Priority Climate Action Plan
State of Maryland

March 1, 2024

PREPARED FOR:

State and Local Climate and Energy Program

U.S. Environmental Protection Agency

PREPARED BY:

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(1) TITLE PAGE

State of Maryland Priority Climate Action Plan

Developed Under the US Environmental Protection Agency Climate Pollution Reduction Grant Program

Grant Number: 95316101-0

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(2) ACKNOWLEDGEMENTS

Maryland Department of the Environment (MDE) acknowledges and thanks the following organizational partners for their ongoing commitment to climate action in Maryland and for their input on the development of the *Maryland Climate Pollution Reduction Plan*, which serves as the foundation to the State of Maryland Priority Climate Action Plan under the CPRG Program.

Maryland Department of General Services
Maryland Department of Housing and Community Development
Maryland Department of Natural Resources
Office of the Governor
Maryland Department of Agriculture
Maryland Department of Transportation
Maryland Department of Planning
Maryland Energy Administration
Public Service Commission
University of Maryland Center for Environmental Science
Maryland Association of Counties (MACo)
Maryland Municipal League (MML)
Maryland Commission on Climate Change (MCCC) and eight Working Groups
Building Energy Transition Implementation Task Force
Green and Blue Infrastructure Policy Advisory Commission
Commission on Environmental Justice and Sustainable Communities

Philadelphia - Camden - Wilmington, PA-NJ-DE-MD: Delaware Valley Regional Planning Commission (DVRPC) and Wilmington Area Planning Council (WILMAPCO)
Baltimore - Columbia - Towson, MD: Baltimore Metropolitan Council (BMC)
Washington-Arlington-Alexandria, DC-VA-MD-WV: Washington, DC and Metropolitan Washington Council of Governments (MWCOG)

MDE acknowledges and thanks the many technical assistance partners who continue to support Maryland in its efforts to tackle and reduce climate pollution. The State of Maryland PCAP builds on the work of the following technical assistance partners: University of Maryland - Center for Global Sustainability, Towson University - Regional Economic Studies Institute, Energetics, Vermont Energy Investment Corporation (VEIC), U.S. Department of Energy, U.S. Environmental Protection Agency, Lawrence Berkeley National Laboratory, Pacific Northwest National Laboratory, Institute for Market Transformation, Northeast Energy Efficiency Partnerships, Regulatory Assistance Project, University of Maryland - Department of Geographical Sciences, and Sierra View Solutions.

Additionally, MDE thanks the US Climate Alliance and the Convener's Network for coordination efforts and resources developed to assist states in meeting the objectives of the CPRG program.

Most importantly, MDE thanks all individual contributors, stakeholders, and Marylanders that have shared their time, expertise, and input in the development of this PCAP and who will be instrumental in taking the multitude of actions needed to meet the State's nation-leading greenhouse gas reduction goals. Meeting the climate crisis requires all Marylanders - companies, nonprofits, communities, and state and local governments. We are ready to show the world that our state can lead in the fight to save our planet.

(3) ACRONYMS AND DEFINITIONS

Acronyms

5MT	Maryland 5 Million Trees Initiative
ACC	Advanced Clean Cars
ACF	Advanced Clean Fleets
ACT	Advanced Clean Trucks
AFC	Alternative Fuel Corridor
ASLRRA	American Short Line and Regional Railroad Association
BAT	Best Available Technology
BEPS	Building Energy Performance Standards
BGE	Baltimore Gas and Electric Company
BMC	Baltimore Metropolitan Council
CAFE	Corporate Average Fuel Economy
CCAP	Comprehensive Climate Action Plan
CEA	Clean Energy Advantage Loan Program
CEJA	Clean Energy Jobs Act
CEJSC	Maryland Commission of Environmental Justice and Sustainable Communities
CHS	Clean Heat Standard
C-PACE	Commercial Property Assessed Clean Energy
CPS	Clean Power Standard
COBRA	Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool
CPRG	EPA's Climate Pollution Reduction Grant Program
CPRP	*Maryland's Climate Pollution Reduction Plan* (December 2023)
CSNA	Climate Solutions Now Act of 2022
DGS	Maryland Department of General Services
DHCD	Department of Housing and Community Development

DNR	Maryland Department of Natural Resources
DOE	Department of Energy
DOEE	DC Department of Energy and Environment
DSCI	Department of Service and Civic Innovation
DVRPC	Delaware Valley Regional Planning Commission
EPA	Environmental Protection Agency
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
EWIP	Energy-Water Infrastructure Program
FHWA	Federal Highway Administration
GCCS	Gas Collection and Control Systems
GDP	Gross Domestic Product
GGRA	GHG Emissions Reduction Act
GGRF	Greenhouse Gas Reduction Fund
GHG	Greenhouse Gas
GWP	Global Warming Potential
IBC	International Building Code
IECC	International Energy Conservation Code
IPPU	Industrial Processes and Product Use
IRA	Inflation Reduction Act
IRC	International Residential Code
ILSR	Institute for Local Self-Reliance
kWh	Kilowatt-hour
LEED	Leadership in Energy and Environmental Design
LIDAC	Low Income and Disadvantaged Community
MACo	Maryland Association of Counties

MBPS	Maryland Building Performance Standards
MCAP	Maryland Clean Energy Capital Program
MCCC	Maryland Commission on Climate Change
MCEC	Maryland Clean Energy Center
MDA	Maryland Department of Agriculture
MDC	Maryland Department of Commerce
MDE	Maryland Department of the Environment
MD-JARC	Maryland Jobs Access Reverse Commute Program
MDOT	Maryland Department of Transportation
MEA	Maryland Energy Administration
MHDV	Medium- and Heavy-Duty Vehicles
MML	Maryland Municipal League
MMTCO2e	Million metric tons of carbon dioxide equivalent
MSA	Metropolitan Statistical Area
MSW	Municipal Solid Waste
MTA	Maryland Transit Administration
MVA	Maryland Motor Vehicle Administration
MWCOG	Metropolitan Washington Council of Governments
MWIFA	Maryland Water Infrastructure Financing Administration
NEVI	National Electric Vehicle Infrastructure Plan
OPC	Office of People's Counsel
PCAP	Priority Climate Action Plan
PE	Potomac Edison Company
PEPCO	Potomac Electric Power Company
PJM	A regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia (including Maryland).

PPA	Power Purchase Agreement
PPRP	Power Plant Research Program
PSC	Public Service Commission
QAPP	Quality Assurance Project Plan
RECs	Renewable Energy Credits
RGGI	Regional Greenhouse Gas Initiative
RPS	Renewable Portfolio Standard
SEIF	Strategic Energy Investment Fund
SMECO	Southern Maryland Electric Cooperative, Inc.
SMM	Sustainable Materials Management
TDM	Transportation Demand Management
TOD	Transit-Oriented-Development
TSNA	Tree Solutions Now Act of 2021
UMD	University of Maryland
USM	University System of Maryland
VMT	Vehicle Miles Traveled
WGL	Washington Gas and Light Company
ZEHES	Zero-Emission Heating Equipment Standard
ZEV	Zero-Emission Vehicles
ZEVIP	Zero-Emission Vehicle Infrastructure Plan

Definitions

Benefits	Direct changes in air pollution (e.g., PM2.5, VOCs) that result from a GHG reduction measure.
Building Energy Performance Standards (BEPS)	Requires certain buildings 35,000 square feet or larger to achieve specific energy efficiency and direct emissions standards, including achieving net-zero direct emissions by 2040. Historic properties, public and nonpublic elementary and secondary schools, manufacturing buildings, agricultural buildings, and federal buildings

	are exempt. There are approximately 9,000 covered buildings in Maryland located across all counties.
Clean Heat Standard (CHS)	A performance-based approach to reducing GHG emissions from the building sector. CHS is designed to broadly decarbonize covered sectors in a manner that is market-based and friendly to customer choice in coordination with other programs. It complements and supports the achievement of other policies including energy codes and standards, EmPOWER, BEPS, and ZEHES.
Clean Power Standard (CPS)	A policy that will complement the Renewable Portfolio Standard (RPS) to ensure that all electricity consumed in the state is generated by clean and renewable sources of energy by 2035.
Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA)	A screening model used regularly in the research community, COBRA is a free, easy-to-use EPA model employed as a preliminary analysis of health impacts and monetized benefits from environmental policy changes.
Commission on Environmental Justice and Sustainable Communities (CEJSC)	CEJSC is a twenty-member body that is tasked with advising the State government on environmental justice and analyzing the effectiveness of State and local government laws and policies to address issues of environmental justice and sustainable communities.
Climate Solutions Now Act (CSNA) of 2022	The Climate Solutions Now Act (CSNA) of 2022 requires Maryland to achieve a 60% reduction in GHG emissions (from 2006 levels) by 2031 and net-zero emissions by 2045. It establishes the most ambitious GHG reduction goals of any U.S. state.
Co-Benefits	Positive effects beyond the stated goal of a GHG reduction measure (e.g., improved public health outcomes, economic benefits, increased climate resilience).
Department of Service and Civic Innovation (DSCI)	DSCI was established by the Serving Every Region Through Vocational Exploration (SERVE) Act of 2023 to promote service and volunteerism in the state of Maryland.
Electric Vehicle Supply Equipment (EVSE)	EVSE-installed means having an EV charging device that is fully installed and ready to use at a parking space.
EmPOWER Maryland	Maryland's energy efficiency program, administered by the six largest utilities and the Maryland Department of Housing and Community Development, to help homeowners, renters, and businesses save energy and money. The program provides incentives and technical assistance to improve insulation, seal air leaks, and install energy-efficient appliances in homes and buildings.
EV-ready	EV-ready means having electrical panel capacity and wiring in place to easily install a level-2 EV charger in the future.

Global Warming Potential (GWP)	A measure of the warming impact of a particular gas over a particular time horizon. GWP values allow for aggregating emissions of the different greenhouse gases into a single metric, known as carbon dioxide equivalent, and reported in the inventory in million metric tons (MMTCO2e).
Greenhouse Gas (GHG)	GHGs include the air pollutants carbon dioxide (CO2), hydrofluorocarbons (HFCs), methane (CH4), nitrous oxide (N2O), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).
Greenhouse Gas Reduction Fund (GGRF)	The second-largest allocation in the IRA was the creation of the $27 billion Greenhouse Gas Reduction Fund (GGRF). The goal of the GGRF is a historic investment to mobilize financing and private capital to address the climate crisis, ensure our country's economic competitiveness, and promote energy independence while delivering lower energy costs and economic revitalization to communities that have historically been left behind.
Greenhouse gas (GHG) Inventory	A list of emission sources and sinks, and the associated emissions quantified using standard methods.
GHG Reduction Measure	Implementable actions that reduce GHG emissions or enhance carbon removal. Measures that enhance "carbon removal" are those that increase the removal of carbon dioxide from the atmosphere through, for example, the uptake of carbon and storage in soils, vegetation, and forests.
Low Income and Disadvantaged Community (LIDAC)	Communities with residents that have low incomes, limited access to resources, and disproportionate exposure to environmental or climate burdens. LIDACs are any Census tract that is included as disadvantaged in the Climate and Economic Justice Screening Tool (CEJST) and/or any census block group that is at or above the 90th percentile for any of EJScreen's Supplemental Indexes when compared to the nation or state, and/or any geographic area within Tribal lands and indigenous areas as included in EJScreen.
Maryland 5 Million Trees Initiative (5MT)	A historic directive to plant and maintain 5 million native trees on public and private land by 2031, with a focus on planting in underserved urban areas, per The Tree Solutions Now Act of 2021 (TSNA).
Maryland's Climate Pathway	A report released in June 2023 by MDE and the University of Maryland Center for Global Sustainability showing a package of policies that could achieve the state's climate goals.
Maryland Register	An official publication of the State of Maryland that is published every two weeks.

Net-zero emissions	Net-zero emissions means that the total GHG emissions from Maryland's economy will be equal to the GHGs removed from the atmosphere through natural and technological systems annually.
National Electric Vehicle Infrastructure (NEVI) Plan	Developed in partnership with MEA, NEVI serves as the foundational first step for a strategic buildout of a robust ZEV infrastructure network. The NEVI Plan details the strategy for awarding $63M of NEVI funds to build out and certify Maryland's 23 EV Alternative Fuel Corridors (AFCs).
Regional Greenhouse Gas Initiative (RGGI)	A collaborative program among 11 East Coast states to reduce CO2 emissions from power plants through a regional cap and invest program.
Renewable Energy Production Tax Credit	The Renewable Energy Production Tax Credit is an IRA-funded program providing a per kilowatt-hour (kWh) tax credit for electricity generated by solar and other qualifying technologies for the first 10 years of a system's operation.
Renewable Portfolio Standard (RPS)	Requires approximately 50% of electricity consumed in Maryland to be generated by renewable resources by 2030 and modifies definitions of qualifying resources.
Strategic Energy Investment Fund (SEIF)	The Strategic Energy Investment Fund (SEIF) distributes funding from Maryland's participation in the Regional Greenhouse Gas Initiative (RGGI) and other programs to provide incentives for decarbonization projects across sectors of Maryland's economy.

(4) TABLE OF CONTENTS

(5) LIST OF FIGURES

(6) LIST OF TABLES

(7) EXECUTIVE SUMMARY

This report is the State of Maryland's Priority Climate Action Plan (PCAP) developed under the EPA Climate Pollution Reduction Grant (CPRG) to meet the requirements of the State of Maryland CPRG Planning Grant. The State of Maryland PCAP builds on the Maryland's Department of the Environment's (MDE) fifteen years of GHG inventory and reduction planning experience and was developed based on the following foundational inputs:

- Existing statewide GHG inventories
- Prior statewide climate action plans
- Maryland Climate Pathway Report (June 2023)
- Stakeholder feedback on the Maryland Climate Pathway Report
- *Maryland's Climate Pollution Reduction Plan* (December 2023) to achieve 60% GHG emissions reductions by 2031 and attain "net zero" by 2045 (goals set by the General Assembly). The statewide and economy-wide plan provides the analytical and policy framework to structure Maryland's PCAP.
- Stakeholder input including over 300 GHG emission reduction measures/projects assembled by MDE from eligible agencies, jurisdictions, and stakeholders.

