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ROOM TO GROW: A CONSUMER-FOCUSED PROPOSAL FOR REVITALIZING OHIO'S RENEWABLE ENERGY SECTOR THROUGH SUSTAINABLE EXPANSION OF THE MARKET

MAIRI MULL*

INTRODUCTION

In June 2014, Ohio became the first state to take a significant step *backwards* in its renewable energy policy when the state legislature “froze” its clean energy program.¹ Originally enacted in 2008, the Alternative Energy Portfolio Standard (“AEPS”) established yearly benchmarks designed to ensure that 25% of Ohio’s energy would be obtained from alternative sources by the year 2025, with 12.5% being derived from renewable energy sources.² Ohio Senate Bill 310 (“SB 310”) paused this progression at the designated 2014 level, requiring that Ohio utility companies derive only 2.5% of the state’s energy from renewable sources.³ Since this landmark legislative reversal, several other states (including Kansas and North Carolina) have likewise moved to halt their renewable energy programs.⁴

Although SB 310 provided that the standards would resume effect in 2017, it also established an Energy Mandates Study Committee (“Committee”) to re-evaluate the appropriateness of the state’s renewable energy policies.⁵ On September 30, 2015, the Committee published a report

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¹ Dan Gearino, *Kasich Signs Bill Freezing ‘Green’ Energy Requirements*, COLUMBUS DISPATCH (June 14, 2014), <http://www.dispatch.com/content/stories/business/2014/06/13/kasich-signs-bill-freezing-green-energy-rules.html> [https://perma.cc/CQW4-ZA5C].

² Eric Romich, *Renewable Energy Policy Series: Ohio SB 221*, OHIO STATE UNIVERSITY EXTENSION, <http://ohioline.osu.edu/cd-fact/pdf/4001.pdf> [https://perma.cc/VY8C-AZ2A].

³ Maura McClelland, *Sub. S.B. 310 Bill Analysis*, OHIO LEGISLATIVE SERV. COMM’N., <http://www.lsc.ohio.gov/analyses130/s0310-rh-130.pdf> [https://perma.cc/83KP-JG59]; Romich, *supra* note 2, at 2.

⁴ Bryson & Glendenning, *States are Unplugging Their Renewable Energy Mandates*, WALL ST. J. (July 10, 2015), <http://www.wsj.com/articles/states-are-unplugging-their-renewable-energy-mandates-1436568792> [https://perma.cc/SEG4-4GY8].

⁵ McClelland, *supra* note 3, at 5.

recommending that Ohio legislators permanently abandon the AEPS, citing concerns about costs to ratepayers and an unwillingness to pursue mandatory energy policies pending the resolution of a multi-state legal challenge to the federal Clean Power Plan.⁶ However, even Governor John Kasich—who supported SB 310 and ultimately signed it into law—has deemed the Committee’s recommended course “unacceptable.”⁷

Representatives of Ohio’s coal, gas, and utility companies, several of whom testified before the Energy Mandates Study Committee, have been particularly vocal critics of the Clean Power Plan.⁸ The legislature should carefully consider the criticisms of those who, arguably, know Ohio’s energy market best—but if current methods of promoting the growth of renewable energy are flawed, the solution is not to abandon the endeavor. An objective, realistic assessment of the economic, environmental, and health costs of failing to timely develop Ohio’s capacity for renewable energy demands that we instead incorporate those criticisms into our legislative strategies, allowing us to facilitate sustainable growth in the industry.

Above all, these strategies must be fundamentally consumer-focused: as advocates of green energy know well, industry subsidies warp markets, creating artificial conditions that must be supported by taxpayers to prevent the collapse of essential industries. Ohio’s lawmakers need not and should not create policies that artificially prop up the state’s renewable energy industry. Rather, they must allow it room to grow by organically stimulating consumer demand while scaling back subsidies for fossil fuels and outdated utilities.

I. HISTORY OF OHIO’S ENERGY MANDATES

A. *The National Context*

During the 1970s, concerns about the long-term viability of fossil fuels first prompted policymakers to re-evaluate their state’s energy

⁶ Jeremy Pelzer, *Ohio Lawmakers Recommend Halting State’s Renewable Energy, Efficiency Mandates*, PLAIN DEALER (Sept. 30, 2015, 10:24 AM), http://www.cleveland.com/open/index.ssf/2015/09/ohio_lawmakers_recommend_halti.html [<https://perma.cc/W7Z6-8XAN>].

⁷ Dan Gearino, *Kasich Calls Indefinite Freeze of Ohio’s Clean Energy Standards ‘Unacceptable’*, COLUMBUS DISPATCH (Oct. 1, 2015, 3:17 AM), <http://www.dispatch.com/content/stories/business/2015/09/30/opposition-clean-energy-standards-freeze.html> [<https://perma.cc/MX55-Q3MY>].

⁸ *Id.*

policies.⁹ By the 1990s the scientific community was reaching increasing consensus regarding the environmental impact of greenhouse gas emissions, and the issue of climate change was quickly gaining prominence in the national political dialogue.¹⁰ Renewable Energy Portfolio Standards (“RPSs”), state-enacted requirements that energy suppliers obtain a minimum percentage of their power from sources meeting specified eligibility criteria, became a popular method of legislatively reshaping energy-use practices.¹¹

The first state to adopt this tactic was Iowa, which enacted its RPS in 1983 with a goal of deriving 105 megawatts (“MW”) from renewable sources by 1999.¹² (For context, Iowa’s 2013 energy consumption totaled approximately 444 million MW.)¹³ By 2012, twenty-nine states and the District of Columbia had adopted comparable programs, and an additional seven states had chosen non-mandatory renewable energy goals.¹⁴

Notably, no two states’ Portfolio Standards are identical.¹⁵ Their energy targets, enforcement mechanisms, and source eligibility criteria vary significantly: for example, while Virginia’s program requires only 15% renewable energy sources by 2025, Maine’s requires 40% by 2017.¹⁶ The basic model has been continuously refined and tailored to the needs and capacities of each state, and while the rate at which new standards are being adopted has slowed, the revision process continues.¹⁷ California recently extended its RPS goal to 33% renewable source use by 2020, and several states have expanded their categories of eligible sources.¹⁸

B. *Senate Bill 221 and the Ohio AEPS*

Ohio’s own portfolio standard was adopted in 2008, with the passage of Senate Bill 221 (“SB 221”). Designated an “Alternative Energy

⁹ Richard Black, *A Brief History of Climate Change*, BBC NEWS (Sept. 20, 2014), <http://www.bbc.com/news/science-environment-15874560> [<https://perma.cc/K4KR-MF9H>].

¹⁰ *Id.*

¹¹ Galen Barbose, *Renewable Portfolio Standards in the United States: A Status Update*, LAWRENCE BERKELEY NATIONAL LABORATORY (Dec. 3, 2012), <http://www.cesa.org/assets/2012-Files/RPS/RPS-SummitDec2012Barbose.pdf> [<https://perma.cc/665L-B8B6>] (last visited Nov. 15, 2016) (presented at the 2012 National Summit on RPS).

¹² U.S. ENERGY INFORMATION ADMINISTRATION, *Iowa State Profile*, <http://www.eia.gov/state/?sid=IA> [<https://perma.cc/7H26-BXAP>] (2016).

