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Jennifer Swan } **Testimony for CO₂ Budget Trading Regulation**
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My name is Patricia M. DeMarco, Vice President of the Forest Hills Borough Council, and Senior Scholar at Chatham University. I reside at 616 Woodside Road, Pittsburgh, PA 15221. I speak today as a private citizen on behalf of the children of the twenty-first century whose quality of life will be shaped by the decisions we make. I urge Pennsylvania to participate in the Regional Greenhouse Gas Initiative (RGGI).

According to international, national and Commonwealth of Pennsylvania climate assessments, human activities, especially emissions of greenhouse gases, are the dominant cause of observed global warming that has occurred most acutely in the last 50 years. Thousands of studies conducted by researchers around the world have documented changes in surface, atmospheric, and oceanic temperatures; melting glaciers; diminishing snow cover; shrinking sea ice; rising sea levels; ocean acidification; and increasing atmospheric water vapor.¹ Baseline emissions patterns continue on a trajectory toward a four-degree increase, or higher, in the average global temperature. Prospects for economic prosperity weaken as climate conditions continue to worsen.² The Market Risk Advisory Committee to the U.S. Commodity Futures Trading Commission issued a report that sounded a stark alarm: “Climate change poses a major risk to the stability of the U.S. financial system and to its ability to sustain the American economy. Climate change is already impacting or is anticipated to impact nearly every facet of the economy, including infrastructure, agriculture, residential and commercial property, as well as human health and labor productivity.”³

Forest Hills has adopted a Climate Action Plan with a goal of reaching net zero carbon emissions by 2050. To reach this goal, we plan to migrate energy consumption increasingly to renewable energy sourced electricity for residential, commercial and transportation sectors. PA participation in RGGI will be important to achieving this goal using PA-generated renewable electricity. The market as it exists now will not assure that renewable energy will be generated in Pennsylvania, rather than being secured from more enlightened neighboring states. We must put in place the regulatory and legal infrastructure to support the transformation of the energy system so the renewable energy industry can grow and thrive in Pennsylvania. The shift away from burning fossil fuels within the next ten to 30 years is necessary for our civilization to survive.

Pennsylvania created much of the wealth of the industrial age derived from its rich endowment of fossil deposits of oil, coal, natural gas. The industries based on the extraction, combustion and industrial production of these extractive industries has supported the economy of the Commonwealth

of Pennsylvania for many decades. Policies in place now and pursued most vigorously stand to defend this historic base, to sustain operations with policies and practices that limit, even punitively, any perceived challengers to the oil, gas and coal industries. Such continued support of the fossil energy industries to the detriment of establishing robust renewable energy systems will leave Pennsylvania behind as our neighboring states and global markets advance into a decarbonized future. If Pennsylvania intends to maintain a leadership position in the energy industry, in keeping with its past history, we will adopt innovation. We will use RGGI as one tool in moving to a renewable energy-based electricity system.

Pennsylvania should participate in the Regional Greenhouse Gas Initiative for three reasons:

1. Carbon Emission Reduction:

RGGI has demonstrated effective reduction in greenhouse gas emissions beyond what would have occurred without the program. After the introduction of RGGI in 2009 the region's emissions would have been 24% higher without the program, accounting for about half of the region's emissions reductions during that time, which were far greater than those achieved in the rest of the United States.⁴

2. Electricity System Economics:

DEP's modeling estimates that from 2022 to 2030, participating in RGGI would lead to an increase in Gross State Product of nearly \$2 billion and a net increase of over 27,000 jobs in this Commonwealth. As much of the existing fleet of electricity generating equipment will reach the end of its useful life from 2030 to 2050, it is important to recognize that utility scale renewable energy resources have achieved already a favorable position in life cycle cost compared to traditional oil, gas, coal and nuclear power plants. The unsubsidized, levelized cost is in the range of \$28 to \$44 per Megawatt hour for solar photovoltaic or wind installations at utility scale compared to \$41 to \$74 per Megawatt hour for the least expensive gas combined cycle units.⁵ While the per unit costs of wind, solar, geothermal and fuel cells continue to decline rapidly each year, the cost of coal and natural gas systems increases with more diligent emissions controls, and as the costs of extraction, transportation and waste processing increase. Participating in the RGGI program will provide resources that can help existing energy providers to shift to more efficient non-carbon- based electricity systems.

