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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

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BOYD DUNN
SANDRA KENNEDY
JUSTIN OLSON
LEA MÁRQUEZ PETERSON

IN THE MATTER OF THE APPLICATION OF)
TUCSON ELECTRIC POWER COMPANY FOR)
THE ESTABLISHMENT OF JUST AND)
REASONABLE RATES AND CHARGES) DOCKET NO. E-01933A-19-0028
DESIGNED TO REALIZE A REASONABLE)
RATE OF RETURN ON THE FAIR VALUE OF) **SIERRA CLUB NOTICE OF**
THE PROPERTIES OF TUCSON ELECTRIC) **FILING EXHIBIT SC-15**
POWER COMPANY DEVOTED TO ITS)
OPERATIONS THROUGHOUT THE STATE OF)
ARIZONA AND FOR RELATED APPROVALS.)

The Sierra Club hereby submits the Response to Late-filed ACC Staff Testimony of Devi Glick as Sierra Club’s Exhibit 15 in the above referenced docket.

RESPECTFULLY SUBMITTED this 22nd day of June, 2020.

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**BEFORE THE
ARIZONA CORPORATION COMMISSION**

**IN THE MATTER OF THE APPLICATION
OF TUCSON ELECTRIC POWER
COMPANY FOR THE ESTABLISHMENT
OF JUST AND REASONABLE RATES AND
CHARGES DESIGNED TO REALIZE A
REASONABLE RATE OF RETURN ON
THE FAIR VALUE OF THE PROPERTIES
OF TUCSON ELECTRIC POWER
COMPANY DEVOTED TO ITS
OPERATIONS THROUGHOUT THE
STATE OF ARIZONA AND FOR RELATED
APPROVALS**

DOCKET NO. E-01933A-19-0028

Response to Late-filed ACC Staff Testimony

Devi Glick

On Behalf of Sierra Club

May 8, 2020

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LIST OF EXHIBITS

Exhibit No. DG-1. Resume of Devi Glick

Exhibit No. DG-2. ACC Staff Response to SC Data Request No. 1.4

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

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

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

6 **Q Please describe Synapse Energy Economics.**

7 **A** Synapse is a research and consulting firm specializing in energy and environmental issues,
8 including electric generation, transmission and distribution system reliability, ratemaking and
9 rate design, electric industry restructuring and market power, electricity market prices,
10 stranded costs, efficiency, renewable energy, environmental quality, and nuclear power.

11 Synapse’s clients include state consumer advocates, public utilities commission staff,
12 attorneys general, environmental organizations, federal government agencies, and utilities.

13 **Q Please summarize your work experience and educational background.**

14 **A** At Synapse, I conduct economic analyses and write testimony and publications that focus on
15 a variety of issues related to electric utilities. These issues include, non-exhaustively, power
16 plant economics, utility resource planning practices, unit commitment and dispatch practices,
17 valuation of distributed energy resources, and utility handling of coal combustion residuals
18 waste. I have submitted expert testimony on plant economics, utility resource needs, unit
19 commitment practices, and solar valuation in the states of Texas, New Mexico, Indiana,
20 Connecticut, Virginia, North Carolina, South Carolina, and Florida. In the course of my
21 work, I develop in-house models and perform analysis using industry-standard models.

22 Prior to joining Synapse, I worked at Rocky Mountain Institute, focusing on a wide range of
23 energy and electricity issues. I have a master’s degree in public policy and a master’s degree
24 in environmental science from the University of Michigan, as well as a bachelor’s degree in

1 environmental studies from Middlebury College. I have more than seven years of
2 professional experience as a consultant, researcher, and analyst. A copy of my current resume
3 is attached as Exhibit DG-1.

4 **Q On whose behalf are you testifying in this case?**

5 **A** I am testifying on behalf of Sierra Club.

6 **Q Have you testified previously before the Arizona Corporation Commission?**

7 **A** No, I have not.

8 **Q Have you previously contributed to the development of testimony that was presented**
9 **before the ACC?**

10 **A** Yes. I assisted Sierra Club witness Avi Allison with the development of his direct and
11 surrebuttal testimony in this docket. Additionally, I am providing expert services to support
12 the Sierra Club in its engagement in the ongoing Arizona Integrated Resource Planning (IRP)
13 process.

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

15 **A** The purpose of my testimony is to review the late-filed testimony of Arizona Corporation
16 Commission (ACC) Utilities Division Staff's (Staff) witness Zachary Branum, which
17 evaluated the reasonableness of Tucson Electric Power Company's (TEP or the Company)
18 purchase of Gila River Power Station Unit 2 (Gila River Unit 2) and construction of ten
19 Reciprocating Internal Combustion Engine (RICE) units.

20 **Q Please identify the documents upon which you base the opinions presented in your**
21 **testimony.**

22 **A** My findings rely primarily upon the ACC Staff's late-filed testimony, exhibits, and discovery
23 responses, the direct and surrebuttal testimony of Sierra Club witness Avi Allison, which I

1 assisted in developing and reviewed, as well as TEP's original testimony, exhibits, and
2 discovery. I also rely, to a limited extent, on external documents such as industry
3 publications and government data.

4 **2. FINDINGS AND RECOMMENDATIONS**

5 **Q Please summarize your findings.**

6 **A** My primary findings include the following:

- 7 1. ACC staff presents no new findings or evidence on the prudence or
8 reasonableness of TEP's purchase of Gila River Unit 2 or construction of the
9 RICE units. Staff has not called into question Sierra Club's evidence
10 demonstrating that TEP's decision to build ten RICE units was imprudent.
11 Further, Staff has not demonstrated that TEP sufficiently analyzed procurement of
12 alternative resources such as wind and battery storage. Finally, Staff has not
13 called into question Sierra Club's evidence demonstrating that TEP's decision to
14 enter a tolling agreement for, and subsequently purchase, Gila River Unit 2 was
15 imprudent.
- 16 2. ACC Staff's late-filed testimony does not change any of Sierra Club's findings
17 and recommendations as outlined in the direct testimony of Sierra Club witness
18 Avi Allison.

