUC reject it. Should the Commission
3 nonetheless consider approving the application, TURN has identified several potential remedies
4 that, singly or in combination, can close the valuation gap and reduce the risk to customers,
5 including increasing the Initial and Additional Shareholder Contributions, eliminating several
6 asymmetric (to customers) Trust provisions, and/or by changing the Surplus Sharing mechanism.

7 These findings and recommendations are discussed in detail in the following sections.

8

1 **II. Value of Shareholder Contributions falls far short of the value of the Recovery**
2 **Bonds**

3 The most straightforward way to assess whether PG&E’s proposed securitization is
4 “neutral, on average, to the ratepayers” is to compare the value of Recovery Bonds (the liability
5 customers are assuming) to the value of the Shareholder Contributions pledged to reimburse
6 them. TURN uses the discounted cash flow method to estimate their respective present values,
7 which entails (1) determining the appropriate discount rate (the cost of capital) and applying it to
8 a (2) cash flow forecast for each asset.²

9 *The present-value cost to customers of the Recovery Bonds is higher than their nominal*
10 *\$7.5-billion value.* Ordinarily, the present-value cost of a loan is simply equated to its nominal
11 value. Implicit in this valuation is the assumption that the payer of interest retains the full benefit
12 of the interest tax deduction and resulting lower effective interest cost, as is done when using the
13 after-tax interest rate when calculating a company’s weight average cost of capital (WACC).

14 But PG&E proposes to deduct the Recovery Bond interest from its corporate taxable
15 income, claiming the interest tax benefit for shareholders without the corresponding interest
16 expense which is borne by customers through the Fixed Recovery Charge (FRC). This benefit,
17 which PG&E would not be able to claim without the Securitization, comes straight out of the
18 pockets of customers in the form of a higher effective (pre-tax) interest rate, 2.92%, instead of
19 their true, after-tax, cost of capital, 2.10%.³ Discounting the additional cost of the foregone
20 interest tax shield at the after-tax interest rate increases the present-value cost of the Bonds to
21 customers by \$0.85 billion, to \$8.35 billion.⁴

22 *Additional Shareholder Contributions are riskier and will come later than PG&E’s*
23 *analysis suggests.* The nominal \$7.59 billion of Additional Shareholder Contributions arise from

² While PG&E also uses DCF to estimate the value of the Trust, its analysis does not value each cash flow stream separately, instead applying to the combined net cash flows of the Recovery Bonds and the Customer Credit Trust a single discount rate – PG&E’s return on rate base, 7.34% [Table 6-7, p. 6-29] – that does not accurately reflect either’s underlying risk and cost of capital.

³ 2.92% x (1 – 28.0% combined Federal and State tax rate) = 2.10%.

⁴ All present values in this testimony are as of 2021, the year of the Securitization and Initial Shareholder Contribution.

1 tax benefits that are realized in proportion to PG&E’s positive taxable income. Recognizing their
2 link to taxable income is important for three reasons.

3 First, taxable income is net of interest, i.e., after debtholders have been paid. Because the
4 Additional Shareholder Contributions are linked to income after interest has been deducted, they
5 are equivalent to equity cash flows, and the appropriate discount rate is therefore 10.25% to
6 reflect PG&E’s authorized return on equity (ROE).⁵ Second, the link to positive taxable income
7 will affect the *timing* of the Additional Shareholder Contributions – the number of years it will
8 take PG&E to contribute the full \$7.59 billion to the Trust. Third, the link to taxable income
9 means the Additional Shareholder Contributions are uncertain. As discussed below, several
10 provisions of the Customer Credit Trust impact customers asymmetrically because they fully
11 absorb all losses but share gains with PG&E shareholders. This asymmetry results in a loss of
12 value to customers that is not captured in the simple comparison of Trust assets and customer
13 liabilities. Uncertainty amplifies this loss of value.

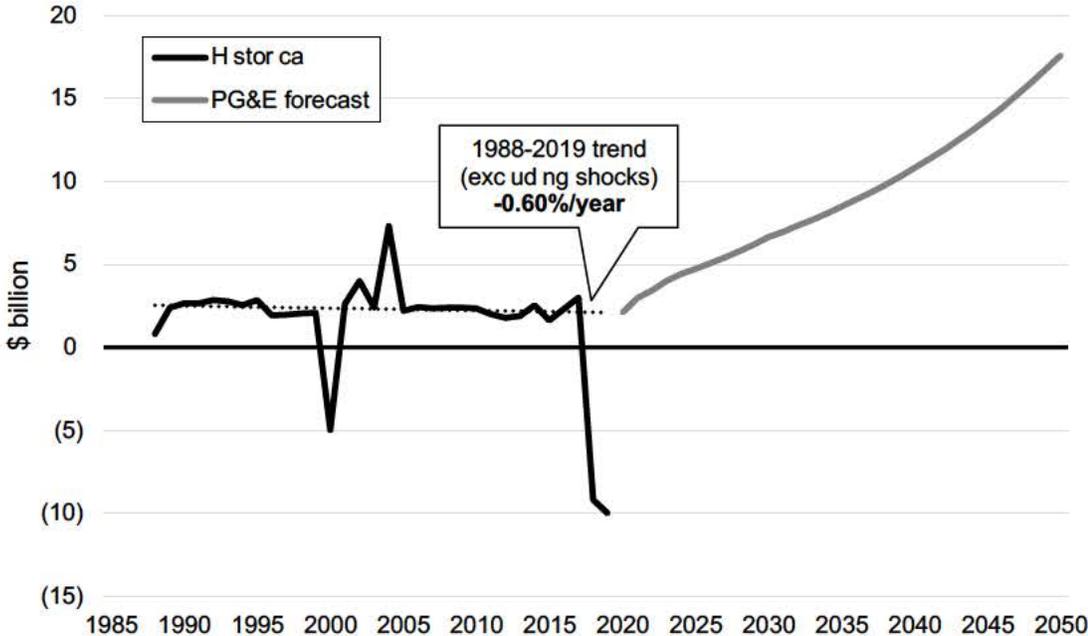
14 *PG&E’s income growth forecast is implausible.* In the model provided in support of
15 Table 6-2: Forecast Utilization of Shareholder Tax Benefits [PG&E testimony, p. 6-11], PG&E
16 projects rate base and earnings before interest and taxes (EBIT) to rise 7% annually from 2024-
17 2030 and 5% thereafter. This rate of growth – which, when added to PG&E’s 2020-24 forecast,
18 averages 5.83% from 2020 through 2050 – is remarkable and unrealistic considering:

- 19
- 20 • PG&E’s historical EBIT growth rate. Excluding one-off events, PG&E’s EBIT
21 trended downward at -0.60%/year (-2.96% in real terms) over the thirty-two-year
22 period from 1988 to 2019. PG&E’s actual earnings over that period compared
23 with forecasted future earnings in the PG&E model are shown in Figure 1

⁵ TURN’s approach to valuing the Additional Shareholder contributions is similar to that of investment bank Lazard. “NOL Monetization Alternatives”, an October 17, 2019, confidential presentation to PG&E provided in PG&E’s Response to TURN Data Request 1-2a. This presentation is included in Confidential Appendix E.

