

**TESTIMONY OF THE NATURAL RESOURCES DEFENSE COUNCIL**

**Mark C. Szybist, Senior Attorney**

**on House Bill 11**

**Before the House Consumer Affairs Committee**



Harrisburg, Pennsylvania

April 15, 2019

Chairman Roae, Chairman Matzie, members of the Committee: thank you for inviting me to comment on House Bill 11.

My name is Mark Szybist and I am a senior attorney for the Natural Resources Defense Council (NRDC), a member-based non-profit environmental organization with more than 110,000 members and activists in Pennsylvania. NRDC works in the U.S. and internationally to protect the air, water, and land that support human health and long-term economic growth. My job is to advocate for Pennsylvania laws and policies that reduce emissions of greenhouse gases and other air pollutants and create an equitable, sustainable, and prosperous clean energy economy.

The following testimony:

1. Outlines the best practices that NRDC uses to evaluate state legislation that subsidizes nuclear power plants, including HB 11;
2. Explains how HB 11 falls short of those best practices;
3. Discusses the state of renewable energy in the U.S. and in the Commonwealth, and Pennsylvania's Alternative Energy Portfolio Standards Act of 2004 (AEPS);
4. Reviews Pennsylvania's 1996 Electricity Generation Customer Choice and Competition Act and explain how competitive energy markets in Pennsylvania favor fossil fuel generation, to the detriment of both renewable energy and nuclear power; and
5. Outlines how Pennsylvania could develop a market-based policy that limit emissions of carbon dioxide from the power sector, creating a more level playing field for renewables and nuclear, and generating revenue.

#### **NRDC'S POSITION ON NUCLEAR POWER AND NUCLEAR SUBSIDIES**

NRDC's position on state subsidies for nuclear power is described in our issue brief, *Transitioning Away from Uneconomical Nuclear Power Plants*, a copy of which is attached to this testimony.<sup>1</sup>

In short, we believe that state policymakers grappling with the future of nuclear power should have the goal of an orderly and deliberate transition away from nuclear to a safer, more economical low-carbon power sector that has significantly higher levels of both renewable energy and energy efficiency. Further, we believe that in managing this transition, policymakers

---

<sup>1</sup> The issue brief is also available at <https://www.nrdc.org/sites/default/files/transition-away-uneconomical-nuclear-plants-ib.pdf>.

should work both to ensure that electricity is affordable for consumers and to support the communities and workers whose livelihoods currently depend on nuclear plants by spurring new economic development in those communities. We believe the policymakers should provide the same support to communities and workers affected by the closure of coal-fired power plants.

In accordance with this position, NRDC's issue brief identifies several "best practices" that we look for in state proposals to compensate nuclear plants for the low-carbon power they generate. These practices include:

1. A requirement that plants show severe financial distress as a precondition to receive subsidies;
2. The narrow tailoring of support mechanisms (i.e., so that they account for current market conditions), accompanied by a finite time horizon to prevent the establishment of an entrenched subsidy;
3. A binding and declining cap on carbon emissions;
4. Policies to significantly scale up energy efficiency and renewable energy;
5. Conditioning support for uneconomical nuclear power plants on a commitment to better manage the toxic waste they house onsite; and
6. Mechanisms to aid the workers and communities that will be affected when a plant closes.

Our position is based mainly on three considerations.

First, it is critical that we – Pennsylvania, the United States, and rest of the world – reduce our greenhouse gas emissions dramatically to avoid the worst impacts of climate change. Based on the latest U.S. National Climate Assessment<sup>2</sup> and a recent report by the Intergovernmental Panel on Climate Change,<sup>3</sup> to avoid the worst impacts of climate change we must limit warming to 1.5 degrees above pre-industrial levels. That requires us to achieve net-zero carbon emissions by 2050.<sup>4</sup> We are not on track to do that. While emissions fell in the United States from 2013 to

---

<sup>2</sup> U.S. Global Change Research Program, *Fourth National Climate Assessment*, available at <https://nca2018.globalchange.gov/chapter/front-matter-about/>.

<sup>3</sup> Intergovernmental Panel on Climate Change, *Global Warming of 1.5 °C*, available at <https://www.ipcc.ch/sr15/>.

<sup>4</sup> Pennsylvania's Climate Change Act, Act 70 of 2008, directs the Department of Environmental Protection to prepare a triennial assessment concerning the impacts of climate change in the Commonwealth. The law also requires the DEP to prepare an action plan to address those impacts. A draft of the latest report, which combines the impacts assessment and action plan, was published in November. The final report is due to be released this spring and will include both "mitigation" strategies to reduce greenhouse gas emissions and slow global warming and "adaptation" strategies that Pennsylvania can use to cope with the impacts that are impossible to avoid.