¹³ *Id.*

¹⁴ Barbose, *supra* note 11, at 4.

¹⁵ *Id.* at 3.

¹⁶ *Id.* at 4.

¹⁷ *See id.* at 10.

¹⁸ *Id.*

Portfolio Standard” in contrast to the more common RPS, the bill set comparatively modest requirements in terms of renewable energy—only 12.5% by 2024.¹⁹ It did, however, establish broader standards for “alternative” energy sources, defined in the statute to include both “advanced” and “renewable” sources.²⁰ Advanced energy sources include methods or technologies that modify existing facilities to increase electricity output without increasing carbon dioxide emissions, clean coal or nuclear power, and demand-side improvements in energy efficiency.²¹ Renewable sources, by contrast, include only those that rely on “rapidly and naturally replenished resources” such as wind and solar power.²² Altogether, alternative energy sources were required to provide at least 25% of Ohio’s energy by 2025.²³

Ohio’s AEPS under SB 221 was also somewhat unique in that it established a specific “set-aside” target for the proportion of energy to be derived from the state’s solar resources.²⁴ This provision required that solar sources provide one-half of one percent of the state’s energy by 2025.²⁵ SB 221 additionally targeted the development of renewable resources within Ohio, stipulating that of the 12.5% renewable energy required by 2025, half (one-quarter of the total alternative energy requirement) must be obtained in-state.²⁶

The in-state requirement of SB 221 was an important aspect of Governor Ted Strickland’s vision for the bill, originally developed as a means of implementing his 2007 “Energy, Jobs, and Progress” plan.²⁷ Strickland called on legislators to develop a policy which would encourage investment in developing renewable energy in Ohio, theorizing that partnership with this rapidly growing industry would stimulate the manufacturing sector which has traditionally formed the heart of Ohio’s economy.²⁸

Coupled with a favorable regulatory landscape and the support of policymakers, proponents of the initiative predicted that Ohio’s low cost

¹⁹ Romich, *supra* note 2.

²⁰ *Id.* at 2.

²¹ Bricker & Eckler LLP Green Strategies Grp., *Ohio Senate Bill 221: A Summary of Its Advanced Energy and Energy Efficiency Provisions*, (2014), <http://www.bricker.com/documents/Publications/1533.pdf> [<https://perma.cc/6NQL-WT6U>] (last visited Nov. 15, 2016).

²² Romich, *supra* note 2.

²³ Bricker & Eckler LLP Green Strategies Grp., *supra* note 21.

²⁴ Romich, *supra* note 2.

²⁵ *Id.*

²⁶ *Id.*

²⁷ Bricker & Eckler LLP Green Strategies Grp., *supra* note 21.

²⁸ OHIO AIR QUALITY DEVELOPMENT AUTHORITY, *Energy, Jobs, and Progress for Ohio*, http://www.ieu-ohio.org/resources/1/information/education/pdf/Strickland_Energy_Plan.pdf [<https://perma.cc/WK2G-7L9U>] (last visited Nov. 15, 2016).

of living, established industrial capacity, and skilled labor force would make it an ideal location for the establishment of new advanced and renewable energy technology production facilities.²⁹ While developing in-state capacity would initially cost more than purchasing and importing energy from otherwise eligible out-of-state sources, it would ultimately lead to the creation of new jobs for Ohioans.³⁰

SB 221 enjoyed remarkable bipartisan support throughout the legislative process. It was first presented to the Ohio Senate and passed unanimously, 32–0, on October 31, 2007.³¹ The House of Representatives added substantially to the bill, inter alia expanding the definitions of eligible sources and providing more specifically for the regulation of public utility rates.³² After several months of deliberation, it too passed the bill with a vote of 93–1.³³ The Senate voted to adopt the House’s changes, and Governor Strickland signed SB 221 into law on May 1, 2008.³⁴

II. OHIO’S TRADITIONAL ENERGY MARKET

In order to understand the impact of energy regulations in Ohio, it is necessary to first develop a basic familiarity with the industries that shape the state’s energy needs and the sources around which its energy market has developed.

A. *Coal*

Because manufacturing is a core component of Ohio’s traditionally industrial economy, the state has relied primarily on coal to meet its significant energy demands for more than a century.³⁵ Ohio ranked sixth in the nation for industrial sector energy consumption in 2012, largely due to the high-energy needs of its many manufacturing plants.³⁶ (For

²⁹ *Id.*

³⁰ *Id.*

³¹ Bricker & Eckler LLP Green Strategies Grp., *supra* note 21.

³² *Am. Sub. S.B. 221* (as passed by the house), OHIO GENERAL ASSEMBLY ARCHIVES, http://archives.legislature.state.oh.us/bills.cfm?ID=127_SB_221_PH [<https://perma.cc/9XUX-UX3X>].

³³ Bricker & Eckler LLP Green Strategies Grp., *supra* note 21.

³⁴ *Id.*

³⁵ U.S. ENERGY INFO. ADMIN., *Ohio*, <http://www.eia.gov/state/?sid=OH> [<https://perma.cc/Z9CN-WZGY>] (last visited Nov. 15, 2016).

³⁶ N. AM. ENERGY ADVISORY, *Energy Deregulation in Ohio*, <https://naea.today/energy-deregulation-in-ohio/> [<https://perma.cc/PU76-JGA6>] (last visited Nov. 15, 2016).

context, it ranked twenty-third in the same year for energy consumption overall.)³⁷

For energy-intensive production processes such as steel-making, coal provides a reliable, relatively cheap fuel that has long been favored by manufacturers despite evidence of its negative effects on the environment and on human health. In fact, although combustion is the most directly harmful stage of the coal “life cycle,” a 2009 study by Physicians for Social Responsibility found that coal negatively impacted human health at every major point in its processing.³⁸ From its extraction to its ultimate disposal, the study linked coal pollutants to respiratory, cardiovascular, and nervous system harms.³⁹

In addition, burning coal releases both methane and carbon dioxide, potent “greenhouse gases” that contribute to climate change by causing the Earth’s atmosphere to retain heat. Nationally, carbon dioxide released through the combustion of coal accounted for almost 25% of total greenhouse gas emissions in 2012.⁴⁰

When the AEPS was enacted in 2008, 85% of the electricity produced in Ohio came from coal.⁴¹ In 2014, coal-fired plants accounted for about 66% of Ohio’s power,⁴² but coal remains by far the predominant energy source in the state.⁴³ Despite the fact that Ohio is among the highest coal-producing states in the country (it ranked tenth in 2011),⁴⁴ it imports a majority of the coal needed to meet its demand from other states.⁴⁵ In 2012, Ohio utilities imported 58% of the coal they used—20.1 million tons of it, or \$1.2 billion worth.⁴⁶

³⁷ *Ohio*, ENERGY TRENDS, <http://www.energytrends.org/ohio> [<https://perma.cc/7XNQ-FWU8>] (last visited Nov. 15, 2016).

³⁸ *Coal Damages Human Health at Every Stage of Coal Life Cycle, Reports Physicians for Social Responsibility*, PHYSICIANS FOR SOCIAL RESPONSIBILITY (Nov. 18, 2009), <http://www.psr.org/news-events/press-releases/coal-pollution-damages-human-health.html> [<https://perma.cc/2A63-PE4X>].