19 **Q Do you have any recommendations to offer the Commission?**

20 **A** Yes. Based on my review of Staff's late-filed testimony, Sierra Club's recommendations
21 regarding Gila River Unit 2 and the RICE units are unchanged.

- 22 1. The Commission should not permit TEP to place Gila River Unit 2 into rate base.
23 In addition, the Commission should require TEP to evaluate the possibility of
24 exiting its current long-term Gila River Unit 2 tolling agreement, which was never
25 properly supported.

1 2. The Commission should not permit TEP to place the RICE units into rate base. In
2 the alternative, the Commission should not permit TEP to earn a return on its
3 investments in the RICE units.

4 **3. PURPOSE OF STAFF’S LATE-FILED TESTIMONY**

5 **Q Please summarize Staff’s testimony, including its conclusions and the approach and**
6 **methodology they used to reach those conclusions.**

7 **A** Staff reviewed TEP’s 2017 IRP, supplemented by other utility plans, as the basis for
8 identifying and evaluating the Company’s stated needs. Staff also reviewed public hourly
9 demand data to analyze daily load profiles against dispatch on TEP’s system over the past
10 year.¹

11 Based on this review, Staff concluded that the Company has experienced operational issues
12 related to the integration of renewable generation. In addition, Staff concluded “that the
13 Company has a demonstrated resource need to meet forecasted demand over the 15-year
14 period of the IRP process.”² Based on these findings, Staff concludes that the procurement of
15 Gila River Power Station Unit 2 and construction of the RICE project were both prudent.³

16 **4. STAFF PERFORMS NO SUBSTANTIVE NEW NEED OR ALTERNATIVES ANALYSIS, AND**
17 **INSTEAD RELIES ON TEP’S ANALYSIS TO INFORM ITS FINDINGS AND CONCLUSIONS**

18 **Q Please summarize your findings on Staff’s need and alternatives analysis.**

19 **A** Staff does not critically evaluate TEP’s claims regarding its future needs or its selection of
20 Gila River Unit 2 and the RICE units to meet the Company’s identified needs. Instead, Staff

¹ Late-Filed Testimony of Zachary Branum, p. 5.

² *Id.*, p. 4.

³ *Id.*, Summary page.

1 appears to rely on TEP's analysis and findings, saying that it "believes the stated needs of the
2 Company are valid and that RICE and NGCC are resources that can help address those
3 needs."⁴ Further, Staff does not consider alternatives for meeting forecasted demand and
4 addressing resource dispatch and operational challenges related to the integration of
5 renewables.

6 **Q Does Staff perform any of its own substantive research or analysis to confirm TEP's**
7 **stated need for the Gila River Unit 2 or the RICE units?**

8 **A** No. As stated above, Staff appears to rely on TEP's analysis and findings. Staff began its
9 evaluation with a baseline acceptance of TEP's stated renewable integration, and demand
10 needs⁵ and then broadly evaluated whether TEP's selected resources (Gila River Unit 2 and
11 the RICE units) could meet TEP's identified needs. Critically, Staff did not evaluate (1) if
12 TEP's stated demand need was justified, (2) if, when considering all alternatives, the Gila
13 River Unit 2 and the RICE units were the most efficient and cost-effective options to meet
14 TEP's demand, renewable integration, and ramping needs, or (3) if TEP's timeline for
15 construction and procurement was reasonable.

16 ***i. Staff was not adequately critical of TEP's choice of the RICE units***

17 **Q Did Staff have the opportunity to engage TEP and critically review TEP's decision to**
18 **construct the RICE units?**

19 **A** Yes. Staff had several opportunities to question TEP's process and selection of the RICE
20 units. However, Staff failed to do so at each point in the process.

⁴ *Id.*, p. 11.

⁵ Staff did use public data to confirm that TEP has ramping needs, which I do not dispute; however, they did not evaluate alternative options TEP had to meet those needs.

1 First, TEP's RFP was flawed and disadvantaged non-fossil resources in that it required all
2 services be provided by a single bidder/developer.⁶ Staff did not review the RFP when it was
3 issued,⁷ and apparently failed to examine whether renewable integration and voltage support
4 are separable needs that could or should have been allowed to be satisfied with different
5 resources.

6 Second, when TEP accelerated the timeline of construction for the second five RICE units,
7 relative to the timeline outlined in TEP's 2018 Action Plan Update,⁸ Staff did not evaluate
8 whether this decision was prudent. Instead, Staff accepted it as reasonable based on the fact
9 that the project cost less than what was assumed in the Reference Case Plan⁹ (this reasoning
10 is logically flawed: it's akin to claiming a purchase is prudent just because an item is on sale
11 at a particular store without considering whether you need the item or if you can get it
12 cheaper elsewhere).

13 Finally, in this rate case, in direct, surrebuttal, and late-filed testimony, Staff did not
14 scrutinize or challenge TEP's assumptions, need assessment, failure to consider alternatives,
15 or any other major points of TEP's analysis. Instead, Staff repeated TEP's claims that (1)
16 battery storage costs were too high, and (2) TEP was concerned about the risk of being a first
17 adopter.¹⁰

⁶ Ex. DG-2, ACC Staff Response to SC Data Request No. 1.4b.

⁷ *Id.*, No. 1.4a.

⁸ Tucson Electric Power, 2018 Action Plan Update, pp. 12-13, (Apr. 30, 2018), *available at* <https://www.tep.com/wp-content/uploads/2018/06/TEP-Action-Plan.pdf> [hereinafter "TEP 2018 Action Plan Update"] (noting RICE needs in 2020 and 2022).