1

Figure 1: Historical and forecast PG&E earnings before interest and taxes



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Source: FERC Form 1 via S&P Global; PG&E; TURN analysis

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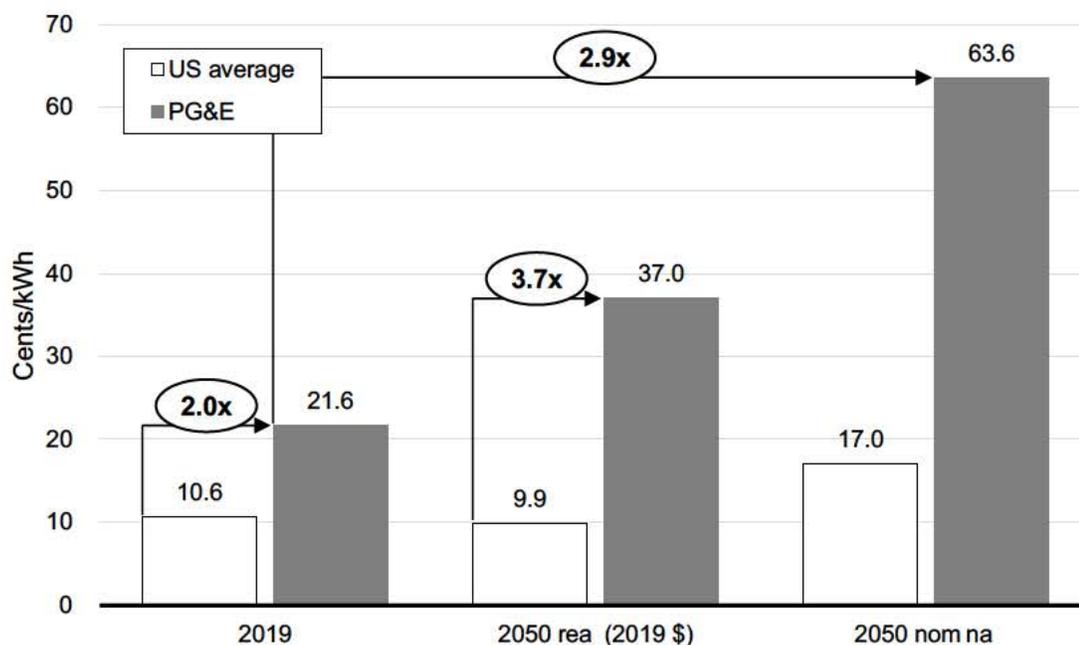
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- The implied increase in PG&E’s average bundled electric rate. Currently double the national average and the country’s fourth highest, by 2050, PG&E’s average bundled electric rate would be 37.0 cents/kWh in constant 2019 dollars, 3.7 times

7

the forecast national average [Figure 2]. In nominal terms, PG&E's rates would nearly triple, to 63.6 cents/kWh.⁶

Figure 2: Current and estimated 2050 PG&E average bundled electric rate under PG&E's rate base and EBIT growth forecast



Source: PG&E; EIA; TURN analysis

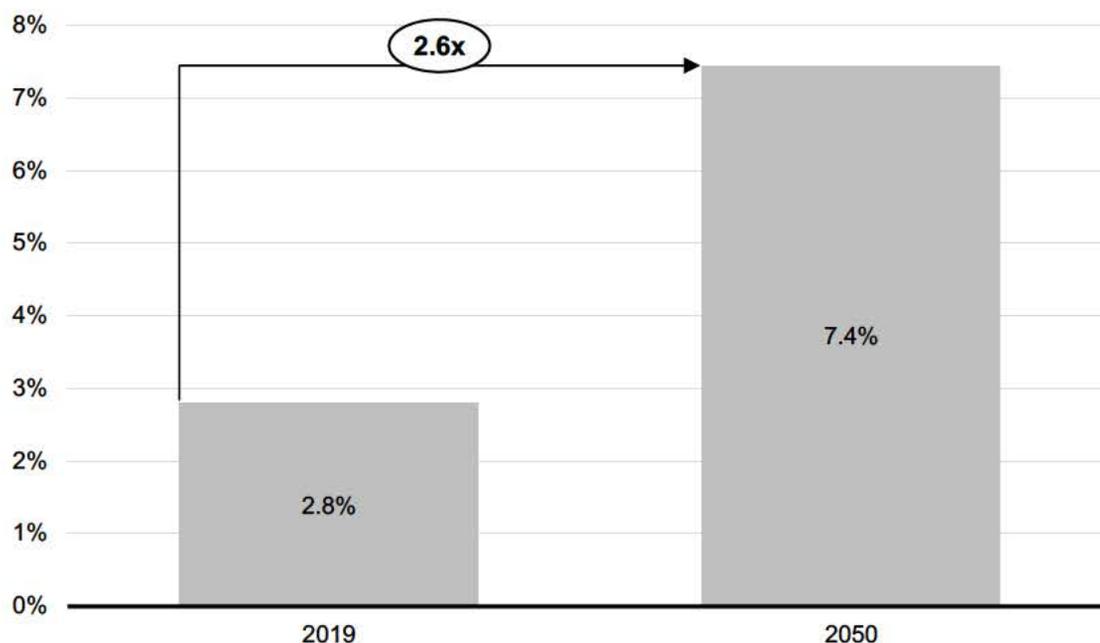
- PG&E's implied share of total US utility income. Currently, PG&E accounts for ~2.8% of the EBITDA of all FERC Form-1 and Form-2 filers (2.5% electric/5.0%

⁶ Assumptions:

- National average rate forecast: EIA AEO 2020 all sectors average rate (reflects -0.16%/year real growth rate)
- PG&E average rate forecast:
 - Two-thirds of PG&E's current average rate, reflecting the approximate historical share attributable to operating costs, held constant in real terms.
 - The remaining one-third escalated at PG&E's 2020-50 average rate base growth rate (5.83%) less inflation (1.76%) less the mid-range PG&E 2020 Integrated Resource Plan energy for load growth forecast (0.24%) = 3.76%.

1 gas). Assuming PG&E’s forecast is realized⁷ while the rest of the sector’s income
 2 grows commensurate with total national electricity and gas utility real revenue
 3 (0.74%),⁸ As shown in Figure 3, PG&E’s share of industry profit would increase
 4 2.6 times, to over 7%.

6 **Figure 3: Current and estimated 2050 PG&E share of US utility industry profit under PG&E income**
 7 **growth assumptions**



8
 9 *Source: PG&E; EIA; TURN analysis*

10
 11 TURN requested any and all documentation PG&E had to support this growth forecast.
 12 None of the information provided explained the source of the 5-7% growth rate assumption; they
 13 are simply hard-coded figures in their spreadsheet model.⁹ If there is a single “smoking gun”
 14 demonstrating the complete implausibility of PG&E’s analysis of its Securitization proposal, the
 15 forecast of future earnings is it. These future values are not the product of any legitimate analysis

⁷ PG&E’s implied real growth rate is $(1+5.83\%)/(1+1.76\%) - 1 = 4.00\%$.

⁸ Combined US electric and gas revenue from the Energy Information Administration Annual Energy Outlook 2020 Reference case.

⁹ PG&E’s Response to TURN Data Requests 1-3 and 8-1.

1 but are instead an invented plug to ensure that the analysis in support of the Securitization
2 proposal shows a decent likelihood of a reasonable outcome for ratepayers.

3 TURN developed an alternative forecast for PG&E's future income, based on PG&E's
4 "2019-2030 Baseline Forecast - Mid Demand Case" electric and gas forecasts developed for the
5 2020 Integrated Energy Policy Report Update (weighted average of 0.16%)¹⁰, market-based
6 inflation expectations (1.76%),¹¹ and modest efficiency gains of -0.16% per year (i.e., profit per
7 kWh increases slightly less than inflation)¹², for a net growth rate of 1.77%/year . TURN's
8 forecast is compared to PG&E's forecast in Figure 4.

9

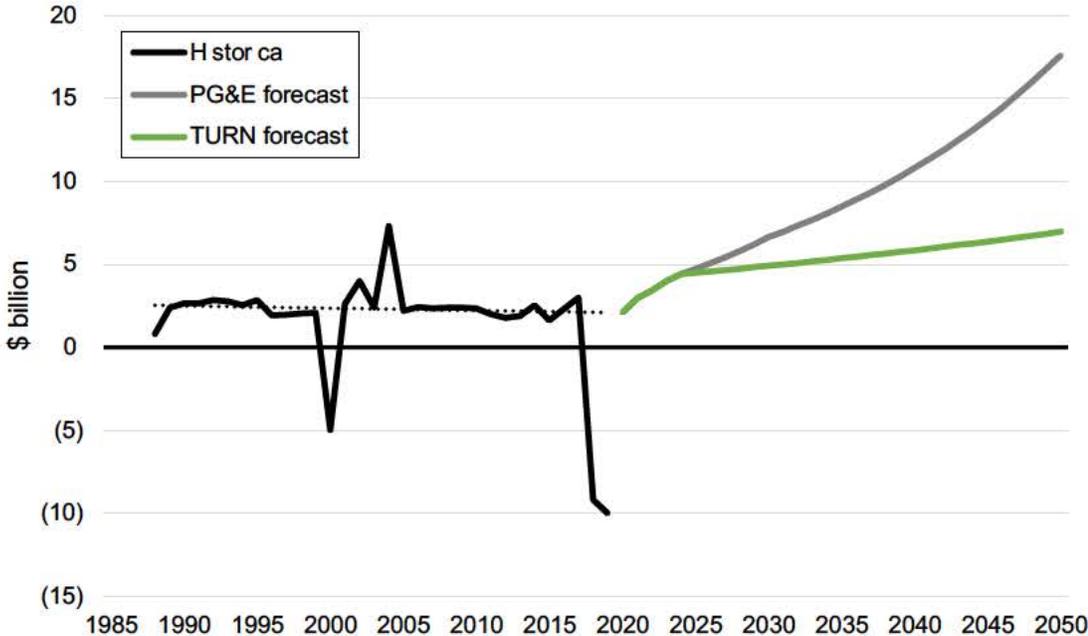
¹⁰ Weighted average = electric energy to serve load growth of 0.24% x 83% of income + gas demand growth of -.22% x 17% of income. Demand growth estimates from California Energy Commission 2020 Integrated Resource Plan proceeding.