The State of Maryland's PCAP covers the geographical scope of the entire state of Maryland, inclusive of the Maryland jurisdictions additionally covered by other CPRG planning grants. CPRG planning areas were designated by the EPA and include both statewide and Metropolitan Statistical Areas (MSA) regional planning. In Maryland, there are four CPRG planning grants, as designated by the EPA, that cover specified counties and municipalities:

State of Maryland*:* Statewide coordination and planning led by the Maryland Department of the Environment (MDE) with a Local Support Program for the following counties: Allegany, Calvert, Caroline, Dorchester, Garrett, Kent, Somerset, St. Mary's, Talbot, Washington, Wicomico, and Worcester. The Maryland CPRG Local Support Program assists counties and their municipalities in identifying high-priority GHG emissions reduction projects with important social, ecological, and economic co-benefits and builds capacity across all of Maryland for project planning, design, financing, implementation, and tracking.

Baltimore-Columbia-Towson, MD: Led by Baltimore Metropolitan Council for the following counties: Anne Arundel, Baltimore City, Baltimore County, Carroll, Harford, Howard, Queen Anne's.

Philadelphia-Camden-Wilmington, PA-NJ-DE-MD: Led by the Delaware Valley Regional Planning Commission for Cecil County.

Washington-Arlington-Alexandria, DC-VA-MD-WV: Led by the DC Department of Energy and Environment (DOEE) and supported by the Metropolitan Washington Council of Governments for the following counties Charles, Frederick, Montgomery, Prince George's.

Included in this PCAP are the following elements:

- GHG Inventory
- GHG Emission Projections
- GHG Reduction Targets
- GHG Reduction Measures
- Benefits Analysis
- Low Income / Disadvantaged Communities Benefits Analysis
- Review of Authority to Implement
- Intersection with Other Funding Availability
- Workforce Planning Analysis
- Next steps

Core policies of the *December 2023 Maryland Climate Pollution Reduction Plan* were aligned based on the *Modeling for the State's Climate Plan* to the following 21 priority climate action plan measures (PCAP measures) to meet the quantification requirements of the EPA's Climate Pollution Reduction Grant Program. The PCAP measures detailed in this PCAP are as follows:

- PCAP MEASURE 1: Clean Economy Standard
- PCAP MEASURE 2: Increasing Renewable and Clean Energy
- PCAP MEASURE 3: Regional Greenhouse Gas Initiative
- PCAP MEASURE 4: Clean Power Standard
- PCAP MEASURE 5: Advanced Clean Cars II
- PCAP MEASURE 6: Advanced Clean Trucks
- PCAP MEASURE 7: Advanced Clean Fleets
- PCAP MEASURE 8: Maryland Transportation Plan and Carbon Reduction Strategies
- PCAP MEASURE 9: Building Energy Performance Standards
- PCAP MEASURE 10: EmPOWER
- PCAP MEASURE 11: Zero-Emission Heating Equipment Standard
- PCAP MEASURE 12: Clean Heat Standard
- PCAP MEASURE 13: Hydrofluorocarbon Regulations
- PCAP MEASURE 14: Control of Methane Emissions from the Natural Gas Industry
- PCAP MEASURE 15: Buy Clean
- PCAP MEASURE 16: Landfill Methane Regulations
- PCAP MEASURE 17: Sustainable Materials Management
- PCAP MEASURE 18: State Incentives for Agricultural Decarbonization
- PCAP MEASURE 19: Agricultural Resource Conservation and Management
- PCAP MEASURE 20: Afforestation and Improved Forest Management
- PCAP MEASURE 21: Coastal Wetland Restoration and Management

1 INTRODUCTION

1.1 CPRG OVERVIEW

The EPA's CPRG program, authorized under §60114 of the Inflation Reduction Act, provides $5 billion in grants to states, local governments, tribes, and territories to develop and implement plans for reducing greenhouse gas (GHG) emissions and other harmful air pollution. The program allocates funding for two phases of grants: $250 million for non-competitive planning grants and approximately $4.6 billion for competitive implementation grants. The Maryland Department of the Environment is leading the state planning grant for Maryland with a statewide focus and regional coordination.

The State of Maryland will deliver statewide and economy-wide climate pollution reduction plans in response to the EPA's CPR) for Planning and to meet Maryland's nation-leading GHG emissions reduction goals to achieve net-zero emissions by 2045. Maryland will utilize the CPRG program to lead the nation in climate pollution reduction with intention, strategy and data. The planning, coordination and action supported by the CPRG program will ensure that Maryland's continued response to the climate crisis and transition to a clean energy economy is robust, equitable and inclusive.

1.2 PCAP OVERVIEW

The table below (Table 1) outlines the required and optional elements for a PCAP and where the relevant information may be found within the document.

Table 1.
Crosswalk of CPRG PCAP requirements to State of Maryland PCAP section

PCAP Required Elements	Section	Page Number
GHG Inventory	See Section 3.1	Page 22
Quantified GHG Reduction Measures	See Section 3.4	Page 34
Low Income and Disadvantaged Community (LIDAC)	See Section 3.6	Page 76
Benefits Analysis	See Section 3.5	Page 68
Review of Authority to Implement	See Section 3.7	Page 84
PCAP Optional Elements		
GHG Emissions Projections	See Section 3.2	Page 32
GHG Reduction Targets	See Section 3.3	Page 34
Benefits Analysis for Full Geographic Scope and Population	See Sections 3.5 and 3.6.3	Pages 68 and 81

Intersection with Other Funding Availability	See Section 3.8	Page 87
Workforce Planning Analysis	See Section 3.9	Page 94
Next Steps/Future Budget and Staffing Needs	See Section 4	Page 95

1.3 SCOPE OF THE PCAP

EPA's Planning Areas

The State of Maryland's PCAP covers the geographical scope of the entire state of Maryland, inclusive of the Maryland jurisdictions additionally covered by other CPRG planning grants. CPRG planning areas were designated by the EPA and include both statewide and MSA regional planning. In Maryland, there are four CPRG planning grants, as designated by the EPA, that cover specified counties and municipalities:

State of Maryland: Statewide coordination and planning led by the MDE with a Local Support Program for the following counties: Allegany, Calvert, Caroline, Dorchester, Garrett, Kent, Somerset, St. Mary's, Talbot, Washington, Wicomico, and Worcester.

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Philadelphia-Camden-Wilmington, PA-NJ-DE-MD: Led by the Delaware Valley Regional Planning Commission for Cecil County.

Washington-Arlington-Alexandria, DC-VA-MD-WV: Led by the DC Department of Energy and Environment (DOEE) and supported by the Metropolitan Washington Council of Governments for the following counties Charles, Frederick, Montgomery, Prince George's.

CPRG Local Support Program

The Maryland CPRG Local Support Program assists counties and their municipalities in identifying high-priority GHG emissions reduction projects with important social, ecological, and economic co-benefits and builds capacity across all of Maryland for project planning, design, financing, implementation, and tracking. Program support includes county-specific outreach, technical support including consultation, facilitation services, and grant writing.

MDE's support program specifically assists counties and their municipalities that are not covered by a CPRG MSA planning grant. They are:

- Western Maryland (Garrett, Allegany, Washington counties),
- Southern Maryland (Calvert, St. Mary's counties), and
- Eastern Shore (Kent, Talbot, Caroline, Dorchester, Wicomico, Somerset, and Worcester counties)

1.4 APPROACH TO DEVELOPING THE PCAP

Maryland continues to build on its fifteen years of GHG inventory and reduction planning experience in its approach to the CPRG and the PCAP. In developing the PCAP, Maryland utilized and expanded its existing climate action and environmental justice commissions, task forces, and working groups for planned stakeholder outreach, with most groups meeting either monthly or quarterly. To ensure representatives of low-income and disadvantaged communities that may be affected by or benefit from plan development are included in the process, Maryland's CPRG for Planning directly aligns with best practices for engagement offered by MDE's new Office of Environmental Justice led by the Assistant Secretary for Environmental Justice and the Maryland Commission of Environmental Justice and Sustainable Communities (CEJSC).

MDE coordinates with the following entities in support of the State of Maryland CPRG for Planning (Table 2):

Table 2. Entities coordinating with MDE in support of the State of Maryland CPRG for Planning.

State agencies/offices:	Department of General Services Department of Housing and Community Development Department of Natural Resources Office of the Governor Maryland Department of Agriculture Maryland Department of Transportation Maryland Department of Planning Maryland Energy Administration Public Service Commission University of Maryland Center for Environmental Science
Local Government Associations:	Maryland Association of Counties (MACo) Maryland Municipal League (MML)
Advisory committees:	Maryland Commission on Climate Change (MCCC) (and eight Working Groups) Building Energy Transition Implementation Task Force Blue and Green Infrastructure Policy Advisory Commission Commission on Environmental Justice and Sustainable Communities
CPRG MSA Lead Organizations:	Philadelphia - Camden - Wilmington, PA-NJ-DE-MD: Delaware Valley Regional Planning Commission (DVRPC) Baltimore - Columbia - Towson, MD: Baltimore Metropolitan Council (BMC) Washington-Arlington-Alexandria, DC-VA-MD-WV: Washington, DC Department of Energy and Environment (DOEE) and Metropolitan Washington Council of Governments (MWCOG)

MDE, its coordinating partners, and technical assistance providers integrate systems for continuous process improvement through the processes outlined in the Maryland CPRG Quality Assurance Project Plan (QAPP), which was approved by the EPA in January 2024. MDE will utilize EPA's Tools and Technical Assistance including the Technical Reference Documents for all elements of the PCAP, CCAP, and Status

Report as well as the resource and best practice sharing from the EPA's Technical Assistance Forums to enhance Maryland's CPRG for Planning deliverables.

Maryland's PCAP was developed based on the following foundational inputs:

- Existing statewide GHG inventories
- Prior statewide climate action plans
- Maryland Climate Pathway Report (June 2023)
- Stakeholder feedback on the Maryland Climate Pathway Report
- *Maryland's Climate Pollution Reduction Plan* (December 2023) to achieve 60% GHG emissions reductions by 2031 and attain "net zero" by 2045 (goals set by the General Assembly). The statewide and economy-wide plan provides the analytical and policy framework to structure Maryland's PCAP.
- Stakeholder input includes over 300 GHG emission reduction measures/projects assembled by MDE from eligible agencies, jurisdictions, and stakeholders.

Stakeholder Engagement Process for PCAP

Stakeholder input from across Maryland has been incorporated into the State of Maryland PCAP. In June 2023, after the publication of the Maryland Climate Pathway Report, MDE held a series of outreach events during the summer and early fall of 2023 to encourage public participation in the development of the State's plan to achieve its climate goals. Sessions included the following in-person sessions across Maryland:

- Bowie State University, July 25, 2023
- Hagerstown Community College, August 8, 2023
- Salisbury University, August 19, 2023
- Morgan State University, September 12, 2023
- College of Southern Maryland, September 19, 2023

Additionally, MDE conducted two virtual sessions:

- For elected officials (with EPA Region 3), September 5, 2023
- For the public, September 26, 2023

Hundreds of Marylanders contributed and shared feedback during the listening sessions and through comments submitted on the Maryland Climate Pathway Report. MDE posted summaries of the public session comments and published stakeholder comments on its website: https://mde.maryland.gov/programs/air/ClimateChange/Pages/Outreach-Results-on-2031-GHG-Reduction-Planning.aspx.

In fall 2023 and winter 2024, MDE assembled over 300 near-term, high-priority, implementation-ready GHG emission reduction measures/projects from eligible agencies, jurisdictions, and stakeholders to include in the PCAP through the PCAP Stakeholder Engagement Process. This process leveraged the concurrent MSA CPRG planning grants, existing plans for counties not covered by a MSA planning grant, and a public stakeholder submission process. Maryland's PCAP identifies programs, policies, measures,

and projects that could be carried out with CPRG implementation grant funding by Maryland's covered eligible entities.

Through the CPRG Program, MDE participates in the three concurrent MSA CPRG Planning Grants, as outlined above in EPA's Planning Areas. Through the steering and technical committees of the MSA Planning Grants, Maryland's covered eligible entities shared priority GHG emissions reduction measures/projects to assist with coordination and enhance collaboration on the overall CPRG program.

The Maryland CPRG Local Support Program assists the following counties and their municipalities in identifying high-priority GHG emissions reduction projects: Allegany, Calvert, Caroline, Dorchester, Garrett, Kent, Somerset, St. Mary's, Talbot, Washington, Wicomico, and Worcester. MDE collected published county reports from each county's website including Comprehensive Plans, Hazard Mitigation Plans, Energy Plans, and Watershed Plans (see Appendix A). Counties were contacted by email and asked to verify that the collected plans were the most up to date. Additionally, counties were asked to highlight specific priorities and direct MDE to any other relevant reports. The reports were reviewed by MDE for GHG emissions reductions measures or measures with potential for GHG emission reduction. A total of 233 measures were identified and documented to inform PCAP development.

MDE issued the State of Maryland Request for Information for the U.S Environmental Protection Agency (EPA) Climate Pollution Reduction Grants (CPRG) to request survey feedback from the public on priority greenhouse gas (GHG) emissions reduction measures and/or projects from November 30, 2023, to January 12, 2024. The responses informed the State of Maryland's economy-wide climate pollution reduction planning for the PCAP. MDE disseminated the survey on its CPRG website, which is regularly updated with resources for public engagement in the CPRG planning process.