⁹ Late-Filed Testimony of Zachary Branum, p. 15.

¹⁰ *Id.*, pp. 16-17.

1 **Q Please elaborate on your concerns with Staff's evaluation of the prudence of TEP's**
2 **investment in the RICE units in its late-filed testimony.**

3 **A** As mentioned above, Staff did not scrutinize or critically evaluate TEP's assertions regarding
4 the RICE units in Branum's late-filed testimony. Specifically:

- 5 1. Staff erroneously discussed system ramping needs as though they could only be
6 met through fossil resources.
- 7 2. Staff ignored TEP's failure to adequately consider alternatives to the RICE units
8 to meet TEP's system needs, including battery storage, renewables, and demand-
9 side management. Staff also ignored TEP's omission of EIM market integration in
10 its modeling.
- 11 3. Staff did not acknowledge or express concern over TEP's failure to consider a
12 portfolio of resources over a single fossil resource.
- 13 4. Staff took TEP's load forecast and load shape as a given.
- 14 5. Staff did not evaluate or acknowledge the risk of stranded asset costs for TEP's
15 new gas resources in the post-2030 and 2040 years.
- 16 6. Staff did not acknowledge that there are many other locations with a high
17 penetration of renewables that are successfully implementing alternatives to
18 replace fossil resources.

19 I will discuss the issues listed here in detail in the remainder of this section.

20 **Q Starting with your first point, staff asserts that TEP's system has ramping needs and**
21 **requires resources to help with renewable integration. Do you find these claims to be**
22 **reasonable?**

23 **A** Yes. It is true that TEP has required and will require resources to meet ramping needs and
24 balance renewable integration.

1 **Q Do you have any concerns with Staff’s assertions that TEP needs fossil resources to**
2 **meet its ramping needs?**

3 **A** Yes. Staff has, in general, focused on fossil fuels to provide ramping services. However, it is
4 not true that fossil resources, in this case specifically the RICE units and Gila River Unit 2,
5 are the only way or even necessarily the most prudent way to provide needed services and to
6 manage the integration of renewables. Staff’s focus on fossil resources is evident from the
7 language and framing in its late-filed testimony, which focuses on the need for fossil
8 resources, rather than on the exact services that TEP’s system needs. For example, Staff
9 witness Branum, when describing the need to ramp power production in the late afternoon,
10 stated that “[a]s system demand begins to increase later in the day, solar production begins to
11 decrease, *which requires the dispatch of natural gas and coal to meet demand.*”¹¹ He also
12 said, when describing different temporal needs for power, that “[a]s more solar generation is
13 added to the system, *TEP must back off fossil generation in the beginning of the day and then*
14 *dispatch the fossil generation in the evening.*”¹² Both of these statements ignore that demand
15 side management and alternative resources can help mitigate and meet system needs, and
16 likely at a lower cost.

17 **Q On your second point, should Staff have pressed TEP on evaluating alternative**
18 **resources that can provide the ramping, renewable integration, and voltage support**
19 **services TEP asserts that it needs?**

20 **A** Yes. It is surprising that Staff did not scrutinize TEP’s failure to consider alternatives
21 throughout the process, or perform its own research on alternatives to the RICE units.

22 Battery storage is very good at meeting ramping needs, and pairing battery storage with solar
23 PV not only provides ramping but also reduces the quantity of non-dispatchable renewables

¹¹ *Id.*, p. 6 [emphasis added].

¹² *Id.*, p. 7 [emphasis added].

1 (namely, un-paired solar) on the system. Wind generation tends to ramp up in the evening,
2 offsetting the ramp-down of solar. In fact, Staff's own analysis confirmed that TEP's system
3 wind generation ramped up as solar generation ramped down in the evening, indicating that
4 wind actually can help manage evening solar ramping needs on TEP's system.¹³ This fact
5 alone would reduce the quantity of battery resources that might otherwise be necessary (i.e.,
6 in the absence of solar PV and wind together). Battery storage, synchronous condensers
7 (retrofit from existing older steam generation units, or new),¹⁴ Static Var Compensation
8 (SVCs),¹⁵ and other alternative technologies can provide local voltage support services that
9 TEP claims it needs in the Tucson area.¹⁶ Moreover, TEP has near-term plans to enter the
10 California Independent Service Operator's Energy Imbalance Market (EIM). The EIM is
11 intended to help individual utilities integrate renewable resources by providing access to a
12 broader geographic spread of incremental and decremental energy resources to smooth out
13 hourly and intra-hourly ramping needs. Staff did not question TEP on why it did not model
14 or consider the impact of EIM market integration on TEP's ability to balance variable
15 renewables.

¹³ *Id.*

¹⁴ Synchronous condensers are devices that are configured (with a free-spinning shaft) to dynamically generate or absorb reactive power as needed to adjust grid voltage or improve the power factor. Conventional static capacitance refers to simple mechanically switched capacitors that provide reactive power but are not fast-acting like SVCs or synchronous condensers.

¹⁵ An SVC is one of several types of devices that can provide a form of either dynamic (i.e., instantaneously responsive) or static (i.e., switched into place by operator action, or automatically) voltage support, allowing the system to remain within acceptable voltage limits. SVCs specifically are electrical devices using solid-state electronic components that provide fast-acting (near instantaneous) reactive power without significant moving parts (except an internal switchgear).

¹⁶ Appendix A to TEP 2018 Action Plan Update, H. Wilson Sundt Generating Station Reciprocating Engine Use Case: Final Report, p. 16 (Dec. 2017).

1 **Q You talk about the ability of resources to provide ramping and voltage support services.**
2 **Are these services similar or related?**

3 **A** No. Even though battery storage and fossil resources can often provide both services,
4 ramping and voltage support are very different services that can be provided by different
5 resources.

