

**BEFORE THE ARIZONA CORPORATION COMMISSION**

**IN THE MATTER OF THE APPLICATION OF ) DOCKET NO. E-01345A-22-0144**  
**ARIZONA PUBLIC SERVICE COMPANY FOR )**  
**A HEARING TO DETERMINE THE FAIR )**  
**VALUE OF THE UTILITY PROPERTY OF )**  
**THE COMPANY FOR RATEMAKING )**  
**PURPOSES, TO FIX A JUST AND )**  
**REASONABLE RATE OF RETURN THEREON, )**  
**AND TO APPROVE RATE SCHEDULES )**  
**DESIGNED TO DEVELOP SUCH RETURN. )**  
**)**

**Surrebuttal Testimony**

**of Devi Glick**

**On Behalf of**

**Sierra Club**

**July 26, 2023**

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1 **1. INTRODUCTION AND PURPOSE OF TESTIMONY**

2 **Q Please state your name and occupation.**

3 **A** My name is Devi Glick. I am a Senior Principal at Synapse Energy Economics,  
4 Inc. (“Synapse”). My business address is 485 Massachusetts Avenue, Suite 3,  
5 Cambridge, Massachusetts 02139.

6 **Q Did you submit direct testimony in this docket?**

7 **A** Yes.

8 **Q What is the purpose of your testimony in this proceeding?**

9 **A** My testimony responds to several points in the rebuttal testimony of Arizona  
10 Public Service Company (“APS”) witness Jacob Tetlow: (1) his concerns with my  
11 evaluation of the reliability of the Company’s coal plants<sup>1</sup> and (2) his assertions  
12 that Four Corners Power Plant (“Four Corners”) is performing well.<sup>2</sup>

13 I also respond to several points in the rebuttal testimony of APS witness Justin  
14 Joiner: (1) his claims that switching to seasonal operations at Four Corners is not  
15 in the best interest of APS customers; (2) his concerns with my calculation of the  
16 levelized cost of energy (“LCOE”) of APS’s coal plants; (3) his claims regarding  
17 APS’s need to continue relying on Four Corners; (4) his assertions that continued  
18 reliance on Four Corners creates costs savings for customers; and (5) his claims

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<sup>1</sup> Rebuttal Testimony of Jacob Tetlow at 12:23–16:2 [hereinafter “Tetlow Rebuttal”].

<sup>2</sup> *Id.* at 13:17–16:2.

1           that the Effluent Limitation Guidelines (“ELG”) compliance project at the Four  
2           Corners plant is necessary and in the best interest of APS ratepayers.<sup>3</sup>

3   **2. APS HAS NOT DEMONSTRATED THAT CONTINUED RELIANCE ON FOUR CORNERS**  
4   **THROUGH 2031, AND ESPECIALLY CONTINUED OPERATION YEAR-ROUND, IS THE**  
5   **MOST ECONOMIC OPTION FOR RATEPAYERS.**

6   **Q     How did Witness Tetlow respond to your evaluation of the recent historical**  
7           **performance of APS’s coal plants?**

8   **A**Witness Tetlow takes issue with my presentation of industry standard plant  
9           utilization and reliability metrics. In my testimony, I presented data on the  
10          capacity factors for APS’s coal plants, as well as their equivalent availability  
11          factors (“EAF”) and their equivalent forced outage rate (“EFOR”). EAF measures  
12          the percentage of time that a unit was available during all the hours in a given  
13          period. EFOR measures the percentage of time that a unit is in demand but was  
14          unavailable due to a forced, or unplanned, outage. Both metrics are important and  
15          regularly used in understanding how reliable a unit is.

16          Witness Tetlow asserts that EAF is a much better measure of reliability<sup>4</sup> and goes  
17          on to suggest that EAF evaluated only for the summer peak period is actually the  
18          most important measure.<sup>5</sup> He cites the high recent summer EAF for Four Corners  
19          over the past four years as evidence that its summer availability was high and

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<sup>3</sup> Rebuttal Testimony of Justin Joiner at 8:22–9:27, 12:11–22:18, 23:12–25:12, 27:11-23 [hereinafter “Joiner Rebuttal”].

