



October 15, 2020

**VIA ELECTRONIC SUBMISSION**

Elijah Abinah  
Director, Utilities Division  
Arizona Corporation Commission  
1200 W. Washington Street  
Phoenix, AZ 85007

**Docket No.:** E-00000V-19-0034 – In the Matter of Resource Planning and Procurement in 2019, 2020, and 2021

**Re:** Comments of Policy Integrity on monetizing pollution quantities reported in resource plans

Dear Mr. Abinah,

The Institute for Policy Integrity at New York University School of Law<sup>1</sup> (Policy Integrity) respectfully submits these comments to the Arizona Corporation Commission (ACC or Commission) pursuant to the Commission's August 12, 2020 order modifying deadlines for filings responsive to the integrated resource plans (IRPs) filed by Tucson Electric Power (TEP), Arizona Electric Power Cooperative (AEPSCO), UNS Electric (UNS), Inc., and the Arizona Public Service Company (APS) in the above-captioned docket. Policy Integrity is a nonpartisan think tank dedicated to improving the quality of government decisionmaking. Policy Integrity regularly advises on state electricity policy generally, including in California, Colorado, and Nevada,<sup>2</sup> and in particular on whether and how to monetize the effects of air pollutant emissions caused by electricity generation. Policy Integrity has also published a number of reports on valuing and compensating emissions reductions.

Thank you for your consideration.

Respectfully,

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<sup>1</sup> These comments do not reflect the views of New York University School of Law, if any.

<sup>2</sup> See Policy Integrity's website, [policyintegrity.org](http://policyintegrity.org), for comments to states.

## Comments of Policy Integrity on Arizona Integrated Resource Planning Filings

Arizona's IRP process is intended to provide the Commission, stakeholders, and the public with detailed information about how load serving entities (LSEs) plan to supply electricity to their ratepayers over the coming 15 years, and, among other things, what adverse environmental impacts are expected to result. Each IRP's presentation of several scenarios involving different resource mixes makes it possible to compare how different resource mixes would perform. All LSEs have now filed their IRPs for 2020-2035 with the Commission, which is charged to acknowledge an IRP (or explain why it does not) after determining whether that IRP complies with various requirements and is "reasonable and in the public interest."<sup>3</sup> Policy Integrity's comments focus narrowly on how LSEs report on the emissions of air pollutants from electricity generation. We encourage the Commission to ask that each LSE includes in its IRP not only information about the quantities of air pollutants the LSE expects to emit but also monetized estimates of the damages expected to result from those emissions. Doing so would be consistent with Arizona's requirements for IRPs, reveal important information about the nature and value of generation mixes presented in each IRP, and help the Commission to determine if each IRP is in the public interest.

### I. Monetizing Emissions Impacts Is Compatible with Arizona IRP Requirements

Every other year, LSEs are required to file with the ACC plans with a 15-year time horizon that disclose environmental impacts from different resource mixes and specify how the LSE will address those impacts. Specifically, the plans must:

- Take into consideration the environmental impacts, including air pollution quantities and rates for carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), mercury (Hg), and particulate matter (PM), among others, for each generating unit represented in the proposed portfolios;<sup>4</sup>
- "[A]ddress the adverse environmental impacts of power production;"<sup>5</sup>
- Include "[a] plan for reducing environmental impacts related to air emissions;"<sup>6</sup>
- Include expected reductions in environmental impacts from demand management programs;<sup>7</sup>
- "[E]ffectively manage the uncertainty and risks associated with costs and environmental impacts;"<sup>8</sup>
- Include "[c]ost analyses and projections, including the cost of compliance with existing and expected environmental regulations."<sup>9</sup>

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<sup>3</sup> § ARIZ. ADMIN. CODE § R14-2-704(B).

<sup>4</sup> § 703(B)(1)(p).

<sup>5</sup> § 703(F)(3).

<sup>6</sup> § 703(D)(17).