6 Ramping refers to the ability of resources to rapidly come online and/or increase output
7 (ramp up) to either replace generation from a resource that has come offline or to meet a
8 sudden increase in demand. Resources with fast ramping characteristics are critical to support
9 renewable integration so that, for example, when the sun begins to set and solar generation
10 ramps down, these resources can quickly ramp up and replace the generation that has just
11 come offline. Conversely, often the same suite of resources can be used to provide reduced
12 output as demand drops (such as charging a battery with otherwise “surplus” solar generation
13 in midday). Such decremental ramping needs can be just as important to reliability as
14 incremental output capabilities.

15 Voltage support, on the other hand, refers to the ability of a generating unit or static
16 equipment (such as SVCs) to either generate or absorb reactive power in order to maintain
17 voltage levels on the system within acceptable bands below and above normal or nominal
18 voltage setpoints. Voltage support is essential to ensure the stability of power flows on the
19 electricity system.

20 **Q On your third point: Why should Staff have been critical of TEP’s failure to consider a**
21 **portfolio of resources in order to provide TEP the ramping and voltage support services**
22 **it claims it needs?**

23 **A** What Staff failed to appreciate is that a portfolio of resources can provide TEP the services
24 that it needs but in a more flexible, nimble, and incremental manner than a single fossil
25 resource. Moreover, such a portfolio can potentially do this at a lower cost and with a smaller
26 environmental impact. For example, a portfolio allows the resources brought online to
27 provide ramping and energy services to be different from resources used to provide voltage

1 support services, if such differences allow for lowest cost operation. This widens the universe
2 of possible solutions and removes constraints that would otherwise eliminate most non-fossil
3 resource options.

4 As noted, TEP is facing a local voltage constraint that requires a local technology solution.
5 But this voltage constraint is located in a high density, urban area where land availability is
6 limited. Renewables paired with battery storage solutions can require larger land footprints
7 than a comparable fossil unit. Thus, when TEP required a single resource to provide all
8 voltage, ramping, energy, and capacity services, renewable energy (otherwise a component
9 of a portfolio solution) was unnecessarily eliminated from contention. If instead TEP had
10 considered portfolios of resources, TEP could have tailored the selection of a wider range of
11 resources to meet those needs. TEP can and should compare the cost and environmental
12 impact of single resources that provide all services, such as the RICE units, with portfolios of
13 resources, such as pairing wind, solar, and/or battery storage, with SVCs and/or synchronous
14 condensing. Because TEP failed to do so, it is impossible to evaluate whether TEP selected
15 the most cost-effective resource or portfolio of resources.

16 **Q In your fourth point, you mention that Staff did not question TEP's load shape and**
17 **demand forecasts. Please elaborate on this.**

18 **A** TEP's load forecast is fundamental to its need claim. However, just as Staff was not critical
19 of TEP's failure to adequately consider supply-side options, Staff also made no mention of
20 any review of TEP's load forecast or demand-side inputs. This is concerning because a
21 utility's load forecast and load shape is not an un-manageable, immutable input. Load can be
22 over-projected, and if the system is built around over-projected load, the result will be a
23 costly, overbuilt system. Load shapes can also be managed through energy efficiency,
24 demand response, and intelligent rate design (for example, time-of-use rates to manage new
25 EV load). Demand-side management programs and intelligent rate design can control and
26 manage system peaks, and therefore reduce the level of ramping support needed. Further,
27 demand-side management tools can do so at likely at a much lower cost than any supply-side
28 resource or technology, and without the stranded asset risk posed by a fossil resource.

1 **Q Refer to your fifth point. Does Staff acknowledge that TEP’s construction of new gas**
2 **resources could expose the ratepayers to stranded asset risks?**

3 **A** No. Staff didn’t evaluate or acknowledge the risk of stranded asset¹⁷ costs for TEP’s new gas
4 resources in the post-2030 and 2040 years, or really any other risks associated with continued
5 reliance on fossil, specifically gas, resources.

6 **Q Finally, referring to your last point: Are there other utilities with high penetration of**
7 **renewables that are using alternatives to fossil plants to meet peaking and renewable**
8 **integration needs?**

9 **A** Yes. In Oakland, California, Pacific Gas and Electric (PG&E) is tapping into two lithium-ion
10 battery storage projects (43.25 MW of 4-hour battery storage) to address reliability needs in
11 the East Bay area. This is part of a larger effort to use targeted distributed energy resource
12 deployment and investment to replace a local 165 MW jet fuel-burning power plant that
13 PG&E plans to retire.¹⁸ California is a leader in renewable installations, with renewable
14 output accounting for around 40% of the California Independent System Operator’s total fuel
15 mix in 2019.¹⁹ TEP’s neighbor, Arizona Public Service (APS), announced a plan last year to
16 add 850 MW of battery storage and at least 100 MW of solar PV. Included in this amount is a
17 contract for 150 MW of third-party-owned storage, which out-competed natural gas peaking

¹⁷A “stranded asset” is an asset that, at some point prior to its economic life, will no longer be able to earn an economic return. This can result from external or internal factors that impact the competitiveness or economics of the asset, or ability of the asset to legally operate within the current regulatory environment.

¹⁸Kavya Balaraman, *PG&E proposes lithium-ion battery projects to replace Oakland fossil fuel plant*, Utility Dive (Apr. 16, 2020), available at <https://www.utilitydive.com/news/pge-proposes-lithium-ion-battery-projects-to-replace-oakland-fossil-fuel-p/576202/>.

¹⁹Rocco Canonica & Kassia Micek, *Rapid renewables growth brings challenges to US states: Part 1 – California*, S&P Global (Apr. 8, 2020), available at <https://www.spglobal.com/en/research-insights/articles/rapid-renewables-growth-brings-challenges-for-us-states-part-i-california>.

