



April 27, 2020

VIA E-File

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
400 North Street, Filing Room
Harrisburg, PA 17120

RE: Act 129 Implementation Phase IV
Docket No. M-2020-3015228

Dear Ms. Chiavetta,

Enclosed for filing in the above-referenced proceeding, please find the Comments of the Environmental Stakeholders.

Should you have any questions, please contact me at dmcdougall@earthjustice.org.

Sincerely,

/s/ Devin McDougall

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**BEFORE THE
PENNSYLVANIA PUBLIC UTILITIES COMMISSION**

Act 129 Implementation)	Docket Nos.	M-2020-3015228
Phase IV)		
)		

COMMENTS OF THE ENVIRONMENTAL STAKEHOLDERS

Sierra Club, Natural Resources Defense Council (“NRDC”), Citizens for Pennsylvania’s Future (“PennFuture”), Clean Air Council, Philadelphia Climate Works, POWER, and 350 Philadelphia (hereinafter “Environmental Stakeholders”) respectfully submit these comments in response to the Pennsylvania Public Utility Commission’s (“Commission” or “PA PUC”) Tentative Implementation Order (“Tentative Order”) on Phase IV of the Act 129 Energy Efficiency and Conservation Program dated March 12, 2020, for the Commission’s consideration in preparing its Final Implementation Order (“Final Order”).¹

I. Introduction

The Environmental Stakeholders continue to support Act 129,² and believe that a well-implemented program will generate substantial energy efficiency benefits, provide for the just and equitable sharing of those benefits, and harmonize with State and local public policy initiatives to decarbonize our energy system. One key way in which the advancement of these goals could be strengthened in the Final Order is through the Commission disallowing the practice of electric distribution companies (“EDCs”) promoting electric-to-fossil fuel-switching as a means of reducing electricity consumption in Phase IV. As discussed in further detail below,

¹ Docket M-2020-3015228, Tentative Implementation Order on Phase IV of the Act 129 Energy Efficiency and Conservation Program, Pennsylvania Public Utility Commission, (Mar. 12, 2020).

² 66 Pa.C.S. § 2806.1.

the Commission's own report on Phase IV shows that all Phase IV targets can be met and exceeded in a cost-effective fashion without any use of electric-to-fossil fuel-switching.³ Moreover, declining to promote electric-to-fossil fuel switching is a prudent means of avoiding inconsistency with State and local public policies towards decarbonization and market and technology trends supporting building electrification.

Additionally, the implementation of consumption reduction and peak demand reduction programs could be strengthened in order to achieve greater energy efficiency benefits and a more just distribution of those benefits. First, the Commission should allow beneficial electrification programs in Phase IV, which can help reduce net energy usage and improve indoor air quality. Second, the Commission should allow EDCs to carry over excess budget funds from Phase III to Phase IV, but EDCs should be required to spend such funds on energy efficiency measures for low-income ratepayers. Third, implementation guidelines should be adjusted, in a variety of ways discussed further below, in order to promote the use of comprehensive programs, to help ensure access to program benefits by low-income ratepayers and residents of multifamily housing, and to ensure that EDCs make as much progress as possible in implementing energy efficiency measures.

II. Statement of Interest

Sierra Club is a non-profit environmental organization whose mission is to explore, enjoy, and protect the wild places of the Earth and to practice and promote the responsible use of the Earth's resources and ecosystems. The Sierra Club currently has over 31,000 members in Pennsylvania, most of whom receive electricity service from one of the EDCs required to offer efficiency services under Act 129. These members have a strong interest in both the success of

³ See *infra* at Point III.A.

energy efficiency programs and in protecting themselves, their communities, and their ambient environment from the effects of fossil fuel generation.

NRDC is a nonprofit environmental organization with more than 1.4 million members and online activists, including nearly 90,000 in Pennsylvania. Since its founding in 1970, their lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, its public health, and the environment. NRDC's top institutional priority is curbing global warming emissions and building the clean energy future—a priority that can be advanced by ramping up investments in energy efficiency via strengthened programs such as those administered under Act 129.

PennFuture is a membership based non-profit advocacy organization focused on energy and environmental issues that impact Pennsylvanians. PennFuture works to create a just future where nature, communities, and the economy thrive. PennFuture enforces environmental laws and advocate for the transformation of public policy, public opinion, and the marketplace to restore and protect the environment, safeguard public health, and reduce the consequences of climate change within Pennsylvania and beyond.

Clean Air Council (the “Council”) is a member-supported environmental organization serving the Mid-Atlantic Region. The Council is dedicated to protecting and defending everyone's right to breathe clean air. The Council works through a broad array of related sustainability and public health initiatives, using public education, community action, government oversight, and enforcement of environmental laws.

Philadelphia Climate Works is a coalition of community organizations, labor unions, environmental advocates, and individuals in Philadelphia advocating for local policies that reduce carbon emissions by creating high-quality jobs and tangible social benefits for a diverse

and growing number of impacted constituencies. Together, Philadelphia Climate Works builds necessary partnerships and community-generated solutions to advance equity, justice, and resilience as the foundation of a safe climate future for Philadelphia. The coalition focuses on a range of issues, from diesel pollution and transit equity to housing disrepair, energy burdens, and health and safety hazards, to ensure that state and local programs, like Act 129, can work to mitigate the burdens that disproportionately impact low-income residents, communities of color, and impacted workers.

POWER is a racial and economic justice organizing force in the state of Pennsylvania, helping people put faith and values into strategic action to win concrete change in the public sphere. POWER organizes in southeastern Pennsylvania and in coalition across the state for racial and economic justice on a livable planet by shifting the moral and policy universe towards possibilities that support the common good. POWER's Climate Justice and Jobs team draws people from both marginalized and privileged neighborhoods into the public struggle over land and energy, considering key land and energy issues as contested space in this world. We fight against dirty fossil fuel expansion and for green economy solutions. In our integrated strategy we center racial and economic equity issues as an essential part of every single building block of policy.

350 Philadelphia is a grassroots, membership-based climate justice organization that operates in Southeastern Pennsylvania and is affiliated with the global 350.org network. 350 Philadelphia works to protect a livable climate, to improve public health, and to build a just and sustainable economy through advocacy, organizing, research, education, protest, and coalition building. The organization promotes a rapid and just transition from fossil fuels to renewable energy as well as large-scale investment in energy efficiency. 350 Philadelphia fights to ensure

that new energy policies prioritize the needs of people who have been most harmed by pollution and by economic inequality.

III. Electric-to-Fossil Fuel Switching Should be Disallowed in Phase IV

A. Electric-to-Fossil Fuel Switching Is Not Necessary for the Cost-Effective Implementation of Phase IV

In Phases I, II, and III of Act 129 implementation, the Commission has permitted electric distribution companies (“EDCs”) to include in their Act 129 energy efficiency and conservation plans (“EE&C Plans”) support for measures that switch equipment from electricity to fossil fuel.⁴ The Environmental Stakeholders respectfully request that the Commission, in its Final Order, determine that EDCs are not permitted to include electric-to-fossil fuel switching measures in their EE&C Plans for Phase IV or future phases.