MDE received a total of 41 responses from a variety of affiliations across 9 Maryland counties. Reflecting Maryland's all-of-economy approach to climate pollution reduction, comments from respondents addressed opportunities and concerns economy-wide. Submissions were reviewed and assessed on a rolling basis and respondents were added to the MDE CPRG email distribution list for updates and next steps.

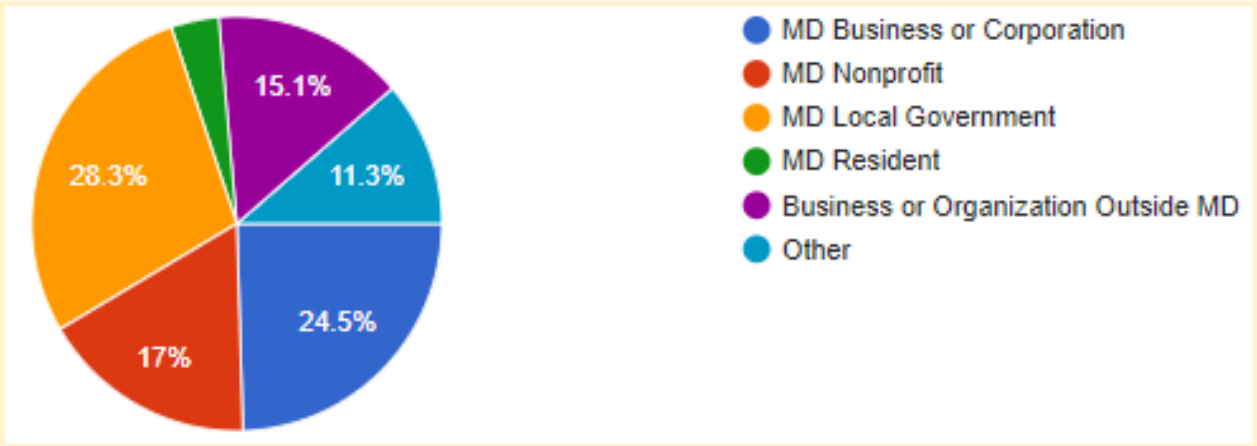

Figure 1. Comment submissions from Marylanders by affiliation.

MDE received two letters in response to the CPRG Request for Information survey: a joint letter from the Institute for Local Self-Reliance (ILSR) and Maryland Clean Water Action, and a letter from the American Short Line and Regional Railroad Association (ASLRRA).

In addition to issuing the CPRG Request for Information survey, MDE held monthly public virtual sessions to provide information, answer questions, and gather input from stakeholders related to CPRG. Dates for the sessions included: December 12, 2023; January 8, 2024; February 12, 2024; and March 20, 2024. Maryland's PCAP includes the public comments received from the CPRG Request for Information survey and the monthly public virtual sessions.

The stakeholder engagement process was supported by the Maryland Chesapeake Conservation and Climate Corps program, managed by the Chesapeake Bay Trust. The Corps member supported the development and implementation of the outreach and engagement plan and created outreach materials.

2 MARYLAND CONTEXT

Maryland is recognized as leading the nation to protect the environment from climate change; the state is taking full advantage of the historic levels of federal investment to tackle damaging climate pollution, accelerate work to address environmental injustice, and deliver cleaner air. Meeting the climate crisis requires all Marylanders - companies, nonprofits, communities, and state and local governments.

With 3,100 miles of shoreline, Maryland is highly vulnerable to the effects of sea-level rise associated with climate change. Rising sea levels and increased storm intensity could have devastating and far-reaching impacts on the Atlantic coast and the Chesapeake Bay ecosystem that affect the environmental, recreational, and economic benefits enjoyed by Marylanders and visitors. Although Maryland's coastal areas may be considered particularly vulnerable, all areas of the state are at risk. In general, climate change alters the severity, frequency, or distribution of existing issues that are impacted either directly or indirectly by temperature and precipitation. This includes, but is not limited to:

- Impacts on coastal, bay, and inland water quality parameters that may change the viable uses of surface water, such as for irrigation, recreation, or human consumption.
- Human health issues, including those affected by impacts on food and water supply, air quality, and extreme weather events.
- A higher probability of negative outcomes for disadvantaged communities and individuals inherently more sensitive or with a reduced adaptive capacity for responding to the impacts of climate change.
- More frequent disruptions to urban and coastal infrastructure in Maryland caused by extreme weather events and sea-level rise impact the economy of the region by restricting the flow of goods and affecting days worked.

Common stressors are experienced among ecosystems, agriculture, fisheries, and forests such as those caused by general changes in temperature and precipitation regimes; increased extreme weather events; and increased pressures from weeds, diseases, and pests.

MDE published Maryland's first Climate Action Plan in 2008 and its first GHG Emissions Reduction Plan in 2012 in response to the GHG Emissions Reduction Act (GGRA) of 2009 to achieve 25% GHG emissions reductions from the 2006 baseline by 2020. In 2021, MDE published the 2030 GGRA Plan to achieve 40% GHG emissions reductions from the 2006 baseline by 2030 as required by the GGRA of 2016. Notably, Maryland more than achieved its GHG reduction goal for 2020. In 2020, statewide GHG emissions were 30% below the 2006 baseline, exceeding the GGRA goal. In 2022, Maryland set the most ambitious GHG emissions reduction goals of any state in the nation. The Climate Solutions Now Act (CSNA) of 2022 requires Maryland to achieve a 60% reduction in GHG emissions (from 2006 levels) by 2031 and net-zero emissions by 2045. Net-zero emissions means that the total GHG emissions from Maryland's economy will be equal to the GHGs removed from the atmosphere through natural and technological systems annually.

In response to these revised targets, MDE published a report called the Maryland Climate Pathway Report in June 2023. The state's final *Climate Pollution Reduction Plan* was published in December 2023.

3 PCAP ELEMENTS

3.1 GREENHOUSE GAS (GHG) INVENTORY

Scope, Data Review, & GHG Accounting Method

The Greenhouse Gas Emissions Reduction Act (Maryland Code, Environment Article §2-1203) requires MDE to prepare and publish an updated inventory of statewide GHG emissions on a three-year cycle. Published Maryland State GHG inventories include the 2006 base year inventory, and the 2011, 2014, 2017 and 2020 triennial inventories.

Maryland's GHG emissions inventory tracks emissions of carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) occurring in the state and from out-of-state electricity generation consumed in the state. These gases have differing lifetimes in the atmosphere and differing warming impacts. The Global Warming Potential (GWP) is a measure of the warming impact of a particular gas over a particular time horizon. GWP values allow for aggregating emissions of the different greenhouse gases into a single metric, known as carbon dioxide equivalent, and reported in the inventory in million metric tons (MMTCO2e).

As required by the Climate Solutions Now Act of 2022, MD's GHG inventory reports emissions with a GWP considered over a 20-year time horizon. Emissions are also presented using a GWP over a 100-yr time horizon, consistent with conventional national and international inventory protocols. The 20-yr GWP emissions are to be used in evaluating progress toward Maryland's GHG reduction goal.

GHG Emission Results by Sector and Gas

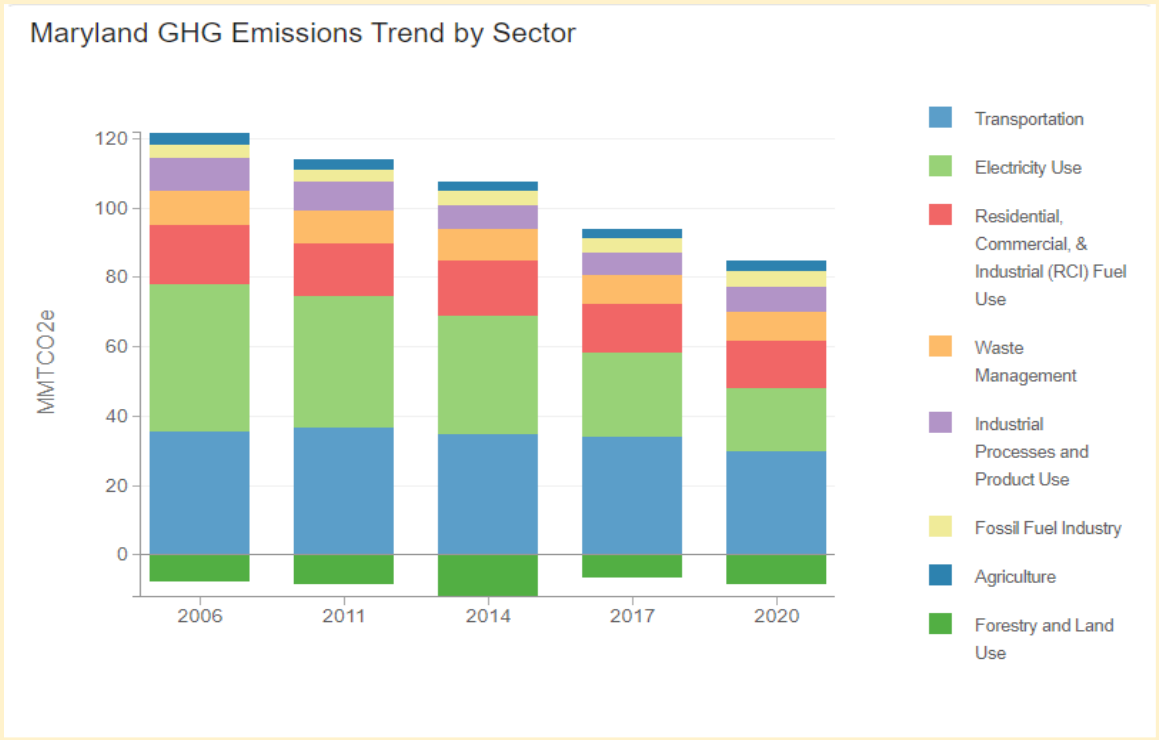

Figure 2. Maryland GHG Emissions Trend by Sector

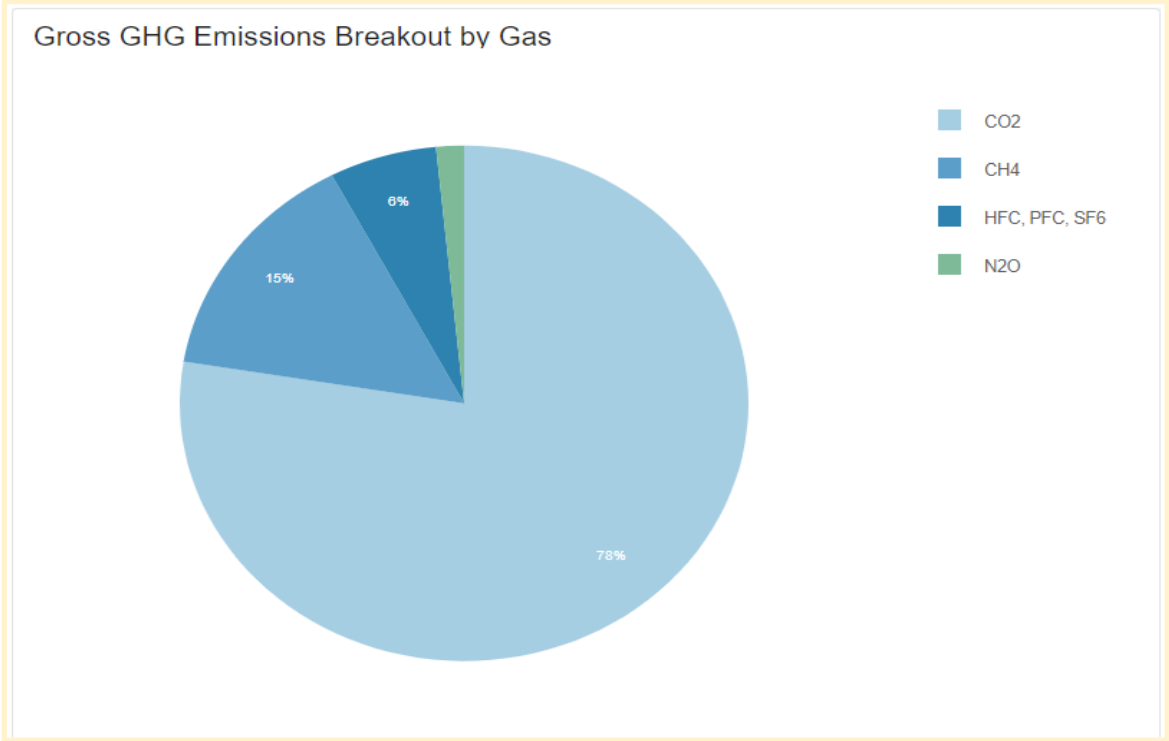

Figure 3. Gross GHG Emissions Breakout by Gas

Electricity

In 2020, electricity consumption accounted for 21% of Maryland's gross GHG emissions. While this may seem like a large amount, the electricity sector has made significant progress since 2006, when it accounted for 35% of emissions. The GHG reductions in this sector can be attributed to programs that reduce total electricity demand, programs aimed at reducing the carbon intensity of the electricity consumed, and wholesale electricity market trends, including the large-scale replacement of coal-fired power plants with cleaner sources of electricity.

Reduced energy demand results from energy efficiency and conservation, which is driven in Maryland by the EmPOWER Maryland program, 11 building energy codes and standards, and other policies. To reduce the carbon intensity of the electricity generated, the state relies on the Renewable Portfolio Standard (RPS) and other clean energy initiatives to incentivize renewable energy generation. In addition, the Regional Greenhouse Gas Initiative (RGGI) and other pollution control programs reduce carbon dioxide (CO2) emissions from fossil fuel-fired energy generation, also impacting the carbon intensity of the electricity. The combination and interaction between these programs lowers the emissions intensity of both in-state electricity generation and imported electricity.