<sup>4</sup> Tetlow Rebuttal at 12:26-27.

<sup>5</sup> *Id.* at 13:4-9.

1 critical for the region. He explains that the plant’s improved performance in 2018  
2 was the direct result of investments made at the plant to increase summer  
3 reliability (which I will discuss later).<sup>6</sup>

4 It is reasonable for the Company to suggest that the EAF during the critical  
5 summer peak period be used as an *additional* metric to evaluate system  
6 performance. But it is not reasonable to suggest that year-round availability and  
7 reliability, for a resource that the Company plans to rely upon year-round, is not  
8 important.

9 **Q If APS load peaks during the summer, why is it important to understand the**  
10 **year-round reliability of APS’s coal plants?**

11 **A** Year-round reliability is important because unplanned outages at the Four Corners  
12 plant during the winter impact seasonal reliability in the region and have recently  
13 cost ratepayers millions of dollars.<sup>7</sup> This is what the EFOR metric shows, as I  
14 discuss in my direct testimony.<sup>8</sup> EFOR paints a less positive picture of plant  
15 performance than the Summer EAF metric that Witness Tetlow advocates for. If  
16 the Company was planning to operate the plant only in the summer moving  
17 forward, I could understand its desire to focus only on summer peak reliability  
18 metrics. But APS has reversed its proposal to operate Four Corners seasonally  
19 beginning in fall 2023.<sup>9</sup> If the plant becomes unavailable when it is expected to be  
20 online, that imposes real costs and impacts on APS and its ratepayers. As I

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<sup>6</sup> *Id.* at 13:20–15:16.

<sup>7</sup> Direct Testimony of Devi Glick at 20:2-4 [hereinafter “Glick Direct”].

<sup>8</sup> *Id.* at 18:4–19:13.

<sup>9</sup> Glick Direct, Attach. DG-2, APS Response to Staff DR 1.14(a-b).

1 discussed in my direct testimony, APS incurred tens of millions in replacement  
2 power costs in January 2023 alone at Four Corners when one unit went offline.<sup>10</sup>

3 **Q What does Witness Joiner say about APS' justification for not switching**  
4 **Four Corners to seasonal operations in 2023?**

5 **A** Company Witness Joiner claims the most economic choice is to continue normal  
6 (year-round) operations at Four Corners.<sup>11</sup> This assertion is inconsistent with  
7 Witness Tetlow's entire justification for focusing only on summer reliability  
8 metrics at Four Corners, and it contradicts his claims that there is sufficient  
9 affordable generation (besides the coal plants) in the West during the non-summer  
10 months.<sup>12</sup>

11 Witness Joiner cites high and volatile forecasts of gas prices for the winter of  
12 2023 and into 2024 as support for APS's decision to continue year-round  
13 operations at Four Corners.<sup>13</sup> But gas prices are inherently volatile, and APS's  
14 decision to defer seasonal operations was made at a time when gas prices were at  
15 a record high. Prices in both the spot market and futures market for natural gas  
16 have dropped significantly since the time APS decided not to switch to seasonal  
17 operations (July 2022) and since the time that APS filed direct testimony  
18 discussing this decision (October 2022).

19 Rather than jumping between whichever fossil resource is less expensive in the  
20 short term, using coal and gas to hedge against each other, APS should focus on  
21 building lower-cost energy and capacity resources. This will allow the Company

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<sup>10</sup> Glick Direct at 20:2-4.

<sup>11</sup> Joiner Direct at 27:20-21.

<sup>12</sup> Tetlow Rebuttal at 13:6-9.

<sup>13</sup> Joiner Rebuttal at 27:13-23.

1 to reduce its reliance on *both* coal and gas resources and reduce the exposure of  
2 ratepayers to volatile fossil fuel prices.

3 **Q What other factors will a switch to seasonal operations at Four Corners**  
4 **impact?**

5 **A** In addition to reducing how much money APS spends to purchase coal (and  
6 therefore reducing exposure to volatile fossil fuel prices), a switch to seasonal  
7 operations at Four Corners will also reduce emissions of carbon dioxide (“CO<sub>2</sub>”)  
8 and other air pollutants, as well as reduce water use.