Although the Tentative Order does not mention electric-to-fossil fuel switching measures, discussion of them can be found in the 2021 Technical Reference Manual (“TRM”) approved by the Commission on August 8, 2019.⁵ The TRM includes discussion of several types of electric-to-fossil fuel switching measures that could, at least in theory, be shown to be cost-effective as a means of reducing electricity consumption under the formulas contained in the Commission’s Total Resource Cost (“TRC”) test.⁶

⁴ PA PUC, Final TRC 2021 at 80.

⁵ PA PUC, Final TRM 2021 (Aug. 8, 2019) at 31 (“Fuel-Switching: Electric Heat to Gas/Propane/Oil Heat”); at 65 (“Fuel-Switching: Electric Resistance to Fossil Fuel Water Heater”); and at 123 (“Fuel Switching: Electric Clothes Dryer to Gas Clothes Dryer”).

⁶ *Id.* It is relevant to note that the TRC and TRM exclude consideration of many important costs associated with fossil fuel consumption, including greenhouse gas emissions and public health impacts. Excluding consideration of such costs leads to an incomplete and skewed cost-benefit analysis, and it is only by undercounting costs in this fashion that electric-to-fossil fuel switching could appear to be cost-effective. The Environmental Stakeholders recognize that the Commission is not accepting comments on the TRC and the TRM in this proceeding. It is also noteworthy that while the electric-to-fossil fuel-switching measures discussed in the TRM may be able to reduce electricity consumption, under many circumstances they may increase net energy consumption.

However, the showing that a particular measure can reduce electricity consumption in a manner that is cost effective under the TRC does not mean that the Commission must approve its use in Phase IV.⁷ Cost-effectiveness is a threshold inquiry, one that sorts proposed measures into those that are cost-effective and those that are not. However, the next step is choosing *among* cost-effective measures to determine which to include in EE&C Plans and which to exclude.

The process of choosing among cost-effective measures, rather than simply between cost-effective measures and non-cost effective measures, is inevitable because as the Statewide Evaluator (“SWE”) has determined in its “Pennsylvania Act 129 - Phase IV Energy Efficiency and Peak Demand Reduction Market Potential Study Report” (“SWE Phase IV Report”), there are many more potential cost-effective energy efficiency measures than are possible to implement under Act 129.⁸ The SWE’s report for the 2021-2026 period found that 8,898,584 megawatt-hours (“MWhs”) of electricity use could be eliminated during that period, but that only 4,512,829 MWhs of reductions are achievable under Act 129 due to the statute’s spending cap.⁹

The SWE’s Phase IV Report reached these conclusions by modelling potential portfolios of energy efficiency measures for each of the seven EDCs subject to Act 129.¹⁰ These models formed the basis for the Phase IV kilowatt-hour (“kWh”) reduction targets for each EDC developed in the SWE’s report and proposed for adoption in the Commission’s Tentative Order.

⁷ 66 Pa.C.S. § 2806.1.

⁸ SWE Phase IV Report at 3.

⁹ *Id.*

¹⁰ Per 66 Pa.C.S. § 2806.1(1), Act 129 applies to the seven EDCs with 100,000 or more customers: PECO Energy Company (PECO), PPL Electric Utilities Corporation (PPL), Duquesne Light Company (Duquesne Light) and the four FirstEnergy EDCs, Metropolitan Edison Company (FE: Met-Ed), Pennsylvania Electric Company (FE: Penelec), Pennsylvania Power Company (FE: Penn Power), and West Penn Power (FE: West Penn Power).

Notably, the SWE did not include in its energy efficiency portfolio modelling for 2021-2026 any use of electric-to-fossil fuel switching by EDCs.¹¹ As such, the SWE's report demonstrates that electric-to-fossil fuel switching is completely unnecessary for any EDC to meet its Phase IV kWh reduction targets in a cost-effective fashion, which makes sense, given the many alternative energy efficiency solutions available, such as high-efficiency electric heat pumps.

Since electric-to-fossil fuel switching is not necessary for the achievement of Phase IV targets,¹² it should be disallowed for two important prudential reasons. First, promoting individuals to increase their fossil fuel consumption is inconsistent with Commonwealth and municipal policies towards decarbonization, and it is prudent for the Commission to avoid, where possible, working at cross-purposes with the Commonwealth and with municipalities. Second, promoting switching from electricity-based to fossil fuel-based equipment is inconsistent with market and technology trends supporting building electrification, including the availability of highly efficient heat pump technology that is expected to continue to improve in price and performance.

Taken together, this combination of policy, market, and technology trends creates a risk that expanded natural gas infrastructure could lead to stranded assets that need to ultimately be replaced again at further expense.¹³ Energy efficiency measures that are based on load reduction,

¹¹ SWE Phase IV Report at 6 (“In modeling energy savings, the SWE team considered all electric efficiency saving measures other than non-CHP fuel switching and fuel switching opportunities that replace electric heating with fossil fuels.”).

¹² SWE Phase IV Report at 6.

¹³ Sherri Billimoria et. al, *The Economics of Electrifying Buildings: How Electric Space and Water Heating Supports Decarbonization of Residential Buildings*, Rocky Mountain Institute at 10 (June 2018) <https://rmi.org/insight/the-economics-of-electrifying-buildings/>.

rather than load shifting to fossil fuel, are a more prudent choice because they do not subject consumers to these risks.

For these reasons, discussed in further detail below, it is both unnecessary and imprudent for EDCs to actively promote consumers to switch from electric to fossil-fueled equipment. Nothing in Act 129 requires such an action, and as the SWE's report demonstrates, Phase IV's kWh reduction targets can be met (almost twice over) without any use of electric-to-fossil fuel switching.¹⁴ The determination to exclude electric-to-fossil fuel switching from the SWE report's modelling of Pennsylvania's energy efficiency future is a good first step, but the Commission should, in order to provide clarity and guidance to the EDCs and to the markets, affirmatively determine in the Final Order that electric-to-fossil fuel switching will not be allowed as part of Phase IV EE&C plans.

B. Electric-to-Fossil Fuel Switching Is Inconsistent With Pennsylvania State and Municipal Public Policies Towards Decarbonization

1. Pennsylvania State Policies

Promoting electric-to-fossil fuel switching is inconsistent with numerous State and local policies. The Commonwealth of Pennsylvania has recently adopted several public policies towards the goal of decarbonizing the state's economy. Notably, on January 8, 2019, Governor Tom Wolf issued Executive Order No. 2019-01, entitled, "Commonwealth Leadership in Addressing Climate Change and Promoting Energy Conservation and Sustainable Governance" ("EO 2019-01").¹⁵ EO 2019-01 stated that "the Commonwealth is committed to further reducing its net greenhouse gas emissions which, left unchecked, would create a high risk of irreversible, widespread, severe climate impacts in the Commonwealth and beyond."¹⁶ As a reflection of this

¹⁴ SWE Phase IV Report at 3.

¹⁵ EO 2019-01.

