

IN THE MATTER OF THE
IMPLEMENTATION OF L. 2018,
C. 16 REGARDING THE
ESTABLISHMENT OF A ZERO
EMISSION CERTIFICATE PROGRAM
FOR ELIGIBLE NUCLEAR POWER
PLANTS

APPLICATION FOR ZERO EMISSION
CERTIFICATES OF SALEM 1 NUCLEAR
POWER PLANT

APPLICATION FOR ZERO EMISSION
CERTIFICATES OF SALEM 2 NUCLEAR
POWER PLANT

APPLICATION FOR ZERO EMISSION
CERTIFICATES OF HOPE CREEK
NUCLEAR POWER PLANT

SUPERIOR COURT OF NEW JERSEY
APPELLATE DIVISION

APPELLATE DIVISION
DOCKET NO. A-003939-18
CIVIL ACTION

On Appeal from a Final
Decision of the New Jersey
Board of Public Utilities

Docket No. EO18080899
Docket No. EO18121338
Docket No. EO18121339
Docket No. EO18121337

**BRIEF OF AMICUS CURIAE INSTITUTE FOR POLICY INTEGRITY
AT NYU SCHOOL OF LAW IN SUPPORT OF NEITHER PARTY**

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The Institute for Policy Integrity at New York University School of Law ("Policy Integrity")¹ submits this brief as amicus curiae in support of neither party.

INTEREST OF AMICUS CURIAE

Policy Integrity is a nonpartisan, not-for-profit think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy. An area of special concern for Policy Integrity is the valuation of externalities in the promulgation of state and federal regulations. Policy Integrity consists of a team of legal and economic experts, trained in the proper scope and estimation of costs and benefits and the application of economic principles to regulatory decisionmaking. Our director, Professor and Dean Emeritus Richard L. Revesz,² as well as our energy policy director, Dr. Burcin Unel,³ have published extensively in the areas of environmental law and energy policy design.

¹ This brief does not purport to represent the views of New York University School of Law, if any.

² A full list of publications can be found in Prof. Revesz's online faculty profile, *available at* <https://its.law.nyu.edu/facultyprofiles/index.cfm?fuseaction=profile.publications&personid=20228>.

³ A full list of publications can be found in Dr. Unel's online staff profile, *available at* <https://policyintegrity.org/about/bio/burcin-unel>.

Harnessing this academic background, Policy Integrity has participated in numerous state and federal proceedings addressing the external cost to society of carbon dioxide emissions. See The Cost of Carbon Pollution: Resources, Inst. for Policy Integrity, <https://costofcarbon.org/resources>. In particular, Policy Integrity submitted comments on New Jersey rejoining the Regional Greenhouse Gas Initiative and on New Jersey's Energy Master Plan. See *ibid.*

Policy Integrity also has an extensive background with programs similar to the zero-emissions credits ("ZECs") program at issue in this case. Policy Integrity submitted comments to the New York State Public Service Commission regarding the design of the state's ZECs payments.⁴ Policy Integrity then submitted amicus briefs in the U.S. Court of Appeals for the Second Circuit and in Albany County Supreme Court when New York's ZECs program was challenged. See Brief of the Institute for Policy Integrity as Amicus Curiae in Support of Petitioners, Coal. for Competitive Electr. v. Zibelman, 906 F.3d 41 (2d Cir. 2018)(No. 17-2654-cv); Brief of the Institute for Policy Integrity as Amicus Curiae in Support of Defendants-Respondents, Hudson River Sloop Clearwater,

⁴ See Policy Integrity Comments on N.Y. State Dep't of Pub. Serv.'s Staff White Paper on Benefit-Cost Analysis in the Reforming Energy Vision Proceeding, Docket No. 392 (Aug. 21, 2015), http://policyintegrity.org/documents/REV_Comments_Aug2015.pdf.

Inc., v. N.Y. State Pub. Serv. Comm'n, 65 Misc. 3d 1219(A) (N.Y. Sup. Ct. Oct. 8, 2019) (No. 7242-16).

In those briefs, Policy Integrity explained that New York had used the federal Interagency Working Group's Social Cost of Carbon ("SCC") to accurately value the avoided carbon dioxide emissions attributable to the ZECs program. A New York state court recently affirmed New York's reliance on the SCC to value ZECs, specifically citing Policy Integrity's brief and evidence showing that the SCC is the "best tool to reflect the environmental monetary damages attributable to reduced carbon emissions." Hudson River Sloop Clearwater v. N.Y. State Pub. Serv. Comm'n, 65 Misc. 3d 1219(A), at *12 (N.Y. Sup. Ct. Oct. 8, 2019).