2017, emissions actually rose in 2018 by 1.4 percent in the power sector and 2.8 percent on an economy-wide basis.

Second, although nuclear power has beneficial low-carbon attributes, it also has significant safety, global security, environmental, and economic risks. Until these risks are properly mitigated and the complete nuclear fuel cycle is sufficiently regulated, nuclear power should not be a leading strategy to diversify America's energy portfolio and reduce carbon pollution.

Third, the most economically and environmentally sustainable way for United States to make dramatic cuts in greenhouse gas emissions is to dramatically increase our use of energy efficiency and renewable energy while minimizing our use of both fossil fuels and nuclear power. NRDC's 2017 report, *America's Clean Energy Frontier: The Pathway to a Safer Climate Future*,<sup>5</sup> sets forth a strategy for doing so that includes dramatic improvements in energy efficiency across all sectors, a 13-fold increase in wind and solar energy, and the electrification of our vehicles, industrial processes, homes, and offices. If the U.S. follows this path, which we can do economically and with existing technologies, we can achieve an 80 percent reduction in greenhouse gas emissions by 2050, with a decline of nuclear power from 20 percent of our generation mix today to less than 3 percent.

### **NRDC'S OPPOSITION TO HOUSE BILL 11**

NRDC opposes HB 11 because the bill is at odds with NRDC's best practices in almost every respect.

HB 11 would amend Pennsylvania's Alternative Energy Portfolio Standards Act (AEPS) to require electric distribution companies, or EDCs, to buy 50 percent of the electricity they distribute from generation sources included in a new Tier III.

Currently, the AEPS has two tiers. Tier I includes renewables, along with biomass, landfill gas, coalbed methane, fuel cells, and biologically derived methane. Tier II includes waste coal, municipal garbage, and other non-renewables. EDCs comply with the AEPS by purchasing alternative energy credits, with each credit representing one megawatt-hour (MWh) of electricity generated by a qualified source. Since 2004, EDCs have been required to incrementally increase

---

<sup>5</sup> See *America's Clean Energy Frontier: The Pathway to a Safer Climate Future*, available at <https://www.nrdc.org/sites/default/files/americas-clean-energy-frontier-report.pdf>.

their purchases of Tier I and Tier II credits in accordance with inclining statutory goals. In 2021, these goals will plateau at 8 percent for Tier I and 10 percent for Tier II.

The price of Tier I and Tier II credits is determined by markets where credits and credit futures are traded, and the costs of credits purchased by EDCs and EGS are passed on to consumers as a cost of electricity generation. Credits represent a revenue stream for prospective alternative projects that can, depending on the price, help them attract debt and equity financing. The Public Utility Commission has estimated that the costs of AEPS compliance in 2021 will be approximately \$0.007 (seven-tenths of one cent) of every dollar spent by EDC customers.<sup>6</sup>

Nominally, Tier III sources include both nuclear power and renewable sources that meet certain criteria. Among other things, Tier III sources must prevent or avoid carbon dioxide and criteria pollutants (e.g., ground-level ozone and particulate matter) emissions in Pennsylvania; they must not have received any kind of subsidy from another state on account of their environmental attributes; and they cannot be owned by a vertically-integrated utility (such as Virginia and North Carolina have) that builds its own power plants.

However, if HB 11 were enacted, it is likely that almost all Tier III credits would be earned by nuclear power because eligibility is only the first step to receiving Tier III credits. The next step would be for the PUC to rank each eligible source for participation in the Tier III program based on “how well the alternative generation source satisfies the criteria specified under this act.” After the eligible source is ranked, the PUC would select sources based on their ranking until the estimated generation from these sources totaled 50 percent of the electricity that EDCs distribute.

Under this rubric, Pennsylvania’s five nuclear plants would almost certainly be picked first because they generate the greatest amounts of low-carbon electricity and so avoid the greatest amount of emissions. Because nuclear plants currently generate around half of the electricity distributed by EDCs,<sup>7</sup> this would leave little to no room for renewables, even though the formula for determining nuclear plants’ estimated generation would yield “discounted” numbers lower than those plants’ actual generation.<sup>8</sup> That said, even if a significant number of Tier III credits ended up being available to renewables, Tier III would be unlikely to drive new renewables

---

<sup>6</sup> This translates to approximately \$103.7 million per year (out of total expenditures of more than \$14 billion). See *PUC, 2017 Annual Report, Alternative Energy Portfolio Standards Act of 2004*, at 12-13, available at [http://www.puc.pa.gov/Electric/pdf/AEPS/AEPS\\_Ann\\_Rpt\\_2017.pdf](http://www.puc.pa.gov/Electric/pdf/AEPS/AEPS_Ann_Rpt_2017.pdf).