¹⁶ *Id* at 1.

commitment, EO 2019-01 further stated that “The Commonwealth shall strive to achieve a 26% reduction of net greenhouse gas emissions statewide by 2025 from 2005 levels, and an 80% reduction of net greenhouse gas emissions by 2050 from 2005 levels.”¹⁷ EO 2019-01 also orders that “[a]ll Commonwealth agencies shall work to achieve the Goals set forth in this Order.”¹⁸

Additionally, on October 3, 2019, Governor Wolf issued Executive Order No. 2019-07, entitled, “Commonwealth Leadership in Addressing Climate Change through Electric Sector Emissions Reductions” (“EO 2019-07”).¹⁹ EO 2019-07 reaffirmed that “the Commonwealth must take concrete, economically sound and immediate steps to reduce GHG emissions.”²⁰ EO 2019-07 also directed the Pennsylvania Department of Environmental Protection (“PA DEP”) to begin the process of developing the regulations needed for the State to join the Regional Greenhouse Gas Initiative, a cooperative effort between nine East Coast states to reduce carbon emissions from the power sector.²¹

Moreover, 2019 also saw the issuance of climate change-related reports by both PA DEP and the Pennsylvania Auditor General’s Office highlighting the urgency of climate change and the need for robust State action to decarbonize the State’s economy. On April 29, 2019, PA DEP released an updated Pennsylvania Climate Action Plan (“Climate Action Plan”).²² The Climate Action Plan identified climate change as “the most critical environmental threat facing the world” and reaffirmed the State’s goal of reducing its emissions by 80% from 2005 levels by

¹⁷ *Id.* at 2.

¹⁸ *Id.* at 3.

¹⁹ EO 2019-07

²⁰ *Id.* at 2.

²¹ *Id.* These two executive orders, EO 2019-01 and EO 2019-07, build on prior policy initiatives of the State, including the State’s Alternative Energy Portfolio Standard of 2004, which requires that 18% of electricity supplied by Pennsylvania EDCs be generated by alternative energy sources by 2021. *See* 73 P.S. § 1648.1 *et seq.*

²² PA DEP, Climate Action Plan (Apr. 29, 2019).

2050.²³ On November 13, 2019, Auditor General Eugene DePasquale issued a special report entitled, “Climate Crisis: The Rising Cost of Inaction.”²⁴ The report observed that in 2018, “climate-related costs to Pennsylvania totaled at least \$261 million,” including losses from floods and landslides, and stated that “[y]our tax dollars will increasingly be spent to clean up after such disasters if state government does not step up now and limit our contribution to the climate crisis.”²⁵

2. Pennsylvania Municipal Policies

Pennsylvania municipalities have also passed numerous public policies towards decarbonization. On September 26, 2019, the City of Philadelphia passed a resolution determining that “the City of Philadelphia shall take measures to achieve a fair and equitable transition to the use of 100% clean renewable energy for electricity in municipal operations by 2030, for electricity City-wide by 2035, and for all energy (including heat and transportation) city-wide by 2050 or sooner.”²⁶ This built on a prior pledge on June 21, 2017 by Philadelphia Mayor Jim Kenney to transition the city to 100% clean energy made as part of Sierra Club’s “Mayors for 100% Clean Energy” campaign.²⁷

Pittsburgh has committed to decarbonization as well. On June 5, 2017, Pittsburgh Mayor Bill Peduto pledged that Pittsburgh would transition to 100% clean energy, also as part of Sierra Club’s “Mayors for 100% Clean Energy” campaign.²⁸ On May 22, 2018, Pittsburgh adopted the

²³ *Id.* at 12.

²⁴ Eugene A. DePasquale, *Climate Crisis: The Rising Cost of Inaction*, Office of the Auditor General, (Nov. 13, 2019).

²⁵ *Id.* at 1.

²⁶ Resolution No. 190728, City of Philadelphia at 3 (Sept. 26, 2019).

Pratima Agrawal, *Mayor Kenney Becomes the 100th Mayor to Pledge Support for Clean Energy*, Sierra Club, (June 21, 2017) <https://content.sierraclub.org/press-releases/2017/06/mayor-kenney-becomes-100th-mayor-pledge-support-100-clean-energy>.

²⁸ *Pittsburgh Aims to Cut Water, Energy Use Under Latest Climate Plan*, Pittsburgh Post-Gazette, (May 22, 2018) <https://www.post-gazette.com/local/city/2018/05/22/Pittsburgh-Climate-Action-Plan-greenhouse-gas-emissions-energy-water-fossil-fuels-goal/stories/201805220099>.

most recent iteration of its Climate Action Plan, which sets forth a plan to achieve an 80% reduction in greenhouse gas emissions by 2050.²⁹

More broadly, as detailed in the attached Affidavit of James Wylie, chair of the Pennsylvania Chapter of Sierra Club (“Wylie Affidavit” or “Exhibit A”), over forty other Pennsylvania municipalities have committed to achieving 100% clean electricity and/or energy.³⁰ The Wylie Affidavit also contains a table correlating each of the above-discussed municipalities with the EDC that serves them; each municipality is served by an EDC that is subject to Phase IV of Act 129 according to the Tentative Order.³¹

C. Electric-to-Fossil Fuel Switching Is Inconsistent With Market and Technology Trends Supporting Building Electrification

Promoting electric-to-fossil fuel switching would also be inconsistent with market and technology trends supporting efficient building electrification. Consumers seeking to replace outdated electric resistance heating systems already have access to highly efficient electric heat pump systems that can operate at least two times as efficiently as an electric resistance system.³² As a report by the Minnesota Division of Energy Resources determined, “Independent research has verified the ability of air source heat pumps to maintain energy efficiency well above other electric heating systems, with coefficients of performance (COP) of between 2 to 3, in

²⁹ Pittsburgh Post-Gazette, “Pittsburgh Aims to Cut Water, Energy Use Under Latest Climate Plan,” May 22, 2018 <https://www.post-gazette.com/local/city/2018/05/22/Pittsburgh-Climate-Action-Plan-greenhouse-gas-emissions-energy-water-fossil-fuels-goal/stories/201805220099>.

³⁰ Wylie Affidavit. In other states, municipalities have recently gone further, and have begun to pursue decarbonization policies by banning new natural gas hookups. In July 2019, Berkeley, California adopted the first-ever municipal ban on new natural gas hook-ups in the United States. More than 50 municipalities, primarily in California and Massachusetts, are currently evaluating adopting similar bans. Amy Turner, *Municipal Natural Gas Bans: Round 1*, Sabin Center for Climate Change Law (Jan. 9, 2020).

³¹ Docket M-2020-3015228, Tentative Implementation Order on Phase IV of the Act 129 Energy Efficiency and Conservation Program, Pennsylvania Public Utility Commission at 12 (Mar. 12, 2020).

³² Heat Pump Systems, U.S. Department of Energy, <https://www.energy.gov/energysaver/heat-and-cool/heat-pump-systems> (last visited Apr. 24, 2020).

temperatures as low as -15° F.”³³ Within the Northeast region, New York³⁴ and Maine³⁵ have recently made deployment of electric heat pumps a centerpiece of their state energy efficiency strategies.

