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Center for Energy Law and Policy

Prospects for Pennsylvania in the Regional Greenhouse Gas Initiative

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About the Center for Energy Law and Policy

Penn State's Center for Energy Law and Policy (CELP) was founded in 2018 with a mission to harness interdisciplinary research strengths at Penn State and beyond to bring emerging science and scholarship to complex problems in energy law and policy. A major part of CELP's mission is to engage with stakeholders around energy policy issues in ways that drive and define interdisciplinary academic research problems and encourage ongoing interactions between researchers and practitioners. The Center for Energy Law and Policy is collaborative effort across Penn State's many disciplines, research centers and campuses, which makes it the only energy research center in the country that can fully harness the strengths of a leading land grant research university to assemble collaborative and interdisciplinary teams, providing Penn State with a unique opportunity to have a major impact. The University and its faculty also have a deep commitment to the kind of engaged and practitioner-informed scholarship that makes the Center for Energy Law and Policy a unique organization to serve the Commonwealth, the nation and the world.

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Executive Summary

The Penn State Center for Energy Law and Policy, as part of its mission to harness the breadth of Penn State's research talent and interdisciplinary capability to provide independent perspectives on complex issues in energy law, regulation and policy, has assembled a team of scholars from across the University to assess Pennsylvania's participation in the Regional Greenhouse Gas Initiative (RGGI). Our work began soon after much of normal life in Pennsylvania, the country, and the planet was disrupted by the Covid-19 pandemic. This public health situation has heightened awareness of the connections between energy, the global climate system, and how local air quality affects health outcomes and risk factors for disease such as Covid-19. It has also reinforced the critical role that energy has played and will continue to play in the Commonwealth and the region as we emerge from this global challenge.

RGGI is a voluntary mechanism to establish a market-based cap and trade system for managing greenhouse gas emissions from electric power generation, and Pennsylvania has taken steps to join RGGI beginning in 2022. Our assessment of RGGI draws on interdisciplinary strengths in energy and administrative law, public policy, power systems and economics, and air quality modeling to evaluate the legal and policy environment for joining RGGI; what it might mean for Pennsylvania's large power generation sector and for local air quality in the Commonwealth; and ways in which RGGI participation might be leveraged to promote energy innovation at a critical economic time for Pennsylvania. This joint work has generated several important insights:

RGGI would benefit Pennsylvania's energy economy overall, but the benefits and costs are not evenly distributed. Joining RGGI would likely accelerate the transition already underway away from using coal for power generation in favor of natural gas in Pennsylvania and other states in the wholesale electricity market managed by PJM. Acceleration of this transition is the primary driver of CO₂ emissions reductions from power generation in Pennsylvania. Because the carbon prices established through RGGI would likely be reflected in somewhat higher wholesale power prices in PJM, power generators in Pennsylvania as a whole are likely to see benefits in the form of higher profits. The implications for consumers' energy bills in Pennsylvania are less clear and will depend upon how allowance revenue from Pennsylvania's entry into RGGI are used.

Joining RGGI will likely reduce emissions of multiple pollutants from Pennsylvania power plants, but the potential for emissions leakage is high. Reduction of CO₂ and other air pollutants from Pennsylvania power plants is likely to be accompanied by substantial emissions leakage as power plants from other states are utilized more heavily within the PJM market. The extent of emissions leakage that we estimate varies by pollutant, with CO₂ and SO₂ leakage rates being higher and NO_x leakage rates being lower. Specifically, we estimate that 86% of the CO₂ reductions from Pennsylvania's joining RGGI would be offset by emissions increases in PJM and/or other RGGI states. This leakage rate is consistent with estimates from other states joining RGGI. Even though the emissions leakage rate is high, we find that CO₂ emissions in the multi-state PJM region decline following Pennsylvania joining RGGI and that the climate benefits exceed the monetary costs of participating in RGGI.

Governor Wolf has the legal authority to direct the Pennsylvania DEP to draft and finalize rules for joining RGGI. Our analysis of multiple potential legal areas concludes that the DEP and the Environmental Quality Board (EQB) have ample authority to create and move forward with rules for joining RGGI. New York provides an instructive comparative case to Pennsylvania, as it is the only other state to join RGGI via executive action.

Steps to mitigate emissions leakage by Pennsylvania will need to be taken with care, preferably in coordination with PJM. The high leakage rates for CO₂ and some other pollutants estimated by our power market model raise potential constitutional issues under the dormant commerce clause if Pennsylvania were to take unilateral action to mitigate leakage. This is somewhat untested legal ground, since no RGGI state (nor the RGGI organization itself) has ever proposed or tried to implement leakage reduction measures.

The health-related co-benefits of Pennsylvania joining RGGI are potentially large, and most of these co-benefits to Pennsylvanians may be concentrated in areas that see the largest reductions in power generation from conventional resources. Reductions of air emissions of pollutants other than CO₂ (including oxides of sulfur and nitrogen, fine particulate matter and volatile organic compounds) could reduce health damages associated with air pollution by between 10 percent and 20 percent per year for some pollutants. The bulk of these health-related co-benefits would arise from reductions in emissions of SO₂, NO_x and PM 2.5. We estimate that the monetary value of these reductions in health damages would amount to approximately \$1 billion to \$4 billion per year over the initial decade of Pennsylvania's RGGI participation.

RGGI does not impose any inherent conflict with major electricity policy measures in Pennsylvania such as Act 129 and the Alternative Energy Portfolio Standard (AEPS). Both the energy efficiency and demand reduction requirements under Act 129 and the incentives for renewable power generation under the AEPS also incentivize fewer greenhouse gas emissions from Pennsylvania’s electricity sector. We find that these programs are complementary to RGGI; RGGI by itself, for example, is unlikely to incentivize large amounts of new low-carbon power generation as the AEPS with RGGI does. Some care may be needed to account for cost recovery under Act 129 if utility efficiency programs are commingled with RGGI energy efficiency investments.

With cooperative approaches across state agencies, revenues from the RGGI auction could be re-invested in ways that promote energy innovation and further decarbonization in Pennsylvania. Other RGGI states have taken a variety of approaches to re-invest auction revenues. An interpretation of Pennsylvania’s Air Pollution Control Act (APCA) suggests that re-investment in Pennsylvania may be constrained to those areas featuring a strong nexus with air pollution reductions. In light of the large share of Pennsylvania’s energy sector to the Commonwealth’s economy, an expansive view of re-investment options merits consideration. In the absence of legislative authorization to direct RGGI revenues outside of the Clean Air Fund, we highlight some ways in which a cooperative and cross-agency approach could allow for reinvestment in targeted communities and to spur innovation that can also enhance economic development and environmental quality.