³⁹ *Id.*

⁴⁰ CENTER FOR CLIMATE AND ENERGY SOLUTIONS, *Coal*, <http://www.c2es.org/energy/source/coal#Impact> [<https://perma.cc/3VGC-XR9X>] (last visited Nov. 15, 2016).

⁴¹ Laura Arenschie, *Coal Industry Taking Lumps*, COLUMBUS DISPATCH (June 8, 2014), <http://www.dispatch.com/content/stories/local/2014/06/08/coal-taking-lumps.html> [<https://perma.cc/2VNQ-5RSJ>].

⁴² *Id.*

⁴³ U.S. ENERGY INFO. ADMIN., *supra* note 35.

⁴⁴ *Ohio: An Energy and Economic Analysis*, INSTITUT. FOR ENERGY RESEARCH (Sept. 24, 2013), <http://instituteeforenergyresearch.org/analysis/ohio-an-energy-and-economic-analysis/> [<https://perma.cc/GAA8-3U2G>].

⁴⁵ U.S. ENERGY INFO. ADMIN., *supra* note 35.

⁴⁶ UNION OF CONCERNED SCIENTISTS, *Ohio’s Dependence on Imported Coal*, <http://www>

Because Ohio's utilities first developed in reliance on coal, the design of the electrical grid tends to support its continued use.⁴⁷ This long reliance also means, however, that many coal-fired power plants are now outdated: three FirstEnergy plants that closed on Lake Erie in April 2015 were 104 years old when they were finally shut down for the last time.⁴⁸ Older plants not only contribute more significantly to pollution, but they also produce power less efficiently, ultimately costing consumers.⁴⁹

As new plants are built to replace those now dying off, "clean coal" technologies that increase efficiency and capture carbon dioxide may be utilized to help reduce their environmental and health impacts.⁵⁰ (As noted earlier, such improvements qualified as "advanced" energy sources under the 2008 AEPS.)⁵¹ Carbon Capture and Sequestration ("CCS") and Underground Coal Gasification ("UCG") are already being used to trap carbon dioxide from coal in China's rapidly expanding energy industry, and in Canada it is now illegal to develop any new coal generation project that does not incorporate a carbon-capture method.⁵² While CCS and UCG do not eliminate all carbon dioxide released when the coal is burned, most current sequestration projects are capable of reducing the resulting emissions to a level equivalent to natural gas (to be discussed below).⁵³

However, clean-up costs make it difficult for coal companies to compete with natural gas.⁵⁴ According to Mark Levin of BB&T Capital Markets in Richmond, Virginia, some 90% of U.S. coal was uneconomical

.ucusa.org/sites/default/files/legacy/assets/documents/clean_energy/Ohio-Coal-Imports-BCBC-Update-2014.pdf [https://perma.cc/2TTG-8AFH].

⁴⁷ See generally Paul Hibbard & Andrea Okie, *Ohio's Electricity Future Assessment of Context and Options*, ANALYSIS GROUP, http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ohio_electricity_future_report_2015_april.pdf [https://perma.cc/KS7X-BEGU] (last visited Nov. 15, 2016).

⁴⁸ John Funk, *FirstEnergy Closes 104-Year-Old Coal Power Plants, Electric Rates to Rise*, PLAIN DEALER, Apr. 15, 2015, http://www.cleveland.com/business/index.ssf/2015/04/first_energy_closes_104-year-ol.html#incart_m-rpt-1 [https://perma.cc/5SRW-SY6K].

⁴⁹ *Retiring Dirty and Costly Coal Plants*, EARTHJUSTICE, <http://earthjustice.org/climate-and-energy/stopping-coal/coal-plants> [https://perma.cc/M6P7-TG4M] (last visited Nov. 15, 2016).

⁵⁰ U.S. DEP'T OF ENERGY, *Clean Coal Research*, <http://energy.gov/fe/science-innovation/clean-coal-research> [https://perma.cc/9TZH-MSVU] (last visited Nov. 15, 2016).

⁵¹ Romich, *supra* note 2.

⁵² R.P. Siegel, *Clean Coal: Pros and Cons*, TRIPLE PUNDIT (Apr. 9, 2012), <http://www.triplepundit.com/special/energy-options-pros-and-cons/clean-coal-pros-cons/> [https://perma.cc/GD2J-S6Q3].

⁵³ *Id.*

⁵⁴ Mario Parker, *Most U.S. Coal is Uneconomical as Natural Gas Fattens Profits*, BLOOMBERG BUSINESS (Apr. 16, 2015), <http://www.bloomberg.com/news/articles/2015-04-16/most-u-s-coal-is-uneconomical-as-natural-gas-fattens-profits> [https://perma.cc/85T8-HGPV].

in 2015.⁵⁵ In Ohio, taxpayers have been asked to help make up this difference: FirstEnergy and American Electric Power (“AEP”), two of Ohio’s largest utility companies, submitted proposals to the Public Utilities Commission of Ohio (“PUCO”) requesting that the state support certain unprofitable power plants through power purchase agreements.⁵⁶

While the low cost of natural gas is currently making the plants uncompetitive, FirstEnergy’s proposal cited internal estimates indicating that the price of natural gas will begin to rise over the new few years.⁵⁷ If those predictions turn out to be correct, the proposal could save Ohioans money; if not, it could cost taxpayers up to \$3 billion over the fifteen-year term of the contract.⁵⁸

AEP was successful in reaching a (widely unanticipated) settlement with state regulators in December 2015.⁵⁹ The settlement agreement provides AEP with eight-year power purchase agreements in exchange for promises to decrease coal generation at other plants and to develop 900 MW of renewable energy in Ohio over the next five years.⁶⁰ Dan Sawmiller of Sierra Club’s Beyond Coal Campaign called the agreement “an important step to cut dangerous carbon pollution, reinvigorate the clean energy economy in Ohio and ensure workers are treated fairly during the transition.”⁶¹

Given that coal is still considered one of the most reliable and readily available sources of energy in the United States, it is likely that it will continue to support a large proportion of our electricity supply well into the future. However, state officials must continue to use subsidies strategically and sparingly to avoid bailing out companies that are no longer independently viable.

B. *Natural Gas*

In the 1990s and early 2000s, concerns about the continued availability of fossil fuels composed a familiar refrain of the energy dialogue.

⁵⁵ *Id.*

⁵⁶ Gavin Bade, *What’s at stake in the FirstEnergy and AEP Ohio power plant subsidy hearings*, UTILITY DIVE (Oct. 1, 2015), <http://www.utilitydive.com/news/whats-at-stake-in-the-first-energy-and-aep-ohio-power-plant-subsidy-hearing/406595/> [https://perma.cc/928V-AC74].

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ Robert Walton, *AEP strikes settlement deal for Ohio plant subsidy proposal*, UTILITY DIVE (Dec. 15, 2015), <http://www.utilitydive.com/news/aep-strikes-settlement-deal-for-ohio-plant-subsidy-proposal/410826/> [https://perma.cc/MQN8-TA5W].