9 Any actions to decrease emissions of CO<sub>2</sub> and other air pollutants will lower  
10 APS’ costs and the risks posed by current and future environmental regulations  
11 that have been adopted or proposed by the Biden Administration to target  
12 emissions and other negative impacts from coal-fired power plants. Coal plants  
13 fundamentally have more inputs and waste outputs that can be regulated than  
14 most other energy sources and are therefore likely to become more costly to  
15 operate and maintain as more and more stringent regulations are enacted.

16 Company Witness Tetlow claims that Four Corners complies with all applicable  
17 environmental regulations, and that even for new proposed regulations with  
18 compliance uncertainty, Four Corners will be compliant, with minimal need for  
19 additional expenditures.<sup>14</sup> But Witness Tetlow’s statement in this respect is  
20 unsubstantiated. And even if capital expenditures are not required, regulations can  
21 still increase operational costs. In the current regulatory environment, there are  
22 likely to be additional policies which could further increase the cost of coal plant  
23 operations.

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<sup>14</sup> Tetlow Rebuttal at 18:6-25.

1 Water availability and limitations are also an important consideration for APS.  
2 The Company gets its cooling water for Four Corners from Morgan Lake (which  
3 is filled from the Navajo Reservoir) and the San Juan River.<sup>15</sup> Witness Tetlow  
4 asserts that there will be sufficient water available for Four Corners even if there  
5 is a shortage at the Navajo Reservoir, despite the fact that the Reservoir reached  
6 its record-lowest level in 2022.<sup>16</sup> These surface water sources are highly  
7 dependent on precipitation and snowpack. Droughts, higher-than-average  
8 temperatures, lower snowpack, and water rights allocation issues all threaten to  
9 increase the cost and decrease the availability of the surface water that Four  
10 Corners relies on for cooling.

11 **Q Can APS still switch Four Corners to seasonal operations in 2023?**

12 **A** Yes. The Company is only required to give seven days' notice if it wishes to  
13 switch Four Corners to or from seasonal operations.<sup>17</sup> APS can still plan for  
14 seasonal operations at Four Corners for the fall of 2023.

15 **Q How do you respond to Company Witnesses Tetlow and Joiner's claims that**  
16 **Four Corners is performing well and creates cost savings for customers?**

17 **A** Company Witness Tetlow asserts in his rebuttal testimony that Four Corners is  
18 performing well, and that increased reliability at Four Corners during the past five

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<sup>15</sup> *Id.* at 16:18-20.

<sup>16</sup> *Id.* at 17:18-23.

<sup>17</sup> Surrebuttal Testimony of Devi Glick at 5:3-6, Docket No. E-01933A-22-0107 (Ariz. Corp. Comm'n Mar. 6, 2023), *available at* <https://docket.images.azcc.gov/E000024675.pdf?i=1690241496136>.



1 years is a direct result of Company investment at the plant, as I discuss above.<sup>18</sup>  
2 This explains why APS's capital spending at Four Corners is much higher than  
3 the industry average for similar coal plants (as I discuss in my direct testimony).<sup>19</sup>  
4 It also supports my concerns that APS's future projections are likely understating  
5 the investments required to keep the plant online. If Four Corners required  
6 substantial age-related capital investments over the past five years to maintain  
7 summer reliability, it is likely to continue to require increased investments and  
8 spending going forward with a continually aging plant. And given that APS's  
9 future capital projections are low compared to past spending, it is not clear that  
10 APS has incorporated this likely high level of capital spending into future  
11 analysis.<sup>20</sup>

12 Company Witness Joiner states in his testimony that Four Corners provided  
13 hundreds of millions in net energy value between 2021 and the end of 2022.<sup>21</sup> But  
14 it is unclear what this value represents, how it was calculated, or what cost and  
15 value assumptions the Company relied upon.

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<sup>18</sup> Tetlow Rebuttal at 13:20–15:16.

<sup>19</sup> Glick Direct at 34:11-23.

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

<sup>21</sup> Joiner Rebuttal at 23:15-17.

