

Docket No.: A.26-01-009  
Exhibit No.: SC-21  
ALJ: Jamie Ormond  
Witness: Vincent Berardi

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Application of Southern California Gas  
Company (U904G) in Compliance with  
Ordering Paragraph 6 of Decision 24-12-076.

Application 26-01-009  
(Filed January 15, 2026)

**REBUTTAL TESTIMONY OF VINCENT BERARDI  
ON BEHALF OF SIERRA CLUB**

**OCTOBER 8, 2026**

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## 1    **Introduction**

2            This rebuttal testimony responds to Southern California Gas Company's (SoCalGas's)  
3    rebuttal testimony of Witness Eduardo J. Martinez, which addresses my critiques of SoCalGas's  
4    peak-day gas demand forecasting methodology presented in my direct testimony. I address  
5    SoCalGas's rebuttal in the order it is presented. Sections V and VI of Witness Martinez's  
6    testimony raise closely related arguments regarding SoCalGas's distribution selection and  
7    goodness-of-fit methodology, and are addressed in the same section below.

8            SoCalGas's rebuttal, considered as a whole, repeatedly responds to arguments I did not  
9    make. In multiple sections, SoCalGas's rebuttal either mischaracterizes my testimony or  
10   responds to a different, sometimes tangentially related, parameter or issue than the one my  
11   testimony actually critiques. I identify and correct these mischaracterizations throughout this  
12   reply. Where SoCalGas raises points that do not bear materially on the conclusions of my direct  
13   testimony or on the resulting demand forecast, I address them briefly. This brevity should not be  
14   construed as agreement with SoCalGas's position.

## 15   **Reply to Section II: SoCalGas's Peak-Day Forecasting Methodology Is Not Reasonable or** 16   **Prudent.**

### 17        **A. Annual temperature forecasts and peak-day calculations are not independent.**

18            In Section II of the rebuttal testimony,<sup>1</sup> SoCalGas responds to my critique of its  
19   temperature forecasting methodology, arguing that its annual heating degree day (HDD)  
20   forecasts and its peak-day forecast serve different planning purposes and should not be conflated:  
21   "Sierra Club's argument rests on treating separate annual-weather and peak-day calculations as  
22   though they were one calculation."<sup>2</sup> But in the very next paragraph, SoCalGas directly  
23   undermines this characterization by stating: "That issue matters because December HDDs are  
24   used in the peak-day calculation: an excessive December input could increase the modeled daily  
25   gas requirement ...."<sup>3</sup> This is a direct admission that the annual December HDD design value,  
26   whose forecasting methodology I critiqued, is inextricably linked to the peak-day calculation.

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<sup>1</sup> Prepared Rebuttal Testimony of Eduardo Martinez on behalf of SoCalGas (Sept. 17, 2026), at 2 [hereinafter referred to as "Martinez Rebuttal Testimony"].

<sup>2</sup> *Id.* at 2.

<sup>3</sup> *Id.*

1 SoCalGas contradicts itself by faulting my testimony for linking these two calculations, and then  
2 conceding one paragraph later that an error in one directly produces an error in the other.

3 This linkage is confirmed directly by SoCalGas’s disclosed methodology, as can be seen  
4 by examining the final step in the peak-day calculation:

$$Demand_{peak} = Demand_{Avg} + m_{HDD} * HDD_{additional}^4$$

6 As outlined in Section 1.b of my direct testimony,<sup>5</sup> the forecasted HDD values explicitly feed  
7 into the derivation of  $m_{HDD}$  and  $HDD_{additional}$ . This further confirms that SoCalGas’s attempt to  
8 treat these calculations as fully separate contradicts its own disclosed methodology.

9 The peak-day demand calculation is directly dependent on forecasted HDDs. It is  
10 precisely this dependency that makes my critiques of SoCalGas’s HDD forecasting methodology  
11 directly relevant to evaluating the reliability of SoCalGas’s peak-day demand forecast.