<sup>7</sup> § 703(D)(14)(d).

<sup>8</sup> § 703(F)(7).

<sup>9</sup> § 703(D)(1)(h).

At present, LSEs take different approaches to complying with these requirements. All Arizona LSEs typically disclose historical and projected emissions *quantities* in their plans,<sup>10</sup> but—even though they are all required to include information about environmental compliance costs<sup>11</sup>—only some LSEs report their anticipated or potential greenhouse gas regulation compliance costs in their modeling or compliance costs for other environmental regulations.<sup>12</sup> Similarly, some but not all LSEs “address the adverse environmental impacts of power production”<sup>13</sup> by identifying the expected costs of achieving different greenhouse gas emission reductions of various portfolios.<sup>14</sup> Currently, however, no LSE reports monetized estimates of the *damages* done by their emissions, even though all LSEs already gather and disclose much, if not all, of the information they would need to make such estimates. Notably, Arizona regulations invite LSEs to provide the ACC with analyses “pertaining to environmental impacts...which may include monetized estimates of environmental impacts that are not included as costs for compliance.”<sup>15</sup>

LSEs should take a more comprehensive and uniform approach to reporting on costs related to emissions, one that monetizes both compliance and damage costs. This would help the ACC, stakeholders, and the public to understand the benefits and costs of LSEs’ IRPs, and it would help LSEs to better “address the adverse environmental impacts of power production,” as Arizona law requires. Reporting compliance but not damage costs omits key differences between proposed generation mixes and makes it harder to compare emissions impacts to revenue requirements. Monetizing damages done by emissions to the environment and public health would facilitate comparison within and across portfolios—which is much of the point of developing and presenting IRPs—of costs relevant to the decisions LSEs face when adopting one or another resource portfolio.

The Arizona Administrative Code’s directive to the ACC to ensure that each LSE’s IRP is “reasonable and in the public interest”<sup>16</sup> is also relevant here. The IRP regulations state that the ACC can make this determination by considering, among other factors, “the environmental impacts of resource choices and alternatives,” “the degree to which the [LSEs] consider[] all relevant resources, risks, and uncertainties,” and “the degree to which the [LSE]’s plan for future resources is in the best interest of its customers.”<sup>17</sup> Because greenhouse gas and local air pollutant emissions pose physical and economic risks to the ratepayers of Arizona, monetizing

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<sup>10</sup> See e.g. Ariz. Corp. Comm’n, Assessment of the 2014 Integrated Resource Plans of the Arizona Electric Utilities, at 74-75, 77-79 [https://www.azcc.gov/docs/default-source/utilities-files/electric/integrated-resource-planning/2014/2014-irp-final-draft-report-for-the-azcc-13-0070-\(non-redlined\)-as-docketed.pdf?sfvrsn=2d221969\\_2](https://www.azcc.gov/docs/default-source/utilities-files/electric/integrated-resource-planning/2014/2014-irp-final-draft-report-for-the-azcc-13-0070-(non-redlined)-as-docketed.pdf?sfvrsn=2d221969_2) [hereinafter ACC 2014 Assessment] (providing summaries of LSE compliance with Ariz. Admin. Code requirements to disclose environmental impacts, including water consumption and contribution to coal ash).

<sup>11</sup> ARIZ. ADMIN. CODE § R14-2-703(D)(1)(h).

<sup>12</sup> See, e.g. Arizona Public Service Company, 2020 Integrated Resource Plan at 146 (June 2020) [hereinafter “APS 2020 IRP”]; Tucson Electric Power Company, 2020 Integrated Resource Plan at 115 (June 2020); UNS Electric, Inc., 2020 Integrated Resource Plan at 71 (Aug. 2020) (all showing carbon dioxide compliance costs); see also ACC 2014 Assessment, *supra* note 10, at 56 & 79 (showing LSE carbon dioxide emission cost forecasts for APS, TEP and UNS and how all LSEs present other compliance costs).