<sup>7</sup> See Public Utility Commission, *Electric Power Outlook (2017-2022)* at 20, available at [http://www.puc.pa.gov/General/publications\\_reports/pdf/EPO\\_2018.pdf](http://www.puc.pa.gov/General/publications_reports/pdf/EPO_2018.pdf)

<sup>8</sup> See section 8.1(b)(2)

because the credit price would be too low, and investors would heavily or completely discount these credits because of their speculative nature.

In addition to doing very little to incentivize renewables, HB 11 fails to accord with NRDC's other best practices. There are no provisions to address the needs of workers and communities when plants eventually close. Credit eligibility is not conditioned on the implementation of best practices concerning waste storage and decommissioning. While the bill *contemplates* a price on carbon, HB 11 would not itself establish carbon limits. Nor would it increase energy efficiency goals. Arguably, the AEPS is not the appropriate legislative vehicle for limiting and pricing carbon or raising efficiency goals. However, there is no reason why an AEPS bill could not be packaged with other bills that address these policy priorities.

HB 11 also requires no showing of severe financial distress. Tier III credits could be claimed by nuclear plants irrespective of their profitability, resulting in high program costs: between \$421 and \$548 million per year. Moreover, the impact on customers' bills would be immediate: there would be no ramp-up to the 50 percent Tier III target in HB 11, as there has been for Tier I and Tier II. Under the Federal Power Act, Pennsylvania may not establish subsidies for nuclear plants (or for any other resource) that are priced to make up the difference between the amount of money that plants are earning on wholesale power markets and the amount of money they need to be profitable.<sup>9</sup> Subsidies must be on account of environmental attributes and must be priced to value those attributes. However, states may establish threshold conditions for the receipt of subsidies, such as requiring companies to open their books to demonstrate financial need. States can also authorize regulators to adjust credit amounts downward to reflect market conditions, which of course can change. Indeed, New Jersey did both when it enacted its "zero emissions credit" in 2018.<sup>10</sup>

The absence of a means test in HB 11 is unacceptable, both as a matter of basic fairness and because many Pennsylvanians currently struggle to pay their electricity bills in both urban and rural areas. Last December, the U.S. Census Bureau released its latest American Community Survey and Poverty Estimates report, which covered 2013 through 2017. It found, among other things, that while U.S. GDP has risen an average of 2.2 percent annually since 2012, the official poverty rate in Pennsylvania has remained at 13.1 percent. The real poverty rate is much higher,

---

<sup>9</sup> See Miles Farmer, "Why the Supreme Court's Decision in Hughes is Good for Clean Energy," available at <https://www.nrdc.org/experts/miles-farmer/why-supreme-courts-decision-hughes-good-clean-energy>

<sup>10</sup> See New Jersey Board of Public Utilities, "Frequently Asked Questions about the Zero Emissions Certificate ("ZEC") Law," available at <https://www.state.nj.us/bpu/pdf/publicnotice/ZEC%20Application%20QA.pdf>

because according to Census Bureau guidelines, a family of four is not considered to be in “poverty” if its income exceeds \$25,100. Although the Commonwealth has “experienced a steady uptick in new jobs,” in recent years, “the pay that comes with them hasn’t been enough to push more workers out of poverty or stop them from seeking government aid to eat.”<sup>11</sup>

To protect Pennsylvanians from the impacts of climate change and ensure sustainable economic growth, Pennsylvania needs to make significant investments in clean energy. But those investments must be equitable and they must return long-term value. The proposed nuclear investments in HB 11 would do neither.

### **RENEWABLE ENERGY IN PENNSYLVANIA AND THE AEPS**

In recent years, renewable energy has grown rapidly in the United States due to falling costs, technological improvements, and targeted incentives like state Renewable Portfolio Standards. Although Pennsylvania has seen significant growth in renewables, it lags behind leading U.S. states largely because the AEPS – an *alternative* energy standard, rather than a *renewable* energy standard – has been a relatively weak driver of renewables. Consequently, while Pennsylvania has created an impressive number of jobs in renewable energy, it has largely failed to take advantage of the economic development and job creation that renewables can bring.