1   **Q**    **Company Witness Joiner takes issue with your use of the levelized cost of**  
2           **energy (“LCOE”) metric to evaluate the economic performance of the**  
3           **Company’s fossil plants compared to alternatives. How do you respond?**

4   **A**    Company Witness Joiner characterizes LCOE as an incomplete and inadequate  
5           method of resource valuation.<sup>22</sup> He goes on to say that it would be inappropriate  
6           to procure resources based solely on LCOE metrics.<sup>23</sup> I don’t disagree that it  
7           would be inappropriate to make resource procurement decisions based *solely* on  
8           LCOE metrics. In fact, I do not and would not suggest that APS rely solely on  
9           LCOE. Resource procurement decisions should not be made in a vacuum based  
10          on a single metric or evaluation. But the LCOE metric is useful because it  
11          combines capital costs, operation and maintenance costs, performance, and fuel  
12          costs all into a single metric.<sup>24</sup> It is therefore a useful way to evaluate and to  
13          compare resource costs across different resource types.

14           LCOE is particularly important here because it makes clear how expensive it is to  
15           continue operating the Four Corners plant. This speaks to the importance of  
16           bringing online other energy resources to economically displace at least some of  
17           the energy from Four Corners. It also shows why it is important for APS to switch  
18           Four Corners to seasonal operations, and not rely on the plant in the non-summer  
19           months when there are other lower-cost resource options.

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<sup>22</sup> *Id.* at 9:3-4, 20:6-18.

<sup>23</sup> *Id.* at 9:6-9.

<sup>24</sup> *Energy Analysis: Simple Levelized Cost of Energy (LCOE) Calculator Documentation*,  
Nation Renewable Energy Laboratory (last accessed July 21, 2023), *available at*  
<https://www.nrel.gov/analysis/tech-lcoe-documentation.html>.

1 **Q Mr. Joiner is also critical of your citation of the 2019 Strategen Consulting**  
2 ***Arizona Coal Plant Valuation Study*.<sup>25</sup> How do you respond?**

3 **A** The Strategen study is just one among many data points that I discuss in my direct  
4 testimony to present a complete picture of what we currently know about the cost  
5 and risks of continued reliance on the Four Corners coal plant. Other data points  
6 discussed in my testimony include the LCOE of the plant, the cost of other  
7 regional resource options, the cost of APS's power purchase agreements, and an  
8 outline of other harder-to-quantify risks associated with continued reliance on  
9 coal. My conclusions about the Four Corners plant are based on all of these  
10 factors, not just the Strategen study. Critically, the Strategen study included the  
11 cost of exiting the Four Corners coal contract, which much of the Company's own  
12 analysis does not include. And despite the Company's criticisms of the Strategen  
13 study as outdated, APS cites studies from a similar timeframe (2020) performed  
14 by E3 to support its position that retirement of Four Corner in advance of 2031 is  
15 more costly than maintaining the current retirement date.<sup>26</sup>

16 **Q How do you respond to Witness Joiner's discussion of the E3 analysis**  
17 **conducted in 2020 and its purported findings regarding the value to**  
18 **ratepayers of early closure of Four Corners?<sup>27</sup>**

19 **A** As discussed above, I am concerned that all the Company's modeling, including  
20 the E3 modeling referenced in Witness Joiner's testimony, substantially  
21 understates the forward-going costs required to maintain reliability at the Four

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<sup>25</sup> Joiner Rebuttal at 17:4-10.

<sup>26</sup> *Id.* at 17:10-18.

<sup>27</sup> *Id.* at 18:19-19:12.

1           Corners plant, especially for summer peak conditions. I am also concerned with  
2           Mr. Joiner’s assertion that APS does not believe that the results of the analysis  
3           would be different today, even after the passage in 2022 of the federal Inflation  
4           Reduction Act (“IRA”) and its substantial associated tax credits.<sup>28</sup> While it is true  
5           that we are coming out of a period of record inflation, supply chain shortages,  
6           labor challenges, and other global challenges, these factors impact all resource  
7           types, not just new renewable resources. These factors will, for example, continue  
8           to drive up the cost to operate and maintain Four Corners.