¹¹ All inflation forecasts referenced in this testimony are based on the "30-year Breakeven Inflation Rate" provided by the Federal Reserve Bank of St. Louis for September 2020. "The breakeven inflation rate represents a measure of expected inflation derived from 30-Year Treasury Constant Maturity Securities (BC_30YEAR) and 30-Year Treasury Inflation-Indexed Constant Maturity Securities (TC_30YEAR). The latest value implies what market participants expect inflation to be in the next 30 years, on average." <https://fred.stlouisfed.org/series/T30YIEM>; last accessed October 3, 2020.

¹² The average of the 1960-2019 historical and 2020-50 EIA forecast decline in real electricity prices (-0.65% and -0.12% per year, respectively).

1

Figure 4: Historical and forecast PG&E earnings before interest and taxes



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Source: FERC Form 1 via S&P Global; PG&E; TURN analysis

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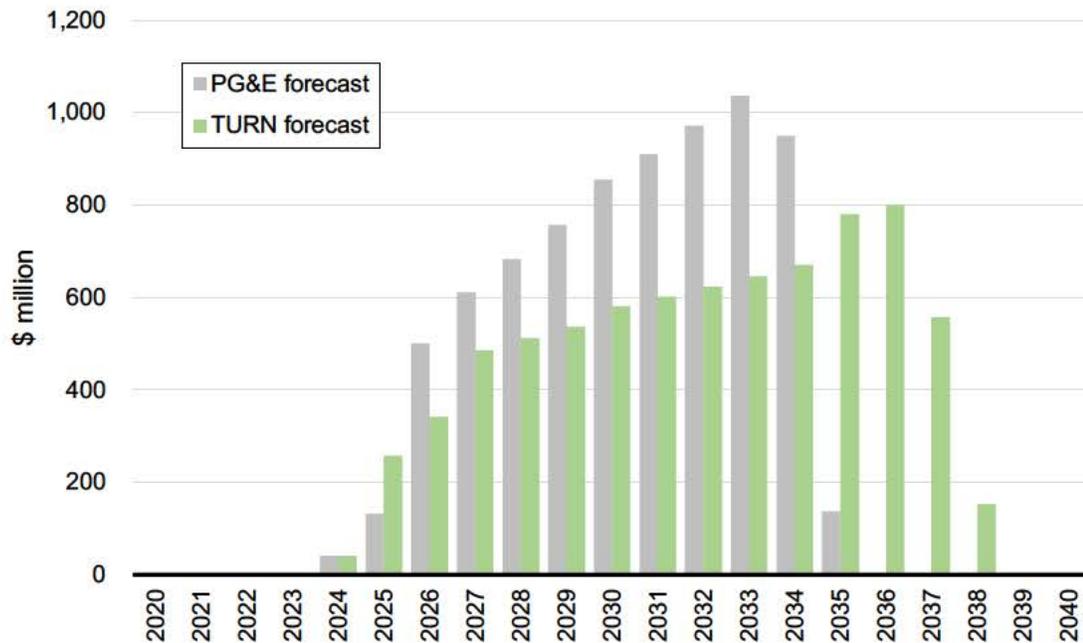
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Because the Additional Shareholder Contributions are directly proportional to income, a lower income growth rate delays those contributions relative to PG&E’s forecast, as shown in Figure 5. Under this more realistic forecast and using the appropriate discount rate, \$7.59 billion (nominal) of Additional Shareholder Contributions has a present value of \$2.79 billion.

9

1

Figure 5: Additional Shareholder Contributions to Customer Credit Trust¹³



2

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Source: PG&E; TURN analysis

4

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The few simple adjustments to PG&E’s analysis described so far – looking at each cash flow stream individually, discounting them at their own cost of capital, and assuming a more realistic income forecast – produce a customer net short of \$3.76 billion (Figure 6).

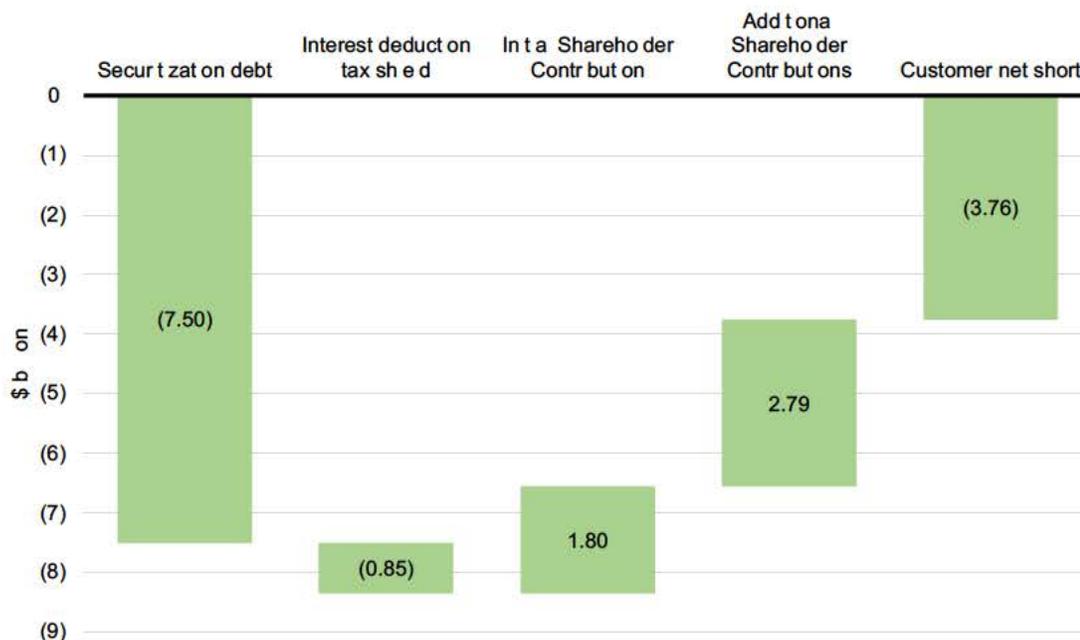
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¹³ TURN identified several potential errors and inconsistencies in PG&E’s calculations of annual tax benefits which result in differences in TURN’s and PG&E’s estimates of the Additional Shareholder Contributions even during the explicit 2020-24 forecast period. TURN attempted to resolve its concerns through written Data Requests submitted to PG&E. Despite TURN’s efforts, PG&E refused to acknowledge the errors and did not provide sufficient information to explain the inconsistencies.

1
2

Figure 6: Breakdown of customer net short



3
4

5 Even before accounting for the Trust’s asymmetric provisions that erode its value to
6 customers, to be discussed below, the Trust is effectively 45% under-funded. This yawning gap
7 between the value of the Recovery Bonds and Shareholder Contributions is a fundamental,
8 unavoidable problem with PG&E’s proposal. If it did not exist, there would be no need for the
9 Securitization to begin with; PG&E could pledge the Shareholder Contribution cash flows as
10 security without a customer guarantee. This under-funding translates directly into an
11 unacceptably high risk of not satisfying the “neutral, on average, to ratepayers” standard.