In light of currently available, high-efficiency electric heat pump technology, it makes little sense to incentivize consumers to switch from electric resistance space or water heating to fossil fueled heating, instead of incentivizing them to switch to electric heat pump systems. Indeed, the SWE Report supports this conclusion, as in the 2021-2026 projections it develops, all consumers that replace electric resistance heating are able to do so in a cost-effective fashion by upgrading to electric heat pumps.³⁶

Moreover, the price and performance of electric heat pump systems are projected to continue to improve in coming years, as determined by a report recently issued by the National Renewable Energy Laboratory entitled “Electrification Futures Study: End-Use Electric Technology Cost and Performance Projections through 2050” (“NREL Report”).³⁷ Four key charts from the NREL Report illustrate these trends. First, the below chart from the NREL Report depicts projected cost and performance improvements for residential air source heat pumps (which provide electric-powered space heating) under three different scenarios of technological advancement:

³³ Mark Brown *et. al.*, *Air Source Heat Pump Efficiency Gains from Low Ambient Temperature Operation Using Supplemental Electric Heating*, Minnesota Division of Energy Resources at 4 (June 2011), <https://www.leg.state.mn.us/docs/2014/other/141021.pdf>.

³⁴ Case No. 18-M-0084, *In the Matter of a Comprehensive Energy Efficiency Initiative, Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios Through 2025*, New York State Dep’t of Pub. Serv. at 79 (Jan. 16, 2020).

³⁵ Public Law LD 1766, *An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives*, (June 14, 2019).

³⁶ SWE Phase IV Report at 6.

³⁷ National Renewable Energy Laboratory, “Electrification Futures Study: End-Use Electric Technology Cost and Performance Projections through 2050” (2017).

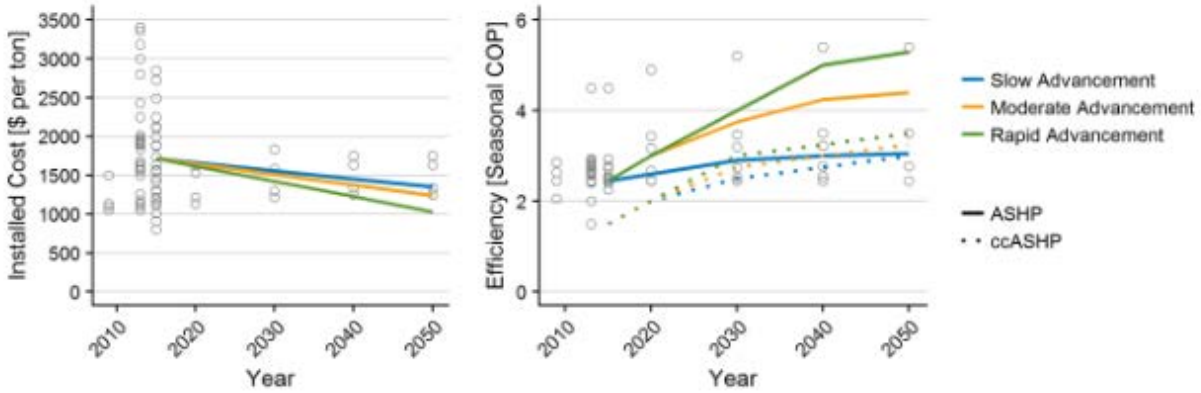


Figure 2. Installed unit costs (left) and performance projections (right) for residential air source heat pumps (“ASHPs”) and cold climate air source heat pumps (“ccASHPs”). Source: NREL Report, p. 42.

Second, the below chart from the NREL Report depicts projected cost and performance improvements for residential heat pump water heaters (which provide electric-powered water heating) under three different scenarios of technological advancement:

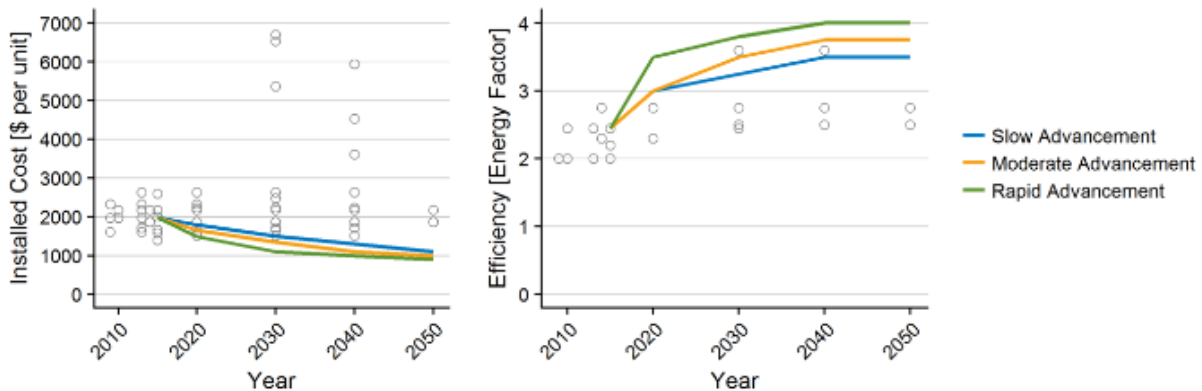


Figure 3. Installed unit costs (left) and performance projections (right) for residential heat pump water heaters. Source: NREL Report, p. 44.

Third, the below chart from the NREL Report depicts projected cost and performance improvements for commercial air source heat pumps under three different scenarios of technological advancement:

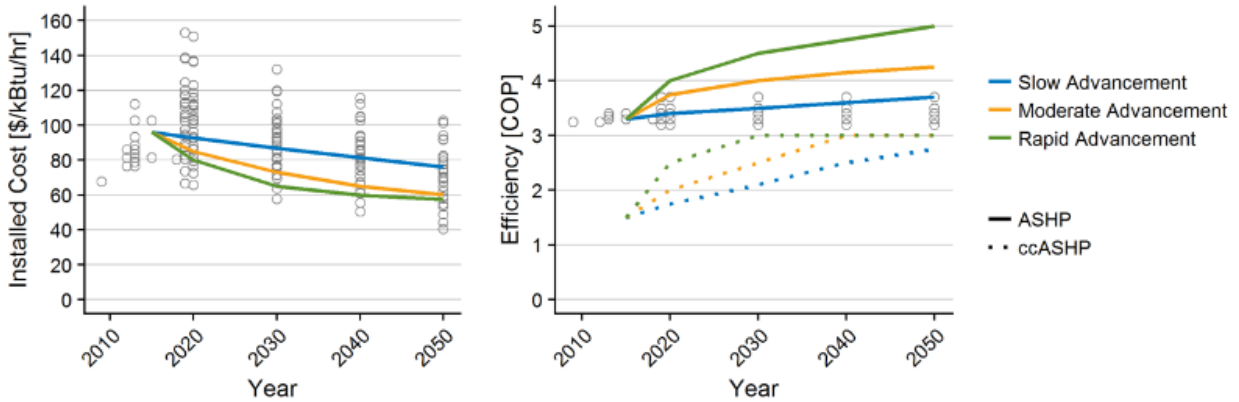


Figure 4. Installed unit costs (left) and performance projections (right) for commercial air source heat pumps (“ASHPs”) and cold climate air source heat pumps (“ccASHPs”). Source: NREL Report, p. 46.