9           Additionally, renewable costs are starting to come down after several years of  
10          price increases. A report published by LevelTen Energy on July 17, 2023 found  
11          that solar power purchase agreement prices fell by around 1 percent across the  
12          United States in the second quarter of 2023, following three years of large price  
13          increases.<sup>29</sup> The report goes on to state that the aggregate 1 percent decline is  
14          actually much larger in most parts of the country and was skewed upward by a 14  
15          percent price jump in Texas due to the unstable legislative climate there.<sup>30</sup>

16   **Q       How do you respond to Company Witness Joiner’s statement<sup>31</sup> that the**  
17   **viability of bringing on replacement resources by 2028 is a limiting factor in**

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<sup>28</sup> *Id.* at 18:13-22.

<sup>29</sup> Emma Penrod, *Solar PPA prices drop for first time since onset of COVID-19: LevelTen*, Utility Dive (July 18, 2023), available at [https://www.utilitydive.com/news/solar-wind-renewable-energy-ppa-prices-levelten/687881/?utm\\_source=Sailthru&utm\\_medium=email&utm\\_campaign=Issue:%202023-07-18%20Utility%20Dive%20Newsletter%20%5Bissue:52691%5D&utm\\_term=Utility%20Dive](https://www.utilitydive.com/news/solar-wind-renewable-energy-ppa-prices-levelten/687881/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202023-07-18%20Utility%20Dive%20Newsletter%20%5Bissue:52691%5D&utm_term=Utility%20Dive) (citing *North America Q2 2023 PPA Price Index Report*, LevelTen Energy (July 18, 2023), available at <https://www.leveltenenergy.com/post/q2-2023-na-ppa-price-index-report>).

<sup>30</sup> *Id.*

<sup>31</sup> Joiner Rebuttal at 20:26–21:3, 22:10-18.

1           **retiring Four Corners early, and that this justifies APS’s investment in the**  
2           **ELG project at Four Corners?**

3    **A**     I understand that it takes time to procure replacement resources, and I would  
4           never suggest that APS should take Four Corners offline before adequate  
5           replacement resources have been procured. But I am concerned that by continuing  
6           to push back on an earlier Four Corners retirement and continuing to approach  
7           procurement planning as though there is no option except 2031 retirement, APS is  
8           essentially eliminating early Four Corners retirement as an option, regardless of  
9           economics. Stated another way, the longer APS waits to begin procuring  
10          replacement resources, the less of a chance there is for the Company to bring  
11          replacement resources online in time for an early Four Corners retirement. There  
12          remains plenty of time to bring replacement resources online in less than eight  
13          years (2023 to 2031), and close Four Corners earlier than 2031.

14          I am also concerned that APS is using this timeline argument to justify its  
15          avoidable \$52 million investment in the ELG project at Four Corners.<sup>32</sup> This  
16          project shows the type of environmental compliance costs that will be borne by  
17          APS ratepayers if APS continues to rely on Four Corners. Witness Joiner defends  
18          the ELG project, stating that the \$52 million in spending on the project enables  
19          970 MW of capacity to continue operating for three years.<sup>33</sup> But this \$52 million  
20          only represents a portion of the cost to ratepayers of extending the life of Four  
21          Corners by three years. APS ratepayers must also continue to pay tens of millions  
22          in fixed operations and maintenance costs and other sustaining capital costs  
23          incurred over those three years, and might also pay potential additional

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<sup>32</sup> *Id.* at 20:19–21:21.

<sup>33</sup> *Id.* at 21:1-14.

1 environmental compliance costs, all of which can be avoided with earlier  
2 retirement.

3 **Q How do you respond to Company Witness Joiner’s statements regarding the**  
4 **need for dispatchable resources overnight,<sup>34</sup> and his analysis on the cost and**  
5 **quantity of resources needed to replace Four Corners?<sup>35</sup>**

6 **A** I agree that the portfolio that replaces Four Corners will need to provide energy  
7 and capacity during the overnight period. But battery storage can store energy for  
8 use overnight, and wind resources tend to ramp up overnight. Combined, a  
9 portfolio of wind, solar, and battery storage resources can provide a reliability-  
10 enhancing, diverse output portfolio.