3. Social Benefits:

As the pollution from burning fossil fuels decreases, significant health benefits will accrue to the communities currently afflicted with power plant emissions. Environmental justice communities deserve relief from the barrage of toxic fumes, particulates and poor air quality that accompany fossil fuel combustion. Particulate pollution from burning coal and gas in Pennsylvania power plants accounted for 2,300 premature deaths and \$20 billion in health burdens in 2015 alone, and 85 % of Pennsylvania's power plants are in neighborhoods with more low income and minority families than the state median.⁶ The shift to renewable energy systems can greatly alleviate these severe health burdens from the fossil energy industries.

The skilled workers of Pennsylvania deserve investment in industries where the job growth has a positive trajectory to the end of the century, rather than an ongoing boom and bust sequence that leaves communities devastated and impoverished while the wealth leaves the area to foreign corporations. Renewable energy systems offer local jobs, sustained jobs that pay well and enrich

the communities local to their use. Renewable energy systems include hydroelectric, wind and solar energy, both passive solar incorporated into building design and active photovoltaic power generation. Solar energy alone employs more people than oil, gas and coal combined with 777,000 jobs posted in 2016.⁷ Solar jobs are growing at 25% per year and wind at 16% per year, though the trend has slowed a bit due to federal policy uncertainty and the tariffs imposed on imports of solar panels and components from China.⁸ The renewable energy production field employs skilled workers such as electricians, electrician helpers, solar installers, repairers, and electric power plant operators. Between 2017 and 2019, clean energy businesses created almost 7,800 new jobs—a growth rate of 8.7 percent in two years.⁹ When these renewable energy systems are built in Pennsylvania, they also employ machinists, construction workers, and building trades workers. RGGI will help to build markets for these kinds of industrial growth in Pennsylvania.

We must look to the future and put in place the regulatory infrastructure to support a smooth transformation of our electricity generating system to reach a net zero carbon emission profile by 2050. This is the moral obligation we have to our children. Please adopt the RGGI Program in Pennsylvania.

¹ Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, B. DeAngelo, S. Doherty, K. Hayhoe, R. Horton, J.P. Kossin, P.C. Taylor, A.M. Waple, and C.P. Weaver, 2017: Executive summary. In: Climate Science Special Report: Fourth National Climate Assessment, Volume I. Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.) U.S. Global Change Research Program, Washington, DC, USA, pp. 12-34, doi: [10.7930/J0DJ5CTG](https://science2017.globalchange.gov/chapter/executive-summary/). <https://science2017.globalchange.gov/chapter/executive-summary/>

² Forest Hills Borough Climate Action Plan. Page 2. <https://foresthillspa.org/Document%20Center/Informational-Memos/News%20And%20Events/Forest%20Hills%20Climate%20Action%20Plan%20-%2012-1-2020%20DRAFT.pdf>

³ Heede, Richard (2019) *Carbon Majors: Accounting for carbon and methane emissions 1854-2010 Methods & Results Report*, re-issued with new foreword, ISBN 978-3-659-57841-0, OmniScriptum, Riga, 148 pp.

⁴ Brian C. Murray, Peter T. Maniloff. “Why have greenhouse emissions in RGGI states declined? An econometric attribution to economic, energy market, and policy factors.” *Energy Economics*. Volume 51, September 2015, Pages 581-589

⁵ Lazard’s Levelized Cost of Energy Analysis- Version 12.0 November 2018. <https://www.lazard.com/media/450784/lazards-levelized-cost-of-energy-version-120-vfinal.pdf> Accessed December 4, 2020.

⁶ Krieger, E, et al., “The Clean Power Plan in Pennsylvania; Analyzing power generation for health and equity,” June 2016. <https://nextgenamerica.org/news-reports/our-air-pa-technical/>

⁷ U.S. Energy Information Administration. Pennsylvania State Profile and Energy Estimates. Last Updated August 2019. <https://www.eia.gov/state/analysis.php?sid=PA>. Accessed December 4, 2020

⁸ Patricia M. DeMarco. Green Jobs and a Living Planet. May 23, 2019. <https://patriciademarco.com/2019/05/23/green-jobs-and-a-living-planet-make-it-happen/>

⁹ [bw] Research Partners. 2020 Pennsylvania Clean Energy Industry Report. Pennsylvania Department of Environmental Protection Energy Programs Office. <http://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/2020EnergyReport/2020PACEIR.pdf>