



To: Pennsylvania Department of Environmental Protection (DEP)
From: ICF
Date: August 12, 2020
Re: Initial Draft List of GHG Reduction Strategies for the Pennsylvania's 2021 Climate Action Plan

This memorandum presents initial ideas for greenhouse gas (GHG) reduction strategies and enabling technologies for potential inclusion Pennsylvania's 2021 Climate Action Plan. These strategies are presented in Table 1 below. The strategies presented in this memorandum are based on four main sources:

1. Feedback from the Climate Change Advisory Committee (CCAC)
2. A review of the 2018 Climate Action Plan, including addendum letters from the CCAC
3. A review of public survey data from DEP on the 2018 Climate Action Plan
4. ICF's knowledge of trending and common strategies used across the country
5. Feedback and discussion with DEP

The strategies presented in this memo are intended to be an initial list, which will then be screened based on a set of agreed upon qualitative criteria. At this point, ICF is soliciting input from both DEP and the CCAC on the completeness and appropriateness of this initial list of strategies to consider and evaluate for inclusion in the 2021 Climate Action Plan (CAP). Specifically, ICF is looking for input on gaps in the initial list, new strategies that need to be included in the CAP (i.e., the highest priority for DEP and a majority of CCAC members), or strategies that are not appropriate to evaluate for the 2021 CAP. ICF is also interested in feedback on the framing of the strategies, in terms of the language used to describe the strategies and if any changes or clarifications are needed.

Once the initial list is agreed upon, ICF suggests further categorizing mitigation actions by the factors below to help facilitate the screening process:

- **Sector** (aligned with the current CAP outline, buildings, transportation, industry, fossil and alternative fuels, electricity, waste, agriculture, forestry and land use, enabling technologies)
- **Timeframe for Implementation** (Long-term, mid-term, near-term)
- **Primary Actor** (State government, Businesses/Industry, Local government, Citizens)
- **Type** (direct GHG reduction strategies implementable now, vs. enabling technologies or infrastructure for future consideration)

For GHG reduction strategies that are classified as implementable now, ICF recommends an initial prioritization of these strategies based on a qualitative weighted score (e.g., high, medium, low) encompassing criteria including:

- GHG reduction impact magnitude
- ease of implementation (legal, institutional)
- initial investment required
- cost-effectiveness

- air quality benefits
- public health benefits
- resilience benefits
- equity and environmental justice benefits, and equitable implementation

While scoring the mitigation strategies, ICF could weight some of these criteria higher than others. This process will result in prioritized list of GHG reduction strategies that will be analyzed either or both quantitatively and qualitatively for GHG reduction potential, economic impacts, air quality and public health benefits, and equity, and then included in the CAP in which strategy benefits and implementation will be discussed. A recommended draft final list of GHG reduction strategies and enabling technologies will be presented to the CCAC in October for final review and feedback.

Table 1. Initial Draft List of GHG Reduction Strategies

Sector (Aligns with CAP Outline)	Strategy	Type	Source
All	Setting a price on carbon, through taxes or cap and trade systems	GHG Reduction Strategy	2018 CAP CCAC Letters
All	Collectively review and develop a plan to address short-lived climate pollutants (e.g., a cohesive plan to address methane emissions, black carbon, tropospheric ozone, and fluorinated gases), incorporating other strategies that already address some of these emissions	GHG Reduction Strategy	ICF/DEP addition
Buildings	Take actions to promote and advance the implementation of healthy high-performance and net-zero buildings, such as expanding and encouraging use of C-PACE financing and other tools	GHG Reduction Strategy	2018 CAP CCAC Letters
Buildings	Provide education and incentive programs to advance building electrification (e.g., heating and hot water systems)	GHG Reduction Strategy	ICF/DEP addition
Buildings	Introduce state appliance efficiency standards for non-federally covered products	GHG Reduction Strategy	ICF/DEP addition
Buildings	Improve EE through building codes: adopt most current building codes, enforce existing codes, encourage stretch codes, educate the public and local officials of the benefits and methods of code enforcement	GHG Reduction Strategy	2018 CAP
Buildings	Improve EE through customer programs, for example, by expanding Act 129 (e.g., increase savings targets and remove spending caps), creating an Act 129 program for natural gas, and improve leverage of programs like LIHEAP and WAP	GHG Reduction Strategy	2018 CAP
Buildings, Industry	Develop program and/or incentives to address high global warming potential (GWP) gases (e.g., hydrofluorocarbons) used for refrigeration through switching to lower or no GWP alternatives	GHG Reduction Strategy	ICF/DEP addition
Buildings, Transportation, Electricity	Provide resources and education on disruptive digital technologies and their potential role in meeting PA's long-term GHG goals	Enabling Technology	ICF/DEP addition