⁶⁰ *Id.*

⁶¹ *Id.*

In Ohio and other Midwestern states, however, that changed significantly when the Utica and Marcellus shale plays—huge underground stretches of organic-rich rock containing vast reserves of natural gas—were first effectively tapped.⁶² Natural gas production in Ohio increased 97% from 2012 to 2013 as a direct result of “fracking” in the Utica play, a newly popular drilling technique that is allowing access to these resources for the first time.⁶³

Approximately 25% of Ohio’s power was produced using natural gas in 2015, and as coal declines natural gas will likely continue to provide even greater proportions of the state’s electricity.⁶⁴ Natural gas is a considerably cleaner source of power than coal, producing nearly half the amount of carbon dioxide per unit of energy.⁶⁵ The 3.85 drop in U.S. carbon emissions observed in 2012 is in part a result of the nation’s growing shift to natural gas.⁶⁶

The natural gas boom has had positive economic impact on the Midwestern region as well. Numerous new drilling sites mean expansion of oil and natural gas companies, as well as valuable mineral rights payments for landowners. They also promise growth for one of Ohio’s most foundational industries: steel. Extracting natural gas from the shale plays requires miles of pipe per well, leading to dramatically increased demand and sparking new investment in Ohio’s steel industry.⁶⁷ Thousands of new jobs have already been created, and the growth is expected to continue for the immediately foreseeable future.

There are, however, several drawbacks to natural gas as a primary source of energy, and the Union of Concerned Scientists advises states not to become overly dependent on it.⁶⁸ The process by which the gas is

⁶² *Utica Shale—The Natural Gas Giant Below the Marcellus*, GEOLOGY.COM, <http://geology.com/articles/utica-shale/> [<https://perma.cc/VPD7-WXQE>] (last visited Nov. 15, 2016).

⁶³ Laura Arenschie, *Fracking Has Nearly Doubled Natural Gas Production in Ohio, Official Says*, COLUMBUS DISPATCH (July 3, 2014), <http://www.dispatch.com/content/stories/local/2014/07/02/State-to-discuss-Utica-play.html> [<https://perma.cc/FN6Z-U9CM>].

⁶⁴ *How Does Ohio Generate Electricity?*, PUB. UTIL. COMM’N. OF OHIO (Jan. 6, 2016), <http://www.puco.ohio.gov/puco/index.cfm/be-informed/consumer-topics/how-does-ohio-generate-electricity/#sthash.MNgakpRE.dpbs> [<https://perma.cc/KUB3-AVAV>].

⁶⁵ Sarah Zielinski, *Natural Gas Really Is Better Than Coal*, SMITHSONIAN.COM (Feb. 13, 2014), <http://www.smithsonianmag.com/science-nature/natural-gas-really-better-coal-180949739/?no-ist> [<https://perma.cc/MWV4-M5GA>].

⁶⁶ *Id.*

⁶⁷ Scott Tong, *America’s Energy Boom Revives Ohio’s Steel Industry*, MARKETPLACE (Oct. 23, 2012), <http://www.marketplace.org/topics/sustainability/americas-energy-boom-revives-ohios-steel-industry> [<https://perma.cc/JW9P-SGBS>].

⁶⁸ *The Natural Gas Gamble: A Risky Bet On America’s Clean Energy Future*, UNION OF

extracted, known as “fracking” (short for “hydraulic fracturing”), involves injecting high-pressure fluid into the rock to drive the gas to the top of the well. This fluid, once used, is contaminated with chemicals that are harmful to surrounding ecosystems and dangerous in drinking water. Researchers also recorded more than one hundred earthquakes near an injection site in the Youngstown area between 2011 and 2013—hardly a typical occurrence in eastern Ohio.⁶⁹ In fact, no earthquakes had ever been recorded in the region prior to the introduction of fracking, and the tremors stopped after use of the responsible well was discontinued.⁷⁰

Although the combustion of natural gas reduces carbon emissions compared with burning coal, the gas itself is primarily composed of methane. “Methane is a potent greenhouse gas,” trapping heat in the atmosphere approximately thirty-times more effectively than carbon dioxide.⁷¹ If too much methane leaks during the production process, the environmental advantage of natural gas over coal would be effectively erased.

While Ohio’s policymakers should embrace the shift to natural gas as a significant step toward cleaner energy, it should not be viewed as an all-encompassing solution. Diversifying Ohio’s energy sources with further development of renewables will have its own economic benefits, will most improve environmental and public health, and will help preserve the region’s supply of fossil fuels for future generations.

III. THE RENEWABLE ENERGY INDUSTRY IN OHIO

A. *Ohio’s Most Promising Renewable Resources*

Because renewable energy is, by definition, derived from naturally occurring sources, different forms are more viable than others in any particular region. In Ohio, several varieties of renewable energy have shown significant potential for further development, including wind, solar, and biogas.

CONCERNED SCIENTISTS (Mar. 2015), <http://www.ucsusa.org/clean-energy/coal-and-other-fossil-fuels/natural-gas-gamble-risky-bet-on-clean-energy-future#.ViQvmn6rTIU> [https://perma.cc/JM4M-2538].

⁶⁹ Arenschie, *supra* note 63.

⁷⁰ Becky Oskin, *Fracking Led to Ohio Earthquakes*, LIVE SCIENCE (Jan. 5, 2015), <http://www.livescience.com/49326-fracking-caused-ohio-earthquakes.html> [https://perma.cc/CBZ3-MJB4].

⁷¹ Zielinski, *supra* note 65.

B. Wind

Wind is by far the most propitious form of renewable energy in Ohio. The National Renewable Energy Laboratory estimates Ohio's on-shore wind capacity alone at over 54,000 megawatts; fully harnessed, the American Wind Energy Association projects that this capacity would be sufficient to meet more than 98% of Ohio's current energy needs.⁷² In 2014, with only 432 megawatts actually installed, wind provided 0.8% of Ohio's power—more than 100,000 average homes' worth.⁷³

While wind, like many renewable sources, varies in output due to natural conditions, its inclusion in the power grid can actually have a stabilizing effect—especially during harsh Ohio winters. During the “polar vortex,” a period of extreme cold during January 2014, the price of energy from traditional fuels such as coal “skyrocketed” due to the difficulties of transportation and the frequent failures of power plants.⁷⁴ Wind, by contrast, remained freely available, reducing the wholesale energy costs of PJM, the regional transmission organization that covers Ohio, by 27%.⁷⁵ According to the American Wind Energy Association, this translated to a savings of \$1 billion, or approximately \$15 per person.⁷⁶

Because of its proximity to the Great Lakes, Ohio also has considerable off-shore wind capacity. Winds tend to be stronger and more uniform over open water, and the potential energy of wind is directly proportional to the cube of the wind speed. This means that even an apparently slight increase can significantly improve energy output. The Bureau of Ocean Energy Management illustrates: “For instance, a turbine at a site with an average wind speed of 16 mph would produce 50% more electricity than at a site with the same turbine and average wind speeds of 14 mph.”⁷⁷

The Lake Erie Energy Development Company (“LEED Co.”) estimates the off-shore wind capacity of Lake Erie's Ohio waters at about 50

⁷² *Ohio Wind Energy*, AM. WIND ENERGY ASS'N., <http://www.awea.org/Resources/state.aspx?ItemNumber=5395> [<https://perma.cc/5RGD-4JK8>] (last visited Nov. 15, 2016).

⁷³ *Id.*

⁷⁴ Pete Danko, *Industry Says Wind Saved Consumers \$1B During '14 Polar Vortex*, BREAKING ENERGY (Jan. 8, 2015), <http://breakingenergy.com/2015/01/08/industry-says-wind-saved-consumers-1b-during-14-polar-vortex/> [<https://perma.cc/N6YG-RUAY>].