1 resources in a competitive RFP solicitation.²⁰ APS has committed to get at least 45 percent of
2 its generation from renewable resources by 2030.²¹

3 **Q How does TEP measure up to these other utilities in regard to its renewable integration**
4 **efforts?**

5 **A** TEP is well behind the utilities mentioned above and other utilities in the region in
6 renewables investment. It is projected to obtain only around 28 percent of its generation from
7 renewable energy by 2021.²² Further, TEP has indicated it only plans to meet 30 percent of
8 its generation needs from renewable resources by 2030.²³ Although TEP stated that it plans
9 to reduce greenhouse gas emissions consistent with the 2015 Paris Agreement on climate
10 change, TEP has yet to actually implement specific reduction targets.²⁴

11 *ii. Staff was not adequately critical of TEP's decision to procure Gila River Unit 2*

12 **Q Does Staff critically evaluate TEP's asserted need for, or procurement of, Gila River**
13 **Unit 2?**

14 **A** No, Staff did not critically evaluate TEP procurement of Gila River Unit 2. Specifically:

- 15 1. Staff did not evaluate TEP's proposed demand growth or asserted need for the
16 procurement of Gila River Unit 2.
17 2. Staff did not criticize TEP for failing to evaluate alternatives to the Gila River
18 Unit 2 procurement.

²⁰ Julia Pyper, *APS Plans to Add Nearly 1GW of New Battery Storage and Solar Resources by 2025*, Green Tech Media (Feb. 2019), available at <https://www.greentechmedia.com/articles/read/aps-battery-storage-solar-2025>.

²¹ AZ Big Media, *APS commits to 45% renewables 2030*, (Jan. 22, 2020) available at <https://azbigmedia.com/business/arizona-energy-industry/aps-commits-to-45-renewables-by-2030/>.

²² TEP Preliminary 2019 IRP, p. 3.

²³ *Id.*

²⁴ *Id.*

- 1 3. Staff did not question TEP's use of the "power purchase agreement" (PPA) cost
- 2 as the baseline for comparison in deciding whether to purchase Gila River Unit 2.
- 3 4. Staff did not question TEP's decision to lock in a large, risky investment when the
- 4 purchase looked only marginally better than the PPA (on an LCOE basis).
- 5 5. Staff did not seem concerned that the purchase of Gila River Unit 2 runs counter
- 6 to Commission guidance against overly focusing on gas resources.

7 **Q On your first point, please explain which portions of TEP's need assessment Staff**
8 **should have reviewed critically.**

9 **A** Staff stated that it relied on TEP's most recent IRP from 2017 in assessing TEP's future
10 needs.²⁵ However, the 2017 IRP does not support developing a new Natural Gas Combined
11 Cycle (NGCC) resource before 2022, or at the size of the Gila River Unit 2 project. Staff did
12 not question or evaluate whether, given the inconsistencies in timeline and sizing, the
13 purchase of Gila River Unit 2 was reasonable and prudent. Specifically, the agreement for
14 Gila River Unit 2 was entered into five years before TEP's claimed need for future NGCC
15 resources. Additionally, Gila River Unit 2 is 138 MW, or 33 percent, larger than TEP's
16 claimed 2022 need. With the purchase of Gila River Unit 2, TEP puts itself into an excess
17 capacity position, and in fact has sold the excess capacity to others through tolling
18 agreements.²⁶

²⁵ Late-Filed Testimony of Zachary Branum, pp. 2-3.

²⁶ TEP 2018 Action Plan Update, p. 26.

1 **Q You state in your second point that TEP never conducted an analysis of alternatives to**
2 **Gila River Unit 2. Please explain why this is concerning and which alternatives Staff**
3 **should have expected TEP to evaluate.**

4 **A** The Company has acknowledged that it never conducted any economic analyses comparing
5 Gila River Unit 2 to renewable alternatives, battery storage, or demand-side resources.²⁷
6 Recent evidence suggests that non-fossil alternatives are cost-competitive with Gila River
7 Unit 2's \$38–\$39/MWh levelized cost of energy (LCOE) in TEP's service territory.
8 Specifically, on a LCOE basis, TEP has access to solar projects in the \$25–\$30/MWh
9 range.²⁸ TEP's assumptions on the cost of wind from its 2018 Action Plan update show near-
10 term full PTC wind at \$21/MWh.²⁹ This is well below Gila River Unit 2's LCOE.

11 Additionally, TEP has recently indicated that even solar-plus-storage paired projects have
12 LCOEs lower than Gila River Unit 2.³⁰ TEP provided a PPA price point estimate of \$38 per
13 MWh in a letter to Commissioner Kennedy, and stated that a number of recent solar plus
14 storage projects had PPA prices around \$35 per MWh.³¹ These price points are both below
15 TEP's estimated LCOE for Gila River Unit 2.

²⁷ TEP later conducted a comparison to solar plus storage in response to a request from Commissioner Kennedy, but that occurred well after the Gila River Unit 2 decision was made. TEP Response to Commissioner Kennedy Letter, p. 3, Docket No. E-01933A-19-0028, (Ariz. Corp. Comm'n) (Sept. 9, 2019) [hereinafter TEP Response to Commission Kennedy].

²⁸ Gavin Badge, *Tucson Electric signs solar + storage PPA for 'less than 4.5 c/kWh'*, Utility Dive (May 23, 2017), available at <https://www.utilitydive.com/news/updated-tucson-electric-signs-solar-storage-ppa-for-less-than-45kwh/443293/>; Emma Foehringer Merchant, *Arizona Water Provider Approves Record-Low-Cost Solar PPA to Replace Coal*, Green Tech Media (June 8, 2018), available at <https://www.greentechmedia.com/articles/read/arizona-water-provider-approves-lower-cost-solar-ppa-to-replace-coal#gs.7i0kp5>.