Policy Integrity's experience with ZECs and its expertise in regulatory decisionmaking give it a unique perspective on the issues raised in this case related to valuing the benefits of avoiding carbon dioxide emissions.⁵

PRELIMINARY STATEMENT

This case concerns the April 2019 order of the New Jersey Board of Public Utilities ("BPU" or the "Board") finding three nuclear facilities eligible to receive ZECs pursuant to the Zero

⁵ Clean Air Task Force has submitted a proposed amicus brief focused on the adverse impacts on regional and New Jersey air quality that would result from New Jersey nuclear plant closures, due to increases in local and interstate regional conventional air pollution.

Emission Certificate Act, P.L. 2018, c. 16 (May 23, 2018) (codified at N.J.S.A. 48:3-87.3 to -87.7) ("ZECs Statute"). N.J. Bd. of Pub. Utils., Order Determining the Eligibility of Hope Creek, Salem 1, and Salem 2 Nuclear Generators to Receive ZECs (Apr. 18, 2019). The appellant, the New Jersey Division of Rate Counsel ("Rate Counsel"), argues that the Board failed to ensure that the rate established by the statute was just and reasonable, and argues that the applicants did not satisfy the eligibility criteria to receive ZECs. (Br. of Appellant New Jersey Division of Rate Counsel ("Rate Counsel Br.") at 1-3). Policy Integrity files this brief to address two limited questions raised in the case about how to properly evaluate policies designed to avoid carbon dioxide emissions.

First, to address any potential confusion about the proper use of the SCC (see Rate Counsel Br. at 53 n.16), this brief explains that the SCC is a tool that allows any agency to estimate the monetary damages that would be avoided for each ton of carbon dioxide emissions that the relevant program avoids. It was developed by the federal Interagency Working Group through a lengthy process and after numerous rounds of public comment. Because the SCC is the best scientific and economic estimate of the damage caused by carbon dioxide emissions, it is the appropriate tool for estimating the benefits provided by a program that avoids carbon dioxide emissions.

Second, Rate Counsel asserts that the ZECs charge "does not appear to be proportional or reasonable" when compared to the benefits associated with emissions inside of New Jersey that the program will avoid. (Rate Counsel Br. at 52-54). But because the avoided emissions both inside and outside of the state would harm New Jersey, the appropriate way to value the benefits of the program is to calculate the total damages that are avoided by the program regardless of where those avoided emissions would occur.

STATEMENT OF FACTS AND PROCEDURAL HISTORY

In this appeal, Policy Integrity adopts and relies on the New Jersey Board of Public Utilities' Statement of Facts and Procedural History at pp. 3-16 in its Brief dated and filed December 6, 2019.

ARGUMENT

I. The Federal Interagency Working Group's Social Cost of Carbon Figure Is the Best Available Estimate for Valuing the Harm Caused by Carbon Dioxide Emissions

At several points, the record and arguments in this case reference the SCC, a technical calculation representing the cost of carbon dioxide emissions. First, in the ZECs Statute, the Legislature states that the program "is structured such that its costs are guaranteed to be significantly less than the social cost of carbon emissions avoided by the continued operation of selected nuclear power plants," and specifically adopts the SCC as the "accepted measure of the cost of carbon emissions." N.J.S.A. 48:3-

87.3(b)(8). Second, in the administrative record, the Public Service Enterprise Group Nuclear LLC ("PSEG") uses the SCC to quantify the damages that would result from an increase in carbon dioxide emissions if the nuclear facilities at issue in this case retired. (Aa 97).⁶ Third, in addressing the proper calculation of emissions savings for this program in its brief, Rate Counsel asserts that the SCC is "evolving and often debated." (Rate Counsel Br. at 53 n.16). To resolve any confusion regarding the basis and status of the SCC, the following section explains why the SCC is the best available estimate for the value of avoiding a ton of additional carbon dioxide.

Carbon dioxide emissions are a classic negative externality. A negative externality is an "uncompensated cost that an individual or firm imposes on others." Paul Krugman & Robin Wells, Microeconomics 437(2d Ed. 2009). For example, carbon dioxide emissions cause harm through more premature deaths from heat waves, worsened air quality with "associated risks in respiratory illnesses and premature death," worse flooding and extreme weather events, and many other harms.⁷ But the cost of those harms is not

⁶ "Aa" refers to Rate Counsel's public appendix.