12 **B. SoCalGas’s justification for selecting December for its cold-year design does not**  
13 **address the finding that extreme cold years distribute HDDs differently than an**  
14 **average year.**

15 SoCalGas defends its selection of December as the basis for its cold-year design  
16 calculation on the basis that December “has the largest average HDD total across the 20-year  
17 historical period.”<sup>6</sup> I do not dispute this claim. Rather, my critique is that SoCalGas overstates  
18 the December design value for an extreme cold-year by applying December’s average-year share  
19 of annual HDDs.<sup>7</sup> SoCalGas’s approach assumes that the proportional distribution of HDDs  
20 across months in an extreme cold year is the same as the proportional distribution observed in an  
21 average year. However, my direct testimony’s analysis of the five coldest years in SoCalGas’s  
22 own 20-year historical dataset demonstrates that this assumption does not hold.<sup>8</sup> Instead,  
23 December’s actual share of annual HDDs runs approximately 3 percentage points lower than its  
24 average-year share. As a result, SoCalGas’s method for calculating monthly cold-year design  
25 values likely overstates the December design value.

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<sup>4</sup> 2024 CGR Workpapers; Exhibit (“Exh.”) SC-2: Direct Testimony of Vincent Berardi on behalf of Sierra Club (Aug. 20, 2026), at 5.

<sup>5</sup> Exh. SC-02 (Berardi) at 5.

<sup>6</sup> Martinez Rebuttal Testimony at 2.

<sup>7</sup> Exh. SC-02 (Berardi) at 6-7.

<sup>8</sup> *Id.* at 8.

1 SoCalGas's characterization of a cold-year design value as an estimate not intended to  
2 replicate precisely how any single extreme winter distributes its cold does not resolve this  
3 concern.<sup>9</sup> My critique does not rest on the premise that SoCalGas's design values should match  
4 the exact pattern of any one historical winter. Rather, my testimony identifies a systematic,  
5 directional bias observed across multiple extreme winters. SoCalGas's rebuttal does not address  
6 this finding, because identifying December as the month with the highest average-year HDD  
7 does not establish that December's average-year proportion of annual HDDs is the correct basis  
8 for constructing a cold-year design value.

9 **C. SoCalGas mischaracterizes the scope of my dummy-variable critique.**

10 SoCalGas states that "Sierra Club's argument ... rests on an error: it assumes that an  
11 adjustment used for annual weather design was also used in the separate peak-day calculation."<sup>10</sup>  
12 I made no such assumption. My testimony explicitly and specifically identified the dummy-  
13 variable adjustment at issue as relating to "the standard deviation used to derive its 1-in-10 and  
14 1-in-35 annual HDD design values," not the peak-day design temperature calculation.<sup>11</sup>  
15 Therefore, SoCalGas's rebuttal does not address my actual critique: that its dummy-variable  
16 treatment of the 2014-2018 period in calculating the standard deviation for its annual HDD  
17 design values artificially reduces the calculated variability of its historical temperature data.

18 **D. SoCalGas's fixed peak-day design temperatures do not account for a documented**  
19 **warming trend.**

20 SoCalGas argues that my critique of its fixed peak-day design temperatures rests on an  
21 assumption that a decline in annual HDDs should produce an "equal decline"<sup>12</sup> in minimum  
22 daily temperature. My testimony makes no such claim. I did not argue, and do not argue here,  
23 that the minimum daily temperature must decline by the same magnitude as annual HDDs.  
24 Instead, my argument is narrower and more direct: SoCalGas applies an explicit warming  
25 adjustment to its annual HDD forecasts while applying no warming adjustment whatsoever to its  
26 peak-day design temperatures. SoCalGas's rebuttal does not address this inconsistency.

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<sup>9</sup> Martinez Rebuttal Testimony at 2.

<sup>10</sup> *Id.* at 2.

<sup>11</sup> Exh. SC-02 (Berardi) at 7.

<sup>12</sup> Martinez Rebuttal Testimony at 3.