<sup>13</sup> ARIZ. ADMIN. CODE § R14-2-703(F)(3).

<sup>14</sup> See, e.g., APS 2020 IRP, *supra* note 12, at 16, Fig. ES-4 (showing portfolio costs as revenue requirements and carbon dioxide emission reduction levels).

<sup>15</sup> ARIZ. ADMIN. CODE § R14-2-703(I).

<sup>16</sup> § 704(B).

<sup>17</sup> § 704(B)(7)–(9).

these costs to facilitate their comparison to other priorities can help the ACC to judge whether a proposed portfolio is in the public interest.

## II. Monetizing Emissions Impacts Would Serve Arizona Ratepayers in Several Ways

Monetizing the damages from the global pollutants, like greenhouse gases, and local pollutants, like PM or SO<sub>2</sub>, that arise from electricity generation would serve several important purposes, in addition to facilitating compliance with Arizona's regulatory requirements for IRPs.

Monetization helps LSEs, the ACC, and stakeholders compare important costs and benefits across portfolios. Monetization also reveals additional information about portfolios' environmental effects, like the significance of the public health consequences that result from exposure to air pollutant emissions. Therefore, monetization improves decisionmaking and LSEs' reporting of environmental impacts in the IRP process.

### Monetization Facilitates Comparison of Important Costs and Benefits

Monetizing the emissions impacts of global and local pollutants would better inform comparisons of the costs and benefits of different generation mixes. Putting a dollar value on the damages from emissions allows LSEs to compare them directly, as costs, to other costs and benefits to which markets assign monetary value, like fuel costs. Enabling apples-to-apples comparisons could be particularly useful for LSEs looking to measure not only the performance of conventional, centralized options against renewable or distributed ones, but also for comparing renewable or distributed generation development options against one another. It could thus more accurately capture the real value of investments that comply with Arizona's Renewable Energy and Energy Efficiency Standards. Furthermore, such comparisons would also be useful for considering the impacts of local pollutants resulting from the operation of conventional resources at different times or locations.

Notably, monetization would also make the importance of emissions reductions, relative to other costs and benefits, more prominent for decisionmakers, which can help the Commission determine if an IRP is in the public interest. This is because monetary values typically have higher salience, which allows decisionmakers, stakeholders, and the public to recognize their relative importance.<sup>18</sup> When LSEs report only the quantity and not the monetized value of emissions, they implicitly and effectively dim the importance of emissions reductions relative to, for instance, revenue requirements. Comparing emissions with other factors in uniformly monetary terms is thus necessary to weigh them properly.

### Monetization Can Reveal Important Additional Information about Costs and Benefits

Monetizing emissions impacts can reveal important details about where exactly different sorts of emissions would bear upon public health in Arizona. Policy Integrity has published several reports that describe in depth the importance of location and timing of operation to pollution-driven impacts of generation resources of different types, and also provide guidance on how to monetize those impacts:

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<sup>18</sup> A well-documented cognitive bias known as "salience bias," as explained by Nobel laureate Daniel Kahneman, among others, causes individuals to focus more on information that is more prominent, and disregard information that is less prominent. DANIEL KAHNEMAN ET AL., JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES (1982).

- *Valuing Pollution Reductions: How to Monetize Greenhouse Gas and Local Air Pollutant Reductions from Distributed Energy Resources* (2018);<sup>19</sup>
- *Getting the Value of Distributed Energy Resources Right: Using a Societal Value Stack* (2019);<sup>20</sup> and
- *Making the Most of Distributed Energy Resources: Subregional Estimates of the Environmental Value of Distributed Energy Resources in the United States* (2020).<sup>21</sup>

Although these reports focus on DERs, their basic observations are no less relevant when assessing the implications of siting centralized, large-scale generation resources in particular places or operating them more or less at particular times. Broadly, they can guide LSEs to identify how different portfolios will contribute to climate damages and affect different populations in Arizona and downwind of Arizona-based generation facilities.