11 Regarding Witness Joiner’s replacement analysis, once again, Mr. Joiner provided  
12 no explanation for his assumptions or the methodology he used to determine the  
13 costs and quantity of replacement resources he assumed. But he does clearly state  
14 that the resource selection outlined in his testimony does not represent the optimal  
15 replacement portfolio.<sup>36</sup> Instead of looking at what the system would need to  
16 replace Four Corners, Mr. Joiner appears to have put together a portfolio that  
17 would replace all of the energy and capacity from the plant. This is not how  
18 resource planning or procurement should be done, because it results in a  
19 massively overbuilt and inefficient system, as Mr. Joiner is surely aware. At best,  
20 Mr. Joiner’s proposed portfolio displays poor resource planning practices. At  
21 worst, it is a misleading attempt to make alternative resources seem unreasonably  
22 expensive.

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<sup>34</sup> *Id.* at 13:6-13.

<sup>35</sup> *Id.* at 14:1–15:21.

<sup>36</sup> *Id.* at 14:10-14.

1 **Q How do you respond to Mr. Joiner’s claims that you and Sierra Club**  
2 **recommend “heavy” levels of market reliance for APS to replace Four**  
3 **Corners?**<sup>37</sup>

4 **A** There is nothing in my testimony that recommends “heavy” reliance on the  
5 market. Instead, I recommend that APS consider market purchases as part of its  
6 portfolio of replacement resources, along with solar PV, onshore wind, battery  
7 storage, demand-side management, transmission build out.<sup>38</sup> As part of its  
8 resource planning practices, APS should incorporate a reasonable level of market  
9 purchases and should understand the value of overall integration within the liquid  
10 and expanding western marketplace.<sup>39</sup> Incorporating market purchases can bolster  
11 resource adequacy and result in lower costs compared to APS conservatively  
12 planning its system to operate like an isolated island.<sup>40</sup>

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<sup>37</sup> *Id.* at 24:11-18.

<sup>38</sup> Glick Direct at 74:11-13.

<sup>39</sup> The California ISO Western Energy Imbalance Market and the planned SPP Market + marketplace are both making strides towards improving liquidity throughout the West through day-ahead market structures to complement the real-time energy imbalance structure that currently exists across the WECC region.

<sup>40</sup> *See, e.g., Western RTO Economic Impact Study: Region-wide Analysis*, Advanced Energy Economy (July 26, 2022), available at <https://www.aee.net/western-rto>; Kelsie Gomanie, *The Race to Organize Energy Markets in the Western U.S. Is On*, NRDC (January 13, 2023), available at <https://www.nrdc.org/bio/kelsie-gomanie/race-organize-energy-markets-western-us>; Concentric Staff Writer, *An Organized Western Electricity Market – Who Would Run It and What Are the Challenges?*, Concentric Energy Advisors (May 13, 2022), available at <https://ceadvisors.com/an-organized-western-electricity-market-who-would-run-it-and-what-are-the-challenges/>.

1 **Q How do you respond to Witness Joiner’s claims regarding the value of Four**  
2 **Corners for resource diversity?<sup>41</sup>**

3 **A** I agree that resource diversity is important. But that doesn’t mean that APS should  
4 keep an aging, uneconomic resource like Four Corners online. Adding solar PV,  
5 onshore wind, battery storage, demand management, and new transmission  
6 infrastructure will also increase resource diversity, and will do so at a lower cost  
7 and with lower risks to ratepayers.

8 **3. REGULATORY CHANGES AND ONGOING GAS MARKET VOLATILITY WILL MAKE**  
9 **RELIANCE ON NEW GAS PLANTS INCREASINGLY RISKY AND EXPENSIVE.**

10 **Q How do you respond to Witness Joiner’s claims that new gas will need to be a**  
11 **part of APS’s resource portfolio going forward?<sup>42</sup>**

12 These claims are concerning, for several reasons. First, Witness Joiner indicated  
13 that the development timeline of new gas plants is longer than for renewables. If  
14 APS plans to rely on gas to replace Four Corners, that would delay the retirement  
15 of Four Corners longer than if APS replaced the plant with a renewable and  
16 battery storage portfolio.<sup>43</sup>

17 Second, as I discussed in my direct testimony, continued reliance on gas resources  
18 subjects APS ratepayers to a volatile and risky global commodity.<sup>44</sup> Figure 1  
19 below shows how volatile natural gas prices have been over the past decade. Even

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<sup>41</sup> Joiner Rebuttal at 12:15-20.