12 **III. The Trust’s underfunding poses an unacceptably high risk of not satisfying the**
13 **“neutral, on average, to ratepayers” standard.**

14 PG&E maintains that ratepayer-neutrality is satisfied if the Trust (1) is able to fully fund
15 the Customer Credit in each billing period over the life of the Securitization and (2) ends in
16 surplus. But PG&E’s own evidence in support of ratepayer-neutrality is weak. PG&E’s model
17 output data indicate only an 84% probability of fully funding the Customer Credit in every
18 billing period over the life of the Securitization which translates into a one-in-six chance of a
19 shortfall at some point over the life of the Trust [PG&E testimony, Table 6-7: Range of Surplus

1 Outcome and Year of First Shortfall, p. 6-29]. Similarly, PG&E’s claimed \$0.12-billion (present
2 value) expected customer surplus – which it deems a “significant opportunity for customers” [p.
3 1-14] – is a mere 1.4% pittance relative to the \$8.36 billion present-value cost to customers of
4 the Securitization.

5 Even these weak indicators of ratepayer-neutrality are significantly overstated. In
6 addition to the discount-rate adjustments and delay to the Additional Shareholder Contributions
7 discussed above, several other aspects of PG&E’s analysis understate the risks to ratepayer-
8 neutrality and further erode the Trust’s value.

- 9
- 10 • PG&E’s return assumptions for the Trust’s three asset classes are aggressive – on
11 average, more than 120 bp (20%) higher than the median of over twenty recent
12 public forecasts from leading investment managers and consultants.
 - 13 • PG&E’s analysis only accounts for one source of uncertainty – the Trust’s
14 returns. Another significant source of uncertainty is the outlook for PG&E’s
15 income growth, which, as described above, determines the timing of the
16 Additional Shareholder Contributions and, therefore, the Trust’s cash flows and
17 prospects for fully funding the Customer Credit in every billing period.
 - 18 • PG&E’s treatment of Customer Credit shortfalls and the Surplus Sharing
19 mechanism impacts customers asymmetrically, fully burdening them with all
20 losses (and then some) but requiring them to share gains with PG&E
21 shareholders. This asymmetry results in a loss of value to customers that is not
22 captured in the simple comparison of Trust assets and customer liabilities.
- 23

24 Adjusting PG&E’s Trust value analysis for each of these dramatically increases the
25 probability of shortfall and widens the valuation gap.

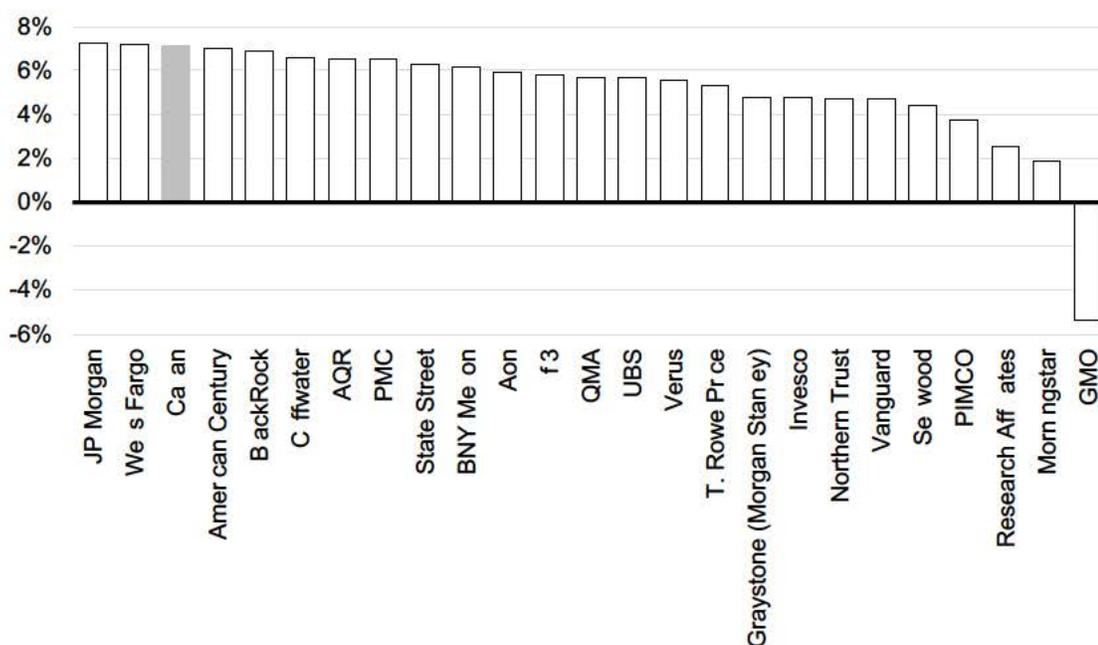
26 **A. PG&E’s CCT return assumptions are aggressively high.**

27 PG&E commissioned the investment consulting firm Callan to estimate the Trust’s future
28 returns, value, and ability to reimburse customers for the Fixed Recovery Charge over the life of
29 the securitization. Table 6-4: Callan Long-Term Capital Market Projections (PG&E testimony, p.
30 6-27) in PG&E’s testimony provides the key capital market assumptions used in Callan’s

1 forecast for the three main asset classes in which the Trust is expected to invest. TURN
 2 compared Callan’s assumptions to the latest publicly available long-term forecasts from twenty-
 3 five reputable investment management and consulting firms (“investors”).¹⁴ For apples-to-apples
 4 comparability, Callan’s own public 10-year forecasts (which differ slightly from its 30-year
 5 forecasts used in its CCT modeling¹⁵) are compared to these other public forecasts in Figures 7, 8
 6 and 9.

7
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Figure 7: Expected long-term geometric return – broad US equity



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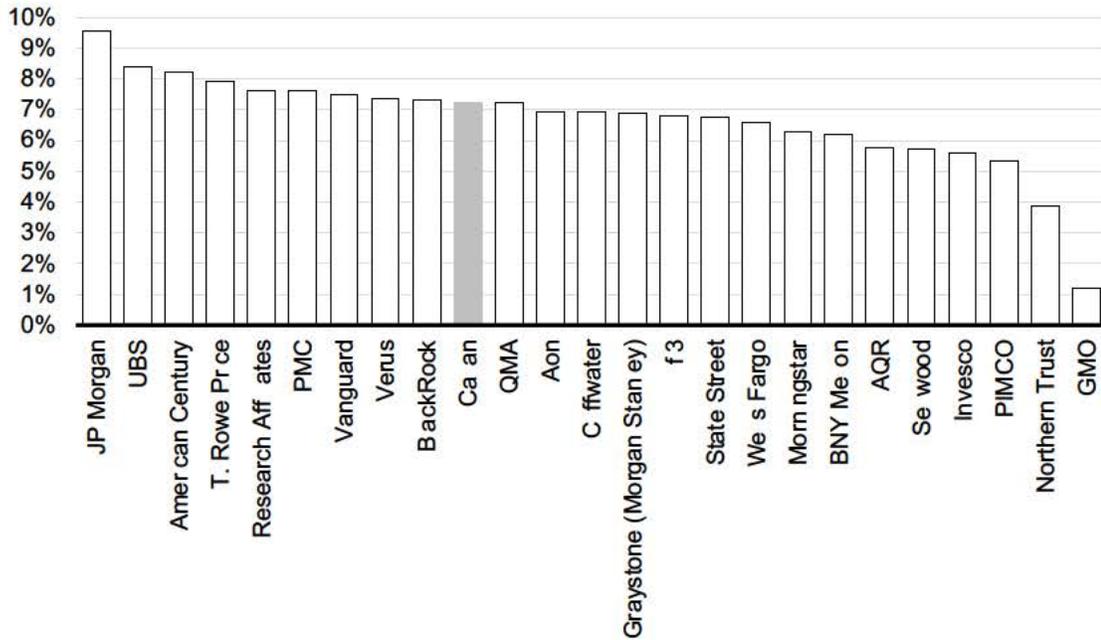
Source: Investment manager and consultant reports; TURN analysis

¹⁴ The list of forecasts used for this analysis are provided in Appendix B.

¹⁵ PG&E Testimony Table 6-4 (p. 6-26) gives 30-year projections of 7.15% and 3.60% for Non-US equity and US fixed income, respectively.