⁷⁵ *Id.*

⁷⁶ *Wind Generation Sets Records, Saves Consumers Money As Extreme Cold Grips Nation*, AM. WIND ENERGY ASS'N (Jan. 7, 2015), <http://www.awea.org/MediaCenter/pressrelease.aspx?ItemNumber=7088> [<https://perma.cc/FK9D-7TZ4>].

⁷⁷ *Offshore Wind Energy*, BUREAU OF OCEAN ENERGY MGMT., <http://www.boem.gov/renewable-energy-program/renewable-energy-guide/offshore-wind-energy.aspx> [<https://perma.cc/RN4Q-MCVM>].

gigawatts, or 50,000 MW.⁷⁸ More than a decade ago, LEED Co. began developing plans for the first off-shore wind farm in the United States.⁷⁹ It was to be located near Cleveland, and was “in the running” for a \$47 million grant from the federal Department of Energy.⁸⁰ Unfortunately, the project has experienced several setbacks in the past few years: the Department of Energy ultimately awarded its funding to offshore projects on the East and West Coasts, and several groups of citizens have raised opposition.⁸¹ Some are concerned about maintaining their scenic views of the lake; others object to the risks offshore wind turbines would pose to the species of migratory birds that cross Lake Erie each year.⁸²

As of September 2015, however, LEED Co. has refused to abandon the idea. Instead, it has continued to move forward by collecting geological samples from beneath the lake floor for analysis by an international team of experts.⁸³ According to Cleveland's *The Plain Dealer*, engineers with experience constructing offshore turbines in the North Sea have since declared the project viable.⁸⁴

C. Solar

Although Ohio, especially northern Ohio, is not famous for its sunshine, its second-highest producing renewable energy resource is solar power. The state currently ranks 20th in the nation for installed solar capacity with 106 MW, enough to power 12,000 average homes; it also ranked 22nd for new installed solar capacity in 2014, adding 15 MW of capacity within the year.⁸⁵

⁷⁸ Joshua Hill, *U.S. Off-Shore Wind Energy Potential is Staggering*, CLEAN TECHNICA (Jan. 15, 2015), <http://cleantechnica.com/2015/01/13/us-offshore-wind-energy-potential-staggering/> [<https://perma.cc/8H4E-7MZL>].

⁷⁹ Julie Grant, *One of Offshore Wind Power's Best Hopes is Fading on Lake Erie*, PRI (July 16, 2014), <http://www.pri.org/stories/2014-07-16/one-offshore-wind-powers-best-hopes-fading-lake-erie> [<https://perma.cc/QT82-5QNH>].

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ John Funk, *Drilling For Wind: LEEDCo Fields International Geotechnical Team 10 Miles Offshore*, PLAIN DEALER (Sept. 3, 2015), http://www.cleveland.com/business/index.ssf/2015/09/drilling_for_wind_leedco_field.html [<https://perma.cc/75Z5-NKEL>].

⁸⁴ John Funk, *Lake Erie Wind Turbines Viable, Say Engineering Firms With North Sea Experience*, PLAIN DEALER (Sept. 23, 2015), http://www.cleveland.com/business/index.ssf/2013/09/lake_erie_wind_turbines_viable.html [<https://perma.cc/NYY8-H7TB>].

⁸⁵ *Ohio Solar*, SOLAR ENERGY INDUS. ASS'N., <http://www.seia.org/state-solar-policy/ohio> [<https://perma.cc/KGN7-VBFG>].

While Ohio will likely never compete with states like California and Arizona in terms of total solar energy production, it does receive an annual daily average of three to four kilowatt hours of sun.⁸⁶ This is roughly twice what is received in central Germany, a global leader in photovoltaic energy;⁸⁷ in fact, in June 2014, Germany shattered records when it satisfied more than 50% of its energy demand exclusively with solar power.⁸⁸ (Germany's renewable energy policies will be discussed further below.)

The 2008 AEPS required that Ohio obtain one-half percent of its electricity from solar power by 2025.⁸⁹ In terms of solar capacity, this requires approximately 300 to 400 MW.⁹⁰ In the same year (2008), a study by the National Renewable Energy Laboratory found that Ohio's businesses and homes had a rooftop solar capacity of approximately 27,000 MW.⁹¹ The most obvious barrier to the development of this capacity is the cost of photovoltaic equipment—although prices have come down nearly 53% in the United States since 2010,⁹² solar panels and other hardware necessary for their installation remain beyond the financial reach of many Ohioans.

To help overcome this challenge, Ohio provides several incentives for residents and businesses willing to invest in rooftop solar. The Ohio Department of Development, for example, offers several grant programs specific to the type of building in question: up to \$200,000 for schools, businesses, nonprofits, and farms, up to \$75,000 for multi-family dwellings (\$100,000 for certified low-income housing), and up to \$25,000 for private residences.⁹³ Additionally, the state administers a loan program under the Ohio Job Stimulus Plan that provides up to \$2 million for the installation of solar power systems.⁹⁴

⁸⁶ *Renewable Energy for America: Harvesting the Benefits of Homegrown, Renewable Energy; Ohio*, NAT'L RES. DEFENSE COUNCIL, <http://www.nrdc.org/energy/renewables/ohio.asp> [https://perma.cc/B4CS-C3K9] [hereinafter NAT'L RES. DEF. COUNCIL].

⁸⁷ *Id.*

⁸⁸ *How Germany Became a Solar Superpower*, TRIPLE PUNDIT (Aug. 13, 2015), <http://www.triplepundit.com/2015/08/germany-became-solar-superpower/> [https://perma.cc/NB2N-75EP].

⁸⁹ Romich, *supra* note 2.

⁹⁰ NAT'L RES. DEF. COUNCIL, *supra* note 86.

⁹¹ J. Paidipati et al., *Rooftop Photovoltaics Market Penetration Scenarios*, NAT'L RENEWABLE ENERGY LABORATORY (Feb. 2008), <http://www.nrel.gov/docs/fy08osti/42306.pdf> [https://perma.cc/Z5KF-ELL9].

⁹² *Ohio Solar*, *supra* note 85.

⁹³ *Ohio Solar Incentive Programs*, SOLARINSURE, <http://www.solarinsure.com/ohio-solar-incentive-programs> [https://perma.cc/YML7-FXKT].