To achieve deeper reductions in emissions from the electricity sector, Maryland intends for 100% of the electricity consumed in-state to be clean by 2035. This goal will be achieved through the deployment of grid-scale and rooftop solar panels, offshore wind, hydropower, nuclear power, and energy storage technologies that incorporate load flexibility and dispatchability into the electric grid as sectors electrify to create a more manageable system. Additionally, new statewide transmission and distribution infrastructure must be built while existing infrastructure is updated to enhance the electric grid, improve the efficiency and delivery of electricity, and facilitate the integration of renewable energy with a priority on clean resources. Ultimately, emerging technologies in the electricity sector must be identified and evaluated to develop solutions for zero-emission dispatchable technologies to meet demand and maintain reliability.

Reaching Maryland's clean energy goals is made easier with incentives funded through the Inflation Reduction Act (IRA). The Renewable Energy Production Tax Credit is an IRA-funded program providing a per kilowatt-hour (kWh) tax credit for electricity generated by solar and other qualifying technologies for the first 10 years of a system's operation. The Investment Tax Credit reduces federal income tax liability for a percentage of the cost of an eligible renewable energy system that is installed during the tax year. Importantly, the IRA also expanded the eligibility for these tax credits, so they can now be utilized by tax-exempt entities and local governments through direct pay provisions, by homeowners installing rooftop solar or residential wind systems, and by more traditional commercial entities. Both tax credits also receive bonuses for domestic content and siting in an energy community.

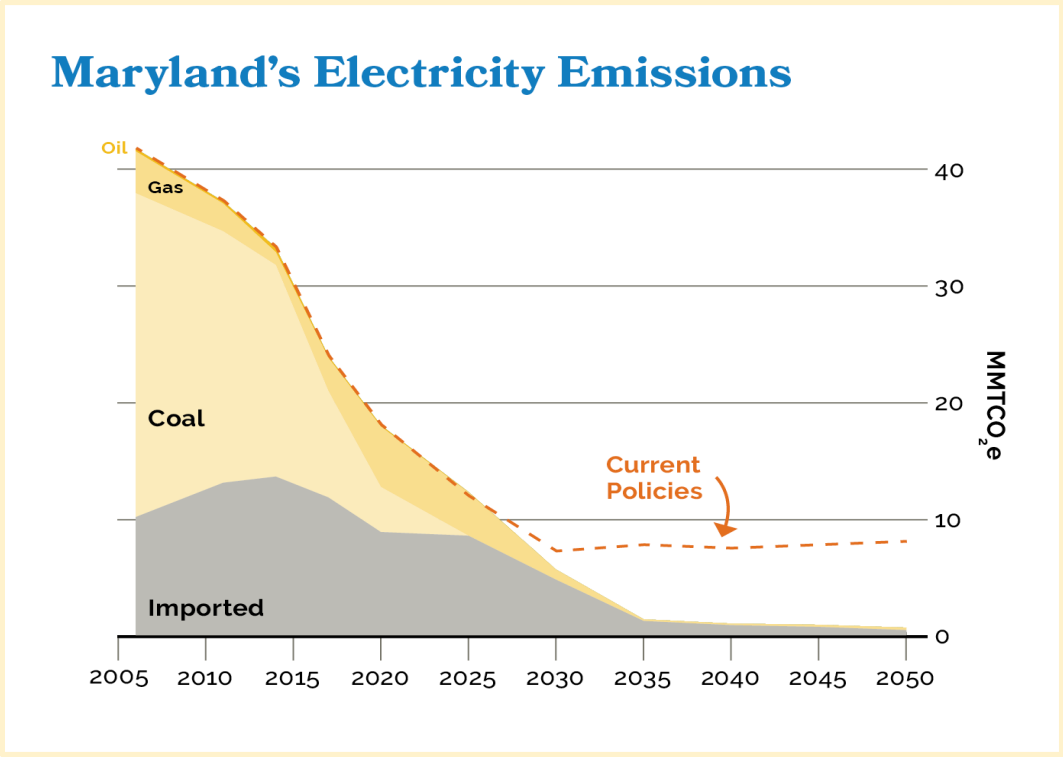

Figure 4. Maryland's electricity sector GHG emissions trends, historical and projected, from 2006 to 2050 based on current and new policies.

Transportation

The transportation sector accounted for 35% of Maryland's GHG emissions in 2020 with most emissions (82%) in this sector coming from on-road vehicles powered by gasoline or diesel. Non-road and other emissions, which are relatively minor compared with on-road emissions, come from vehicles, including airplanes, trains, marine vessels, farming equipment, recreational vehicles, and other motorized vehicles that do not operate on public roads.

On-road gasoline and diesel emissions have decreased steadily and will continue to decrease with the influx of vehicles meeting federal Corporate Average Fuel Economy (CAFE) standards and increased demand for EVs. Emissions from heavy-duty diesel vehicles have remained consistent since 2006 but the U.S. Environmental Protection Agency's (EPA) more stringent heavy-duty engine and vehicle GHG standards will be fully implemented by model year 2027.

To achieve deeper reductions from the transportation sector, it will be necessary to transition much of the light-duty fleet to zero-emission vehicles (ZEV) by 2031 and increase the use of other modes of transportation, including public transportation and micro-mobility options. New charging infrastructure will need to be developed and installed in conjunction with the retrofitting of existing gas stations to support charging stations. Public transportation and mobility alternatives must be enhanced, with an emphasis on promoting sustainable growth and other transit and mobility-oriented development.

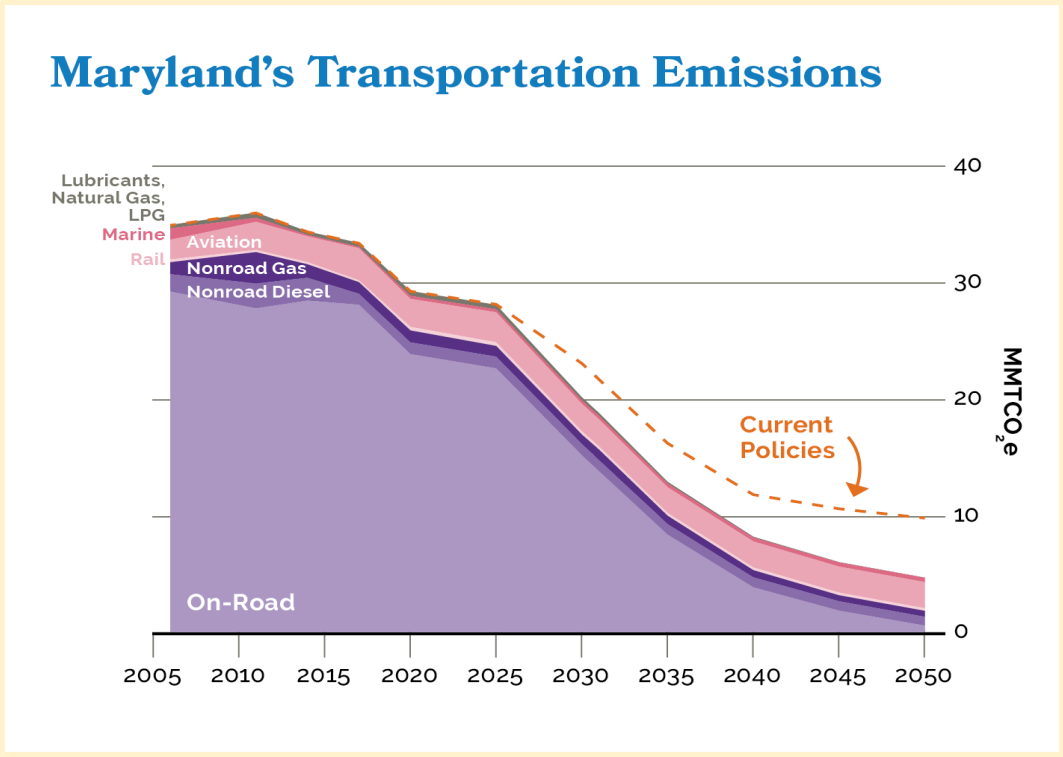

Figure 5. Maryland's transportation sector GHG emission trends, historical and projected, from 2006 to 2050 based on current and new policies.

Buildings

Direct fuel use in the building sector accounted for 16% of Maryland's GHG emissions in 2020. This includes emissions from burning fuel for space heating, water heating, cooking, and industrial heating processes. Buildings also use almost all the electricity consumed in the state, so improving energy efficiency to reduce electricity consumption and fuel use is a key strategy for addressing climate change and reducing energy costs for consumers.

Maryland's 2030 GGRA Plan called for the state to accelerate the transition of fossil fuel heating equipment in buildings to efficient electric equipment that can be powered by clean electricity. Using electric, zero-emission appliances for applications like space heating, water heating, and cooking is common throughout Maryland and the rest of the nation. Several current policies described below already support reductions in fossil fuel combustion from these end-uses as well as the transition from fuel-burning to zero-emission equipment in buildings. New policies will accelerate those efforts while minimizing impacts on the electric grid, preparing for future EV charging needs, managing a transition of the natural gas system, and reducing household and business energy costs. Fuel use for high-temperature applications in the industrial building sector is harder to electrify but new technologies and incentives are expected to help achieve deep decarbonization of Maryland's building sector over the next 21 years.

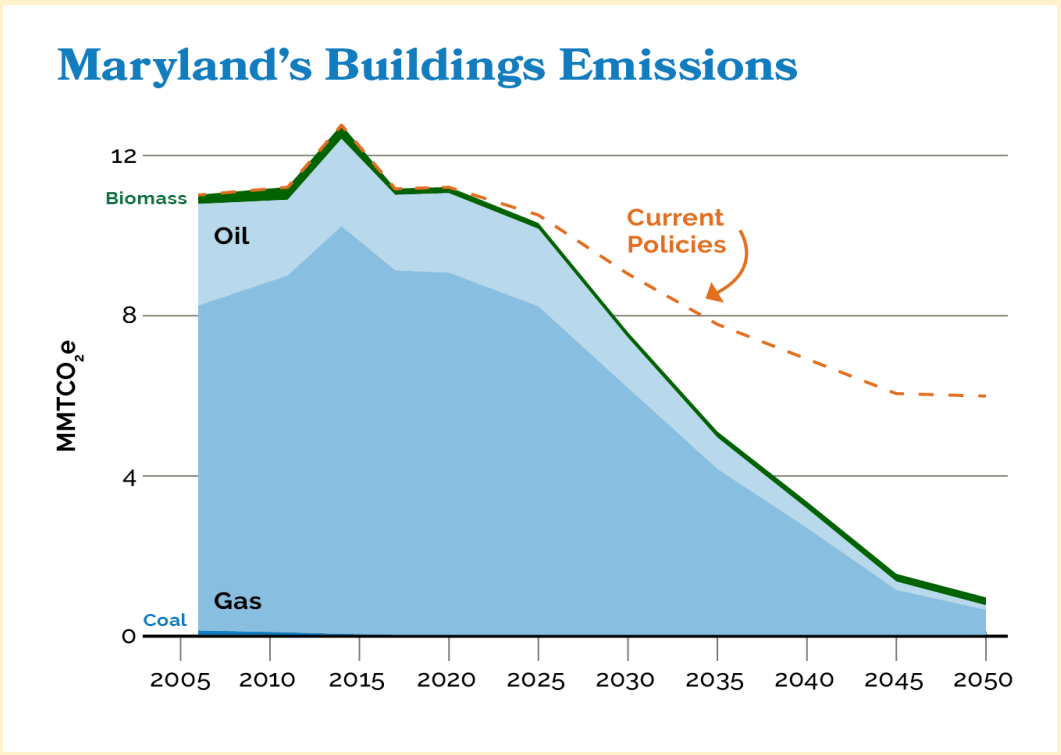

Figure 6. Direct GHG emissions from fuel use in Maryland's building sector, historical and projected, from 2006 to 2050 based on current and new policies.

Industry

Industrial processes and product use (IPPU), industrial fuel use, and direct emissions from the fossil fuel industry, which are three different sectors in Maryland's GHG Inventory, comprised 18.3% of Maryland's GHG emissions in 2020. The five largest sources of industrial emissions are:

- Hydrofluorocarbon (HFC) and perfluorocarbon (PFC) emissions from their use primarily in cooling and refrigeration equipment (5.2 MMTCO2e in 2020)
- Methane (CH4) emissions from leaks in natural gas infrastructure (3.1 MMTCO2e in 2020)
- CO_2 emissions from fossil fuel use in industrial facilities (2.7 MMTCO2e in 2020)
- CO_2 emissions from the calcination of limestone in the manufacturing of cement (1.8 MMTCO2e in 2020)
- CO_2 emissions from generators used to produce liquified natural gas (1 MMTCO2e in 2020)

Within the IPPU sector, approximately 96% of emissions come from two sources: cement manufacturing and the use of HFCs for cooling and refrigeration equipment. A small number of emissions comes from limestone use, soda ash use, non-fertilizer usage of urea, and sulfur hexafluoride (SF6) use for electric power transmission and distribution systems.

Within the industrial fuel use sector, emissions were evenly split between coal, oil, and natural gas in 2020. Practically all the coal used in the industrial sector is used by two cement manufacturing plants while almost all the oil and gas is consumed by non-cement industries. Switching industry to cleaner fuels or electricity is an important part of decarbonizing this sector. The largest of the two cement manufacturing plants in Maryland is currently working to replace coal with natural gas while the other

plant is considering a replacement of coal with refuse-derived fuel. These two fuel-switching projects are included in the emissions modeling for this sector.