1           Notably, SoCalGas concedes the point at issue in its rebuttal when they state that “the  
2 long-term decline in minimum daily temperature is *limited* relative to the decline in annual  
3 HDDs.”<sup>13</sup> This statement claims that the decline is limited, not that no decline exists.  
4 Additionally, Table 1 shows a decline in minimum daily temperature over time.<sup>14</sup> This decline is  
5 consistent with, not contrary to, my bootstrap analysis, which found a statistically significant  
6 3.26°F increase in minimum daily temperature between the earliest and most recent 20-year  
7 windows in the historical data.<sup>15</sup> SoCalGas does not dispute that this warming trend exists, only  
8 that its magnitude is smaller than that of the annual HDD trend.

9           **E. SoCalGas mischaracterizes the purpose of my bootstrap analysis.**

10           SoCalGas states that bootstrap resampling “does not by itself determine which historical  
11 observations are appropriate for a conservative planning standard.”<sup>16</sup> I did not use bootstrap  
12 resampling for that purpose. Instead, I used it for exactly what SoCalGas describes it as being  
13 useful for, i.e., to measure uncertainty.<sup>17</sup> More specifically, bootstrapping established that the  
14 observed difference between early and recent peak-day temperature estimates is statistically  
15 significant, which supports my conclusion that a warming adjustment to peak-day design  
16 temperatures is warranted.

17           **F. A general claim of prudence does not resolve SoCalGas’ methodological deficiencies**  
18           **that I identified in my testimony.**

19           Finally, SoCalGas defends its unadjusted peak-day design temperature as prudent  
20 because it “reflect[s] both short-term and long-term observed minimum daily temperatures.”<sup>18</sup>  
21 This does not respond to my testimony, which does not object to SoCalGas’s use of long-term  
22 historical data, but rather objects to its failure to account for a documented warming trend in this  
23 data. Rather than address any of these specific deficiencies, SoCalGas’s rebuttal relies on a  
24 general claim of prudence, without explaining why that claim resolves the specific problems my  
25 testimony identifies.

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<sup>13</sup> *Id.* at 3 (emphasis added).

<sup>14</sup> *Id.* at 4.

<sup>15</sup> Exh. SC-02 (Berardi) at 9.

<sup>16</sup> Martinez Rebuttal Testimony at 4.

<sup>17</sup> *Id.*

<sup>18</sup> *See id.* at 3 (“SoCalGas’s peak-day design temperatures are prudent for system planning because they reflect both short-term and long-term observed minimum daily temperatures.”).

1 **Reply to Section III: SoCalGas Does Not Adequately Account for Climate Change in Its**  
2 **Demand Forecasting.**

3 **A. SoCalGas’s out-of-model adjustment does not sufficiently account for climate**  
4 **change.**

5 In Section III of its rebuttal, SoCalGas addresses my critique that its forecast does not  
6 appropriately account for climate change. SoCalGas concedes the crux of my argument, that its  
7 Navigator forecast does not include climate change adjustments.<sup>19</sup> SoCalGas instead argues that  
8 it “accounted for climate change through an out-of-model adjustment” and that the “location of  
9 the adjustment in the forecasting sequence does not make it ineffective.”<sup>20</sup> As I demonstrate  
10 below, this statement overstates the scope and impact of the out-of-model adjustment that  
11 SoCalGas introduces.

12 Two facts frame this issue. First, by SoCalGas’s own admission, average demand is  
13 forecast via Navigator and does not include a climate change adjustment for space heating or any  
14 other unit end consumption (“UEC”).<sup>21</sup> Second, the only example of climate change adjustments  
15 that SoCalGas cites in its 2024 Workpapers and its rebuttal testimony is for its HDD forecasts.<sup>22</sup>  
16 This is done by reducing HDDs by 7.0 per year over the forecast period. I do not dispute that  
17 SoCalGas makes this adjustment. But an examination of the calculation that converts average-  
18 year to cold-year demand demonstrates the insufficiency of SoCalGas’s climate change  
19 adjustments.

20 As outlined in Section 1.b of my direct testimony, this formula is:

21 
$$ColdYear = AvgYear + (ColdYearHDD - AvgYearHDD) * HDD\ Sensitivity,$$
<sup>23</sup>

22 Which shows that the cold-year forecast is built from two components: i.) the non-climate-  
23 adjusted average-year demand; and ii.) an adjustment based on the *difference* between the  
24 average-year and cold-year HDD values. But this difference cancels the climate adjustment,  
25 meaning that the calculation proceeds as if there was no adjustment at all. For example, if I have  
26  $X - 7$  and  $Y - 7$  and I take the difference, I have:

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<sup>19</sup> *Id.* at 5.