Fourth, the below chart from the NREL Report depicts projected cost and performance improvements for commercial heat pump water heaters under three different scenarios of technological advancement:

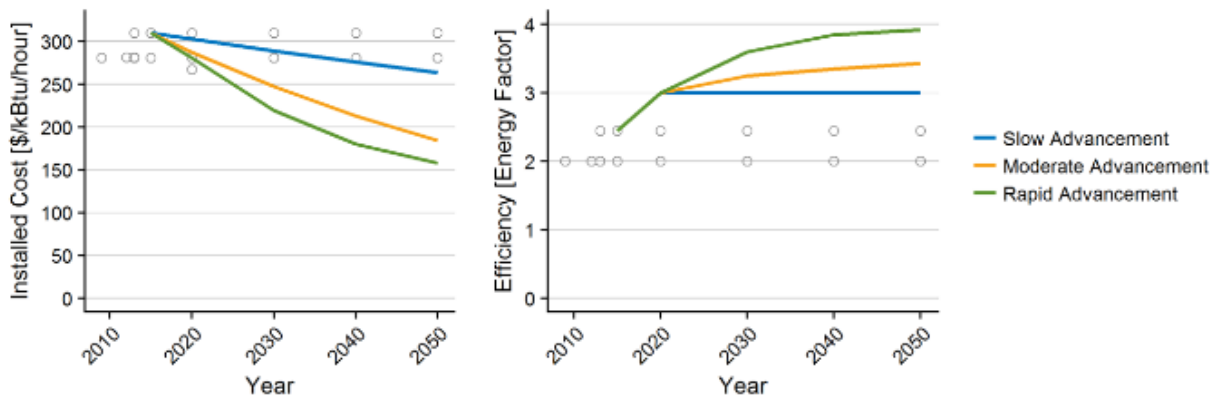


Figure 5. Installed unit costs (left) and performance projections (right) for commercial heat pump water heaters. Source: NREL Report, p. 48.

As can be seen in the above charts, costs are expected to continue to fall, and performance to continue to improve, for key electric space heating and hot water technologies. Additionally, if public policy supporting building electrification grows more active, this may further accelerate market growth.³⁸ In general, as demand and economies of scale grow, the

³⁸ Rocky Mountain Institute, *supra* note 12, at 6.

purchase price of building electrification technologies will likely continue to drop, fueling further increased deployments.³⁹

More broadly, there is a long-term trend of buildings shifting an increasing portion of their on-site energy usage to electricity, a trend which is expected to continue.⁴⁰ As the Rocky Mountain Institute has noted, about one in four U.S. homes is all-electric, and about one in three U.S. commercial buildings are all-electric, and those numbers are growing in all regions.⁴¹ In a highly electrified future, natural gas distribution infrastructure and building equipment “will be obsolete,” and “gas ratepayers face significant stranded asset risk in funding its expansion today.”⁴² Incentivizing ratepayers to switch to from electric to fossil fueled building equipment only exacerbates such risks.

An additional market and technology trend that is relevant for consideration is the increasing penetration of variable renewable resources into the grid, such as wind and solar. In a report issued by PA DEP in 2018, entitled “Pennsylvania’s Solar Future Plan” (“PA Solar Future Plan”), PA DEP set a goal of increasing solar deployment in Pennsylvania by over 10 gigawatts, which would be 10% of Pennsylvania’s energy consumption, by 2030.⁴³ For context, the below graph shows the historical upward trend of solar deployment in Pennsylvania:

³⁹ *Id.* at 9 (“The purchase price of heat pump devices is expected to decline as the market grows and manufacturers realize economies of scale.”).

⁴⁰ Jeff Deason et al., *Electrification of buildings and industry in the United States*, at 9 (Mar. 2018).

⁴¹ Rocky Mountain Institute, *The Impact of Fossil Fuels in Buildings: A Fact Base*, at 50–51 (Dec. 2019).

⁴² Rocky Mountain Institute, *supra* note 12, at 10.

⁴³ PA Solar Future Plan, at xvi. As of 2018, solar comprised 0.2% of the power consumed in Pennsylvania, and the plan sets a goal of increasing that to 10%, which would require the deployment of approximately 10.7 gigawatts of additional solar. *Id.* at 18, 23.

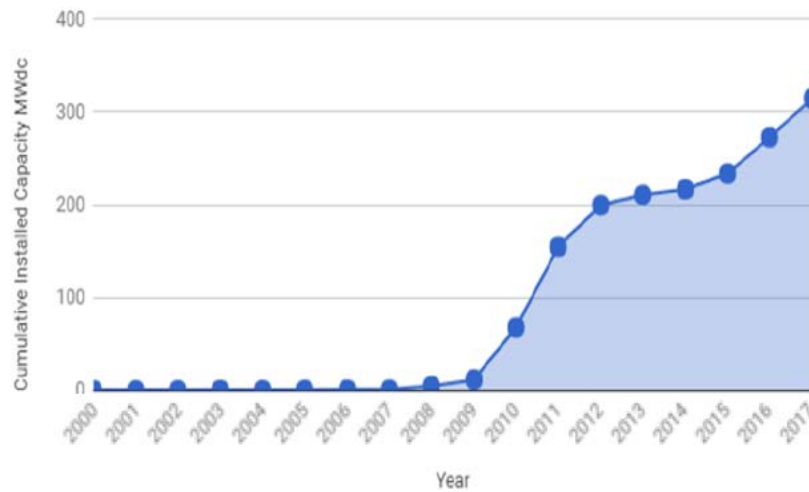


Figure 6. Pennsylvania’s Cumulative Installed Solar Capacity. Source: PA Solar Future Plan, p. 24.

More broadly, PA DEP identified 10% as an achievable goal in light of recent trends towards increased solar deployment nationally, noting that the U.S. has had an average annual growth rate of 59% for solar capacity since 2008 and that the price of solar power has decreased 66% since 2010.⁴⁴

Considering these trends, another reason to avoid electric-to-fossil fuel switching is that electrified buildings, if optimized, can help integrate increased levels of variable renewable power such as solar into the grid in a cost-effective fashion. As observed by the Rocky Mountain Institute, “[E]lectric space and water heating loads can be optimized to support efficient operation of the electric grid by shifting loads into periods of low-cost and abundant renewable generation, reducing loads during periods of peak demand, and providing other grid support services at the bulk power and local levels.”⁴⁵ If combined with time-of-use rates, the ability of programmable

⁴⁴ PA Solar Future Plan, at 2.

⁴⁵ Rocky Mountain Institute, *supra* note 12, at 41. Examples of other services that electric equipment can provide is frequency regulation and voltage management. *Id.*

electric equipment to shift load to lower-cost time periods, for example, by preheating or precooling, could provide substantial savings for ratepayers.⁴⁶

D. Conclusion

Since, as discussed above, electric-to-fossil fuel switching is not necessary for the cost-effective implementation of Act 129,⁴⁷ the Commission has a choice about whether to permit EDCs to include it in their Phase IV EE&C Plans or not. The Commission should choose not to permit it, first, out of a prudent concern to avoid working at cross-purposes with State and municipal policies towards decarbonization where such inconsistency can be avoided, and second, in light of market and technology trends towards increased building electrification and clean energy deployment.