Within the fossil fuel industry, most of the direct emissions are from the natural gas industry, which includes the in-state emissions from the production, transmission, and distribution of natural gas. A small portion of emissions are from coal mining, which includes underground and surface mines and abandoned mines.

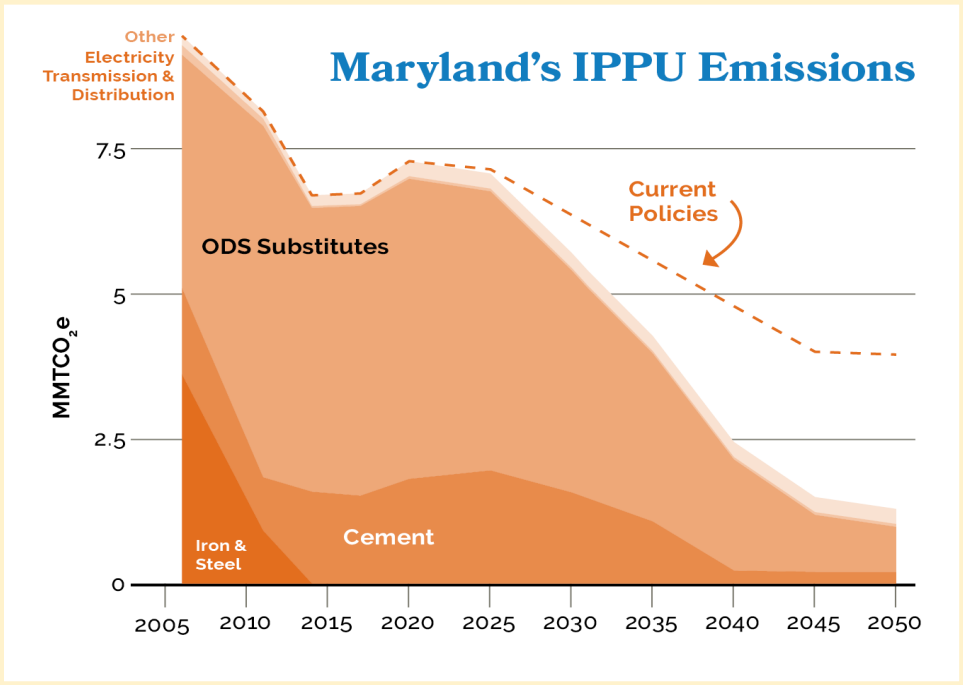

Figure 7. Maryland's industrial processes and product use GHG emissions trends, historical and projected, from 2006 to 2050 based on current and new policies.

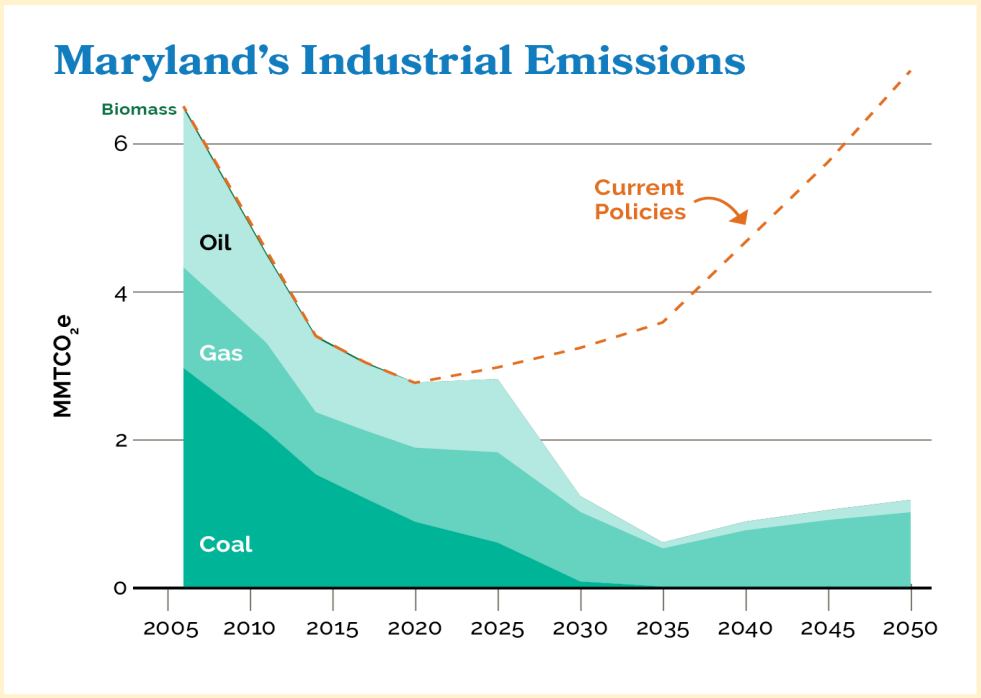

Figure 8. Maryland's industrial sector fuel use GHG emissions trends, historical and projected, from 2006 to 2050 based on current and new policies.

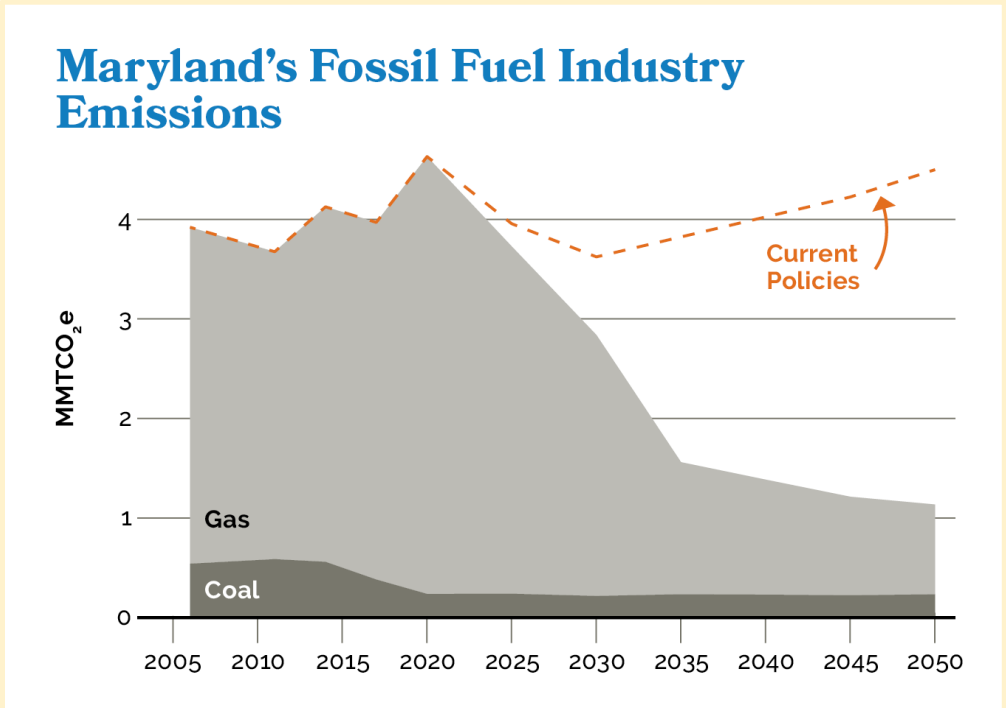

Figure 9. Maryland's fossil fuel industry GHG emissions trends, historical and projected, from 2006 to 2050 based on current and new policies.

Waste

The waste sector accounted for 10% of Maryland's GHG emissions in 2020. This sector includes emissions from landfills, wastewater management, waste combustion, and residential open burning. Maryland can reduce GHG emissions in the waste sector by implementing waste reduction, reuse, and recycling strategies to fundamentally shift the way businesses and residents currently produce, use, and handle products and materials at the end-of-life cycle. Additional emissions reductions can be achieved by minimizing emissions at solid waste management facilities and wastewater treatment plants, and through the evaluation of the beneficial use of methane captured from landfills.

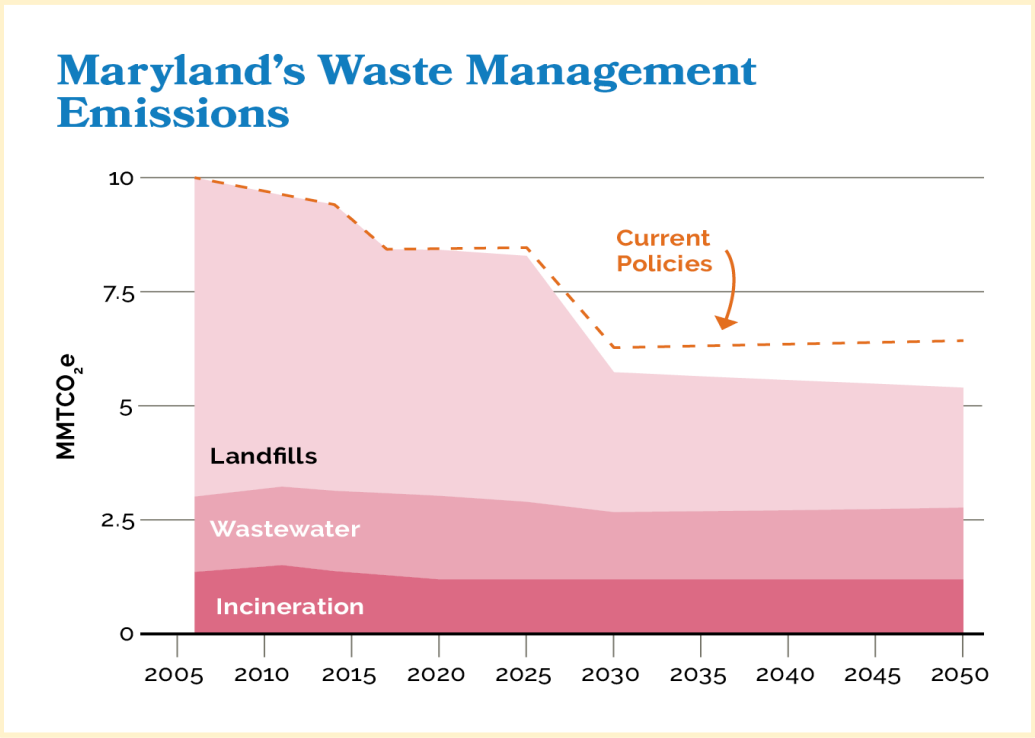

Figure 10. Maryland's waste sector GHG emissions trends, historical and projected, from 2006 to 2050 based on current and new policies.

Agriculture

The agriculture sector represented 4% of the state's GHG emissions in 2020. This sector includes emissions from enteric fermentation (i.e. methane emissions from cattle), manure management, and nutrient application. Emissions from the combustion of fossil fuels in agricultural equipment are not included in this sector as they are already accounted for under building fuel use and non-road transportation. Reductions in atmospheric CO2 from carbon sequestration in soils are included in the forestry and land use sector along with other emissions sinks.

Agricultural sector GHG emissions can be reduced through mitigation methods involving manure management practices and precision animal feeding.

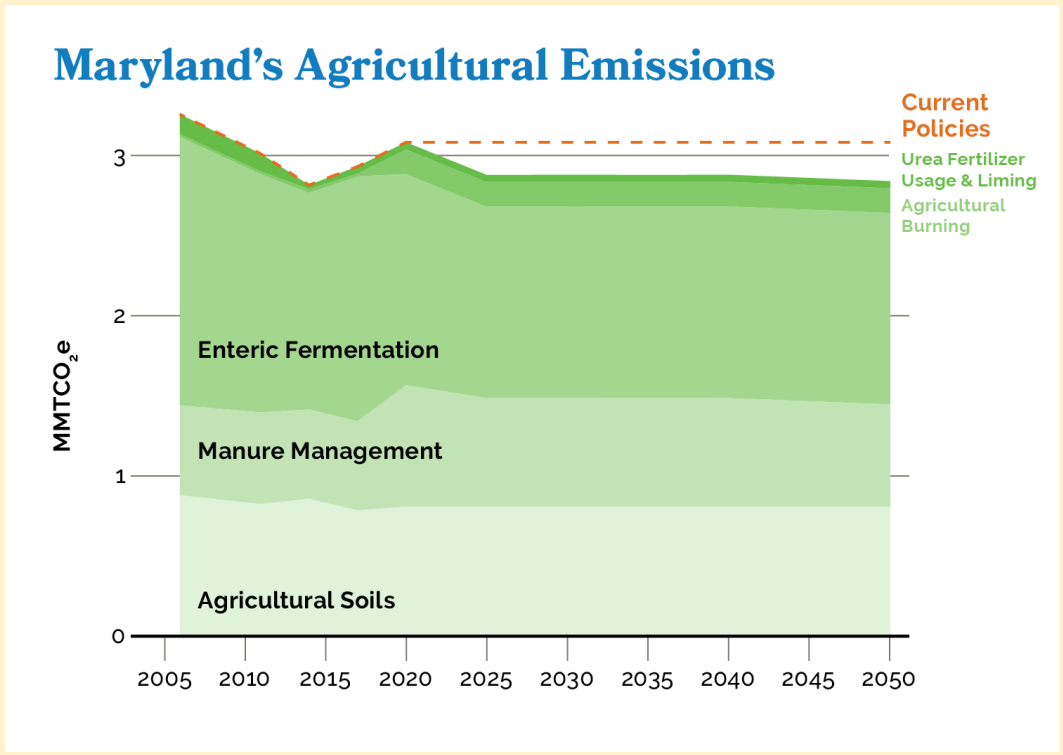

Figure 11. Maryland's agricultural sector GHG emissions trends, historical and projected, from 2006 to 2050 based on current and new policies.