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> 2024 CGR Workpapers.

<sup>23</sup> Exh. SC-02 (Berardi) at 4.

1 
$$(X - 7) - (Y - 7) = X - Y.$$

2 It does not matter that I reduced both values by 7. Similarly, the climate change adjustments to  
3 cold and average year HDD in SoCalGas's calculation cancel out.

4 As a result, SoCalGas's out-of-model adjustment does not introduce any climate-related  
5 change into the cold-year forecast. The cold-year forecast remains built entirely on the non-  
6 climate-adjusted, Navigator-based average-year forecast, combined with an HDD-based  
7 adjustment that is itself unaffected by SoCalGas's stated climate change methodology. This  
8 demonstrates that SoCalGas's out-of-model adjustments inadequately account for climate change  
9 and that direct, climate-related adjustments to the Navigator model inputs are needed,  
10 specifically for the space-heating UEC.

11 **B. SoCalGas has not disclosed the methodology underlying its HDD Sensitivity value.**

12 SoCalGas addresses my critique that its temperature sensitivity (denoted as  
13 *HDD Sensitivity* in my direct testimony) is undefined by stating “[w]hile SoCalGas did not  
14 include an explicit discussion of weather sensitivity in its 2024 CGR workpaper, there is an  
15 underlying methodology.”<sup>24</sup> This statement confirms my point: absent an “explicit discussion”,  
16 SoCalGas did not provide sufficient information to evaluate this component of its modeling.  
17 SoCalGas goes on to state that “[t]he base-year HDD Sensitivity was calculated through  
18 regressions on historical monthly consumption data across the observed range of monthly  
19 weather and demand conditions.”<sup>25</sup> Notably, this explanation discloses none of the specifics of  
20 that regression, including the time period covered, the inclusion of any covariates, and whether  
21 adjustments (e.g. the introduction of dummy variables, which SoCalGas has done in other  
22 calculations) were made. This pattern is continued in SoCalGas's responses to Data Request 7,  
23 which provides the values used for temperature sensitivity, but, again, none of the regression  
24 details.<sup>26</sup>

25 **C. SoCalGas conflates  $m_{HDD}$  with *HDD Sensitivity*.**

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<sup>24</sup> Martinez Rebuttal Testimony at 6.

<sup>25</sup> *Id.*

<sup>26</sup> Attached as Exh. SC-23: SoCalGas Response to Sierra Club Data Request 7 - First Set of Responses (Sept. 23, 2026), and Exh. SC-24: SoCalGas Response to Sierra Club Data Request 7 - Supplemental (Sept. 30, 2026).

1 In addressing my critique of its two-point extrapolation method, SoCalGas repeatedly  
2 references *HDD Sensitivity*. However, my critique focused on the demand-sensitivity term  
3  $m_{HDD}$ , not *HDD Sensitivity*.<sup>27</sup>  $m_{HDD}$  and *HDD Sensitivity* are distinct parameters that play  
4 different roles in SoCalGas's methodology. I explicitly direct my two-point extrapolation critique  
5 at SoCalGas's calculation of  $m_{HDD}$  in several locations of my direct testimony. For instance, in  
6 Section 1.c I state "SoCalGas's peak-day demand forecasts rely on a demand-sensitivity  
7 relationship (denoted as  $m_{HDD}$  in the Section 1.b, Step 4) that is estimated from only two data  
8 points ...."<sup>28</sup> I explain that this unit produces a peak-day HDD value that is substantially more  
9 extreme than can be justified.<sup>29</sup> This same conflation is continued in Section III when SoCalGas  
10 states "The HDD Sensitivity used in SoCalGas's peak-day calculations is derived from  
11 regression analysis of historical monthly consumption data.... The two-point-style formula used  
12 by Sierra Club is a simplified explanation used to show how a sensitivity value can be extracted  
13 ...."<sup>30</sup> This is likely a description of how *HDD Sensitivity* is calculated, but it says nothing  
14 about  $m_{HDD}$ , which SoCalGas's own methodology shows is calculated via a two-point  
15 extraction. Therefore, SoCalGas has not responded to my argument.