IV. Beneficial Electrification Should be Permitted in Phase IV

The Commission should permit EDCs to include in their EE&C Plans for Phase IV cost-effective beneficial electrification measures that replace fossil fuel-powered home equipment with electricity-powered equipment. For the reasons discussed above, in addition to helping achieve Act 129 targets, such beneficial electrification measures carry the added benefits of improving alignment with State and municipal policies towards decarbonization and of providing added value to ratepayers in the context of increasing renewables deployment.

Beneficial electrification also provides further benefits. To start, once electric space heating is installed in a building, then building envelope measures like whole-home weatherization become more cost-effective under the TRC test, so beneficial electrification can help pave the way for the inclusion of more comprehensive measures in EE&C Plans. Moreover, beneficial electrification can also help reduce indoor air pollution, an issue of particular concern

⁴⁶ Id.

⁴⁷ See *supra* at Point III.A.

for low-income communities that are often already over-burdened with air pollution and subject to heightened asthma rates.⁴⁸ Finally, beneficial electrification can help protect ratepayers from volatility in gas prices, as electric retail prices are historically much more stable than gas prices.⁴⁹

One important issue for consideration with respect to beneficial electrification is that while the Tentative Order is structured in terms of achieving kWh reductions,⁵⁰ beneficial electrification measures will result in an at least a modest increase in kWh consumption, even if they are a cost-effective means of reducing a ratepayer's overall energy use.

However, Act 129 provides the Commission with the authority to permit the inclusion of cost-effective beneficial electrification measures that result in a decrease in total *energy* consumption in EDCs' EE&C Plans, even if they result in an increase in electricity consumption. Section § 2806.1(a) of Act 129 requires that the Commission "adopt an energy efficiency and conservation program to require electric distribution companies to adopt and implement cost-effective energy efficiency and conservation plans to reduce energy demand and consumption[.]"⁵¹

As can be seen, the statutory mandate is for the Commission to pursue the reduction of "energy demand and consumption," not simply a reduction in kWhs of electricity.⁵² Moreover, Act 129 also authorizes the Commission to review the cost-effectiveness of energy efficiency and conservation plans established under Section § 2806.1(a) either using a total resource cost test, which Act 129 defines as a test based on the avoided cost of supplying electricity, or "a

⁴⁸ Rocky Mountain Institute, *supra* note 40, at 71.

⁴⁹ *Id.* at 45.

⁵⁰ Tentative Order at 10.

⁵¹ 66 Pa.C.S. § 2806.1(a).

⁵² *Id.*

cost-benefit analysis determined by the commission.”⁵³ This provides the Commission with the authority to adopt a cost-benefit analysis based on energy savings, not simply on electricity savings.

The Commission should initiate a working group to examine ways in which cost-effective beneficial electrification energy efficiency measures can be optimally integrated into Act 129 implementation for future phases. However, the Commission does not need to and should not wait until a Phase V to authorize the inclusion of cost-effective beneficial electrification measures in EE&C Plans. Instead, the Commission should include in the Final Order for Phase IV a determination that net site energy reductions achieved by beneficial electrification measures shall be credited towards the achievement of an EDC’s kWh reduction targets by converting the net energy reduction achieved, as measured in British thermal units (“BTUs”), into the equivalent amount of energy as measured in kWhs. BTUs, which measure the amount of heat needed to raise the temperature of one pound of liquid water by one degree Fahrenheit, are recommended by the U.S. Energy Information Administration (“EIA”) as a unit of measurement that can provide a means of comparing different energy sources on an equal basis.⁵⁴ The conversion between BTUs and kWhs can be performed arithmetically, and the EIA provides a calculator for this conversion on its website.⁵⁵

V. Budget Carryover Issues

In the Tentative Order, the Commission proposes that any excess funds from EDCs’ budgets for Phase III should be refunded to ratepayers and not applied towards the

⁵³ 66 Pa.C.S. § 2806.1(c).

⁵⁴ EIA, Units and calculators explained: British thermal units (Btu) (2020), <https://www.eia.gov/energyexplained/units-and-calculators/british-thermal-units.php>.

⁵⁵ EIA, Units and calculators explained: Energy conversion calculators (2020), <https://www.eia.gov/energyexplained/units-and-calculators/energy-conversion-calculators.php>.

implementation of Phase IV.⁵⁶ The Environmental Stakeholders oppose this approach. As indicated by the SWE Report, there are far more cost-effective energy efficiency opportunities available in Pennsylvania than can be accomplished under Act 129's spending cap.⁵⁷ The leftover funds from Phase III were originally set aside in conformity with Act 129's mandate to spend such monies on achieving progress in energy efficiency, and given that substantial energy efficiency opportunities remain, the funds should be spent on those opportunities.

However, the Environmental Stakeholders propose, as a means of furthering Act 129's requirement that energy efficiency opportunities be distributed equitably,⁵⁸ that excess funds from Phase III be spent on funding work necessary to implement comprehensive energy efficiency measures for low-income ratepayers. In many instances, low-income ratepayers living in housing that requires substantial preparatory work for energy efficiency improvements or may require more expensive energy efficiency work, such as weatherization, in addition to lower-cost measures like lighting replacement.⁵⁹ We propose that excess Phase III funds be first used to provide "whole home" weatherization to low-income customers enrolled in the Customer Assistance Program, and then if excess funds remain, that such funds be used for other types of energy efficiency measures for low-income ratepayers. Using excess Phase III funds in such a fashion will help the benefits of Act 129 to be distributed more equitably.

⁵⁶ Tentative Order at 69.

⁵⁷ SWE Phase IV Report at 3–4.

⁵⁸ 66 Pa.C.S. § 2806.1(a)(5).

⁵⁹ Environmental Defense Fund, *Low-Income Energy Efficiency: A Pathway to Clean, Affordable Energy for All*, at 8 (Feb. 2018), https://www.edf.org/sites/default/files/documents/liee_national_summary.pdf.

VI. Consumption Reduction Issues

A. Reduction Targets

The kWh reduction targets for Phase IV should be set in a manner that encourages maximum possible reductions consistent with Act 129. In furtherance of this objective, if rollover savings credits are expected from Phase III, they should be treated as measures with zero additional acquisition cost in Phase IV, and Phase IV targets should be raised proportionally.

Moreover, EDCs' target compliance should be enforced annually subject to penalty under 66 Pa.C.S. § 2806.1(f). This will encourage utilities to make steady progress and promote regularity and compliance in implementation of the approved plan. Otherwise, utilities will only be penalized if they fail to submit a plan and if they fail to achieve their targets at the end of Phase IV, leaving them *de facto* free to disregard the approved plan and reach the targets however they please.

B. Comprehensive Programs

In the Tentative Order, the Commission states its belief that “more comprehensive programs are beneficial to electric customers,” and that for Phase IV, “EDCs should consider implementing a comprehensive mix of measures.”⁶⁰ The Commission proposes that each EDC's EE&C Plan “include at least one comprehensive program for residential and at least one comprehensive program for non-residential customer classes.”⁶¹ However, comprehensiveness comes from the design of the portfolio as a whole, and is determined by how well each program integrates and complements each other, and not by simply having a set number of “comprehensive” programs.