Forestry and Land Use

The forestry and land use sector includes a combination of GHG emissions sources and sinks, which makes it unique from other sectors. GHG emissions in this sector include methane (CH4) and nitrous oxide (N2O) emissions from wildfires and prescribed forest burns, N2O from the application of synthetic fertilizers to settlement soils, and CH4 from reservoirs and coastal wetlands. Net emissions sinks (carbon sequestration pathways) in this sector include the carbon flux in forested and treed landscapes; carbon stored in harvested wood products, wood in landfills, and landfilled yard trimmings and food scraps; carbon flux in agricultural soils; and carbon flux in coastal (tidal) wetlands and submerged aquatic vegetation. This sector is not included in Maryland's gross emissions accounting and is instead factored into Maryland's net emissions calculation for 2045.

In 2020, the forestry and land use sector counteracted 9% of Maryland's gross GHG emissions by removing 8.34 MMTCO2e from the atmosphere. While this number is variable year to year, due to differences in rates of forest growth largely influenced by weather and natural or human-induced disturbance, this value is very similar to the long-term trend. The carbon sequestration potential of the agricultural sector can be maximized through the expansion of the Maryland Department of Agriculture's (MDA) resource conservation programs, which increase the rate of best management practice adoption across Maryland's croplands. Further GHG emissions reductions in this sector can be achieved through the expansion of forestry programs involving forest conservation, improved forest management, and reforestation facilitated by Maryland Department of Natural Resources (DNR) and other agency partners.

To achieve Maryland's 2045 net-zero emissions goal, carbon sequestration must be increased to offset specific sectors that are difficult to decarbonize. This will be a challenge, given recent trends in land-use change and population growth, aging forests that tend to sequester less carbon annually, and climate change impacts like sea level rise and more frequent and intense storms. Ongoing and increased investment in natural climate solutions today will help the state maximize its carbon sink by 2045.

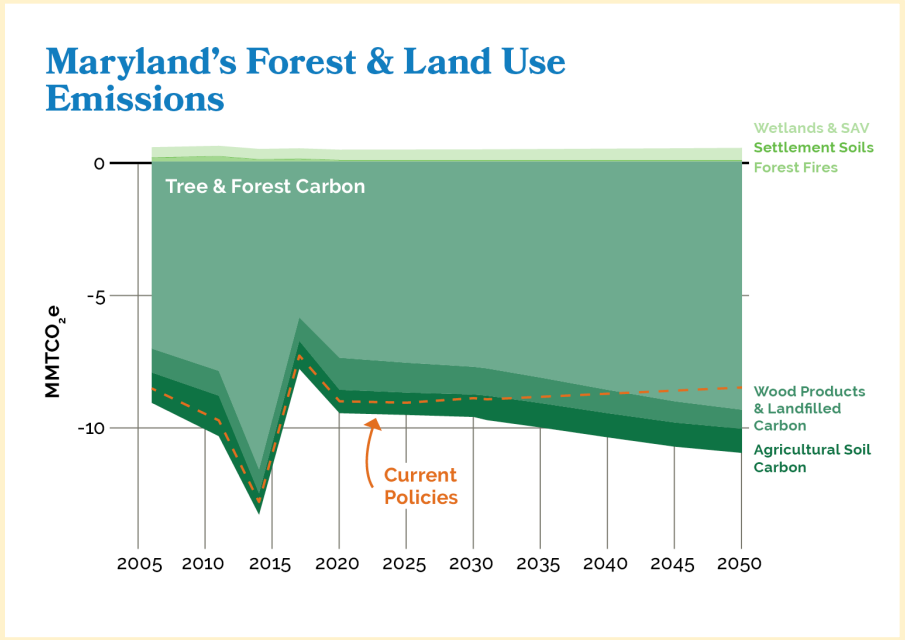

Figure 12. Maryland's forestry and land use sector GHG emissions and sinks, historical and projected, from 2006 to 2050 based on current policies and future potential.

3.2 GHG Emissions Projections

The University of Maryland (UMD) Center for Global Sustainability was contracted by MDE to evaluate options for achieving the state's requirements to reduce GHG emissions and, with supplemental analysis from the Regional Economic Studies Institute at Towson University (TU), identify economic impacts from these actions. In June 2023, MDE and UMD released *Maryland's Climate Pathway*, a report showing a package of policies that could achieve the state's climate goals. The report found:

- Current policies will reduce emissions 51% by 2031 - Current policies include Advanced Clean Cars II, Advanced Clean Trucks, Building Energy Performance Standards, EmPOWER, Renewable Portfolio Standard, etc., also federal policies and investments such as those made possible by the Inflation Reduction Act.
- Adding new sectoral policies could reduce emissions 56% by 2031 - New sectoral policies include Advanced Clean Fleets, Clean Power Standard (100% clean power by 2035), Zero-Emission Heating Equipment Standard, etc.
- Adding economy-wide policies to new sectoral policies could reduce emissions 60% by 2031 - New economy-wide policies, such as a cap and invest program, could be necessary for Maryland to achieve its emissions reduction goals.

MDE and UMD hosted seven public listening sessions from July to September 2023. The community was invited to participate in policymaking by testifying and submitting comments. Thousands of people participated in the sessions or submitted written comments. Feedback was carefully considered and often included in this report.

The Moore-Miller Administration, through MDE and other state agencies, is advancing the actions in the *Maryland's Climate Pollution Reduction Plan* published in December 2023 based on the findings of, and public response to, *Maryland's Climate Pathway*, findings of countless other studies, and the state's long history of developing and implementing policies to achieve the state's GHG reduction goals. Maryland will continue leading the transition to a clean energy economy by using the best science, data, and practicality.

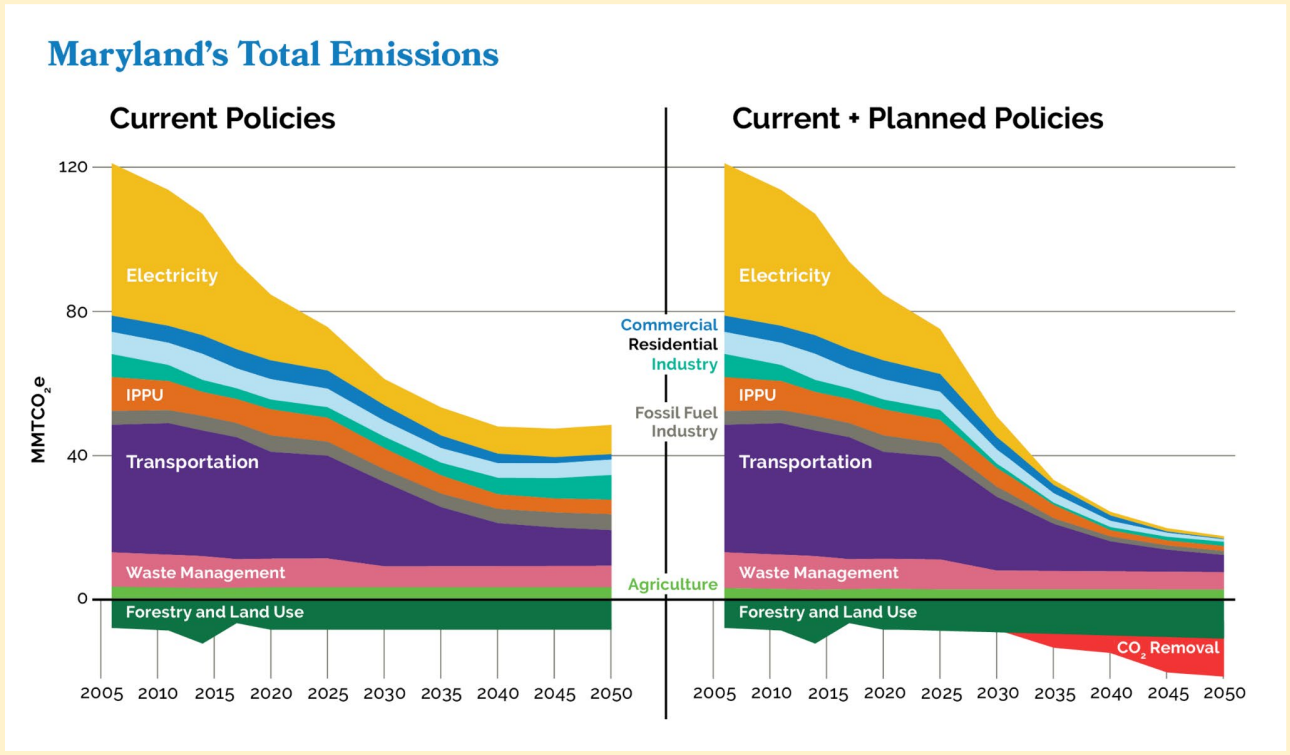

Figure 13. Maryland's statewide GHG emissions and sequestration trends, historical and projected, from 2006 to 2050 based on current and new policies.

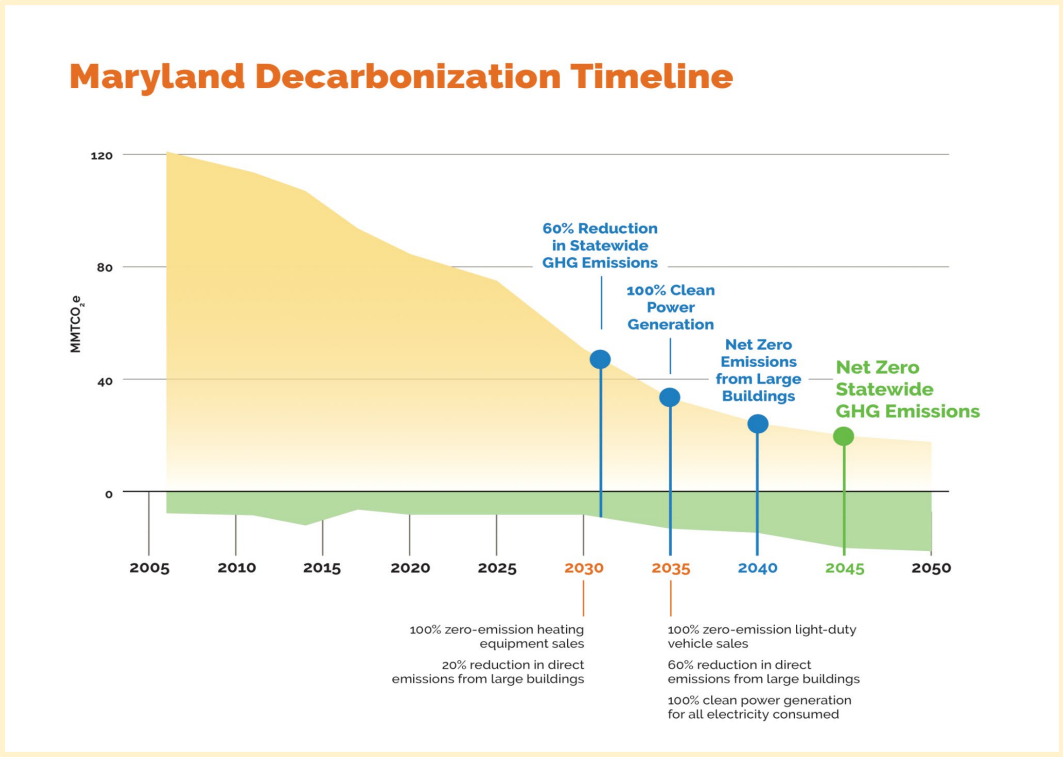

Figure 14. Major Milestones on Maryland's Decarbonization Timeline

3.3 GHG Reduction Targets

Maryland has long been a leader in addressing the cause of climate change, reducing GHG emissions faster than most other states while cleaning the air, improving public health, and growing the economy. In 2022, the Maryland General Assembly passed the CSNA, establishing the most ambitious GHG reduction goals of any U.S. state. Maryland is now required to reduce statewide GHG emissions 60% from 2006 levels by 2031 and achieve net-zero emissions by 2045 while creating jobs and net economic benefits. Net-zero emissions means that the total GHG emissions from Maryland's economy will be equal to the GHGs removed from the atmosphere through natural and technological systems annually.

3.4 GHG Reduction Measures

New policies will transition the state from the fossil fuel era of the past to a clean energy future. Marylanders will benefit from cleaner air, improved public health, lower energy costs, and more jobs with higher wages. As detailed in *Maryland's Climate Pollution Reduction Plan*, published in December 2023, new policies will generate up to $1.2 billion in public health benefits, $2.5 billion in increased personal income, and a net gain of 27,400 jobs between now and 2031 as compared with current policies. Average households will save up to $4,000 annually on energy costs. Air quality and public

health outcomes will improve for everyone, especially people living in historically underserved and overburdened communities.

Core policies of the *December 2023 Maryland Climate Pollution Reduction Plan* were aligned based on the *Modeling for the State's Climate Plan* to the 21 priority climate action plan measures (PCAP measures) to meet the quantification requirements of the EPA's Climate Pollution Reduction Grant Program. The key measures and policies discussed in this PCAP are as follows:

3.4.1 Summary of GHG Emissions Reduction Measures

Table 3.
Summary of GHG Emissions Reduction Measures Economy-wide and by Sector

Economy-wide	
PCAP MEASURE 1: Clean Economy Standard	Directs the state to provide incentives, set sectoral standards, and set economy-wide standards to reduce GHG emissions. **Expanded Strategic Energy Investment Fund -** Distributes funding from Maryland's participation in the Regional Greenhouse Gas Initiative and other programs to provide incentives for decarbonization projects across different sectors of Maryland's economy. **New Funding Sources -** Provides approximately $1 billion annually for new state investments in equitable climate action.
Electricity	
PCAP MEASURE 2: Increasing Renewable and Clean Energy	**Renewable Portfolio Standard -** Requires approximately 50% of electricity consumed in Maryland to be generated by renewable resources by 2030 and modifies definitions of qualifying resources. **POWER Act -** Sets a goal for the state to build 8,500 megawatts of offshore wind energy capacity by 2031. **Energy Storage Act -** Sets a goal for Maryland to have 3,000 megawatts of energy storage capacity by 2033. **Community Solar Act -** Requires community solar projects constructed under the program to dedicate 40% of energy output to LMI subscribers. Latest legislation removes the cap on the amount of community solar capacity that Maryland can deploy, constraining it only by the state's statutory net energy metering limit of 3,000 megawatts. **State Incentives for Renewable Energy -** Provides robust incentives for a wide range of renewable energy projects.