⁷ Endangerment and Cause or Contribute Findings for Greenhouse Gases, 74 Fed. Reg. 66,496, 66,497-98, 66,525, 66,533 (Dec. 15, 2009) (to be codified at 40 C.F.R. pt. 1); See also Technical Support Document for Endangerment Finding, https://www.epa.gov/sites/production/files/2016-08/documents/endangerment_tsd.pdf; Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility

borne by the parties to the private transaction for power generation. Thus, emitters benefit from a transaction to make and sell electricity, while not bearing the costs of the carbon dioxide emissions that are caused through the transaction. See Krugman & Wells, supra, at 436.

Reducing those emissions will avoid those harms however. So when calculating the value of reducing emissions, the best estimate for that value is the value of the harms that are avoided. See William J. Baumol & Wallace E. Oates, The Theory of Environmental Policy 21–22 (2d ed. 1988). And as this section will explain, the SCC is the best available estimate for that calculation.

A. The SCC Was Prepared and Vetted Through a Rigorous Process

The SCC was developed through a lengthy process that first began in 2009, when an Interagency Working Group assembled experts from a dozen federal agencies and White House offices to “estimate [] the monetized damages associated with an incremental increase in carbon emissions in a given year” based on “a defensible set of input assumptions grounded in the existing scientific and economic literatures.” Interagency Working Group on Social Cost of Carbon,

Generating Units, 80 Fed. Reg. 64,662, 64,686–88 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60) (summarizing recent scientific assessments and concluding that climate change is harming every region of the country).

Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 1–2 (2010).⁸

To prepare the estimates, the Interagency Working Group used three highly-cited peer-reviewed models that have been built to connect carbon emissions to global and local harms of climate change (including extreme weather, increased disease, decreased fresh water availability, lost agricultural productivity, lost property value, and many others). See id. at 1, 5. William Nordhaus, the author of one of the three models, recently won the Nobel Prize for that climate modeling work.⁹

The Interagency Working Group ran these models using a baseline scenario including inputs and assumptions drawn from the peer-reviewed literature, and then ran the models again with an additional unit of carbon emissions to determine the increased economic damages associated with one additional unit of carbon emissions. See id. at 24–25; Interagency Working Group on Social Cost of Greenhouse Gases, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 15 (2016) (describing methodology).¹⁰

⁸ Available at https://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf.

⁹ William Nordhaus - Facts, The Nobel Prize, <https://www.nobelprize.org/prizes/economic-sciences/2018/nordhaus/facts/>.

¹⁰ Available at https://www.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf.

Carbon emissions have unique features when compared to more local or regional pollutants. When carbon is emitted anywhere it can affect storms and extreme weather that happen close to home, as well as cause spillovers from other countries through “such pathways as global migration, economic destabilization, and political destabilization.” Nat’l Acads. of Scis., Eng’g & Med., Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide 9 (2017).¹¹ Because of those interactions, “[a]ccurately estimating the damage” of carbon to the United States requires an examination of damages that occur inside and outside of the United States. Ibid.

While the SCC continues to be refined, the SCC has received substantial scientific support and vetting, and it remains the best available estimate for calculating the external cost of carbon emissions. For example, in 2014, the U.S. Government Accountability Office reviewed the Interagency Working Group’s methodology and concluded that it had followed a “consensus-based” approach, relied on peer-reviewed academic literature, disclosed relevant limitations, and adequately planned to incorporate new information through public comments and updated research. U.S. Gov’t Accountability Office, GAO-14-663, Regulatory Impact Analysis: Development of Social Cost of Carbon Estimates 12-20

¹¹ Available at <https://www.nap.edu/read/24651/chapter/1>.

(2014). In 2016, the U.S. Court of Appeals for the Seventh Circuit held that the U.S. Department of Energy's reliance on the SCC was reasonable. Zero Zone, Inc. v. U.S. Dep't of Energy, 832 F.3d 654, 678–79 (7th Cir. 2016). And recently, a New York court similarly held that the New York State Public Service Commission's reliance on the SCC to set the rate for the state's ZECs was reasonable. Hudson River Sloop Clearwater, 65 Misc. 3d 1219(A), at *12.

The metric continues to receive endorsements. In 2016 and 2017, the National Academies of Sciences issued two reports that supported the continued use of the estimates, while recommending further refinements to the methodology. Nat'l Acads. of Scis., Eng'g & Med., Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide 1–3 (2017)¹²; Nat'l Acads. of Scis., Eng'g & Med., Assessment of Approaches to Updating the Social Cost of Carbon: Phase 1 Report on a Near-Term Update 1–2 (2016).¹³ And though the current federal administration withdrew the Interagency Working Group's technical support documents, Exec. Order No. 13,783, 82 Fed. Reg. 16,093, 16,095–96 § 5(b) (Mar. 28, 2017), experts continue to recommend that agencies rely on the Interagency Working Group's SCC estimate as the best estimate for the external cost of greenhouse gases. See Richard Revesz, Michael Greenstone,

¹² Available at <https://www.nap.edu/read/24651/chapter/1>.