⁶⁰ Tentative Order at 15.

⁶¹ *Id.*

Specifically, EDCs should be encouraged to implement as many non-lighting measures as possible, and should be discouraged from achieving significant savings through mail-out energy savings kits. Such measures amount to “cream-skimming,” which achieve short-term cost reductions but neglect the implementation of long-term measures that have a higher upfront cost but potentially much greater lifetime savings. A well-designed beneficial electrification program would be an example of such a long-term measure, which may involve a higher upfront investment than lighting measures, but would have the potential for higher long-term savings, as well as laying the groundwork for demand flexibility that can help integrate increasing amounts of clean energy into the grid. Another example of the type of comprehensive measures that should be prioritized is whole-home weatherization, including insulation and air-sealing, which again has a higher up-front cost than other measures but also a higher lifetime efficiency return. Moreover, there can be synergies between comprehensive measures such as beneficial electrification and weatherization, where performing both measures in a coordinated fashion can result in greater total efficiency gains than the sum of implementing those measures alone.

Finally, where EDCs conduct audits as part of their Act 129 compliance, such audits should be required to study total energy use and savings potential, not simply electricity use and savings potential. This will provide higher quality, more complete information to ratepayers, and will help ratepayers understand the potential benefits of building electrification, as well as non-electric energy savings they could pursue outside of Act 129.

C. Low-Income Issues

Act 129 requires the equitable distribution of the benefits of EDC energy efficiency plans to all ratepayers.⁶² As reflected by its legislative history, one of the primary objectives of the

⁶² 66 Pa.C.S. § 2806.1(a)(5).

General Assembly in passing Act 129 was to ensure the protection of low-income ratepayers from rising electricity costs.⁶³ This makes sense as a matter of public policy, since low-income ratepayers are often the most heavily burdened by utility costs as a portion of their budget, and energy efficiency measures can be an impactful way of reducing this burden.⁶⁴

In the Tentative Order, the Commission proposes that all EDCs include in their EE&C Plan a number of specific measures for low-income households (defined as households at or below 150% of the Federal Poverty Income Guidelines), in proportion to that sector's share of energy usage.⁶⁵ The Tentative Order further proposes that each EDC obtain a minimum of 5.8% of its consumption reduction target from "from programs solely directed at low-income customers or low-income-verified participants in multifamily housing programs."⁶⁶ The Environmental Stakeholders strongly support the Commission's effort to ensure the inclusion of low-income ratepayers in Act 129 programs, but respectfully request that low-income measures be augmented.

The rationale for the 5.8% figure is not directly explained, but it appears to be drawn from the SWE Report. The SWE Report conducted modelling for each EDCs based on a low-income spending carveout of 12.7%, and this carveout percentage was derived from the amount EDCs had spent on low-income measures in prior phases.⁶⁷ The SWE Report found, that given such a budget, low-income customers could achieve approximately 6.5% of total portfolio

⁶³ See PA H.R., House Journal at 386-403 (Feb. 11, 2008); PA H.R., House Journal at 430-432 (Feb. 12, 2008); PA S., Senate Journal at 2626-2631 (Oct. 8, 2008); Pa. H.R., House Journal at 2323-2328 (Oct. 8, 2008).

⁶⁴ University City Review, *Council President Clarke Hails Progress of Energy Fit Low-Income Housing Preservation Program* (Aug. 12, 2015) ("There are 331,000 row homes in Philadelphia, 38 percent of which are owned by low-income people – a high percentage relative to other major cities. Many of these homes are poorly maintained and not energy efficient, leading to utility costs of 25 percent to 40 percent of monthly income."), <http://ucreview.com/council-president-clarke-hails-progress-of-energy-fitlow-income-housing-pr-p5859-1.htm>.

⁶⁵ Tentative Order at 16–17.

⁶⁶ *Id.* at 17.

⁶⁷ *Id.* at 16.

savings, with the specific amount for each EDC varying, from 5.8% for PECO to 9.4% for Penn Power.⁶⁸ As such, the Commission appears to have set the low-income carveout at the lowest figure modelled for any EDC in the SWE Report.

This approach is insufficient, and is not in keeping with Act 129's statutory mandate to ensure that the benefits of energy efficiency are distributed equitably.⁶⁹ Since the SWE has derived projections of the potential for low-income savings for each EDC, rather than simply taking the lowest potential savings percentage for any EDC and applying that to all EDCs, the Commission should take the savings projections already calculated by the SWE for each EDC, and set that percentage as the carveout for each EDC.

The Commission should also examine and develop a reasoned explanation for why 12.7% of the budget is an adequate amount to spend on energy efficiency measures for low-income ratepayers. It may not be, given the energy burdens experienced by many low-income households.⁷⁰ The sole rationale for the 12.7% figure is that it is based on previous levels of EDC low-income spending, but this does not suffice as a reasoned explanation for why such an amount is the proper amount. This analytical gap should be corrected.

Additionally, the Commission should provide greater attention to ensuring that low-income ratepayers residing in multi-family housing have access to the benefits of Act 129. Low-income multi-family housing is a sector that faces numerous challenges to energy efficiency implementation, including more complex ownership structures than single-family homes (often involving multiple owners that must agree on decisions); limited administrative resources to evaluate energy efficiency opportunities; limited access to capital; and pressing repair and

⁶⁸ *Id.*

⁶⁹ 66 Pa.C.S. § 2806.1(a)(5).

⁷⁰ University City Review, *supra* note 63.

maintenance issues that can compete for limited resources and may prevent the implementation of energy efficiency measures until resolved.⁷¹

Helping overcome these barriers may require EDCs to provide additional administrative and technical support, and in order to ensure that such work is done, the Commission should include a carveout requirement that 1% of an EDC's total portfolio savings should come from direct-install measures at low-income multi-family properties; since this 1% would be targeted to low-income ratepayers, it would also count towards EDC's achievement of their broader low-income carveout. A direct install requirement, which would require the direct installation of durable efficiency measures, is important because it helps ensure that EDCs will go beyond measures like home energy reports to provide deeper and longer-lasting savings.

D. Government, Nonprofits, and Institutions Issues

In the Tentative Order, the Commission proposes not to include a specific carveout for the government, nonprofits, and institutions ("GNI") sector, on the basis that GNI targets were substantially exceeded in Phase III and that market studies indicate that substantial GNI savings will continue to be achieved even without a specific carveout.⁷² However, government entities are differently situated from nonprofit institutions in that government entities are funded directly by taxpayers, and reductions in government energy use provides a direct benefit to the public in the form of a lower tax burden. Accordingly, the Commission should retain a "G" carveout that sets savings targets for government buildings to be met by each EDC, which is another means by which the Commission can ensure that the benefits of Act 129 are widely shared by the public.

VII. Peak Demand Reduction Issues

⁷¹ Stefen Samarripas and Dan York, *Closing the Gap in Energy Efficiency Programs for Affordable Multifamily Housing*, at 2 (Apr. 2019), <https://www.aceee.org/sites/default/files/publications/researchreports/u1903.pdf>.

⁷² Tentative Order at 20–21.