²⁹ TEP 2018 Action Plan Update, p. 11.

³⁰ TEP Response to Commission Kennedy Letter.

³¹ *Id.*, pp. 2-3.

1 **Q In your third point, you state that Staff did not question TEP's use of Gila River Unit**
2 **2's PPA cost as a baseline for deciding whether to purchase Gila River Unit 2. Why is**
3 **this concerning?**

4 **A** TEP admitted that it made the decision to purchase Gila River Unit 2 at the time it entered
5 into the PPA.³² This admission makes the entire exercise of comparing the cost of a purchase
6 to the PPA appear disingenuous and engineered to support a solution that TEP already
7 decided on and prearranged (i.e., the purchase of Gila River Unit 2). Further, the entire
8 exercise shows that for TEP, the purchase of the unit is only marginally better on an LCOE
9 basis than staying in the PPA.

10 **Q Refer to your fourth point. Did Staff appear skeptical of the purchase given TEP's own**
11 **analysis showed that the purchase of Gila River Unit 2 was only marginally better than**
12 **staying in the PPA?**

13 **A** No. Staff expressed no concern with TEP's desire to make a large, risky purchase on such a
14 small margin. This gas plant is subject to numerous risks that renewables do not face,
15 including uncertainty about future CO₂ prices and other environmental regulations, gas price
16 volatility, and stranded asset risk. These are all risks with associated costs that TEP intends to
17 recover from its ratepayers.

18 **Q Finally, refer to your fifth point. Does Staff show concern that TEP's decision to**
19 **purchase Gila River Unit 2 went against Commission guidance?**

20 **A** No. Surprisingly, Staff remained uncritical of the purchase, despite it running counter to
21 Commission guidance. Commissioner Tobin commented in the 2017 IRP docket that the

³² Tr. Vol. II, pp. 356:21-23 (Sheehan Test.); Tr. Vol. I, pp. 141:15-18 (Hutchens Test.).

1 preliminary IRPs from AZ utilities did not achieve a reasonable balance, as they were
2 “heavily weighted towards the selection of a single resource – natural gas.”³³

3 **5. SIERRA CLUB’S FINDINGS AND RECOMMENDATIONS REMAIN UNCHANGED**

4 **Q Has anything in Staff testimony changed any of Sierra Club’s recommendations?**

5 **A** No, Staff performed no new substantive analysis that addresses Sierra Club’s concerns and
6 therefore has not influenced or changed any of Sierra Club’s findings and recommendation.
7 Sierra Club reiterates its findings that:

- 8 1. The purchase of Gila River Unit 2 was imprudent.
9 2. The construction of the RICE units on an accelerated timeline was imprudent and
10 unjustified.

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

12 **A** Yes.

³³ Decision No. 76632, No. E-00000V-15-0094, p. 22, (Ariz. Corp. Comm’n) (Mar. 13, 2018).

Exhibit DG-1

Devi Glick, Senior Associate

Synapse Energy Economics | 485 Massachusetts Avenue, Suite 3 | Cambridge, MA 02139 | 617-453-7050
dglick@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics Inc., Cambridge, MA. *Senior Associate*, April 2019 – Present, *Associate*, January 2018 – March 2019

Conducts research and provides expert witness and consulting services on energy sector issues.

Examples include:

- Modeling for resource planning using PLEXOS and Encompass utility planning software to evaluate the reasonableness of utility IRP modeling.
- Modeling for resource planning to explore alternative, lower-cost and lower-emission resource portfolio options.
- Providing expert testimony in rate cases on the prudence of continued investment in, and operation of, coal plants based on the economics of plant operations relative to market prices and alternative resource costs.
- Providing expert testimony and analysis on the reasonableness of utility coal plant commitment and dispatch practice in fuel and power cost adjustment dockets.
- Serving as an expert witness on avoided cost of distributed solar PV, and submitting direct and surrebuttal testimony regarding the appropriate calculation of benefit categories associated with the value of solar calculations.
- Reviewing and assessing the reasonableness of methodologies and assumptions relied on in utility IRPs and other long-term planning documents in Arizona, Kentucky, New Mexico, Florida, South Carolina, North Carolina, South Africa, Newfoundland, and Nova Scotia for expert reports.
- Co-authoring public comments on the adequacy of utility coal ash disposal plans, and federal coal ash disposal rules and amendments.
- Analyzing system-level cost impacts of energy efficiency at the state and national level.

Rocky Mountain Institute, Basalt, CO. August 2012 – September 2017

Senior Associate

- Led technical analysis, modeling, training and capacity building work for utilities and governments in Sub-Saharan Africa around integrated resource planning for the central electricity grid energy. Identified over one billion dollars in savings based on improved resource-planning processes.
- Represented RMI as a content expert and presented materials on electricity pricing and rate design at conferences and events.
- Led a project to research and evaluate utility resource planning and spending processes, focusing specifically on integrated resource planning, to highlight systematic overspending on conventional resources and underinvestment and underutilization of distributed energy resources as a least-cost alternative.

Associate

- Led modeling analysis in collaboration with NextGen Climate America which identified a CO2 loophole in the Clean Power Plan of 250 million tons, or 41 percent of EPA projected abatement. Analysis was submitted as an official federal comment which led to a modification to address the loophole in the final rule.
- Led financial and economic modeling in collaboration with a major U.S. utility to quantify the impact that solar PV would have on their sales, and helped identify alternative business models which would allow them to recapture a significant portion of this at-risk value.
- Supported the planning, content development, facilitation, and execution of numerous events and workshops with participants from across the electricity sector for RMI's Electricity Innovation Lab (eLab) initiative.
- Co-authored two studies reviewing valuation methodologies for solar PV and laying out new principles and recommendations around pricing and rate design for a distributed energy future in the United States. These studies have been highly cited by the industry and submitted as evidence in numerous Public Utility Commission rate cases.