Over the last decade, prices for solar and onshore wind in the U.S. have fallen by 88 and 64 percent, respectively. In some parts of the U.S., solar and wind are already the cheapest type of new generation to build, and they are projected to become increasingly cheaper. A recent analysis found that by 2025, building new renewables will be less expensive than running 86 percent of *existing* coal plants in the United States.<sup>12</sup>

These changing economics have translated into a massive increase in renewable generation. In 2008, less than 1.5 percent of the electricity generated in the United States came from wind and solar power. Since then, wind and solar generation have increased by 550 percent, to almost 9 percent. Overall, renewables (wind, solar, and hydropower) now account for around 16 percent of electricity generation in the U.S. In 2018, eighteen states generated 10 percent or more of their electricity from the sun and wind, and eleven states generated at least 20 percent.<sup>13</sup>

---

<sup>11</sup> See <https://www.mcall.com/news/pennsylvania/mc-nws-pennsylvania-census-poverty-pay-20181205-story.html>

<sup>12</sup> See [https://energyinnovation.org/wp-content/uploads/2019/03/Coal-Cost-Crossover\\_Energy-Innovation\\_VCE\\_FINAL.pdf](https://energyinnovation.org/wp-content/uploads/2019/03/Coal-Cost-Crossover_Energy-Innovation_VCE_FINAL.pdf)

<sup>13</sup> Amanda Levin, “U.S. Power in 2018: The Good, the Bad, and the Gassy,” available at <https://www.nrdc.org/experts/amanda-levin/us-power-2018-good-better-and-gassy>

| Top 10 Wind & Solar States in 2018 (as % of generation) |       |              |       |                |       |
|---|-------|--------------|-------|----------------|-------|
| Wind & Solar Total                                      |       | Wind         |       | Solar          |       |
| Kansas  | 36.5% | Kansas       | 36.4% | California     | 19.0% |
| Iowa  | 33.9% | Iowa         | 33.7% | Nevada         | 12.7% |
| Oklahoma  | 31.8% | Oklahoma     | 31.7% | Hawaii         | 11.2% |
| Vermont   | 26.8% | North Dakota | 25.8% | Vermont        | 11.0% |
| North Dakota  | 25.8% | South Dakota | 24.4% | Massachusetts  | 10.7% |
| California  | 25.5% | Maine        | 21.0% | Arizona        | 6.5%  |
| South Dakota  | 24.4% | New Mexico   | 18.7% | Utah           | 6.4%  |
| New Mexico  | 23.5% | Minnesota    | 17.9% | North Carolina | 5.4%  |
| Maine   | 21.6% | Colorado     | 17.3% | New Mexico     | 4.7%  |
| Colorado  | 20.3% | Texas        | 15.9% | New Jersey     | 4.2%  |

This is the good news. The bad news is that we are not ramping up renewables fast enough to achieve the carbon reductions necessary to avoid the worst impacts of climate change. This is especially true in Pennsylvania. Currently, renewables account for less than five percent of electricity generated in the state,<sup>14</sup> and most of new generation being built is natural gas-fired power. Since 2011, approximately 40 new gas power projects representing more than 17,000 megawatts (MW) of generation capacity have sought air quality permits from the Pennsylvania Department of Environmental Protection.<sup>15</sup>

The explosion of gas-fired power is due in part to historically low (for now) natural gas prices, which investors see as an opportunity to push coal and nuclear power offline in Pennsylvania's competitive power markets,, then enjoy handsome returns on their investment as gas prices rise.

<sup>14</sup>See Public Utility Commission, *2017 Annual Report: Alternative Energy Portfolio Standards Act of 2004*, available at [http://www.puc.pa.gov/Electric/pdf/AEPS/AEPS\\_Ann\\_Rpt\\_2017.pdf](http://www.puc.pa.gov/Electric/pdf/AEPS/AEPS_Ann_Rpt_2017.pdf)

<sup>15</sup>See Department of Environmental Protection, "Natural Gas Power Project List as of 4/2/2019"



But this growth of gas generation is also a function of the fact that Pennsylvania's AEPS has been so weak over the last fifteen years.

As noted above, the AEPS currently has only an eight percent goal for "Tier I" resources, which include both renewable sources (solar, wind, hydropower, and geothermal) and non-renewable sources (coal-mine methane, biomass, and wood manufacturing waste products). Within this eight percent, there is a "carve-out" of one-half of one percent (0.5 percent) for solar photovoltaic (PV) electricity.

Pennsylvania has the potential to cost-effectively generate much greater amounts of renewable energy than this. According to the DEP's 2018 Energy Assessment, Pennsylvania has the potential to economically increase grid scale solar 3,687 percent and distributed generation solar 255 percent from 2015 – 2050.<sup>16</sup> In its recently completed "Finding Pennsylvania's Solar Future" project, the DEP explored a narrower question: whether Pennsylvania has sufficient technical and economic solar potential to meet 10 percent of in-state electricity demand with in-state solar generation by 2030. The report found that Pennsylvania does have such potential and recommended fifteen strategies for achieving it, including increasing the solar target in the AEPS to between four and eight percent by 2030.<sup>17</sup> Wind capacity is currently only 1,369 MW in Pennsylvania, but the state has the technical potential for 108,946 MW.<sup>18</sup>

The independent analysis completed for DEP in the "Finding Pennsylvania Solar Future" project also revealed that increasing solar to 10 percent by 2030 would create "60,000 to 100,000+ jobs, depending on the ratio of smaller systems to larger systems [smaller distributed generation requires more labor and results in more jobs than grid scale]. From installers to system designers, these solar jobs have median wages of \$20–\$38 per hour, and will be available in rural, urban, and suburban areas," and "could result in a net benefit of over \$1.6 billion annually from 2018 to 2030."