Sector (Aligns with CAP Outline)	Strategy	Type	Source
Transportation	Increase adoption of alternative fuel vehicles, by following the EV Roadmap, using a ZEV mandate, providing education and outreach, additional or modified incentives through AFIG and AFV, and approaches to reaching low-income communities	GHG Reduction Strategy	2018 CAP CCAC Letters
Transportation	Reduce vehicle miles traveled for single-occupancy vehicles through expanded public transit infrastructure, for example	GHG Reduction Strategy	2018 CAP
Transportation	Implement the MHDV MOU	GHG Reduction Strategy	ICF/DEP addition
Transportation, Fossil and Alternative Fuels	Implement a Low Carbon Fuel Program to incentivize and increase the implementation of carbon intensity of fuels	GHG Reduction Strategy	ICF/DEP addition
Industry	Expand energy assessments and other technical assistance, including additional staff training, e.g. through E4	GHG Reduction Strategy	2018 CAP
Industry, Fossil Fuels	Implement policies and practices to reduce methane emissions across oil and natural gas systems, building on the regulatory work already going on in PA	GHG Reduction Strategy	2018 CAP
Industry, Buildings, Fossil and Alternative Fuels	Incentivize and increase use of combined heat and power (CHP) and consider combined with microgrids	GHG Reduction Strategy and Enabling Technology	2018 CAP, CCAC Input
Industry, Electricity	Analyze the potential role of Carbon Capture and Geologic Sequestration in meeting PA's goals	Enabling Technology	CCAC Input
Industrial, Buildings, Transportation, Alternative Fuels, Electricity	Analyze the potential role of hydrogen and power to gas in meeting PA's goals	Enabling Technology	CCAC Input

Sector (Aligns with CAP Outline)	Strategy	Type	Source
Alternative Fuels	Increase the production and use of bio/renewable gas (e.g., as from coal mines, agriculture, wastewater, and landfills) through education and outreach	GHG Reduction Strategy	2018 CAP CCAC Letters, 2018 CAP
Electricity	Increase Alternative Energy Portfolio Standard (AEPS) Tier 1 targets and the solar share	GHG Reduction Strategy	2018 CAP
Electricity	Pass legislation to support a more robust solar industry both at the distributed and grid levels (PA Solar Future)	GHG Reduction Strategy	2018 CAP CCAC Letters
Electricity	Take action to expand wind generation, such as through incentives or legislation	GHG Reduction Strategy	2018 CAP CCAC Letters
Electricity	Develop strategies or programs that encourage the development and increase the value of solar renewable energy credits (SRECs)	GHG Reduction Strategy	2018 CAP CCAC Letters
Electricity	Implement policy to maintain nuclear generation at current levels	GHG Reduction Strategy	2018 CAP and 2018 CAP CCAC Letters
Electricity	Encourage and incentivize grid-scale battery energy storage, through state legislative requirements or voluntary efforts	Enabling Technology	CCAC Input
Waste	Reduce waste generated by citizens and business thereby reducing waste sent to landfills, and WTE facilities, and expand the beneficial use of waste	GHG Reduction Strategy	2018 CAP
Waste	Increase waste diversion and reduction	GHG Reduction Strategy	2018 CAP CCAC Letters

Sector (Aligns with CAP Outline)	Strategy	Type	Source
Waste	Reduce food waste	GHG Reduction Strategy	ICF/DEP addition
Agriculture	Support for agricultural best practices, such as those focused on no-till farming practices, methane capture with digestors, integrated farm management and conservation planning, and soil management practices such as rotational grazing, silvopasture, organic and regenerative agriculture	GHG Reduction Strategy	2018 CAP CCAC Letters and 2018 CAP
Agriculture	Increase energy efficiency for agricultural buildings and equipment	GHG Reduction Strategy	ICF/DEP addition
Land Use and Forestry	Take actions to more effectively manage forest and crop lands to sequester carbon naturally (more specifics to be defined)	Enabling Technology or GHG Reduction Strategy	CCAC Input
NA	Provide information resources and education on Direct Air Capture and its potential role in meeting PA's long-term GHG goals	Enabling Technology	ICF/DEP addition
NA	Analyze the potential role of GHG offsets in meeting PA's long-term GHG goals	Enabling Technology	ICF/DEP addition