16 **Reply to Section IV: Sierra Club Identifies Specific, Unrebutted Structural Advantages in**  
17 **The CEC's Forecasting Approach.**

18 SoCalGas's rebuttal does not engage with the specific structural advantages I identified in  
19 comparing SoCalGas's Navigator-based methodology to the CEC's forecasting approach, which  
20 include the incorporation of temperature directly as an explicit input to its demand calculation,  
21 the generation of probabilistic uncertainty rather than point estimates, and the disclosure of  
22 methodological limitations.<sup>31</sup> SoCalGas's response is that Navigator is an "industry-standard"  
23 tool that has been used "reliably for many years."<sup>32</sup> My testimony does not rest on the  
24 proposition that a newer or more complex tool is automatically superior; it identifies specific  
25 features of the CEC's methodology that Navigator's own methodology lacks. SoCalGas's  
26 rebuttal leaves each of these specific points unaddressed.

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<sup>27</sup> Exh. SC-02 (Berardi) at 15

<sup>28</sup> *Id.* at 5.

<sup>29</sup> *Id.* at 15:20-16:8.

<sup>30</sup> Martinez Rebuttal Testimony at 6.

<sup>31</sup> Exh. SC-02 (Berardi) at 17-20.

<sup>32</sup> Martinez Rebuttal Testimony at 7.

1   **Reply to Sections V and VI: SoCalGas’s Defense of Its Distribution Selection Does Not**  
2   **Resolve the Underlying Methodological Questions Raised in My Testimony.**

3           SoCalGas defends its selection of the Student’s *t*-distribution primarily on the basis that it  
4   has the lowest root mean square error (RMSE) among historical observations.<sup>33</sup> Further, it  
5   defends its goodness-of-fit evaluation on the grounds that evaluating the tail in isolation could  
6   produce an unstable result.<sup>34</sup> Neither defense addresses the basis for my critique, namely that the  
7   Student’s *t*-distribution was developed to describe uncertainty around an average, while the  
8   Generalized Extreme Value (GEV) distribution was specifically developed to describe the  
9   behavior of extreme values.<sup>35</sup> Nor do they clarify whether SoCalGas’s goodness-of-fit metric  
10   gives any particular weight to tail accuracy specifically, as opposed to treating all observations  
11   equally. I maintain that GEV is the more theoretically-appropriate tool for this analysis and that  
12   SoCalGas has not disclosed sufficient detail about its fit metric to evaluate its treatment of tail  
13   behavior.

14   **Reply to Section VII: SoCalGas’s Defense of Its Uncertainty Methodology Does Not**  
15   **Resolve the Underlying Concern.**

16           SoCalGas’s defense of its uncertainty methodology does not resolve the underlying  
17   concern raised in my testimony that its flat 0.6°F margin does not reflect the fact that the 1-in-10  
18   and 1-in-35 estimates represent meaningfully different levels of statistical rarity, even though  
19   both happen to fall within the same broad tercile of historical observations.<sup>36</sup> I do not attempt to  
20   resolve this technical dispute here, as its practical significance is modest relative to the more  
21   significant deficiencies identified elsewhere in my testimony and this reply.

22   **Reply to Section VIII: HDD Sensitivity Variation Does Not Resolve the Underlying**  
23   **Disclosure Gap.**

24           SoCalGas states that “Sierra Club’s argument rests on the assumption that a forecast  
25   parameter is valid only if it remains constant.”<sup>37</sup> This is not my argument. I mentioned the  
26   variability in the context of trying to reverse engineer the temperature sensitivity procedure that  
27   SoCalGas did not provide. Rather, my argument is that a forecast parameter cannot be evaluated

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<sup>33</sup> *Id.* at 7-8.

<sup>34</sup> *Id.* at 8.