¹³ Available at <https://www.nap.edu/read/21898/chapter/1>.

et al., Best Cost Estimate of Greenhouse Gases, 357 Science 655 (2017).

B. Multiple States Have Adopted the SCC to Value Carbon Emissions

Besides receiving widespread vetting and endorsements from experts, the SCC has also been endorsed at the state level. An expanding number of states have been integrating the SCC estimates into their regulatory programs and utility planning. For example:

- California has used the SCC to calculate the value of avoided economic damages associated with a “suite of policies developed to reduce” greenhouse-gas emissions in the state. Cal. Air Res. Bd., The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California’s 2030 Greenhouse Gas Target 60–61 (2017). The California Public Utilities Commission also uses the SCC as part of its decision tool for determining when utilities must integrate distributed energy resources. Cal. Pub. Utils. Comm’n, Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning and Evaluation of Integrated Distributed Energy Resources, No. 14-10-003 (May 16, 2019) at 3.

- The Colorado Public Utilities Commission is required to use the SCC to evaluate the value of reduced emissions when assessing utility investments in new electricity resources, Colo. Rev. Stat. § 40-3.2-106, as well as plant retirements, net metering, demand-side management programs, and beneficial electrification, Colo. Rev. Stat. § 40-3.2-106(1).
- Illinois uses the SCC to set the value of avoided emissions in a program that compensates nuclear generators for benefits provided by emission-free generation. 20 Ill. Comp. Stat. 3855/1-75(d-5)(1)(B)(i).
- Maine's Public Utility Commission used the SCC in a study to determine the value of reduced emissions associated with distributed solar energy generation. Me. Pub. Utils. Comm'n, Maine Distributed Solar Valuation Study at 35 & n.26 (2015). Maine relied on the study in a subsequent net metering rulemaking. Me. Pub. Utils. Comm'n, Notice of Proposed Rulemaking, No. 2016-00222 (Sept. 14, 2016) at 4 n.6.
- The Minnesota Department of Commerce adopted the SCC to set the price paid to generators of distributed solar energy for the value of carbon emissions avoided. Minn.

Dep't of Commerce, Minnesota Value of Solar: Methodology 40 (2014). The Minnesota Public Utilities Commission also used the SCC to finalize the carbon cost estimates that utilities must use when planning for new projects. Minn. Pub. Utils. Comm'n, Order Updating Environmental Cost Values, In the Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statutes Section 216B.2422, Subdivision 3, No. E-999/CI-14-643 (Jan. 3, 2018).

- Nevada utilities are required to use the SCC in resource planning. Nev. Pub. Utils. Comm'n, Order on Investigation and Rulemaking to Implement Senate Bill 65, No. 17-07020 (Aug. 5, 2018).
- The New York State Public Service Commission has set the price for its ZEC payments with reference to the SCC. N.Y. Pub. Serv. Comm'n, Order Adopting a Clean Energy Standard, No. 15-E-0302 (Aug. 1, 2016) at 49–51.
- Washington State has adopted the SCC for use by all state agencies when assessing the cost of carbon emissions associated with public decisions. Wash. Dep't of Commerce, The Social Cost of Carbon: Washington State Energy Office Recommendation for Standardizing the

Social Cost of Carbon When Used for Public Decision-Making Processes 2 (2014). Washington State law also requires the use of the SCC in utility resource planning. Wash. Rev. Code § 19.280.030(3)(a).

In sum, the SCC is based on the best available scientific and economic data, and is used by numerous state agencies. In New Jersey, the Legislature has stated that ZECs are designed to “reflect[] the emissions avoidance benefits associated with the continued operation of selected nuclear power plants.” N.J.S.A. 48:3-87.5(j)(1). And using the SCC as the “accepted measure of the cost of carbon emissions,” id. 48:3-87.3(b)(8), is the best approach for valuing the benefits of avoiding carbon emissions through retention of nuclear generation.