⁹⁴ *Id.*

Once a rooftop system is installed, its owners can recoup some of their investment through net metering. This process allows home- and business-owners to sell the power produced by their solar panels in excess of their needs back into the local electrical grid. When this happens, owners' utility accounts are credited toward future use; if in the course of a year a solar power system produces more power than its owner has consumed, on average, for the preceding three years, the utility company is required by law to issue a refund check.⁹⁵

Rooftop solar power has now grown to a degree in Ohio that representatives of the state's two primary utility companies, FirstEnergy and AEP, have become concerned about its impact on the rest of the market.⁹⁶ The utilities have challenged the net metering policies of the Public Utilities Commission of Ohio ("PUCO") before the Ohio Supreme Court, arguing, *inter alia*, that solar-producing customers should not be reimbursed at the same rate they would be charged if they were purchasing energy.⁹⁷ Because the per-kilowatt-hour rates charged by the utility companies include not only the cost of the energy itself (although that accounts for most of it) but maintenance and delivery charges that support the grid as a whole, FirstEnergy and AEP argue that customers are not entitled to compensation for these additional costs.⁹⁸

More problematically for Ohioans at large, they further argue that exempting solar-producing customers from payment of these surcharges shifts the cost of maintaining the grid disproportionately onto ratepayers who cannot afford or do not choose to purchase solar equipment.⁹⁹ Environmentalists and opposing counsel counter that solar power contributors help reduce these shared costs by reducing the need for power companies to construct additional plants, or to maintain "back-up" plants which are often older, dirtier (in the pollution-causing sense), and more expensive to run.¹⁰⁰ Also, as wind power is often most productive during harsh winter weather, solar power output tends to increase during the hottest days of summer—when demand for electricity also typically peaks.¹⁰¹

⁹⁵ John Funk, *Solar Power Sparks Resistance From Ohio Utilities*, PLAIN DEALER (July 29, 2015), http://www.cleveland.com/business/index.ssf/2015/07/solar_power_sparks_resistance.html [<https://perma.cc/77VM-EKFF>].

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ Funk, *supra* note 95.

Diversifying Ohio's electrical grid with increased solar capacity helps prevent blackouts and minimize cost spikes when the grid is stressed.¹⁰²

The Ohio Supreme Court has not spoken on the issue, but the central conflict in the case is illustrative of the broader tension in the state. Each of Ohio's large electric utilities has unregulated affiliates that produce and sell energy, and deterring private energy generation by reducing economic incentives preserves profits for the established producers.¹⁰³ To some proponents of renewable energy, this seems to present a conflict of interest.¹⁰⁴ The utility companies also strongly supported freezing Ohio's renewable energy standards through SB 310, and several were key campaign donors for Republican governor John Kasich.¹⁰⁵

As recently as 2013, however, Columbus-based utility AEP had its own plan to expand the use of solar energy in Ohio.¹⁰⁶ Turning Point, a 49.9 MW solar energy project planned for construction near Zanesville, Ohio, would have been "the largest solar array east of the Rockies."¹⁰⁷ The cost of the project was estimated around \$250 million, which AEP hoped to distribute through a new charge on customers' bills.¹⁰⁸

According to the Columbus Dispatch, the PUCO had previously stated that it would permit such charges if AEP could show that they were needed and that "the free market was not going to provide a similar resource."¹⁰⁹ Contrary to the recommendations of PUCO staff, however, the agency's governing board rejected the charge, leaving AEP without a viable means of financing its project.¹¹⁰ As AEP spokesperson Terri Flora observed, the abandonment of Turning Point represents a "missed opportunity."¹¹¹

¹⁰² Matt Kasper, *How to Secure the Grid and Save Rate Payers Money*, ENERGY AND POLICY INST., <http://www.energyandpolicy.org/value-of-solar-versus-fossil-fuels-part-three/> [<https://perma.cc/2EXY-BT9X>].

¹⁰³ Kathiann Kowalski, *Ohio Utilities Take Net Metering Fight to State Supreme Court*, MIDWEST ENERGY NEWS (Aug. 4, 2014), <http://midwestenergynews.com/2014/08/04/ohio-utilities-fight-net-metering-rules/> [<https://perma.cc/3XW4-FM4Q>].

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*; Dan Gearino, *Turning Point Solar Project in Noble County All But Dead*, COLUMBUS DISPATCH (Jan. 9, 2013, 7:59 PM), <http://www.dispatch.com/content/stories/business/2013/01/09/turning-point-solar-project-all-but-dead.html> [<https://perma.cc/RX8H-3SND>].

¹⁰⁶ Gearino, *supra* note 105.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

¹¹¹ *Id.*

D. *Benefits of Renewable Energy for Ohio Manufacturing*

As noted in our discussion of SB 221, the creation of jobs was a major motivating factor behind the passage of Ohio's AEPS. While other states may be naturally suited for greater production of wind or solar power, Ohio's industrial core and strong manufacturing base makes it uniquely equipped to meet those states' demand for the various components that make the development of renewable energy possible. According to the National Resources Defense Council, "Ohio has the sixth-highest number of green jobs in the nation, . . . more than 29,000 of them . . . in manufacturing."¹¹²

In early 2011, Ohio ranked second in the country for the production of solar panels.¹¹³ By 2012, 107 wind power supply chain businesses and 65 solar power supply chain businesses called the state "home," from Toledo-based glassmakers to Cincinnati metal-casting foundries.¹¹⁴ In Cleveland, an economic development organization known as NorTech has helped refocus the city's traditional industrial capacity on new and innovative projects expected to bring long-term growth to the area.¹¹⁵ NorTech's partnership with Quasar Energy, which uses microorganisms to convert waste into power, facilitated the shift of Quasar's supply chain from Europe.¹¹⁶ As a result, digester components previously purchased overseas are now being produced within the Buckeye State.¹¹⁷

The growth the renewable energy industry has stimulated in Ohio is in sharp contrast to the general decline the state has experienced. According to the BlueGreen Alliance, a national partnership between labor unions and environmental organizations, Ohio lost more than 400,000 manufacturing jobs between 2000 and 2011.¹¹⁸ The renewable energy industry offers an opportunity for the state to reassert itself as a

¹¹² NAT'L RES. DEF. COUNCIL, *supra* note 86.

¹¹³ *Id.*

¹¹⁴ Ashley Craig et al., *The Solar and Wind Energy Supply Chain in Ohio*, ENVTL. LAW & POLICY CTR. (Jan. 2012) <http://elpc.org/wp-content/uploads/2013/02/OhioWindSupply-0218.pdf> [<https://perma.cc/9W2W-JXVX>].

¹¹⁵ Amy Nordrum, *Cleveland Becomes CleanTech Leader But Ohio Backtracks on Renewable Energy*, INSIDE CLIMATE NEWS (Sept. 11, 2014), <http://insideclimatenews.org/news/20140911/cleveland-becomes-cleantech-leader-ohio-backtracks-renewable-energy> [<https://perma.cc/7UV5-9XBA>].

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ *The Ohio Green Manufacturing Action Plan*, BLUEGREEN ALLIANCE (Dec. 2011), <https://www.bluegreenalliance.org/wp-content/uploads/2016/07/GreenMAP-OH-vFINAL.pdf> [<https://perma.cc/ZX2F-FXFB>].

national manufacturing center, with the promise of continued growth throughout the next several decades: a November 2015 report by NextGen Climate America predicts that the clean energy industry could bring some 200,000 jobs to the Midwest by 2030, and “as many as 400,000” by 2050.¹¹⁹

It is imperative, however, that Ohio policymakers maintain a regulatory climate that will facilitate investment within the state. The legislature’s recent reversal on renewable energy has created uncertainty for investors which imperils new projects in Ohio, threatening to drive new factories and supply contracts into other states at a crucial point in the industry’s development.

IV. RECOMMENDED STRATEGIES FOR OHIO’S LEGISLATURE

Criticisms of Ohio’s pre-SB 310 renewable energy policies have centered around several recurrent themes: (1) the general economic impact of increased costs associated with clean energy;¹²⁰ (2) the creation of artificial, unsustainable market conditions through legislative interference;¹²¹ and (3) the disproportionate burden placed on the state’s low-income residents.¹²² These concerns must be given their due weight as legislators continue to reshape Ohio’s energy laws, but should be addressed in a manner that does not deny citizens the economic, environmental, and public health benefits of clean energy, nor choke out the related industries that have become established in the state since 2008.