1

Figure 8: Expected long-term geometric return – non-US equity



2

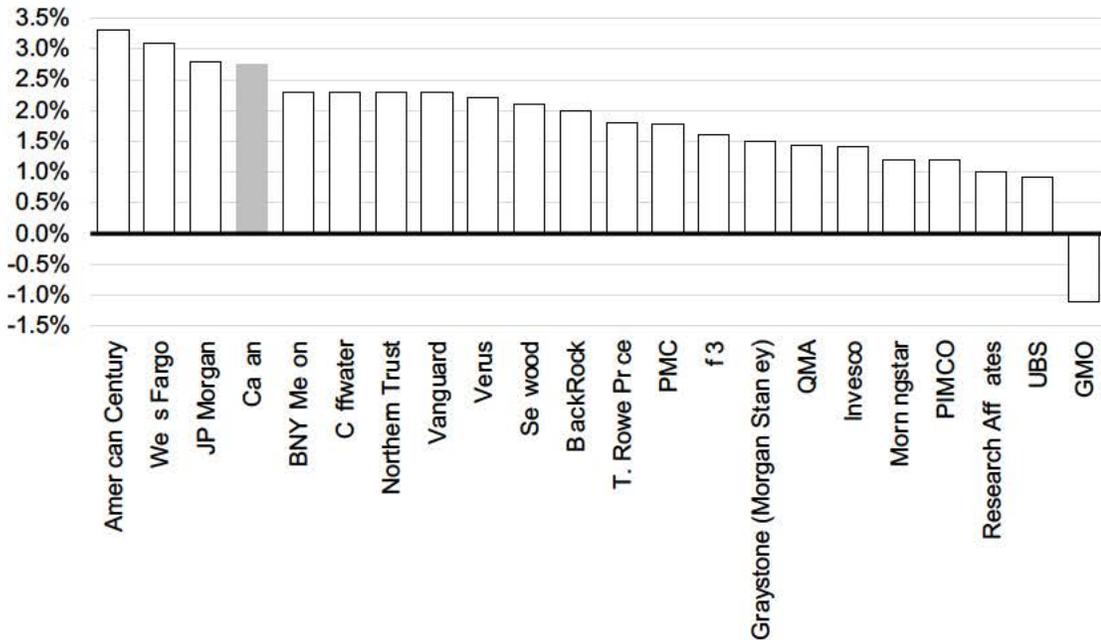
3

Source: Investment manager and consultant reports; TURN analysis

4

5

Figure 9: Expected long-term geometric return – US fixed income



6

7

Source: Investment manager and consultant reports; TURN analysis

8

1 Table 1 summarizes the forecasts and the position of Callan’s 10-year estimates among
2 its industry peers. While Callan’s assumptions fall within the range of the other forecasts, they
3 are 0.34% to 1.45% higher than the median forecast for each asset class.

4
5 **Table 1: Summary of investors’ long-term return forecasts and Callan’s position among them**

Line no.		Broad US equity	Non-US equity	US fixed income
1	Callan public 10-year	7.15%	7.25%	2.75%
2	Number of forecasts	25	25	22
3	Average geometric return	5.11%	6.68%	1.82%
4	Median geometric return	5.70%	6.91%	1.90%
5	Callan – average	+2.04%	+0.57%	+0.93%
6	Callan – median	+1.45%	+0.34%	+0.85%
7	Standard deviation	2.53%	1.58%	0.91%
8	Callan rank	3 (12%)	10 (40%)	4 (18%)
9	Percentile	21%	36%	15%

6
7 TURN believes the median of the investor forecasts represents a more realistic and
8 appropriate set of base case return and risk (standard deviation) assumptions. Table 2 presents
9 the development of TURN’s asset class return assumptions starting with the median of the
10 geometric and arithmetic return and standard deviation assumptions found in the investor
11 forecasts and the resulting figures for the Trust portfolio.¹⁶ Callan’s public 10-year and CCT 30-
12 year forecasts are then shown for comparison. The two sets of assumptions have slight
13 differences in their equity returns and a substantial 0.85% difference in US fixed income. The
14 next set of figures are TURN’s adjustment factors, equal to the ratio of Callan’s 30-year CCT
15 forecast to its 10-year public forecast.¹⁷ The last set of figures are TURN’s asset class and

¹⁶ TURN uses the following formula for the relationship between arithmetic (a) and geometric (g) returns and standard deviation (σ): $g \approx -1 + \frac{(1+a)}{\sqrt{\sigma^2/(1+a)^2}}$. See Formula #4 in Mindlin, Dimitry, “On the Relationship between Arithmetic and Geometric Returns” (August 14, 2011), available at: <https://ssrn.com/abstract=2083915>. Due to sparse investor data on correlations, TURN uses PG&E’s assumptions [Table 6-5: Callan Long-Term Capital Market Projections – Correlation, p. 6-27.]

¹⁷ Because the median investor forecast is ten years, TURN adjusts it to reflect the longer time horizon of Callan’s 30-year CCT projection by the ratio of Callan’s 30-year CCT to its 10-year public forecast.

1 portfolio assumptions. For the portfolio as a whole, expected return, 5.59%, is 1.2% lower than
2 PG&E's forecast with 15% less risk.

3
4

Table 2: Investor, Callan, and TURN long-term capital market assumptions

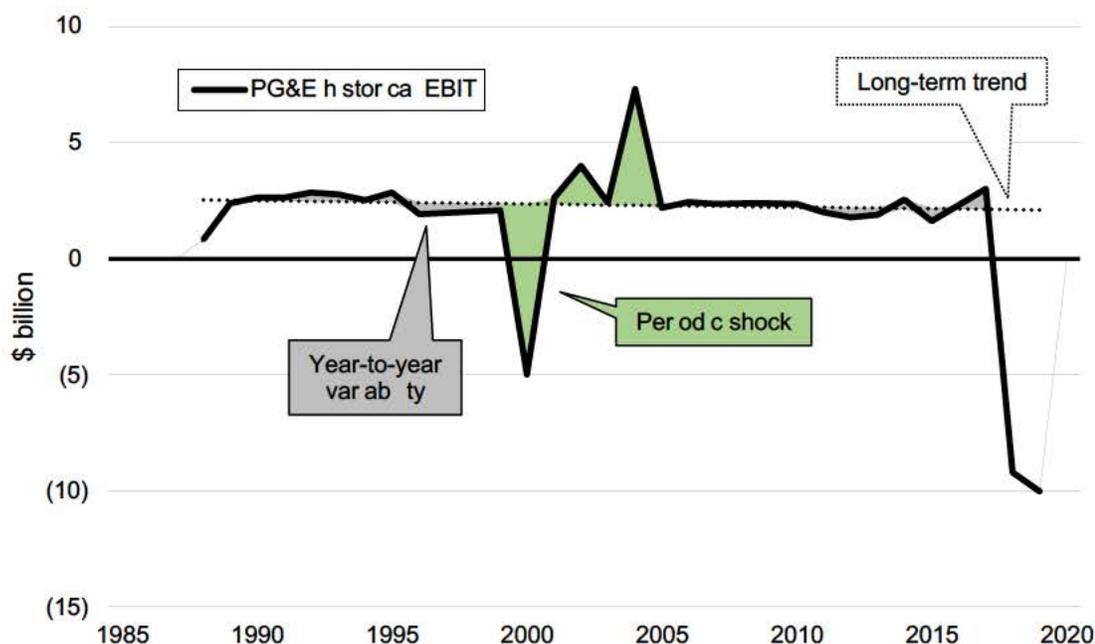
Line no.	Asset class	Weight	30-year geometric average return	Standard deviation	Arithmetic average return
<i>Investor median</i>					
1	Broad US equity	56%	5.70%	15.71%	6.84%
2	Non-US equity	24%	6.91%	16.40%	8.14%
3	US fixed income	20%	1.90%	3.90%	1.97%
4	Portfolio total	100%	5.49%	12.13%	6.18%
<i>Callan public 10-year</i>					
5	Broad US equity	56%	7.15%	18.10%	8.63%
6	Non-US equity	24%	7.25%	20.50%	9.13%
7	US fixed income	20%	2.75%	3.75%	2.82%
8	Portfolio total	100%	6.64%	14.34%	7.59%
<i>Callan CCT 30-year</i>					
9	Broad US equity	56%	7.15%	18.10%	8.63%
10	Non-US equity	24%	7.15%	20.50%	9.03%
11	US fixed income	20%	3.60%	3.75%	3.67%
12	Portfolio total	100%	6.79%	14.34%	7.73%
<i>TURN adjustment factors</i>					
13	Broad US equity	56%		1.000	1.000
14	Non-US equity	24%		1.000	0.989
15	US fixed income	20%		1.000	1.301
16	Portfolio	100%			
<i>TURN forecast</i>					
17	Broad US equity	56%	5.70%	15.71%	6.84%
18	Non-US equity	24%	6.82%	16.40%	8.05%
19	US fixed income	20%	2.50%	3.90%	2.57%
20	Portfolio	100%	5.59%	12.13%	6.27%

5

B. The outlook for PG&E’s income is a significant additional source of uncertainty affecting the Securitization’s ratepayer-neutrality

PG&E’s analysis of the Trust’s value and ratepayer-neutrality only accounts for one source of uncertainty – the Trust’s returns. Another significant source of uncertainty is the outlook for PG&E’s income growth, which, as described above, determines the timing of the Additional Shareholder Contributions and, therefore, the Trust’s cash flows and prospects for ratepayer-neutrality. There are three main sources of uncertainty in PG&E’s future income, illustrated in Figure 10: the overall growth trend, normal year-to-year variation that all utilities face, and periodic one-off shocks (both positive and negative) to which PG&E has been uniquely prone.