II. The Benefits of the ZECs Program Should Be Calculated Based on the Avoided Emissions Inside and Outside of New Jersey

Assuming the ZECs program is responsible for preventing the closure of nuclear power plants, the parties do not dispute that the program will avoid emissions and that the avoidance of emissions will provide benefits as contemplated by the ZECs Statute, Id. 48:3-87.3(a). (See Rate Counsel Br. at 52-53; Aa613, 624-26, 642-44, 658-59, 714-15). Rate Counsel nonetheless argues that the ZECs charge set by statute “does not appear to be proportional or reasonable” when compared to the benefits

associated with emissions reductions that the program will achieve inside of New Jersey. (Rate Counsel Br. at 52-54). But that concern is misplaced. Because of the unique characteristics of the electricity system and of carbon pollution, the only rational way to value the avoided emissions of the program is to value all emissions that would actually be avoided, which will include emissions that would have been produced by power plants both inside and outside of the state.

A. Because the Grid Is Interconnected, Nuclear Generation Has the Potential to Avoid Emissions Both Inside and Outside New Jersey

New Jersey's electricity grid is connected to electricity grids outside of the state and so if a nuclear plant closes in New Jersey, additional electricity generation to fill the gap would likely come from both within and outside of New Jersey. Individual particles of electricity do not flow from one place to another like cars driving an interstate. Instead, the wires are kept electrified at a common frequency, ready to serve any electricity needs. See Florida Power & Light Co., 37 F.P.C. 544, 549 (1967), aff'd FPC v. Florida Power & Light Co., 404 U.S. 453 (1972). Thus, electricity market operators must ensure that any time electricity is used, generators are available to feed power into the grid to balance the current. Fed. Energy Regulatory Comm'n, Energy Primer:

A Handbook of Energy Market Basics 54 (2015)¹⁴; see also William D. Stevenson, Jr., Elements of Power System Analysis 1-3 (4th ed. 1982).

For that reason, any "electricity that enters the grid immediately becomes a part of a vast pool of energy." New York v. FERC, 535 U.S. 1, 7 (2002). And, depending on the bid price of nuclear generation compared to the bid price of more carbon-intense generation, the nuclear generation at issue in this case has the potential to avoid or replace more carbon-intense generation from anywhere within that grid.

Here, according to an analysis in the record, the program would avoid almost 6 million metric tons of emissions inside New Jersey during the three relevant years if the program prevented all three plants from retiring. (Aa683). And that estimate of avoided emissions increases significantly when looking at the avoided emissions both inside and outside New Jersey during the same period. (Aa097; see also Appendix to Response Brief of Respondent Exelon Generation Co., EXa71 (describing modeling results showing that retirement of the nuclear generators would lead to emissions increases inside and outside New Jersey)). The latter methodology is the appropriate one as it looks at the value

¹⁴ Available at <https://www.ferc.gov/market-assessments/guide/energy-primer.pdf>.

of avoiding emissions regardless of where those emissions would have occurred.

B. Emissions Inside and Outside of New Jersey Harm the State Equally

Because of the unique characteristics of carbon emissions, valuing the program's benefits requires an analysis of the avoided emissions attributable to the program, regardless of the location of the avoided emissions. In contrast to local and regional pollutants, like mercury and sulfur dioxide, which respectively cause damage near the emissions source or in the geographic region where they are emitted, a global pollutant like carbon does not stay within geographic borders, but rather mixes in the earth's atmosphere and affects climate worldwide. See Mass. v. Env't'l Prot. Agency, 549 U.S. 497, 508 (2007). Consequently, carbon emissions "contribute to damages around the world even when they are emitted in the United States—and conversely, greenhouse gases emitted elsewhere contribute to damages in the United States." Interagency Working Group on Social Cost of Greenhouse Gases, Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 5 (2016). Additionally, damages from carbon emissions worldwide "can have spillover effects on the United States, particularly in the areas of national security, international trade, public health, and humanitarian concerns." Id at 17.

Stated simply, because carbon dioxide is a global pollutant, the location of its emission does not determine where it will cause harm. Carbon dioxide emitted in Pittsburgh or Delaware will contribute equally to climate change damage in New Jersey as carbon emitted in Newark. New Jersey experiences localized effects from climate change, like sea level rise and disrupted growing seasons, but the cause is carbon dioxide emitted worldwide.

Thus, when looking at the value of avoiding emissions through the ZECs program, the proper perspective is to look at the avoided emissions both inside and outside New Jersey. Because carbon emissions cause harm in New Jersey regardless of where they occur, looking at only a subset of the program's avoided emissions would not properly account for the "harmful emissions that adversely affect the citizens of the State" that are avoided by the ZECs program. See N.J.S.A. 48:3-87.5(e)(2). Any valuation of the program's benefits should instead look at the full amount of emissions that would be avoided.

CONCLUSION

Accordingly, when considering the benefits of the ZECs program, the full benefits of all the avoided emissions should be considered and their value should be calculated using the SCC.

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Respectfully submitted,

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