PCAP MEASURE 3: Regional Greenhouse Gas Initiative	Maryland's existing cap and invest program, which limits emissions from fossil fuel power plants and invests proceeds in Maryland communities, generated $151 million in 2022. Maryland is advocating for a stronger regional pollution cap aligned with Maryland's and partner states' 100% clean energy goals in ongoing multistate deliberations and planning to remove offsets and certain exemptions.
PCAP MEASURE 4: Clean Power Standard	Requires 100% of the electricity consumed in Maryland to be generated by clean and renewable sources of energy by 2035.
Transportation	
PCAP MEASURE 5: Advanced Clean Cars II	Requires 100% of new cars, light-duty trucks, and sport utility vehicles (SUVs) sold in Maryland to be ZEVs by 2035. **Zero-Emission Vehicle Infrastructure Plan -** A comprehensive plan to further develop Maryland's charging infrastructure for zero-emission vehicles (ZEVs). **State Incentives for Purchasing EVs -** Provides a point-of-sale rebate to lower the upfront cost of buying new and used EVs and provides bonus rebates to low- and moderate-income Marylanders.
PCAP MEASURE 6: Advanced Clean Trucks	Requires certain types of medium and heavy-duty trucks sold in Maryland to be ZEVs in certain years. **ZEV School Buses -** Requires school districts to purchase or contract for the use of ZEV school buses starting in 2024, provided that federal, state, or private funding is available to cover incremental costs, relative to non-ZEV buses.
PCAP MEASURE 7: Advanced Clean Fleets	Requires specific high-priority fleets of medium and heavy-duty vehicles to transition to ZEVs.
PCAP MEASURE 8: Maryland Transportation Plan and Carbon Reduction Strategies	Aims to reduce vehicle miles traveled per capita by 20% through infrastructure and programmatic investments. Also aims to minimize fossil fuel consumption, reduce greenhouse gas emissions, and improve air quality from the transportation sector. **ZEV Transit Buses -** Requires state-owned transit buses to transition to ZEVs. **Off-Road Zero-Emission Vehicle Upgrades** - Accelerating the widespread adoption of zero-emission off-road/non-road electric equipment at port facilities, aviation facilities, rail facilities and other non-road transportation modes.
Buildings	
PCAP MEASURE 9: Building Energy Performance Standards	Requires certain buildings 35,000 square feet or larger to achieve specific energy efficiency and direct emissions standards, including achieving net-zero direct emissions by 2040.

	State Government Lead by Example - Requires all-electric new construction and other emission reduction measures for state-owned buildings. **State Incentives for Building Decarbonization -** Provides substantial new funding for projects that improve energy efficiency and reduce emissions from residential, commercial, and institutional buildings statewide.
PCAP MEASURE 10: EmPOWER	Requires utility companies and the state government to help customers improve energy efficiency and reduce GHG emissions, including through beneficial electrification.
PCAP MEASURE 11: Zero-Emission Heating Equipment Standard	Requires new space and water heating systems to produce zero direct emissions starting later this decade. **Energy Codes and Standards -** Requires the state to adopt the latest version of the International Energy Conservation Code, with possible amendment, within 18 months of issuance. **EV-Ready Standards for New Buildings -** Requires EV charging equipment to be installed during the construction of single-family detached houses, duplexes, and townhouses, and extends new requirements to multifamily buildings.
PCAP MEASURE 12: Clean Heat Standard	Requires clean heat measures to be deployed in buildings at the pace required to achieve the state's GHG reduction requirements. **Gas System Planning -** Requires natural gas utility companies to plan their gas system investments and operations for a net-zero emissions future.
Industry	
PCAP MEASURE 13: Hydrofluorocarbon Regulations	Prohibits the use of certain products that contain particular chemicals with high global warming potential. **State Incentives for Industrial Decarbonization -** Supports decarbonization activities in Maryland's industrial sector.
PCAP MEASURE 14: Control of Methane Emissions from the Natural Gas Industry	Requires methane emissions from natural gas transmission and storage facilities to be mitigated through fugitive emissions detection and repair.
PCAP MEASURE 15: Buy Clean	Requires producers of cement and concrete mixtures to submit environmental product declarations to the state and for the state to establish a maximum acceptable global warming potential values for each category of eligible materials.
Waste	
PCAP MEASURE 16: Landfill Methane Regulations	Requires landfills to detect and repair landfill gas leaks and operate emission control systems to reduce methane emissions.

PCAP MEASURE 17: Sustainable Materials Management	Sets goals for GHG emissions reductions, material-specific recycling rates, and overall statewide recycling and waste diversion rates. **Food Residuals Diversion Law -** Requires businesses that generate at least one ton of food residuals per week to separate the food residuals from other solid waste and ensure that the food residuals are composted. **State Incentives for Waste Sector Decarbonization -** Provides substantial funding for waste sector decarbonization activities.
Agriculture	
PCAP MEASURE 18: State Incentives for Agricultural Decarbonization	Provides additional funding for decarbonization activities in Maryland's agricultural sector.
Forestry and Land Use	
PCAP MEASURE 19: Agricultural Resource Conservation and Management	Supports farmers in adopting best management practices that improve soil health and increase carbon sequestration on agricultural lands.
PCAP MEASURE 20: Afforestation and Improved Forest Management	Promotes tree planting activities and sustainable forestry management practices on public and private forest lands in Maryland. **Maryland 5 Million Trees Initiative -** Requires the state to plant and maintain five million native trees in Maryland by 2031, with at least 10% of these trees located in urban underserved areas of the state. **Forest Preservation and Retention Act -** Requires that when forested land is lost to development, it is either replaced through planting new trees or compensated for through conserving existing forest. **State Incentives for Forestry and Land Use -** Provides additional support for activities that promote enhanced carbon sequestration in Maryland's forestry and land use sector.
PCAP MEASURE 21: Coastal Wetland Restoration and Management	Maximizes carbon sequestration and coastal resilience benefits by protecting and restoring coastal wetlands.

3.4.2 Economy-wide

PCAP MEASURE 1: Clean Economy Standard

Geographic Location/Applicable Sector: Statewide/Economy-wide

Summary: The Clean Economy Standard directs the state to provide incentives, set sectoral standards, and set economy-wide standards to reduce GHG emissions. Modeling shows that a policy that would require polluters to pay for their pollution and provide at least $1 billion per year for clean economy investments could be critical for Maryland to achieve a 60% reduction in GHG emissions by 2031.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 3.476 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 15.558 MMTCO2e

Implementing agency or agencies: MDE, along with coordinating entities such as the Maryland Energy Administration

Milestones for obtaining implementing authority, as appropriate:

- Provide Incentives - Target investments in clean electricity, clean buildings, clean vehicles, and clean industry in communities throughout the state, especially overburdened and underserved communities.
- Set Sectoral Standards - Establish regulatory standards to ensure critical actions are taken in each sector of the economy.
- Set Economy-wide Standards - Consider expanding Maryland's cap and invest program or developing new revenue-generating policies to complement targeted investments and sectoral standards, while providing a sustainable revenue source for state-funded community investments.

Implementation Schedule: Expand the Strategic Energy Investment Fund (SEIF) which distributes funding from Maryland's participation in the Regional Greenhouse Gas Initiative (RGGI) and other programs to provide incentives for decarbonization projects across different sectors of Maryland's economy. New investments from SEIF will stimulate Maryland's economy and help consumers, businesses, local governments, farmers, and foresters invest an estimated $1 billion annually into measures that reduce reliance on fossil fuels, deploy clean energy solutions, and sequester more carbon in Maryland's natural and working lands. New investments will support:

  - Home Energy Efficiency and Electrification Incentives
  - Commercial, Multifamily, and Institutional Building Incentives
  - EV and Charging Infrastructure Incentives
  - Industry, Public Infrastructure, and Nature-Based Solutions Incentives

Metrics for Tracking Progress: To achieve the state's emissions goals, the new policy would need to reduce annual GHG emissions by 3.5 million metric tons of carbon dioxide equivalent (MMTCO2e) in 2031, and 15.6 MMTCO2e in 2045.

3.4.3 Electricity

PCAP MEASURE 2: Increasing Clean and Renewable Energy

Geographic Location/Applicable Sector: Statewide/Electricity

Summary: To effectively decarbonize Maryland's electricity supply, the state intends to increase the deployment of clean and renewable energy resources through the Renewable Portfolio Standard (RPS) and other clean energy initiatives.

- The Renewable Portfolio Standard requires approximately 50% of electricity consumed in Maryland to be generated by renewable resources by 2030.
- The Promoting Offshore Wind Energy Resources (POWER) Act sets a goal for the state to build 8,500 megawatts of offshore wind energy capacity by 2031.
- The Energy Storage Act of 2023 established a goal for Maryland to have 3,000 megawatts of energy storage by 2033.
- The Community Solar Act Requires community solar installations to dedicate 40% of energy output to low- and moderate-income customers.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.647 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: -1.561 MMTCO2e

Implementing agency or agencies: Maryland Public Service Commission (PSC), Maryland Energy Administration (MEA), Maryland Department of General Services (DGS), PJM

Milestones for obtaining implementing authority, as appropriate: No action needed as these are current policies.

Implementation Schedule:

<u>Renewable Portfolio Standard (RPS)</u>

- Maryland's Renewable Portfolio Standard (RPS) requires Maryland electric suppliers to provide increasingly large proportions of Maryland's electricity from renewable energy sources like solar, wind, hydropower, and qualifying biomass. The program is implemented through the creation, sale, and transfer of Renewable Energy Credits (RECs). The current RPS goal is for 52.5% for non-municipal utilities and 20.4% for municipal utilities of Maryland's electricity to come from renewable sources by 2030 through increases in solar power, deployment of new offshore wind energy off the Atlantic coast, and geothermal energy.
- Under the Clean Energy Jobs Act (CEJA) and through the SMART-Power partnership, Maryland aims to expand education and training programs to grow a new offshore wind workforce, expand local supply chains, support the redevelopment of and improvements to critical port infrastructure, and advance research and innovation. In addition, Maryland will work with the U.S. Department of the Interior Bureau of Ocean Energy Management to explore the expansion of offshore wind lease areas in federal waters.
- The *Climate Pollution Reduction Plan* calls for the definitions of qualifying resources in the RPS program to align with definitions of clean power resources under the forthcoming Clean Power Standard, including the elimination of eligibility for municipal solid waste incineration. Legislation will be needed to change the RPS definitions, which are set in the state's statute.

<u>POWER Act</u>

- The POWER Act intends to upgrade and expand the transmission system to accommodate the buildout of at least 8,500 MW of offshore wind energy from qualified projects and maximize the

opportunities for obtaining and using federal funds for offshore wind and related transmission projects.

Energy Storage Act

- The law requires PSC to implement a Maryland Energy Storage Program to cost-effectively procure energy storage over the next decade. PSC issued Order No. 90823 on October 2, 2023, initiating a workgroup to develop a Maryland Energy Storage Program and docketed Case No. 9715 to develop this program.

State Incentives for Renewable Energy

- Over the years, Maryland has hosted a wide range of incentives to encourage the new development of renewable energy projects. The Maryland Clean Energy Center (MCEC) provides public-private and public-public partnerships, including through leading Commercial Property Assessed Clean Energy (C-PACE), the Maryland Clean Energy Capital Program (MCAP), and the Clean Energy Advantage (CEA) Loan Program. The state also administers the Maryland Energy Storage Income Tax Credit Program and the Maryland Solar System Sales Tax Exemption. Local governments have created Green Banks, Finance Authorities, and Energy Conservation Tax Credits.

Metrics for Tracking Progress: RPS will continue to require that approximately 50% of electricity consumed in Maryland will be generated by renewable sources by 2030. RPS will also link with a new Clean Power Standard to achieve the Administration's goal for 100% of the electricity consumed in-state to be clean by 2035.

PCAP MEASURE 3: Regional Greenhouse Gas Initiative (RGGI)

Geographic Location/Applicable Sector: Statewide/Electricity

Summary: RGGI is a collaborative program among 11 East Coast states to reduce CO2 emissions from power plants through a regional cap and invest program. RGGI is currently composed of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Virginia. These states adopted market-based CO2 cap and invest programs designed to reduce emissions from fossil fuel-fired electric power generators with a nameplate capacity of 25 megawatts or greater. Maryland has participated in RGGI since the program's inception in 2007. Through RGGI, the participating states have cut power plant emissions in half while enjoying billions of dollars of economic benefit and creating thousands of jobs.

RGGI participating states reinvest the proceeds from the quarterly CO2 allowance auctions in consumer benefit programs to improve energy efficiency and accelerate the deployment of renewable energy technologies. Maryland allocates proceeds from the sale of CO2 allowances into SEIF - a special, non-lapsing fund administered by MEA. MEA deploys SEIF funds to promote affordable, reliable, and clean energy across Maryland's diverse regions and communities while reducing energy bills, creating jobs in growing industries, helping to reduce GHG emissions, increasing resiliency, and promoting energy independence. RGGI generated $151 million in 2022.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.271 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.729 MMTCO2e

Implementing agency or agencies: MEA, MDE, PJM

Milestones for obtaining implementing authority, as appropriate: No action needed as RGGI is a current initiative.