Figure 10: Three sources of uncertainty in PG&E’s income outlook



Source: FERC Form 1 via S&P Global; TURN analysis

1 TURN developed models for each of these three sources of uncertainty based on PG&E’s
2 historical income and publicly available forecasts of future demand growth, inflation, and utility
3 rates. Appendix C summarizes the key elements of TURN’s modeling approach.¹⁸

4 **C. Asymmetric Trust provisions further erode the value of the Trust**

5 The Customer Credit Trust’s provisions for the treatment of Customer Credit shortfalls
6 and the Surplus Sharing mechanism impact customers asymmetrically, fully burdening them
7 with all losses (and then some) but requiring them to share gains with PG&E shareholders. This
8 asymmetry results in a loss of value to customers that is not captured in the simple comparison of
9 Trust assets and customer liabilities.

10 *Tax gross-up.* In the discussion of its Trust modeling results PG&E describes an income
11 tax gross-up mechanism for Customer Credit shortfalls [PG&E testimony, p.6-28, Footnote 18]:
12

13 “During a period in which the Customer Credit is less than the FRC, any portion of the
14 FRC that exceeds the Customer Credit and is in excess of tax deductions related to
15 interest payments on the securitized Bonds (i.e., principal) is taxable income. Thus it is
16 assumed that customers will reimburse PG&E for any computed tax liability created by
17 the principal component of shortfalls. The grossed-up tax rate used on the principal
18 component of shortfalls in the analysis was 38.9 percent.”
19

20 Customers not only cover the shortfalls but, adding insult to injury, are also required to
21 compensate PG&E for the associated tax liability. This represents an incremental cost to
22 customers not reflected in the comparison of their assets and liabilities.

23 *Customer Credit shortfall make-up.* In its overview of the Customer Credit, PG&E refers
24 to a Customer Credit make-up mechanism [PG&E testimony, p. 6-2]:
25

26 “If assets in the Customer Credit Trust are insufficient to fund a Customer Credit equal to
27 the FRCs for a period of time, the future Customer Credit Trust balance will first be used
28 to make up any previous shortfalls in Customer Credits.”
29

¹⁸ TURN did not apply a random-walk model, similar to that used by Callan for Trust returns, to PG&E’s income as it would have introduced an unrealistic degree of variability.

1 The Callan model does not include such a make-up provision. Instead, it accumulates the
2 shortfalls, including the tax gross-up described above, over time and deducts them from any
3 Trust ending surplus before Surplus Sharing, effectively crediting them back to customers at the
4 end of the Trust’s life. Because Callan’s model does not account for any time-value-of-money
5 for these risky “loans” to the Trust, it understates their economic cost. To compensate, TURN
6 added a cost-of-capital charge to the shortfall payments equivalent to PG&E’s ROE as the
7 “loans” are only reimbursed with Additional Shareholder Contributions, which, as explained
8 above, have the same risk profile as PG&E’s equity.

9 *Surplus Sharing.* PG&E proposes to share with customers 25% of any Customer Credit
10 Trust surplus. The 75% of Trust surplus that goes to PG&E is a third loss of value to customers
11 that is not reflected in the comparison of their assets and liabilities.

12 **D. More realistic assumptions and properly accounting for customer costs**
13 **significantly reduce the probability the Securitization will be ratepayer-neutral**

14 TURN had access to Callan’s model and consulted with Callan through a series of
15 information-sharing sessions organized by PG&E to assist TURN in using it. TURN re-ran the
16 model’s 2,000 Monte Carlo simulations with its own assumptions for PG&E’s income
17 (Additional Shareholder Contribution timing) and Trust returns, and with the other adjustments
18 described above.¹⁹ Table 3 compares TURN’s results to those presented by PG&E in Table 6-7:
19 Range of Surplus Outcomes and Year of First Shortfall [PG&E testimony, p. 6-29]. Under these
20 more realistic assumptions, the Trust has a 44% probability of shortfall over the course of life.
21 and a 15% probability of shortfall as early as 2029 (corresponding to the 85th percentile and
22 shaded in gray in the table). In contrast, PG&E’s analysis concludes a shortfall that early in the
23 Trust’s life is virtually impossible, with the *earliest* shortfall in its 2,000 simulations occurring
24 fourteen years later in 2043. This stark difference in the potential onset of Trust shortfalls is a

¹⁹ During its conversations with Callan, TURN learned that Callan’s model contains numerous “tuning” parameters that require recalibration whenever any return assumption is changed – a process Callan advised against. Instead, TURN developed used well-known statistical techniques to adjust Callan’s 2,000 simulated return forecasts and re-simulate the Trust’s performance. This approach allowed TURN to run the model under different assumptions on its own while still retaining the nuanced cross-asset and inter-temporal relationships embedded in Callan’s return forecasts.

1 clear demonstration of how PG&E's analysis grossly underestimates the Securitization's risks to
2 ratepayer-neutrality.

3 While the expected future value of the Trust, at \$950 million (Table 3 - line 20), is
4 positive, the customer value is -\$0.34 billion (in 2050 dollars) under the Surplus Sharing
5 mechanism, under which customers absorb 100% of deficits but keep only 25% of surpluses.²⁰
6 This is just one of several asymmetric aspects of the Trust that erode its value to customers.

²⁰ 25% x \$1,718 = \$430 - \$768 = -\$338.

1 **Table 3: Range of surplus outcomes and year of first shortfall under PG&E and TURN income and**
2 **return assumptions**