The monetization methodologies suggested by these reports are more complex than the analysis presently done by most LSEs, but they would be consistent with the IRP requirement, noted above, of disclosing adverse environmental impacts.<sup>22</sup> Indeed, they would arguably be more consistent than merely reporting emissions volumes; just reporting those volumes does not indicate clearly the magnitude or incidence of the harmful impacts of those emissions. Revealing where and when those impacts originate and also where and how hard they hit would better discharge LSEs' duty of disclosure.

### III. There Are Readily Available Tools and Techniques for Monetizing Emissions

Several available tools and techniques, described below, make monetizing emissions impacts of both global and local pollutants relatively easy. In other words, because the availability of these tools makes the cost of potentially valuable information low, investing the small amount of resources required to generate and report that information to the ACC, stakeholders, and the public is worthwhile.

#### A Tool to Monetize Global Emissions: The Interagency Working Group's Social Cost of Carbon

LSEs must disclose adverse environmental impacts of their electricity production; climate change is one such impact. Each unit of greenhouse gases emitted by the combustion of fossil fuels contributes to climate change and thus to the damaging effects of climate change. Although LSEs do disclose volumes of emissions,<sup>23</sup> emissions themselves are not environmental impacts. There is a readily available tool for valuing the emissions that cause climate change: The Social Cost of Carbon (SCC) developed by the federal government's Interagency Working Group (IWG), which indicates the monetary cost of releasing an additional ton of CO<sub>2</sub> into the atmosphere.<sup>24</sup> The IWG produced a range of estimates for the value of CO<sub>2</sub> emissions, as well as

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<sup>19</sup> JEFFREY SHRADER ET AL., INST. FOR POL'Y INTEGRITY, VALUING POLLUTION REDUCTIONS (2018), [https://policyintegrity.org/files/publications/Valuing\\_Pollution\\_Reductions.pdf](https://policyintegrity.org/files/publications/Valuing_Pollution_Reductions.pdf) [hereinafter "VALUING POLLUTION REDUCTIONS"].

<sup>20</sup> JUSTIN GUNDLACH & BURCIN UNEL, INST. FOR POL'Y INTEGRITY, GETTING THE VALUE OF DISTRIBUTED ENERGY RESOURCES RIGHT (2019), [https://policyintegrity.org/files/publications/Getting\\_the\\_Value\\_of\\_Distributed\\_Energy\\_Resources\\_Right.pdf](https://policyintegrity.org/files/publications/Getting_the_Value_of_Distributed_Energy_Resources_Right.pdf).

<sup>21</sup> MATT BUTNER ET AL., INST. FOR POL'Y INTEGRITY, MAKING THE MOST OF DISTRIBUTED ENERGY RESOURCES (2020), [https://policyintegrity.org/files/publications/Making\\_the\\_Most\\_of\\_Distributed\\_Energy\\_Resources.pdf](https://policyintegrity.org/files/publications/Making_the_Most_of_Distributed_Energy_Resources.pdf).

<sup>22</sup> See ARIZ. ADMIN. CODE § R14-2-703(B)(1)(p).

<sup>23</sup> See, e.g., APS 2020 IRP, *supra* note 12, at 180–181, Tbl. D-14(1)-(3) (quantifying avoided carbon dioxide and other emissions attributed to renewable energy resources for different portfolios).

<sup>24</sup> See INTERAGENCY WORKING GROUP ON THE SOCIAL COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 at 23 (2010).

estimates for methane and nitrous oxide emissions. These estimates are based on three widely-cited integrated assessment models (IAMs) that combine physical climate effects with economic damages. The IWG began developing the SCC in 2009 and continued to refine it through 2016, before the group was disbanded. Despite the fact that the SCC and other social costs of greenhouse gases are not currently being updated by the federal government, the estimates released in 2016 remain the best available estimates of the marginal damages caused by greenhouse gases.<sup>25</sup>