A. *General Economic Impact of Renewable Energy*

The testimony of Dr. Ryan Yonk before the Energy Mandates Study Committee on July 20, 2015 painted a grim picture of the effect of Renewable Portfolio Standards on adopting states’ economies.¹²³ Yonk attributed significant economic loss in Ohio to the enactment of the

¹¹⁹ Mary Kuhlman, *Report: Green Economy Could Boost Ohio Manufacturing Jobs*, GALION INQUIRER (Nov. 18, 2015), <http://galioninquirer.com/news/6088/report-green-economy-could-boost-ohio-manufacturing-jobs> [https://perma.cc/T7KN-NQN8].

¹²⁰ See, e.g., Testimony of Ryan M. Yonk PHD, Utah State University (July 20, 2015), <http://emsc.legislature.ohio.gov/Assets/Testimony/72015-dr-ryan-yonk.pdf> [https://perma.cc/3GSW-LFQ7].

¹²¹ See, e.g., Greg Lawson, *Interested Party Testimony Submitted to the Ohio Energy Mandates Study Committee* (July 20, 2015), <http://emsc.legislature.ohio.gov/Assets/Testimony/72015-greg-lawson.pdf> [https://perma.cc/BX43-UJMK].

¹²² *Id.*

¹²³ Yonk, *supra* note 120.

state's original AEPS, including a 9.6% increase in unemployment.¹²⁴ Environmental advocates, however, have expressed concern over Yonk's ties to fossil fuel interests and pointed to what they claim are statistical errors in Yonk's data.¹²⁵ Just before the Committee's report was released, Gabe Elsner and Matt Kasper of Energy and Policy Institute wrote that the study Yonk referenced "misses the most basic statistical principle: correlation is not causation."¹²⁶ The measured economic downturn, they argue, was symptomatic of the larger financial crisis that has plagued the country since 2008 and does not reflect the impact of the AEPS.¹²⁷

Even if the 2008 AEPS *has* had a net negative effect on Ohio's economy so far, it does not follow that renewable energy initiatives are inherently uneconomical. Growing pains and transitional costs are to be expected, and it is far too soon to see the environmental or health benefits of the state's modest increase in renewable energy. Looking to leaders in renewable energy for legislative models on which to improve, Ohio lawmakers may benefit from the experience of other states and nations in refining Ohio's renewable energy policies.

In Germany, strong public support for the "Energiewende" (literally, "energy turn")¹²⁸ has allowed for the unprecedented growth of clean energy. According to National Geographic, support for the transition was "at an impressive 92%" in the fall of 2015—despite the immediate costs.¹²⁹ Germany, which also has a large manufacturing sector, now derives approximately 27% of its energy from renewables.¹³⁰

Germany's energy transformation was largely facilitated by a 2000 law that guaranteed 20-year feed-in tariffs for renewable energy.¹³¹ When the law was first enacted it paid fifty euro cents per kilowatt-hour,

¹²⁴ *Id.*

¹²⁵ Gabe Elsner, *Ohio Energy Mandates Study Committee Relies on Fossil Fuel Interests to Attack Alternative Energy Portfolio Standard (AEPS)*, ENERGY AND POLICY INST. (Sept. 29, 2015), <http://www.energyandpolicy.org/ohio-energy-mandates-study-committee-relies-on-fossil-fuel-interests-to-attack-alternative-energy-portfolio-standard> [<https://perma.cc/2654-HFA9>].

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ Hardy Graupner, *What Exactly is Germany's 'Energiewende'?*, DEUTSCHE WELLE (Jan. 22, 2013), <http://www.dw.com/en/what-exactly-is-germanys-energiewende/a-16540762> [<https://perma.cc/XZ52-64HW>].

¹²⁹ Robert Kunzig, *Germany Could Be a Model For How We'll Get Power in the Future*, NAT'L GEOGRAPHIC (Oct. 15, 2015), <http://ngm.nationalgeographic.com/2015/11/climate-change/germany-renewable-energy-revolution-text> [<https://perma.cc/8NE6-7C9P>].

¹³⁰ *Id.*

¹³¹ *Id.*

incentivizing private citizens across the nation to install photovoltaic, wind, and biogas systems.¹³² In 2012 alone, 7.6 gigawatts of photovoltaic panels were installed—the equivalent of seven nuclear power plants when the sun is shining.¹³³ As capacity grew, the price of wind and solar power accordingly declined, eventually becoming competitive with fossil fuels.¹³⁴ The feed-in tariff for large new solar facilities is now below ten euro cents per kilowatt-hour, and while ratepayers are still shouldering modest surcharges, according to Gerd Rosenkranz, an analyst for Agora Energiewende, “[t]he German economy as a whole devotes about as much of its gross national product to electricity as it did in 1991.”¹³⁵

This method of stimulating consumer demand for renewable energy has created a boom within Germany that is rapidly spreading with word of its success.¹³⁶ The Energiewende demonstrates the cumulative power of small-scale private investment, and the importance of a positive, innovative approach to the problem of climate change—coupled with a realistic appreciation of its disastrous potential costs. While still requiring initial public investment, renewable energy policies that bolster consumer demand rather than directly subsidizing large-scale producers help to avoid the second criticism raised above.

B. Artificial Market Conditions Created Through Legislative Interference

Before the Energy Mandates Study Committee, Greg Lawson of the Buckeye Institute for Public Policy Solutions asserted that the 2008 AEPS amounted to “nothing less than the government picking winners and losers in the marketplace.”¹³⁷ Such policies ultimately hurt Ohio’s consumers, he argued, by skewing the market and stifling innovation.¹³⁸

The same is not true, however, of programs that reward private individuals for their participation in the renewable energy market rather than suppliers; if consumers could obtain better (cheaper, more reliable) energy using new equipment or methods, under such a policy they would still be incentivized to do so.

¹³² *Id.*

¹³³ *Id.*

¹³⁴ *Id.*

¹³⁵ Kunzig, *supra* note 129.

¹³⁶ *Id.*

¹³⁷ Lawson, *supra* note 121.

¹³⁸ *Id.*

In California, lawmakers have experimented with this premise by compensating customers (often through green energy marketers) with a simple per-kWh credit.¹³⁹ As in Germany, there is widespread public support for the fight against climate change in California, as densely populated coastal areas will be among the first to feel the effects of rising ocean levels.¹⁴⁰

Several other states, however, have since followed California's (modified) example: New York and Rhode Island have implemented their own versions of the program, with amendments designed to address some of the major issues encountered in California.¹⁴¹ In Rhode Island, for example, per-customer sign-up incentives were substituted for per-kWh credits in order "to buy-down the costs of customer marketing" without disrupting prices and creating an unsustainable market.¹⁴² While the customer-credit model would require significant revision before it could be applied to Ohio's energy market, the underlying principle of supporting the growth of renewable energy through the stimulation of voluntary consumer demand is transferable.