By scaling up renewable energy through a strengthened AEPS, Pennsylvania could create tens of thousands of new good-paying jobs. Since 2015, Environmental Entrepreneurs (E2) and the Keystone Energy Efficiency Alliance (KEEA) have released annual reports enumerating the

---

<sup>16</sup> See Department of Environmental Protection, *Energy Assessment Report for the Commonwealth of Pennsylvania* (April 16, 2018). See also *Pennsylvania's Solar Future Plan: Strategies to Increase Electricity Generation from In-State Solar* (November, 2018), available at

<https://www.dep.pa.gov/Business/Energy/OfficeofPollutionPrevention/SolarFuture/Pages/Pennsylvania's-Solar-Future-Plan.aspx>

<sup>17</sup> See *Pennsylvania's Solar Future Plan: Strategies to Increase Electricity Generation from In-State Solar*, *id.*

<sup>18</sup> See <https://www.awea.org/Awea/media/Resources/StateFactSheets/Pennsylvania.pdf>

Commonwealth's jobs in energy efficiency, renewable energy, battery storage, and clean vehicles. The 2018 *Clean Jobs Pennsylvania* report counted more than 8,500 renewable energy jobs.<sup>19</sup> But because Pennsylvania's renewable energy goals lag behind those of neighboring states, the state's job-creation rates also lag. For example, New Jersey and New York, which have both set goals to obtain 50 percent of their electricity from renewable sources, have 1,321 and 918 clean energy jobs per million residents, respectively. Pennsylvania has only 681 jobs per million residents.

At a House Committee hearing on April 8, one witness suggested to the Committee that because of the declines in renewable energy costs noted above, policies like the AEPS are no longer needed to drive growth in renewables. This is not true, at least in Pennsylvania.

Historically, the federal government and state governments have intervened liberally in energy markets “to develop public goods, such as national security and defense, to promote positive externalities, such as economic development within the United States and an expansion of power abroad, and to overcome market barriers, such as the high cost and financial risks of transporting remote natural resources to markets.”<sup>20</sup> Although the oil and gas, coal, and nuclear industries would like us to believe that they have simply pulled themselves up by their bootstraps in free markets, they have benefited enormously from government assistance – far, far more than renewables have – and they continue to do so today.<sup>21</sup>

Given the urgent need to reduce greenhouse gas emissions, it is critical that states support energy resources that both create jobs and economic development *and* reduce these emissions – especially when wholesale energy markets inhibit those resources, as the markets run by the PJM Interconnection do. (These markets are described in the following section). While there is an argument for providing narrowly tailored, time-limited support to struggling nuclear plants in Pennsylvania so that they can be replaced by renewable energy, efficiency, or other low-carbon

---

<sup>19</sup> See <https://www.e2.org/wp-content/uploads/2018/06/Clean-Jobs-Pennsylvania-2018.pdf>

<sup>20</sup> Tracey M. Roberts, “Picking Winners and Losers: A Structural Examination of Tax Subsidies to the Energy Industry,” *Columbia Journal of Environmental Law*, Vol. 41:1 (2016), available at [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2657336](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2657336)

<sup>21</sup> See, e.g., Gilbert E. Metcalf, “Ending Fossil Fuel Subsidies: Removing Tax Preferences for Domestic Oil and Gas Production,” Kleinman Center for Energy Policy (April 27, 2017), available at <https://kleinmanenergy.upenn.edu/policy-digests/ending-fossil-fuel-tax-subsidies>. See also David Roberts, “Friendly policies keep US oil and coal afloat far more than we thought,” available at <https://www.vox.com/energy-and-environment/2017/10/6/16428458/us-energy-coal-oil-subsidies>, and Doug Koplow, *Nuclear Power: Still Not Viable Without Subsidies*, Union of Concerned Scientists (2011), available at [https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nuclear\\_power/nuclear\\_subsidies\\_report.pdf](https://www.ucsusa.org/sites/default/files/legacy/assets/documents/nuclear_power/nuclear_subsidies_report.pdf)

resources instead of natural gas-fired power plants without carbon capture technology, to ensure long-term emission reductions the Commonwealth must make stronger support for renewables the foundation of changes to the AEPS.