<sup>35</sup> Exh. SC-02 (Berardi) at 11.

<sup>36</sup> Martinez Rebuttal Testimony at 9.

<sup>37</sup> *Id.* at 10.

1 if the full details of its calculation are not made available,<sup>38</sup> which to date SoCalGas has not done  
2 for the temperature sensitivity (See my reply to Section III above).

3 Additionally, SoCalGas's explanation for why HDD Sensitivity varies over the forecast  
4 period does not resolve the underlying gap identified in my response to Section III.A above.  
5 SoCalGas has still not disclosed the regression methodology used to calculate temperature  
6 sensitivity, including the time period, covariates, or any adjustments used in that regression.  
7 Without this information, neither the Commission nor stakeholders can evaluate SoCalGas's  
8 explanation for why the resulting value changes over time.

9 **Reply to Section IX: SoCalGas Mischaracterizes the Implications of Demand Becoming**  
10 **Less Predictable at Extreme Temperatures.**

11 SoCalGas does not dispute my finding that gas demand becomes less predictable as  
12 temperatures grow more extreme.<sup>39</sup> Instead, it argues that this finding supports the need for  
13 greater storage capacity,<sup>40</sup> rather than addressing my testimony's actual conclusion, namely that  
14 SoCalGas's forecasts of peak-day demand carry greater uncertainty than SoCalGas has  
15 acknowledged or disclosed. SoCalGas does not engage with the underlying uncertainty that my  
16 testimony identifies.

17 **Reply to Section X: The 1-in-10 Forecast Does Not Have an Independent Statistical Basis.**

18 In my direct testimony, I outlined SoCalGas's 1-in-10 peak-day demand calculation that  
19 uses temperature data drawn from a 1-in-35 Cold Year scenario.<sup>41</sup> To better illustrate this  
20 phenomenon, Figure 1 below presents a schematic of the final two steps of the 1-in-35 and 1-in-  
21 10 peak day demand calculations, referred to as Steps 3 and 4 in my direct testimony.<sup>42</sup> Note that  
22 Step 4A is inconsequential to this discussion, so it was not included in the schematic.

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<sup>38</sup> Exh. SC-02 (Berardi) at 15.