The University of Michigan, Ann Arbor, MI. *Graduate Student Instructor*, September 2011 – July 2012

The Virginia Sea Grant at the Virginia Institute of Marine Science, Gloucester Point, VA. *Policy Intern*, Summer 2011

Managed a communication network analysis study of coastal resource management stakeholders on the Eastern Shore of the Delmarva Peninsula.

The Commission for Environmental Cooperation (NAFTA), Montreal, QC. *Short Term Educational Program/Intern*, Summer 2010

Researched energy and climate issues relevant to the NAFTA parties to assist the executive director in conducting a GAP analysis of emission monitoring, reporting, and verification systems in North America.

Congressman Tom Allen, Portland, ME. *Technology Systems and Outreach Coordinator*, August 2007 – December 2008

Directed Congressman Allen's technology operation, responded to constituent requests, and represented the Congressman at events throughout southern Maine.

EDUCATION

The University of Michigan, Ann Arbor, MI

Master of Public Policy, Gerald R. Ford School of Public Policy, 2012

Master of Science, School of Natural Resources and the Environment, 2012

Masters Project: *Climate Change Adaptation Planning in U.S. Cities*

Middlebury College, Middlebury, VT

Bachelor of Arts, 2007

Environmental Studies, Policy Focus; Minor in Spanish

Thesis: *Environmental Security in a Changing National Security Environment: Reconciling Divergent Policy Interests, Cold War to Present*

PUBLICATIONS

Biewald, B., D. Glick, J. Hall, C. Odom, C. Roberto, R. Wilson. 2020. *Investing In Failure: How Large Power Companies are Undermining their Decarbonization Targets*. Synapse Energy Economics for Climate Majority Project.

Glick, D., D. Bhandari, C. Roberto, T. Woolf. 2020. *Review of benefit-cost analysis for the EPA's proposed revisions to the 2015 Steam Electric Effluent Limitations Guidelines*. Synapse Energy Economics for Earthjustice and Environmental Integrity Project.

Camp, E., B. Fagan, J. Frost, N. Garner, D. Glick, A. Hopkins, A. Napoleon, K. Takahashi, D. White, M. Whited, R. Wilson. 2019. *Phase 2 Report on Muskrat Falls Project Rate Mitigation, Revision 1 – September 25, 2019*. Synapse Energy Economics for the Board of Commissioners of Public Utilities, Province of Newfoundland and Labrador.

Camp, E., A. Hopkins, D. Bhandari, N. Garner, A. Allison, N. Peluso, B. Havumaki, D. Glick. 2019. *The Future of Energy Storage in Colorado: Opportunities, Barriers, Analysis, and Policy Recommendations*. Synapse Energy Office for the Colorado Energy Office.

Glick, D., B. Fagan, J. Frost, D. White. 2019. *Big Bend Analysis: Cleaner, Lower-Cost Alternatives to TECO's Billion-Dollar Gas Project*. Synapse Energy Economics for Sierra Club.

Glick, D., F. Ackerman, J. Frost. 2019. *Assessment of Duke Energy's Coal Ash Basin Closure Options Analysis in North Carolina*. Synapse Energy Economics for the Southern Environmental Law Center.

Glick, D., N. Peluso, R. Fagan. 2019. *San Juan Replacement Study: An alternative clean energy resource portfolio to meet Public Service Company of New Mexico's energy, capacity, and flexibility needs after the retirement of the San Juan Generating Station*. Synapse Energy Economics for Sierra Club.

Suphachalasai, S., M. Touati, F. Ackerman, P. Knight, D. Glick, A. Horowitz, J.A. Rogers, T. Amegroud. 2018. *Morocco – Energy Policy MRV: Emission Reductions from Energy Subsidies Reform and Renewable Energy Policy*. Prepared for the World Bank Group.

Camp, E., B. Fagan, J. Frost, D. Glick, A. Hopkins, A. Napoleon, N. Peluso, K. Takahashi, D. White, R. Wilson, T. Woolf. 2018. *Phase 1 Findings on Muskrat Falls Project Rate Mitigation*. Synapse Energy Economics for Board of Commissioners of Public Utilities, Province of Newfoundland and Labrador.

Allison, A., R. Wilson, D. Glick, J. Frost. 2018. *Comments on South Africa 2018 Integrated Resource Plan*. Synapse Energy Economics for Centre for Environmental Rights.

Hopkins, A. S., K. Takahashi, D. Glick, M. Whited. 2018. *Decarbonization of Heating Energy Use in California Buildings: Technology, Markets, Impacts, and Policy Solutions*. Synapse Energy Economics for the Natural Resources Defense Council.

Knight, P., E. Camp, D. Glick, M. Chang. 2018. *Analysis of the Avoided Costs of Compliance of the Massachusetts Global Warming Solutions Act*. Supplement to 2018 AESC Study. Synapse Energy Economics for Massachusetts Department of Energy Resources and Massachusetts Department of Environmental Protection.

Fagan, B., R. Wilson, S. Fields, D. Glick, D. White. 2018. *Nova Scotia Power Inc. Thermal Generation Utilization and Optimization: Economic Analysis of Retention of Fossil-Fueled Thermal Fleet To and Beyond 2030 – M08059*. Prepared for Board Counsel to the Nova Scotia Utility Review Board.

Ackerman, F., D. Glick, T. Vitolo. 2018. *Report on CCR proposed rule*. Prepared for Earthjustice.

Lashof, D. A., D. Weiskopf, D. Glick. 2014. *Potential Emission Leakage Under the Clean Power Plan and a Proposed Solution: A Comment to the US EPA*. NextGen Climate America.

Smith, O., M. Lehrman, D. Glick. 2014. *Rate Design for the Distribution Edge*. Rocky Mountain Institute.