### **Pennsylvania’s Competition Act and the Problem with PJM’s Competitive Power Markets**

The Electricity Generation Customer Choice and Competition Act of 1996 (“Competition Act,” or “Act”) may be Pennsylvania’s most important energy law, and understanding it is critical to understanding why nuclear power is increasingly struggling in the Commonwealth. The Act also helps explain why so many new natural gas power plants are being built in Pennsylvania at a time when we should be decarbonizing our power sector.

The Competition Act “restructured” Pennsylvania’s electric power industry by separating the generation and distribution of electricity into separate businesses. It was part of a wave of regulatory reform that sought to introduce competition in various utility functions after the end of the Cold War, following what was seen as the successful economic deregulation of many other industries, from airlines to telecommunications.<sup>22</sup>

Before the Act, Pennsylvania’s electric utilities were “vertically integrated,” meaning that they both (1) built and operated power plants and (2) distributed electricity to homes, businesses, and factories. Utilities had a monopoly on both functions (subject to oversight by the state Public Utility Commission, or PUC), and when a utility wanted to build a power plant, it had to get approval from the PUC. The point of PUC review was to ensure that construction of the plant was “prudent,” since the cost of building the plant would be reflected in the price of the utility’s electricity, and customers had no choice but to buy that electricity.

The Competition Act was based on the premise that while electricity *distribution*—essentially, building and operating poles, wires, and substations—is a “natural monopoly” that can be performed most efficiently by one company under PUC supervision, a competitive market could be established for electricity *generation*, and that this would lead to increased efficiency (i.e., lower prices for consumers). Accordingly, the Act made three major changes to Pennsylvania’s electricity system.

---

<sup>22</sup> Borenstein and Bushnell, “The U.S. Electricity Industry After 20 Years of Restructuring,” National Bureau of Economic Research (April, 2015), available at <https://www.nber.org/papers/w21113.pdf>

First, the Act forced utilities out of the generation business, requiring them to spin off their power plants and become “electricity distribution companies,” or EDCs. Today, the job of Pennsylvania’s EDCs is to maintain distribution infrastructure, design rates, manage bills, and run assistance programs for Pennsylvania’s many payment-troubled customers, as well as programs to help customers use energy more efficiently. These functions are supervised by the PUC.

Second, the Competition Act created a “retail” electricity market where customers can choose to buy electricity generation from any qualified “electric generation supplier” (EGS), and EGS (including both companies that own power plants and marketers that buy power and re-sell it to customers) are allowed to market different generation “products” to customers. When customers don't shop, “default suppliers” (usually EDCs) buy electricity for them under rules established in the Competition Act.

Third, the Competition Act effectively outsourced planning for Pennsylvania’s electricity generation sector to the markets designed and run by Montgomery County-based PJM Interconnection, LLC. PJM is authorized under The Federal Power Act to act as a “regional transmission organization” for the Mid-Atlantic United States, which essentially means that it manages the electricity system and ensures the system’s reliability. PJM does this in part by creating and designing “wholesale” electricity markets where electricity is sold as a commodity. These markets determine what power plants are generating electricity at any given time, as well as the price of that electricity.

The restructuring of Pennsylvania’s power sector is sometimes described as “deregulation,” but that is a misnomer. Before the Competition Act was enacted, Pennsylvania’s power sector was regulated by the PUC under laws passed by the General Assembly. Now the power sector is regulated by market rules adopted by PJM and approved by the Federal Energy Regulatory Commission (FERC). PJM, a limited liability company, designs the rules for its markets based on input from its members, most of which are companies that participate in the markets. (The members of an LLC are roughly equivalent to shareholders of a corporation). The Commonwealth of Pennsylvania is not a member of PJM, and the General Assembly has no voice in the design of PJM’s markets. Pennsylvania’s only formal engagement at PUC is through the Organization of PJM States (OPSI), which itself is not a member of PJM, only a “stakeholder.”

The struggles of nuclear power to remain economical in Pennsylvania are largely due to a profound design flaw in PJM’s markets: they do not account for the climate impacts of carbon pollution from power plants that burn coal and gas. (While coal produces more carbon pollution than gas, gas-fired power plants emitted 24.20 million tons of carbon dioxide in Pennsylvania in 2015, and several new gas plants have been built since then). If the markets did price carbon pollution—something that PJM has begun to explore but has never acted on—companies emitting it by burning coal and gas would have to pay for it. That would make non-emitting power sources, including both renewables and nuclear, more competitive.