3 \$ million

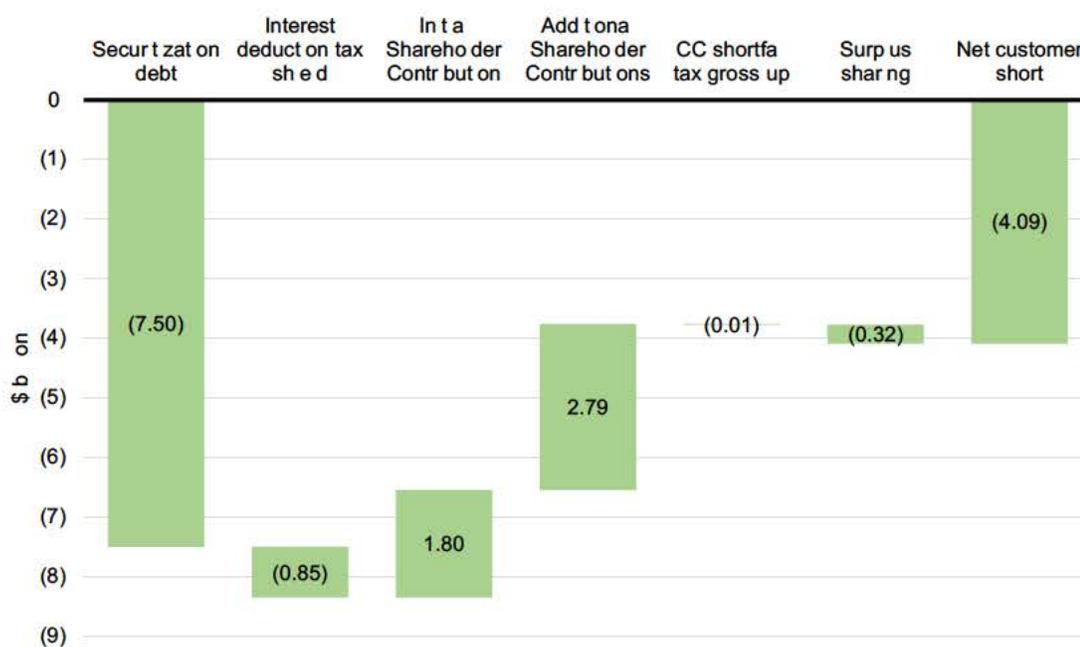
Line no.	Percentile	PG&E		TURN	
		Nominal surplus (deficit)	First shortfall year	Nominal surplus (deficit)	First shortfall year
1	5%	\$16,639	NA	\$8,386	NA
2	10%	\$12,642	NA	\$5,671	NA
3	15%	\$9,874	NA	\$4,520	NA
4	20%	\$8,176	NA	\$3,547	NA
5	25%	\$7,005	NA	\$2,943	NA
6	30%	\$6,034	NA	\$2,367	NA
7	35%	\$5,180	NA	\$1,877	NA
8	40%	\$4,468	NA	\$1,417	NA
9	45%	\$3,860	NA	\$1,029	NA
10	50%	\$3,276	NA	\$652	NA
11	55%	\$2,785	NA	\$226	NA
12	60%	\$2,292	NA	(\$148)	2050
13	65%	\$1,809	NA	(\$505)	2049
14	70%	\$1,372	NA	(\$976)	2048
15	75%	\$914	NA	(\$1,346)	2047
16	80%	\$421	NA	(\$1,696)	2046
17	85%	(\$106)	2050	(\$2,214)	2029
18	90%	(\$851)	2049	(\$2,917)	2027
19	95%	(\$1,928)	2047	(\$4,785)	2027
20	Expected value (EV)	\$4,414		\$950	
21	EV positive outcomes	\$4,566		\$1,718	
22	EV negative outcomes	(\$152)		(\$768)	
23	Customer EV	\$535		(\$338)	
24	Breakeven pre-tax return	4.04%		4.71%	
25	Probability of surplus/deficit	84%/16%		58%/42%	
26	Probability of shortfall ²¹	16%		44%	

²¹ “Shortfall” refers to the Trust’s inability to fully fund the Customer Credit at any point in its life, a key criterion of ratepayer neutrality. “Surplus” and “deficit” refer to Trust ending values. It is possible to have a shortfall and still end in surplus after Additional Shareholder Contributions are added to the Trust and earn a return.

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With these modeling results we can adjust our customer asset/liability calculation for the loss of customer value due to the Customer Credit (CC) shortfall tax gross-up (plus its time-value-of-money) and the Surplus Sharing.²² Each is discounted back from 2050 at its respective cost of capital. As shown in Figure 11, the customer gap is now \$4.09 billion, leaving the Trust 49% under-funded.²³

Figure 11: Breakdown of customer net short



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We can also examine the impact of each of TURN's changes sequentially on the probability of shortfall, as shown in Figure 12. Note that no single change to PG&E's assumptions accounts for most of the difference in shortfall probability. Investor returns adds the most (+10%), but Additional Shareholder Contribution delays and unanticipated shocks income

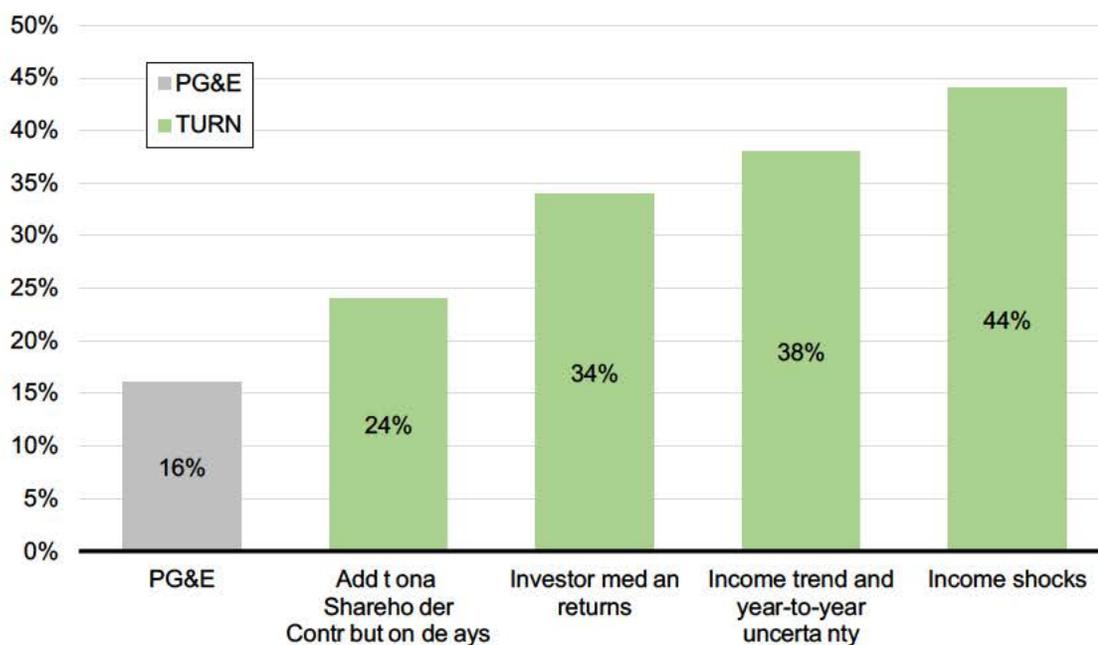
²² The loss of customer value due to Surplus Sharing, relative to the value of the Trust assets, is simply the difference between the Trust and customer expected values (\$950 + \$388 = \$1,288).

²³ For Surplus Sharing, the expected after-tax return on the Trust (4.77%). The expected value of the Customer Credit shortfall tax gross-up, \$197 million, in 2050, is discounted at PG&E's ROE (10.25%).

1 shocks each add 6%. This highlights the importance of recognizing *all* the potential risks to
2 ratepayer neutrality, not just those that are obvious or easy to quantify.²⁴

3 While TURN believes even PG&E’s estimated shortfall probability of 16% is
4 unacceptably risky to ratepayer neutrality, no reasonable person would conclude that a 44% risk
5 meets this standard. To put these figures in context, the Recovery Bonds that customers are
6 guaranteeing are expected to obtain a AAA credit rating. Since 1980, AAA-rated bonds have had
7 a default rate of 0.00%. The quality of the customer guarantee to Recovery Bondholders far
8 exceeds that of PG&E’s pledge to customers, another reflection of the yawning gap in value
9 between customer assets and liabilities.

11 **Figure 12: Probability of Customer Credit shortfall under PG&E and TURN assumptions**



12

13

14 **IV. Potential remedies**

²⁴ TURN recognizes that this analysis does not incorporate other known risks, such as changes in tax law or corporate actions that could materially impact taxable income (e.g., asset sales, acquisitions, change of control), and many others yet to be identified.

1 PG&E's proposed Securitization and Customer Credit Trust is clearly a very bad deal for
2 customers: a \$4.09-billion loss in present value terms and an unacceptably high risk of not being
3 ratepayer-neutral. TURN therefore recommends the CPUC reject PG&E's application to protect
4 ratepayer interests.

5 Should the Commission feel compelled to approve the Securitization, TURN has
6 identified several potential remedies, which singly or in combination could mitigate the risk to
7 customers and bring PG&E's proposal closer to ratepayer-neutrality.

8 *Increase the Initial Shareholder Contribution.* The foregoing analysis suggests two
9 potential criteria for determining an Initial Shareholder Contribution that is fair to customers and
10 has a reasonable probability of being ratepayer-neutral throughout its life. The first is to close the
11 current customer present-value net short of \$4.09 billion. Adding this to the currently proposed
12 \$1.8 billion brings the total Initial Shareholder Contribution to \$5.89 billion.

13 A second criterion is to ensure a maximum specified probability of shortfall over the
14 Trust's life (currently 44%). Customers are providing sufficient security of payment to earn the
15 Recovery Bonds a credit rating of AAA, which historically has corresponded to a 0% default
16 rate. The Callan model has only $1/2,000 = 0.05\%$ resolution, but we can use the model to
17 estimate an Initial Shareholder Contribution that produces a shortfall probability of less than
18 0.05%.