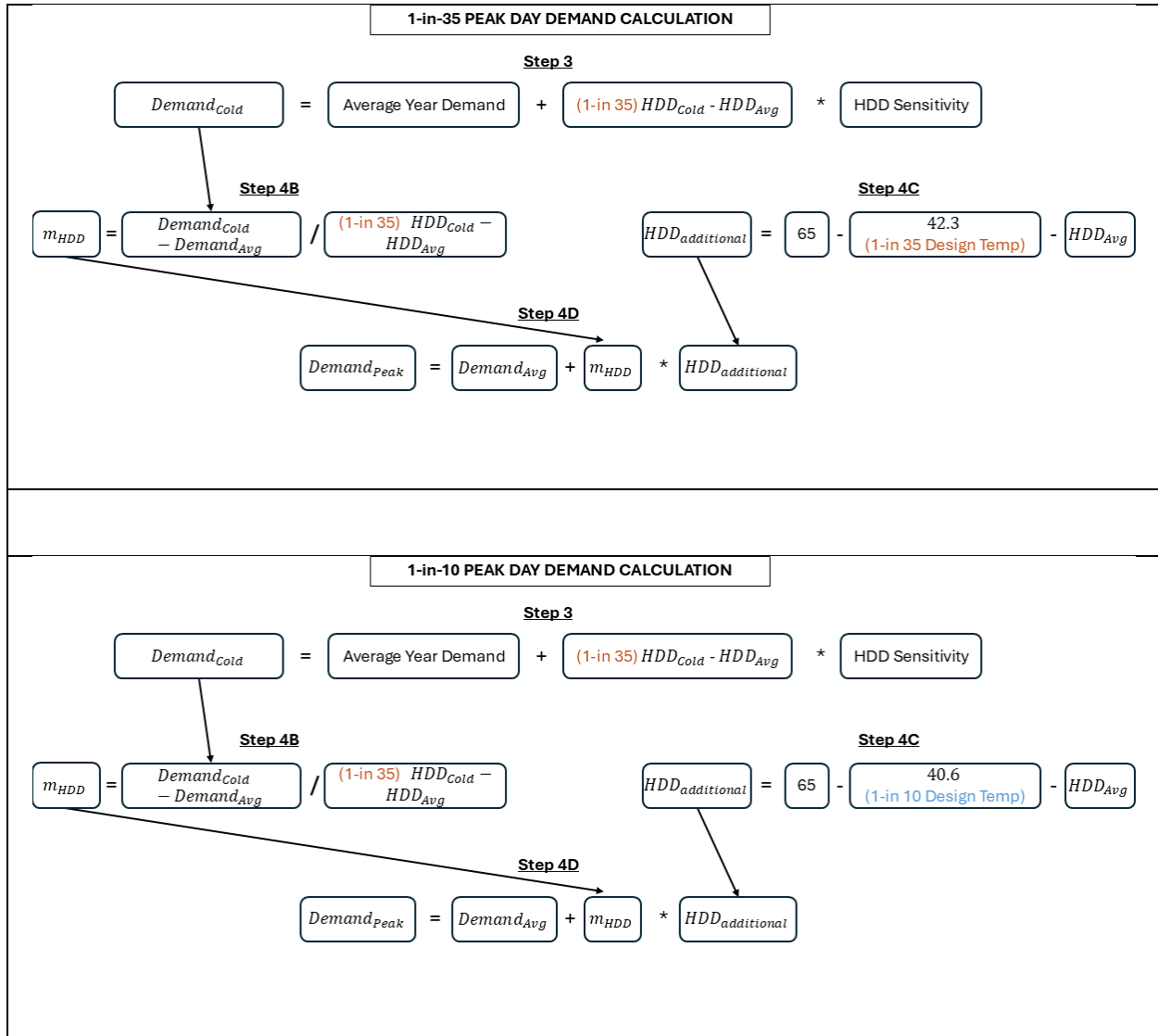
<sup>39</sup> *Id.* at 16.

<sup>40</sup> Martinez Rebuttal Testimony at 10.

<sup>41</sup> Exh. SC-02 (Berardi) at 17.

<sup>42</sup> *Id.* at 4.

1 **Figure 1: 1-in-35 peak day demand calculation and 1-in-10 peak day demand calculation**



2 In Steps 3 and 4A of both the 1-in-10 and 1-in-35 peak day calculations, SoCalGas  
3 introduces a 1-in-35 cold-year HDD forecast. The only aspect that differentiates the 1-in-10 and  
4 1-in-35 peak-day demand scenarios is Step 4C, where different design temperatures are used. My  
5 critique is that, despite the workpapers including forecasts of cold-year HDDs at both the 1-in-10  
6 and 1-in-35 probabilities, only the latter is used in the peak day demand forecasts. SoCalGas  
7 does not explain this misalignment nor why the 1-in-10 HDD forecast was calculated if it was  
8 not used in this calculation.

1           SoCalGas argues that the same demand-temperature relationship can properly be applied  
2 to different design temperatures.<sup>43</sup> Under SoCalGas's logic, the extremeness of the underlying  
3 HDD forecast is inconsequential. Had, for instance, a 1-in-100 Cold Year scenario been used in  
4 Steps 3 and 4B, as long as the 42.3°F temperature (1-in-10) was input to the model Step 4C, this  
5 would still be a 1-in-10 prediction. The fact that 1-in-35, 1-in-100, or any other extreme scenario  
6 for HDD forecasts would equally lead to what SoCalGas calls a 1-in-10 peak demand prediction,  
7 so long as 42.3°F is substituted at the final step, demonstrates my claim that the 1-in-10 peak-  
8 day demand calculation does not have an independent basis.

9           The use of 1-in-35 rather than 1-in-10 HDD forecasts increases the number of HDDs  
10 under consideration, and ultimately inflates peak-day demand calculation.

11          This concludes my testimony.

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<sup>43</sup> Martinez Rebuttal Testimony at 11.