A. Reduction Targets

As with the Consumption Reduction part of Act 129 implementation, the Commission should require that the targets set for Peak Demand Reduction be enforced annually subject to penalty under 66 Pa.C.S. § 2806.1(f). This will encourage utilities to make steady progress and promote regularity and compliance in implementation of the approved plan. Otherwise, utilities will only be penalized if they fail to submit a plan and if they fail to achieve their targets at the end of Phase IV, leaving them *de facto* free to disregard the approved plan and reach the targets however they please.

B. Implementation Issues

The Environmental Stakeholders strongly support the Commission's stated preference for coincident peak demand reduction from energy efficiency measures rather than demand response. Energy efficiency measures have a wide array of additional consumer benefits, spread across a broader class of consumers, than demand response measures typically do. However, the Commission should also encourage the implementation of energy efficiency measures which have a potential dual use as demand response measures. For example, electric heat pumps for space and water heating can be managed in such a fashion as to provide demand response services by shifting heating load to lower-demand times.⁷³ Increased adoption of time-of-use rates would further encourage this time of optimization of load and demand.⁷⁴

The Environmental Stakeholders also fully support the Commission's proposal in the Tentative Order⁷⁵ to require EDCs to bid energy efficiency demand reduction measures into PJM's forward capacity market. We note that funds received in this manner will have the net

⁷³ Rocky Mountain Institute, *supra* note 12, at 41.

⁷⁴ *Id.*

⁷⁵ Tentative Order at 73.

effect of reducing the costs of an EDC's EE&C Plan. This should be reflected accurately in EDC progress reports as lower costs for the plan, which will free up additional dollars under Act 129's spending cap for investment in energy efficiency measures.

VIII. Conclusion

The Environmental Stakeholders respectfully request that the Commission consider the foregoing comments in its preparation of the Final Order on Phase IV of the Act 129 Energy Efficiency and Conservation Program.

Dated: April 27, 2020

Respectfully submitted,

/s/ Devin McDougall

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EXHIBIT A.

AFFIDAVIT OF JAMES WYLIE

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITIES COMMISSION**

**Act 129 Implementation
Phase IV**

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Docket Nos.

M-2020-3015228

**AFFIDAVIT OF JAMES WYLIE
IN SUPPORT OF THE COMMENTS OF THE
ENVIRONMENTAL STAKEHOLDERS**

I, James Wylie, being duly sworn, depose and say:

1. My name is James Wylie, and I am the volunteer chair of the Pennsylvania Chapter of Sierra Club. I am a longtime member of Sierra Club and have been an active volunteer for the past 12 years. I hold a Bachelor of Science degree in Electrical Engineering from Bucknell University and a Graduate Certificate in Sustainable Development from the University of Massachusetts, Dartmouth. I am a resident of West Chester Borough, Chester County, Pennsylvania.

2. As part of my work at Sierra Club, I advocate for Pennsylvania municipalities to adopt strong climate policy commitments and track the progress of Pennsylvania municipalities in doing so.

3. The following 29 Pennsylvania municipalities have passed legislative resolutions to work towards 100% clean electricity and 100% clean energy used for heat and transportation, as part of the Sierra Club’s “Ready for 100” campaign, by the dates indicated:

Name of Municipality	EDC Serving the Municipality	Date for 100% Clean Electricity	Date for 100% Clean Heat & Transportation
Ambler Borough	PECO	2035	2050
Cheltenham Twp	PECO	2035	2050
Conshohocken Borough	PECO	2035	2050
Downingtown Borough	PECO	2035	2050

Doylestown Twp	PECO	2035	2050
East Bradford Twp	PECO	2035	2050
East Pikeland Twp	PECO	2035	2050
Haverford Twp	PECO	2035	2050
Kennett Twp	PECO	2035	2050
Landsdowne Borough	PECO	2035	2050
Narberth Borough	PECO	2030	2040
Norristown Borough	PECO	2035	2050
City of Philadelphia	PECO	2035	2050
Phoenixville Borough	PECO	2035	2050
Plymouth Meeting Twp	PECO	2035	2050
Pocopson Twp	PECO	2035	2050
Radnor Twp	PECO	2035	2050
Reading City	Met-Ed	2035	2050
Schuylkill Twp	PECO	2035	2050
Springfield Twp	PECO	2035	2050
State College Borough	WPenn Pwr/Allegheny	2035	2050
Swarthmore Borough	PECO	2035	2050
Tredyffrin Twp	PECO	2035	2050
Upper Merion Twp	PECO	2030	2040
Uwchlan Twp	PECO	2035	2050
West Chester Borough	PECO	2035	2050
West Norriton Twp	PECO	2035	2050
West Vincent Twp	PECO	2035	2050
Whitemarsh Twp	PECO	2035	2050

4. The mayors or boards of supervisors of the following 17 Pennsylvania municipalities have pledged to work towards achieving 100% clean electricity and/or energy, either as part of Sierra Club’s “Mayors for 100% Clean Energy” or as part of advocacy campaigns coordinated by other groups, without setting a specific target date:

Name of Municipality	EDC Serving the Municipality	Clean Electricity/Energy Commitment
Abington Twp	PECO	100% clean electricity and 100% clean energy for heat and transportation
City of Allentown	PPL	100% clean energy
Atglen Borough	PECO	100% clean energy
Bellevue Borough	Duquesne Light	100% clean energy
Bridgeport Twp	PECO	100% clean electricity and 100% clean energy for heat and transportation
Carlisle Twp	PPL	100% clean energy

Charlestown Twp	PECO	100% clean electricity and 100% clean energy for heat and transportation
City of Bethlehem	PPL	100% clean energy
City of Pittsburgh	Duquesne Light	100% clean energy
Collegeville Borough	PECO	100% clean energy
Easton	Met-Ed	Meeting the clean energy targets of the Paris Agreement
Ferguson Twp	WPenn Pwr/Allegheny	100% clean electricity and 100% clean energy for heat and transportation
Forest Hills	Duquesne Light	100% clean electricity and 100% clean energy for heat and transportation
Kennett Square Borough	PECO	100% clean energy
City of Lancaster	PPL	100% clean electricity and 100% clean energy for heat and transportation
Millvale Borough	Duquesne Light	100% clean energy
Sharpsburg Borough	Duquesne Light	100% clean energy
West York Borough	Met-Ed	100% clean electricity and 100% clean energy for heat and transportation

5. This concludes my affidavit.

ATTESTATION

I am the witness identified in the foregoing affidavit. I have read the affidavit and am familiar with its contents. The facts set forth herein are true to the best of my knowledge, information, and belief.



James J Wylie

April 26, 2020

State Of Virginia County Of Prince William

Subscribed and sworn to before me Atm Alam (Notary Public)

this 26th day of April, 2020 By James J Wylie.



Notary Public

My Commission expires: 06/30/2020



Electronic Notary Public

Notarized online using audio-video communication

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document, the Comments of the Environmental Stakeholders, electronically filed today at the Pennsylvania Public Utility Commission, via e-mail upon the parties of Docket No. M-2020-3015228, listed below, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a party).

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Dated this 27th day of April, 2020.

Sincerely,

/s/ Devin McDougall

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