19 Figure 13, which plots the shortfall probability (in log-scale) against the Initial
20 Shareholder Contribution (ISC), illustrates this approach. In the base case (black line), PG&E's
21 proposed \$1.8-billion ISC has a shortfall probability (P_s) of 44%. As we increase the ISC, P_s
22 declines exponentially: at ISC = \$2.5 billion, $P_s = 10\%$, and at ISC = \$3.5 billion, $P_s = 1\%$. We
23 can extend this line by increasing the ISC until our target P_s is met.

24 Because the relationship between P_s and ISC is exponential, mathematically, even an
25 infinite ISC would not reduce the shortfall probability to 0.00%. Historical AAA default rates are
26 reported only to two decimal places, so a default rate of $\frac{1}{2}$ of 0.01% would still be reported as
27 0.00%. TURN uses this standard – 0.005% – as the target shortfall probability. To meet this
28 standard, the Initial Shareholder Contribution would need to be \$6.1 billion (indicated by the
29 open bubble at the end of the black dashed trend line), consistent with closing the present value
30 gap.

1 *Increase the Additional Shareholder Contributions.* This testimony has already identified
2 one cash flow stream that rightly belongs to customers yet is not being contributed to the Trust –
3 the interest tax shield on the Recovery Bonds, which has a present value of \$0.85 billion.
4 TURN’s analysis indicates that increasing the Additional Shareholder Contributions (ASC) by
5 the Recovery Bond tax shield can reduce the probability of shortfall from 44% to 10%.

6 Contributing the interest tax shield would benefit both PG&E and customers. As
7 explained previously, the present value is \$0.85 billion. With the interest contribution, satisfying
8 $P_s = 0.005\%$ would require an ISC of \$4.6 billion (indicated by the open bubble at the end of the
9 gray dashed line representing the “Interest ASC” scenario), for a total contribution of \$5.45 –
10 \$0.65 billion less than would be required by increasing the ISC alone. A lower total shareholder
11 contribution is required because the interest deduction would flow into the Trust over its entire
12 life and more closely match the Trust’s expected outflows than the returns on the ISC.²⁵ This
13 bigger “bang for the buck” can be observed in the steeper downward slope of the “Interest ASC”
14 line relative to the base case.

15 A second potential source of cash flow that could be used to protect customers is PG&E’s
16 dividend, which it plans to resume as early as 2023 and would distribute nearly ██████████ to
17 shareholders through ██████████.²⁶ As a condition of approval, the CPUC could require PG&E to make
18 a voluntary but binding commitment to dedicate some portion of its future dividends to the Trust
19 for a specified period of time (up to and including the life of the Trust) or until Trust assets reach
20 a specified level. TURN’s modeling indicates contributing an additional ██████████ in
21 future dividends can reduce the probability of shortfall over the Trust’s life to 10% and would
22 require an ISC of \$4.6 billion to meet $P_s = 0.005\%$, comparable to the effect of contributing the
23 interest tax shield (the orange line representing the “Dividend ASC” scenario in Figure 13).²⁷

²⁵ The Customer Credit is intended to offset the FRC, which correspond to the Securitization debt’s interest and principal.

²⁶ PG&E Testimony, Chapter 5, Exhibit 5.6, p. 5; PG&E Testimony Chapter 1, Exhibit 1.5, p. 29.

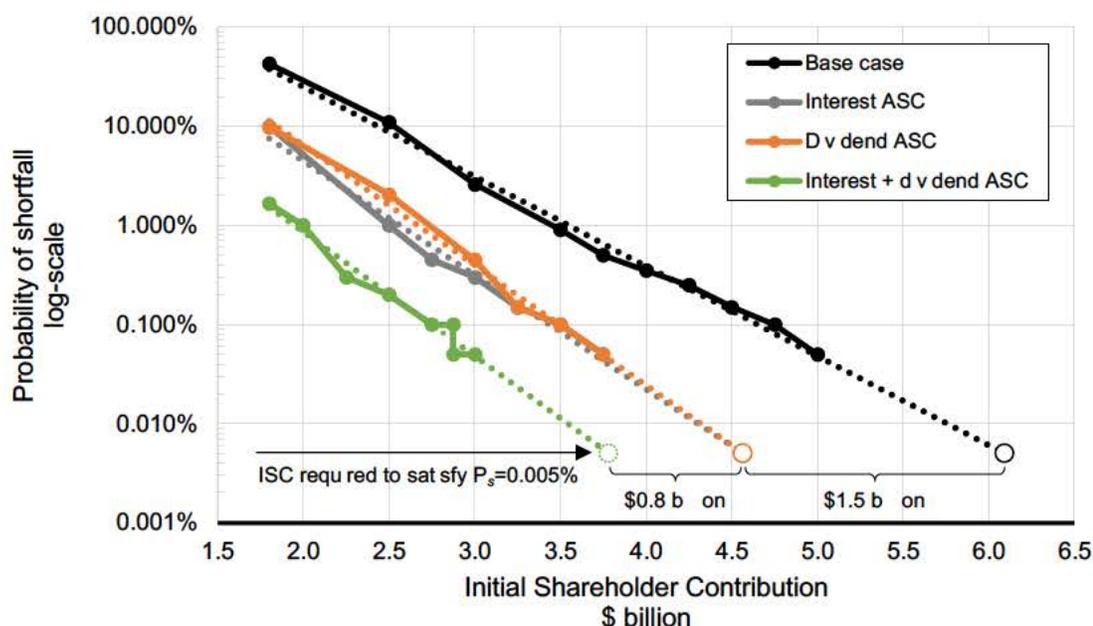
²⁷ TURN estimated this amount as ██████████

██████████. In TURN’s modeling, the

1 While the relationship between ISC and P_s for the dividend contribution is similar to that
 2 for the interest tax shield (as indicated by their overlapping plots), it is likely more expensive to
 3 PG&E. While the nominal value of the dividend contributions would be [REDACTED], the
 4 present value would be [REDACTED] at PG&E's 10.25% ROE.

5 Somewhat surprisingly, the benefits of combining the interest and dividend contributions
 6 are not additive. We might expect that if the interest and dividend contributions each reduced the
 7 required ISC at $P_s = 0.005\%$ by \$1.5 billion, contributing both would reduce the required ISC by
 8 \$3.0 billion. Combined, though, they only reduce the required ISC by \$2.3 billion, to \$3.8 billion
 9 (the "Interest + dividend ASC" scenario represented by the green line in Figure 13).

10
 11 **Figure 13: Probability of CCT shortfall as a function of Initial Shareholder Contribution under**
 12 **different Additional Shareholder Contribution scenarios**



13
 14 A third potential source of incremental cash is the removal of the Customer Credit
 15 shortfall tax gross-up described previously. According to TURN's analysis, the expected cost of

dividend is based on the underlying income trend growth rate, before the addition of year-to-year variation or shocks, to reflect their general stability. In the event of a negative shock, the dividend is suspended for four years; 50% of positive shocks are distributed as one-time dividends.

1 this gross-up over the life of the Securitization is \$197 million (in 2050).²⁸ Worse, it adds insult
2 to injury since customers are already paying the difference between the Customer Credit and the
3 FRC. This provision should simply be removed from the Trust agreement.

4 *Change the Surplus Sharing mechanism.* This testimony previously identified one
5 deficiency in the Surplus Sharing mechanism: the Trust's ending surplus/deficit does not account
6 for the time-value-of-money of any Customer Credit shortfalls. In its modeling, TURN added a
7 capital charge equal to the Trust's after-tax expected return. This addition is one potential
8 remedy.

9 Another remedy is to structure the Surplus Sharing to create an incentive for PG&E to
10 voluntarily cure any Customer Credit shortfalls as they occur. For example, the customer share
11 of any residual value could increase from 25% to 100% if PG&E fails to voluntarily cure any
12 Customer Credit shortfalls using shareholder funds. The testimony of TURN's Jennifer Dowdell
13 further discusses this potential remedy.

²⁸ PG&E's testimony refers to a make-up (p. 6-2) that would reimburse customers for both the Customer Credit shortfall and tax gross-up from future Additional Shareholder Contributions, but details are not provided and Callan's model does not include such a mechanism.