<sup>42</sup> Joiner Rebuttal at 16:1-24.

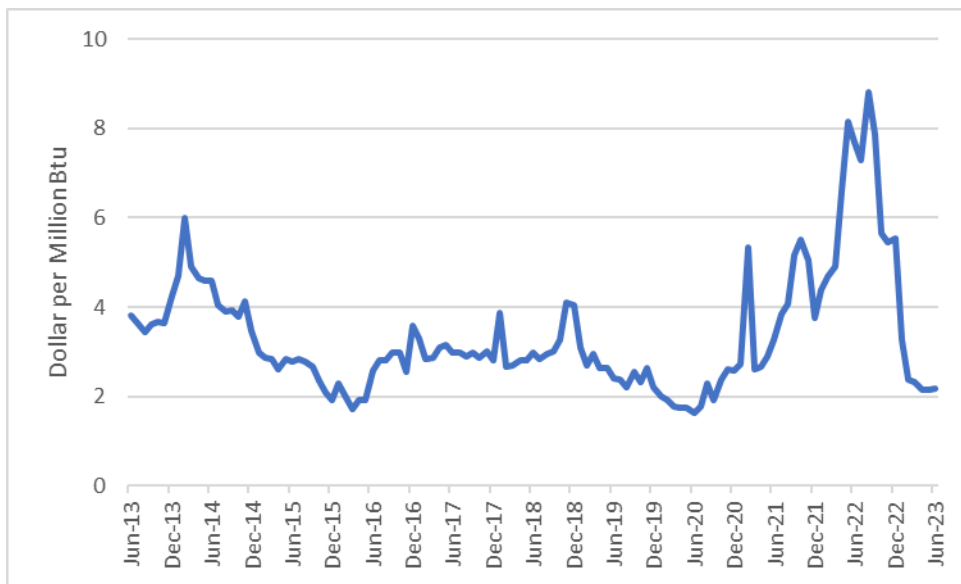
<sup>43</sup> *Id.* at 22:1-4.

<sup>44</sup> Glick Direct at 15:6-11.



1           though gas prices have decreased since last year, as Company Witness Joiner  
2           stated in his testimony, forward gas prices are still forecasted to come back up to  
3           above \$3.50/mmBtu during the winter of 2023 and above \$4.00/mmBtu into  
4           2024.<sup>45</sup>

5           *Figure 1: Henry Hub Natural Gas Spot Prices Over the Past Decade*



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7           Source: *Henry Hub Natural Gas Spot Market Prices*, U.S. Energy Information Administration  
8           (July 21, 2023), available at <https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm>.

9           Finally, finalization of proposed federal regulations governing emissions of  
10          greenhouse gases from power plants under Clean Air Act section 111(b) will  
11          make continued reliance on natural gas resources more expensive than it was in  
12          the past. Specifically, under the proposed regulations all new gas-fired plants that  
13          plan to operate between 20 and 50 percent capacity factors (gas turbines and

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<sup>45</sup> Joiner Rebuttal at 27:14-16.

1 combined cycle plants) must co-fire at least 30 percent on hydrogen by 2032.<sup>46</sup>  
2 All new gas-fired plants that expect to operate at capacity factors above 50  
3 percent (combined-cycle and simple-cycle combustion turbines) must either  
4 install carbon capture and sequestration technology that captures 90 percent of  
5 CO<sub>2</sub> emissions by 2035, or co-fire with hydrogen 30 percent by 2032 and 96  
6 percent by 2038.<sup>47</sup> This requirement will substantially change the cost and  
7 operational parameters of continuing to rely on gas.

8 **Q Does this conclude your testimony?**

9 **A** Yes.

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<sup>46</sup> *New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule*, 88 Fed. Reg. 33240, 33244 (May 23, 2023), available at <https://www.govinfo.gov/content/pkg/FR-2023-05-23/pdf/2023-10141.pdf> (to be codified at 40 C.F.R. pt. 60).

<sup>47</sup> *Id.*