C. *Impact on Low-Income Ohioans*

A final criticism of the 2008 AEPS, which must be addressed in reforming Ohio's renewable energy policy, points to its disproportionate impact on the state's low-income residents. As Mr. Lawson also noted in his testimony, the most vulnerable segments of the population, namely the elderly and those living below the federal poverty level, are those most affected by rising energy costs.¹⁴³ A recent report by Policy Matters Ohio found that these costs exceed 30% of annual income for more than 300,000 Ohio households, even without counting the accompanying health costs.¹⁴⁴

¹³⁹ Ryan Wisser et al., *Innovation, Renewable Energy, and State Investment: Case Studies of Leading Clean Energy Funds*, ERNEST ORLANDO LAWRENCE BERKELEY NAT'L. LAB. 89 (Sept. 2002), <https://emp.lbl.gov/sites/all/files/report-lbnl-51493.pdf> [<https://perma.cc/2ZH9-5RWK>].

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ Lawson, *supra* note 121.

¹⁴⁴ Kathiann Kowalski, *Low-income Ohioans to Bear Brunt of Weatherization Cuts*, MIDWEST ENERGY NEWS (Nov. 7, 2014), <http://midwestenergynews.com/2014/11/07/cost-saving-ohio-low-income-weatherization-program-faces-cuts/> [<https://perma.cc/9JR8-HBGQ>].

Furthermore, while declining installation costs for photovoltaic equipment have made solar production incentives accessible to more middle class residents, they remain out of reach for a large proportion of Ohioans.¹⁴⁵ Many of those who could most benefit from solar energy programs lack the initial funds, have no access to rooftop space, or do not have a legal right to build on the property they inhabit.¹⁴⁶

Other states have utilized several strategies to extend the benefits of renewable energy to low-income populations which might be incorporated into Ohio's revised renewable energy policy.¹⁴⁷ The development of community solar gardens in California, Colorado, and other areas has allowed low-income families (many of whom live in apartments and therefore would otherwise lack the space to deploy solar equipment) to share start-up costs, as well as to leverage prices through bulk purchasing.¹⁴⁸ Once established, these solar gardens provide investing community members with credits that help alleviate the burden of energy costs.¹⁴⁹ The Center for American Progress suggests that such projects may even help facilitate community redevelopment, as land that is otherwise unusable or of low property value may be purchased cheaply and thus put to productive use.¹⁵⁰

A second strategy for minimizing the burden placed on low-income Ohioans is investment in weatherization projects which promote energy efficiency in low-income housing.¹⁵¹ Prior to the passage of SB 310, private investment in such programs had been increasing.¹⁵² Uncertainty regarding the state's regulatory climate, however, has curbed the trend, despite the fact that this method was (according to the report by Policy Matters Ohio) yielding a savings of \$2.51 for every dollar spent.¹⁵³ Low-income weatherization efforts by Ohio utilities, which had increased sevenfold between 2008 and 2014, have declined by 26% since the passage of SB 310.¹⁵⁴

¹⁴⁵ *Id.*

¹⁴⁶ Ben Bovarnick & Darryl Banks, *State Policies to Increase Low-Income Communities' Access to Solar Power*, CENTER FOR AMERICAN PROGRESS (Sept. 23, 2014), <https://www.americanprogress.org/issues/green/report/2014/09/23/97632/state-policies-to-increase-low-income-communities-access-to-solar-power/> [<https://perma.cc/JX2M-F5ZK>].

¹⁴⁷ *Id.*

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

¹⁵⁰ *Id.*

¹⁵¹ Kowalski, *supra* note 144.

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Ohio Clean-Energy Freeze Hurts Home Weatherization Efforts*, POLICY MATTERS OHIO

The weatherization of low-income housing also has health benefits, helping to minimize mold and other hazards.¹⁵⁵ Considering that many of these same residents rely on public assistance for their healthcare, their benefit may in time be expected to accrue to the general taxpaying population. Leveraging these collective potential benefits, it is quite possible that Ohio's state officials may serve all three goals articulated here at once by promoting the accessibility of renewable energy and energy efficiency to a larger proportion of the state's population.

The U.S. Department of Energy has been providing states with grants through the Weatherization Assistance Program since 1976, impacting more than seven million families across the nation since its inception.¹⁵⁶ While Ohio's Development Services Agency does have a Weatherization Assistance Program in place to facilitate the distribution of federal funds, state lawmakers might consider the program as a potential model for state investment in the development of renewable energy.¹⁵⁷

As reflected in the figures provided above, data collected on the success of the Weatherization Assistance Program within Ohio has primarily focused on "savings," or reductions in energy usage.¹⁵⁸ However, a study of the economic impact of the weatherization assistance program in Oregon additionally found that for every dollar spent on employee compensation at the county level, another \$1.43 in labor income was produced.¹⁵⁹ For every job created in connection with weatherization efforts, another 1.66 jobs were created across the state.¹⁶⁰ These outcomes reflect a successful

(Dec. 8, 2015), <http://www.policymattersohio.org/weatherization-dec2015> [<https://perma.cc/F552-7BJR>].

¹⁵⁵ Kate Kuholski et al., *Healthy Energy-Efficient Housing: Using a One-Touch Approach to Maximize Public Health, Energy, and Housing Programs and Policies*, J. PUB. HEALTH MGMT. PRAC. S68–S74 (2010), http://www.greenandhealthyhomes.org/sites/default/files/3Healthy_Energy_Efficient_Housing.pdf [<https://perma.cc/Q5C3-HMQD>].

¹⁵⁶ *Weatherization Assistance Program*, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY, <http://energy.gov/eere/wipo/weatherization-assistance-program> [<https://perma.cc/M85Z-HVUJ>] (last visited Nov. 15, 2016).

¹⁵⁷ *Weatherization Assistance Program*, OHIO DEV. SERV. AGENCY, https://development.ohio.gov/is/is_hwap.htm [<https://perma.cc/C6WV-AZT7>] (last visited Nov. 15, 2016).

¹⁵⁸ *Ohio Weatherization Assistance Program Impact Report*, OHIO OFF. OF ENERGY EFFICIENCY (July 6, 2006), <https://development.ohio.gov/files/is/HWAPImpactEvaluation.pdf> [<https://perma.cc/XGK9-QCG4>] (noting that the author's use of a report predating the Ohio AEPS is intended to demonstrate the impact of this program without the larger regulatory scheme in place, and to more closely parallel the Oregon report cited).

¹⁵⁹ Melissa Torgerson, *The Economic Impacts of Oregon's Low Income Weatherization Program: An Input-Output Analysis*, OR. ST. U., http://www.oregon.gov/ohcs/CRD/SOS/docs/Wx_Economic_Impact_Analysis.pdf [<https://perma.cc/2SMX-H6ZW>].

¹⁶⁰ *Id.*

interaction between government and economy, and the Weatherization Assistance Program's longevity is evidence of its sustainability.

CONCLUSION

To not lose the ground we have gained since 2008, it is crucial that Ohio's lawmakers take a clear, positive stance on renewable energy. However, this need not manifest as industry subsidies: by investing in projects that expand the accessibility of renewable energy to a greater proportion of the state's residents, the Ohio government may stimulate private consumer demand that will help overcome the initial costs of updating our energy infrastructure. Once established, Ohio's renewable energy providers will be able to compete in the energy market or they will be forced to adapt—and all Ohioans will be better off for it.