### **Carbon Limits and Pricing: A Market-Based Approach to Help Fix Pennsylvania’s Power Sector**

At the Committee’s hearing on April 8, one witness suggested that it was time for a “conversation” about carbon pollution. In fact, though, a conversation has been happening for years – and it has increasingly pointed in the direction of using market mechanisms to cap and price carbon emissions from the power sector and create a more level playing field between generation sources that emit carbon pollution and those that do not. In part, the current struggles of the state’s nuclear plants can be attributed to Pennsylvania’s not having adopted such a mechanism to date. We respectfully suggest that the General Assembly consider immediate action to do so now.

Over the last 125 years, Pennsylvania has developed or embraced a number of innovative policies to solve environmental problems. For example, in 1901, after clear-cutting of the state’s vast hardwood and Hemlock forests led to a succession of floods and fires (which in turn resulted in human casualties and property damage),<sup>23</sup> the General Assembly responded by creating the Department of Forestry (now the Department of Conservation and Natural Resources), to bring the land back to productive use and protect watersheds. Today, according to a recent Penn State study for the Center for Rural Pennsylvania, the total estimated annual expenditures associated

---

<sup>23</sup> “For this industrial progress [brought by the lumber trade], the commonwealth paid an exorbitant and ruinous price. In their wake, the loggers left vast acreages of devastation. All cutover land, strewn with waste tree limbs, bark, and unwanted logs, was dry and inflammable. Fires swept over the mountains, destroying timber, creating soil erosion, silting streams, and causing incredible destruction to what we today recognize as the ecosystem. So ravaging were these forces of cutting and burning that millions of acres of once productive and beautiful sylvan landscape became acres of desolation. Joseph Trimble Rothrock called this area ‘the Pennsylvania Desert.’” Henry Clepper, “Forest Conservation in Pennsylvania: the Pioneer Period, from Rothrock to Pinchot,” available at <https://journals.psu.edu/phj/article/viewFile/24211/23980>

with state forest visitation are nearly \$400 million (a figure that does not include expenditures associated with state park visits).<sup>24</sup>

More recently, during the 1980s Pennsylvania had the worst acid rain in the U.S.<sup>25</sup> because of sulfur dioxide pollution from coal-fired power plants – a problem both for the health of the state’s rebuilt forests and the trout population of its streams. President George H.W. Bush proposed the nation’s first major market-based environmental law, a cap-and-trade program, and Pennsylvania embraced this program. It was a huge success, cutting emissions faster and cheaper than expected.<sup>26</sup>

The acid rain program is just one example of how, when legally binding, declining limits are placed on pollution and environmental costs are priced into markets, the markets work to reduce emissions. In short, send a strong and clear signal to a sector that it should move in a direction and the market responds through innovation to get there. Do nothing, and the unsustainable status quo will persist.

This is a lesson that Pennsylvania can apply to carbon pollution from its power sector and, in the process, both help the economics of its nuclear plants and create a revenue stream that the General Assembly can use to help Pennsylvanians.

One approach that Pennsylvania could take would be to join – or simply link to – the Regional Greenhouse Gas Initiative, or RGGI (pronounced “Reggie”), a market-based, cap-and-invest program to cut carbon pollution from power plants that launched in 2009. RGGI’s members currently include Delaware, Maryland, New York, and the six New England states. New Jersey is in the process of joining RGGI, and Virginia is preparing to link to RGGI’s trading markets (both states are far along in their regulatory processes, and will be part of RGGI by next year, January 1, 2020).

The “cap” part of RGGI is a regional limit on carbon emissions from the power plants of participating states. The cap is determined by negotiation among the RGGI states, then lowered by 3 percent annually. The “invest” part starts with the fact that power plants under RGGI must

---

<sup>24</sup> Ran, Hafer, et al. “An Economic Evaluation of the State Forest System” (December, 2018), available at <http://www.rural.pa.legislature.us/documents/reports/State-Forest-Economic-Eval-2018-print.pdf>

<sup>25</sup> New York Times, “Rain in Pennsylvania Found Most Acidic” (January 3, 1989), available at <https://www.nytimes.com/1989/01/03/science/rain-in-pennsylvania-found-most-acidic.html>

<sup>26</sup> Joe Goffman, “What Environmental Protection Owes to George H.W. Bush,” available at <https://eelp.law.harvard.edu/2018/12/what-environmental-protection-owes-george-h-w-bush/>

purchase one “allowance” for every ton of carbon that they emit. RGGI creates allowances in a number equal to the number of tons in the regional cap, then auctions the allowances to power plants (and other parties who wish to buy them). The auction proceeds are then returned to states to be invested in various beneficial purposes, including energy efficiency, renewable energy projects, and bill rebates for consumers.