LSEs can use the IWG SCC to convert the greenhouse gas emissions quantities already reported in their IRPs to monetary values.<sup>26</sup> For instance, if APS were to use the IWG SCC to monetize the emissions avoided by its Bridge Portfolio and Accelerate Portfolio for years 2020 through 2035, it would find that those portfolios would avoid climate damages worth \$4.49 billion and \$5.55 billion respectively.<sup>27</sup> These values represent a significant fraction of those portfolios' revenue requirements—\$26.59 billion for the Bridge Portfolio and \$28.44 billion for the Accelerate Portfolio.<sup>28</sup>

### Tools to Monetize Local Emissions: Existing Public Health Models

A number of models exist that monetize the damages from local air pollutants. It is important to note that these damages depend not only on what pollutant is emitted, but also where they go and the timing—both time of day and season—of their emission. IRPs often contain some but not all of this information. This subsection provides an overview of how to approximate these damages.

Arizona LSEs already quantify aggregate historical and projected annual emissions of a number of local pollutants in their IRPs.<sup>29</sup> These IRPs also disclose details about specific generating units.<sup>30</sup> It would involve only a small further step for LSEs to determine what local pollutants are emitted from particular generators, and when those emissions occur. However, the 2020 IRPs from the state's LSEs do not disclose information about when different generators are dispatched.

Armed with these details, LSEs can approximate the damages caused by their emission of local pollutants using any one of several existing models, including: Estimating Air Pollution Social Impact Using Regression (EASIUR), BenMap, Air Pollution Emission Experiments and Policy Analysis Model, and Co-Benefits Risk Assessment (COBRA). Details on model characteristics and required inputs can be found in our report, *Valuing Pollution Reductions*.<sup>31</sup>

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<sup>25</sup> Richard L. Revesz et al. *Best Cost Estimate of Greenhouse Gases*, 357 *SCI.* 655 (2017), [https://policyintegrity.org/documents/Science\\_Revesz\\_et\\_al\\_081718.pdf](https://policyintegrity.org/documents/Science_Revesz_et_al_081718.pdf).

<sup>26</sup> The IWG SCC should be considered an underestimate of the cost of global pollutant emissions that results from electricity production because it omits several important categories of climate damages and so fails to capture the costs of those damages. NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE, *VALUING CLIMATE DAMAGES: UPDATING ESTIMATION OF THE SOCIAL COST OF CARBON DIOXIDE* (2017) (citing PETER HOWARD, INST. FOR POL'Y INTEGRITY, *OMITTED DAMAGES: WHAT'S MISSING FROM THE SOCIAL COST OF CARBON* (2014)). Because the IWG SCC increases over time, see IWG 2010, *supra* note 24, LSEs should be sure to use the IWG SCC for the appropriate year of emissions for each of the 15 years included in their IRPs.

<sup>27</sup> See APS 2020 IRP, *supra* note 12, at 180–181, Tbl. D-14(1) and (3). Reported in 2019 dollars, calculations made using the IWG SCC of \$42 (2007 dollars) per metric ton of CO<sub>2</sub> for year 2020 emissions through \$55 (2007 dollars) per metric ton for year 2035 emissions, converting 2007 dollars to 2019 dollars using a rate of inflation of 1.23.

<sup>28</sup> *Id.* at 376–78.

<sup>29</sup> These pollutants include CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, Hg, and PM. See *supra* notes 4 and 10.

<sup>30</sup> See, e.g. APS 2020 IRP, *supra* note 12, at 50.

<sup>31</sup> VALUING POLLUTION REDUCTIONS, *supra* note 19, at 22-24.

Even if applying this technique to an IRP yields a somewhat rough estimate of the monetary costs of pollution-related damages, that information is important for the Commission, LSEs, and other stakeholders to have when comparing IRP portfolios. Local pollution can impose tremendous costs to public health, and if two otherwise identical options would result in grossly disparate public health impacts, that feature should inform how those options weigh.