Hansen, L., V. Lacy, D. Glick. 2013. *A Review of Solar PV Benefit & Cost Studies*. Rocky Mountain Institute.

TESTIMONY

Indiana Utility Regulatory Commission (Cause No. 38707-FAC123): Direct Testimony of Devi Glick in the application of Duke Energy Indiana, LLC for approval of a change in its fuel cost adjustment for electric service. On behalf of Sierra Club. March 6, 2020.

Texas Public Utility Commission (PUC Docket No. 49831): Direct Testimony of Devi Glick in the application of Southwestern Public Service Company for authority to change rates. On behalf of Sierra Club. February 10, 2020.

New Mexico Public Regulation Commission (Case No. 19-00170-UT): Testimony of Devi Glick in Support of Uncontested Comprehensive Stipulation. On behalf of Sierra Club. January 21, 2020.

Nova Scotia Utility and Review Board (Matter M09420): Expert Evidence of Fagan, B, D. Glick reviewing Nova Scotia Power's Application for Extra Large Industrial Active Demand Control Tariff for Port Hawkesbury Paper. Prepared for Nova Scotia Utility and Review Board Counsel. December 3, 2019.

New Mexico Public Regulation Commission (Case No. 19-00170-UT): Direct testimony of Devi Glick regarding Southwestern Public Service Company's application for revision of its retail rates and authorization and approval to shorten the service life and abandon its Tolk generation station units. On behalf of Sierra Club. November 22, 2019.

North Carolina Utilities Commission (Docket No. E-100, Sub 158): Responsive testimony of Devi Glick regarding battery storage and PURPA avoided cost rates. On behalf of Southern Alliance for Clean Energy. July 3, 2019.

State Corporation Commission of Virginia (Case No. PUR-2018-00195): Direct testimony of Devi Glick regarding the economic performance of four of Virginia Electric and Power Company's coal-fired units and the Company's petitioned to recover costs incurred to company with state and federal environmental regulations. On behalf of Sierra Club. April 23, 2019.

Connecticut Siting Council (Docket No. 470B): Joint testimony of Robert Fagan and Devi Glick regarding NTE Connecticut's application for a Certificate of Environmental Compatibility and Public Need for the Killingly generating facility. On behalf of Not Another Power Plant and Sierra Club. April 11, 2019.

Public Service Commission of South Carolina (Docket No. 2018-3-E): Surrebuttal testimony of Devi Glick regarding annual review of base rates of fuel costs for Duke Energy Carolinas. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. August 31, 2018.

Public Service Commission of South Carolina (Docket No. 2018-3-E): Direct testimony of Devi Glick regarding the annual review of base rates of fuel costs for Duke Energy Carolinas. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. August 17, 2018.

Public Service Commission of South Carolina (Docket No. 2018-1-E): Surrebuttal testimony of Devi Glick regarding Duke Energy Progress' net energy metering methodology for valuing distributed energy resources system within South Carolina. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. June 4, 2018.

Public Service Commission of South Carolina (Docket No. 2018-1-E): Direct testimony of Devi Glick regarding Duke Energy Progress' net energy metering methodology for valuing distributed energy resources system within South Carolina. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. May 22, 2018.

Public Service Commission of South Carolina (Docket No. 2018-2-E): Direct testimony of Devi Glick on avoided cost calculations and the costs and benefits of solar net energy metering for South Carolina Electric and Gas Company. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. April 12, 2018.

Public Service Commission of South Carolina (Docket No. 2018-2-E): Surrebuttal testimony of Devi Glick on avoided cost calculations and the costs and benefits of solar net energy metering for South Carolina Electric and Gas Company. On behalf of South Carolina Coastal Conservation League and Southern Alliance for Clean Energy. April 4, 2018.

Resume updated May 2020

Exhibit DG-2



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April 22, 2020

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Devi Glick
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Cambridge, MA 02139

Re: Staff's Responses to Sierra Club's First Set of Data Responses
Docket No. E-01933A-19-0028

Dear Mses. Eberle, Raffel-Smith and Messrs. Wannier and Glick:

Enclosed are Staff's responses to Sierra Club's First Set of Data Request to the Arizona Corporation Commission Staff in the above-referenced matter.

Please do not hesitate to contact Staff if you have any questions regarding the attached.

Sincerely,

/s/ P. Robyn Poole
P. Robyn Poole, Staff Counsel
Stephen J. Emedi, Staff Counsel
Wesley C. Van Cleve, Assistant Chief Counsel
Legal Division
(602) 542-3402

PRP:SJE:WCVK:klc

cc: Zach Branum (zbranum@azcc.gov)

**ARIZONA CORPORATION COMMISSION STAFF'S RESPONSE TO
SIERRA CLUB'S FIRST SET OF DATA REQUESTS
DOCKET NO. E-01933A-19-0028
APRIL 22, 2020**

1.4 Refer to the Late-filed testimony of Staff Witness Branum, pages 16-17.

a. Did ACC Staff review the RFP?

RESPONSE: Pursuant to Arizona Administrative Code Title 14 Chapter 2 Article 7, Staff did not review the RFP. Staff reviewed the report of the Independent Monitor.

b. Did the RFP process require all services to be provided by a single bidder / developer, or did the process allow TEP to consider a combination of resource and technologies to provide the services the utility asserts it needs to support increased penetration of renewables?

RESPONSE: Pursuant to Arizona Administrative Code Title 14 Chapter 2 Article 7, Staff did not review the RFP. Staff reviewed the report of the Independent Monitor. Based on discussion with the Company, Staff's understanding is that the RFP process required all services to be provided by a single bidder/developer.

RESPONDENT: Zach Branum, Utilities Division, 1200 West Washington Street,
Phoenix, Arizona 85007.