RGGI gives the power sector flexibility to achieve the required emissions reductions efficiently. After allowances have been auctioned, they can be traded among power plants and third parties on secondary markets. This maximizes the economic efficiency of RGGI by incentivizing emission reductions where they are most cost-effective. The result? Delivering pollution reductions at a lower cost to consumers while jumpstarting investment in the transition to a clean energy economy.

RGGI also makes generating resources that do not emit carbon pollution – including both nuclear power and renewables like wind and solar – more competitive in power markets by increasing the price of resources that do emit carbon more expensive. And it raises revenue for states. Since 2009, RGGI states have received more than \$3 billion from the auction of allowances. They have invested these monies in their local economies in the form of (among other things) energy efficiency programs and measures, renewable energy projects, bill assistance for consumers, and education and job training programs.<sup>27</sup> According to the most recent evaluation of RGGI’s economic impacts, from 2015 to 2017 the RGGI program led to \$1.4 billion (in net present value) of net positive economic activity in the nine-state region.<sup>28</sup> And that is on top of nearly \$3 billion in net economic benefits from RGGI’s first six years.<sup>29</sup> This bears emphasis: these states have slashed power plant pollution *while growing their economies, maintaining a reliable electric sector, and capturing an increasing market share of the burgeoning clean energy economy.*

---

<sup>27</sup> Analysis Group, *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States: Review of the Use of RGGI Auction Proceeds from the Third Three-Year Compliance Period (2015-2017)*, (April 17, 2018), available at [https://www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/analysis\\_group\\_rggi\\_report\\_april\\_2018.pdf](https://www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_april_2018.pdf)

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

<sup>29</sup> Analysis Group (2015), *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States: Review of the Use of RGGI Auction Proceeds from the Second Three-Year Compliance Period (2012-2014)*, [https://www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/analysis\\_group\\_rggi\\_report\\_july\\_2015.pdf](https://www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_july_2015.pdf); Analysis Group (2011), *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States: Review of the Use of RGGI Auction Proceeds from the First Three-Year Compliance Period*, [https://www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/economic\\_impact\\_rggi\\_report.pdf](https://www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/economic_impact_rggi_report.pdf)

RGGI, then, is a very different value proposition from HB 11. As with HB 11, Pennsylvania’s joining RGGI would have the effect of raising electricity rates (though probably less). But unlike HB 11, RGGI would return a significant amount of money to the Commonwealth to be used for beneficial purposes, including not only clean energy investments but also potentially aiding in worker and community transitions where plants retire. By investing RGGI revenues in efficiency programs that enable consumers to use less energy, Pennsylvania could also save consumers money on their overall electricity bills.<sup>30</sup> Moreover, because around 30 percent of the electricity generated in Pennsylvania is exported to – and paid for by – other states, RGGI auctions would effectively *import* money from those states to Pennsylvania.

RGGI is not the only market-based system that Pennsylvania could use to make the operation of PJM’s competitive power markets fairer in the Commonwealth. But it is ready-made program with a proven track record. And this is a propitious time to join RGGI, because PJM recently announced plans to study carbon pricing in an effort to better reflect states’ policy priorities in its markets.<sup>31</sup> This is critical, because if Pennsylvania were to adopt carbon pollution limits and price that pollution, PJM has already begun exploring mechanisms by which they could adjust wholesale electricity prices at the border and thereby mitigate market distortions that might otherwise result. With Pennsylvania pricing carbon—and teaming with New Jersey, Delaware, Maryland, and Virginia—a compelling case could be readily made to PJM to go beyond the exploratory stage and actually begin analyzing different options that could be implemented.

Chairman Roae, Chairman Matzie, thank you again for the opportunity to testify on HB 11 and the important energy policy issues facing Pennsylvania today. I would be happy to answer any questions you may have.

---

<sup>30</sup> For example, according to data from the current RGGI states, investments made under RGGI through 2016 have already saved consumers more than \$900 million on their energy bills, and energy efficiency and other clean energy measures that have already been installed under RGGI will ultimately save consumers more than \$9 billion on their energy bills. See *RGGI, Inc. (2018), Investment of RGGI Proceeds in 2016*, [www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI\\_Proceeds\\_Report\\_2016.pdf](http://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2016.pdf); *RGGI, Inc. (2017), Investment of RGGI Proceeds in 2015*, [www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI\\_Proceeds\\_Report\\_2015.pdf](http://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2015.pdf); *RGGI, Inc. (2016), Investment of RGGI Proceeds Through 2014*, [www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI\\_Proceeds\\_Report\\_2014.pdf](http://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2014.pdf).

<sup>31</sup> See PJM Interconnection Issue Charge, “Carbon Pricing in the PJM Energy Market” (March 21, 2019), available at <https://pjm.com/-/media/committees-groups/committees/mrc/20190321/20190321-item-08-carbon-pricing-issue-charge.ashx>