Implementation Schedule:

Maryland is advocating for a stronger regional pollution cap aligned with Maryland's and partner states' 100% clean energy goals in ongoing multistate deliberations and planning to remove offsets and certain exemptions. The participating states are expected to reach an agreement on a new program structure in 2024. If the outcome of the multistate agreement is not sufficiently stringent to meet the goals of the Climate Solutions Now Act, MDE will consider additional complementary regulations.

MDE, which enforces Maryland's regulations for RGGI participation, will also eliminate underutilized components of the program including offsets and the Limited Industrial Exemption Set Aside when it updates its CO2 Budget Trading Program regulation in 2024.

Metrics for Tracking Progress: RGGI sets a binding cap on CO2 emissions from power plants in the region that reduces every year. The 2030 Greenhouse Gas Emissions Reduction Act (GGRA) Plan proposed to reduce the RGGI cap to zero by 2040, with cost controls.

PCAP MEASURE 4: Clean Power Standard

Geographic Location/Applicable Sector: Statewide/Electricity

Summary: To achieve Governor Moore's commitment to achieve 100% clean power by 2035, strengthen Maryland's status as a climate leader, and support the goal of reducing statewide GHG emissions, the Administration and state agencies are developing a Clean Power Standard (CPS). CPS is a policy that will complement the RPS to ensure that all electricity consumed in the state is generated by clean and renewable sources of energy by 2035. Although the policy is still in development, it will likely allow for solar, wind, hydro, nuclear, energy storage, and other zero-emission technologies to qualify as clean energy sources, while eliminating existing eligibility and subsidies for municipal solid waste incineration.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.895 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 2.507 MMTCO2e

Implementing agency or agencies: MDE, MEA, DNR, PSC, OPC

Milestones for obtaining implementing authority, as appropriate: MEA, MDE, the Maryland Department of Natural Resources (DNR) Power Plant Research Program (PPRP), the Maryland Public Service Commission (PSC), and the Office of People's Counsel (OPC) will determine the best approach to a potential rulemaking.

Implementation Schedule: The state agency partnership will design requisite components, timing, and milestones for outcomes of a potential regulation, including responsible agency; designing supportive and/or complementary policy; identifying the relevance of existing and proposed federal policy; and identifying key stakeholders for their perspectives on a potential rule framework. The partnership will

address any economic and ratepayer impact. Ideally, a CPS would have minimal impact on electricity rates and promote public and private investment within the state. The goal is to design a program that mitigates potential ratepayer impacts, ensuring that existing inequities are remediated while stimulating economic growth within the state. Challenges related to generation deployment within the RPS will likely apply to CPS implementation as well.

Metrics for Tracking Progress: The Clean Power Standard requires 100% of the electricity consumed in Maryland to be generated by clean and renewable sources of energy by 2035.

3.4.4 Transportation

PCAP MEASURE 5: Advanced Clean Cars II

Geographic Location/Applicable Sector: Statewide/Transportation

Summary: The Maryland Clean Cars Act of 2007 required MDE to adopt regulations implementing the California Advanced Clean Cars I (ACC I) program in Maryland. The ACC I program is a dynamic, changing program in which many of the relevant California regulations are continuously updated to stay current with vehicular technology advancement and environmental science. To retain California's standards, Maryland must remain consistent with their regulations, hence when California updates its regulations, Maryland must reflect these changes by amending our regulations. The ACC I program included requirements for vehicles through model year 2025.

The Advanced Clean Cars II (ACC II) program requires that by 2035 all new passenger cars, trucks, and SUVs sold will be ZEVs. The ACC II program takes the state's already growing ZEV market and robust motor vehicle emission control rules and augments them to meet more aggressive tailpipe emissions standards and ramp up to 100% ZEV. The ACC II program adopts new requirements for model year 2026 and later vehicles.

To accomplish Maryland's goal for rapid growth in the number of ZEVs on Maryland's roads, building out a robust ZEV infrastructure network is critical. As such, the Maryland Department of Transportation's (MDOT's) National Electric Vehicle Infrastructure (NEVI) Plan, which was developed in partnership with Maryland Energy Administration (MEA), serves as the foundational first step for this strategic network buildout. The NEVI Plan details the strategy for awarding $63M of NEVI funds to build out and certify Maryland's 23 EV Alternative Fuel Corridors (AFCs) before investing in public community charging infrastructure throughout the state. Maryland's initiatives supporting increasing zero-emission vehicles include the following:

<u>State Incentives</u>

- The Maryland EV Tax Credit Program provides a one-time excise tax credit up to $3,000 for the purchase or lease of a new zero-emission plug-in electric or fuel cell electric vehicle. Businesses may also qualify for the tax credit for up to ten vehicles. Tax credits are issued on a first-come, first-served basis while funding is available.
- Maryland's Electric Vehicle Supply Equipment (EVSE) Rebate Program offers a one-time rebate for 50% of the costs of acquiring and installing qualified EVSA up to $700 for residential

installations and up to $5,000 for commercial installations. Rebates are also issued on a first-come, first-served basis while funding is available.

- A new Maryland Clean Vehicle Rebate program will provide a point-of-sale rebate of $2,500 for a new EV and $1,000 for a used EV to all Marylanders who meet the criteria to qualify for the federal Clean Vehicle Credit. The state incentive will stack on top of the federal incentive, which offers up to $7,500 for a new EV and $4,000 for a used EV. Combined, qualifying Marylanders would save $10,000 on a new EV and $5,000 on a used EV, making it even easier and less expensive for all low-, moderate-, and middle-income individuals, businesses, and tax-exempt organizations to purchase EVs.
- Low- and moderate-income Marylanders will be eligible for an additional bonus rebate of $5,000 for a new EV and $3,000 for a used EV, which brings the combined federal and state incentives for low- and moderate-income households to $15,000 for a new EV and $8,000 for a used EV. These stacked rebates roughly cut in half the purchase price of the more affordable new and used EVs currently available for sale. The new state rebate is designed to reduce a low- and moderate-income household's transportation costs to around 10% of annual income, which could significantly reduce the energy cost burden for many Maryland households.
- A Superuser Bonus program will provide additional incentives for Marylanders, including individuals and businesses/tax-exempt organizations located in Maryland, that commute the farthest and consume much more than the average amount of fuel for drivers in the state. Superusers in Maryland consume approximately two or more times the amount of motor fuel used by average drivers and tend to drive long distances for work. Helping superusers, who represent roughly 10% of Maryland drivers, switch from internal combustion vehicles to EVs would reduce on-road gasoline emissions by 30% or more.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.902 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 5.814 MMTCO2e

Implementing agency or agencies: MDE, MDOT, MEA, Electric Utilities

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: Maryland's implementation of the ACC II program will begin with the 2027 model year. Although there are a substantial number of conforming revisions, the major revisions associated with the ACC II program consist of a requirement that vehicle manufacturers continue to offer more ZEVs for sale, culminating in a 100% sales requirement by model year 2035, and a requirement that internal combustion engine vehicles meet increasingly stringent pollutant standards during the period in which they continue to be sold.

Zero-Emission Vehicle Infrastructure Plan (ZEVIP) and NEVI Plan and Plan Update: These documents describe the comprehensive plan to further expand Maryland's charging infrastructure for zero-emission vehicles (ZEVs). This will build upon NEVI implementation currently underway.

- MDOT submitted the Maryland State Plan for NEVI Formula Funding Deployment to the Federal Highway Administration (FHWA) in 2022, and the 2023 Update of the 'NEVI Plan' in August 2023. The 2023 Plan Update, approved by FHWA in September 2023, describes Maryland's activities that support the successful deployment of charging infrastructure. This ensures that

there will be reliable EV infrastructure accessible to the traveling public, with a minimum of two stations per EV AFC capable of charging four EVs simultaneously and located no more than 50 miles apart. MDOT anticipates the addition of 40-48 charging sites along Maryland AFCs to achieve corridor build-out and certification by FHWA. After corridor buildout the remaining NEVI funds under the Bipartisan Infrastructure Law will then be invested in community charging to increase equitable charging across diverse locations in the state.

The NEVI Plan is updated annually. In its 2024 update of the NEVI Plan, MDOT will address progress in Maryland's first round of NEVI awards, potential applications of NEVI funding to support Medium- and Heavy-Duty Vehicle (MHDV)/Trucking infrastructure and continued engagement with the public, industry, and other stakeholders. Throughout NEVI deployment, MDOT will prioritize disadvantaged and rural communities, support workforce development, and collaborate closely with public and private stakeholders.

The NEVI Plan, including its annual updates, will constitute the foundation of a greater statewide strategy for light-, medium- and heavy-duty electric vehicle charging infrastructure known as the Zero-Emission Vehicle Infrastructure Plan (ZEVIP). ZEVIP will take into consideration not only the demand for robust charging infrastructure to support ACC II goals, but also to support ACT goals as well, which are discussed in the following section.

Metrics for Tracking Progress: 100% of new cars, light-duty trucks, and sport utility vehicles (SUVs) sold in Maryland to be ZEVs by 2035.

PCAP MEASURE 6: Advanced Clean Trucks (ACT)

Geographic Location/Applicable Sector: Statewide/Transportation

Summary: Maryland's Clean Trucks Act of 2023 requires MDE to exercise authority and adopt regulations implementing the California ACT program in Maryland. Adopting ACT in Maryland will result in a significant reduction of harmful emissions associated with medium- and heavy-duty trucks and help Maryland attain its air quality goals. The ACT program will reduce NOx, PM2.5, and GHG emissions from the mobile source sector as cleaner, zero-emission trucks replace older internal combustion vehicles.

Robust ZEV infrastructure is critical to enable the transition to medium and heavy-duty ZEV in Maryland, regionally, and nationally. Therefore, Maryland's ZEVIP and NEVI Plan must include investments in deploying charging infrastructure for commercial medium- and heavy-duty ZEV at sites along major highways and freight corridors, as well as support private fleet charging depots.

Zero-Emission School Buses: The CSNA includes school bus electrification as a goal for the state. Under the CSNA, beginning in fiscal year 2025, a county board of education may not enter into a new contract for the purchase or use of any school bus that is not a zero-emission vehicle. There are exemptions for lack of sufficient funding or availability of a vehicle that meets the performance requirements. The CSNA also permitted electric utilities to provide rebates for school buses subject to certain limitations.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.496 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.821 MMTCO2e

Implementing agency or agencies: MDE, MDOT, MEA, County/City School Districts (for school buses), Electric Utilities

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: MDE adopted regulations in 2023 through incorporation by reference of the applicable California regulations.

Zero-Emission School Buses

- CSNA requires school districts to purchase or contract for the use of ZEV school buses starting in 2024, provided that federal, state, or private funding is available to cover incremental costs, relative to non-ZEV school buses. Switching over to electric fleets has become a goal for many cities and school districts. As of June 2023, there were 2,277 electric buses either on the streets or on order for school districts in the U.S., according to the World Resources Institute. More than double that number are committed, meaning that school districts plan to continue electrifying their fleets.

  Several school districts in Maryland have already deployed or are in the process of deploying ZEV school buses, often using federal or state incentives to assist with the transition. For example, through Maryland's Clean Fuels Incentive Program (CFIP), five school districts received grant funding for more than 20 ZEV school buses from 2021-2023. More ZEV school buses are expected to be funded through the Medium- and Heavy-Duty Emission Vehicle Grant Program, discussed further in the following section, succeeding CFIP.

Zero-Emission Commercial Medium- and Heavy-Duty Vehicles (MHDV)

- State funding for the purchase of new Class 3-8 electric vehicles will be offered through Maryland's Medium- and Heavy-Duty Zero-Emission Vehicle Grant Program, which is required by statute. These competitive grants will offset up to 75% of incremental costs associated with transitioning commercial on- and off-road fleets to battery electric or fuel cell vehicles that will be primarily domiciled and operated in the state.

Metrics for Tracking Progress: Requires certain types of medium and heavy-duty trucks sold in Maryland to be ZEVs in certain years.

PCAP MEASURE 7: Advanced Clean Fleets

Geographic Location/Applicable Sector: Statewide/Transportation

Summary: The California Advanced Clean Fleets (ACF) regulation applies to fleets performing drayage operations (freight from an ocean port to a destination), those owned by state, local, and federal government agencies, and high-priority fleets. High-priority fleets are entities that own, operate, or direct at least one vehicle in the state, and that have either $50 million or more in gross annual revenues, or that own, operate, or have common ownership or control of a total of 50 or more vehicles (excluding light-duty package delivery vehicles). The regulation affects medium- and heavy-duty on-road

vehicles with a gross vehicle weight rating greater than 8,500 pounds, off-road yard tractors, and light-duty mail and package delivery vehicles.

The state will also provide technical assistance grants to owners of small fleets (with 10-199 vehicles) to help develop fleet electrification plans. Fleet vehicles are typically driven more miles annually than average vehicles, so they have an outsized impact on transportation sector emissions and an outsized opportunity to reduce emissions through electrification. Additional details on these incentives can be found in the 2023 Annual Report of the Maryland Commission on Climate Change.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: -0.001 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 1.782 MMTCO2e

Implementing agency or agencies: MDE

Milestones for obtaining implementing authority, as appropriate: MDE would be responsible for developing, adopting, and implementing regulations to enact and enforce ACF in Maryland. MDE intends to work with stakeholders in 2024 to analyze and determine if adopting ACF would result in emissions reductions beyond those expected by Maryland's adoption of the ACT regulation.

Implementation Schedule: Under the ACF program, covered fleets are required to make an increasing amount of their new purchases be ZEVs. These ZEV purchase requirements are phased-in beginning in 2025. Between 2035 and 2042, all covered fleets are required to make 100% of their new vehicle purchases ZEVs. This regulation would work in conjunction with the ACT regulation, which helps ensure that ZEVs are brought to market.

Metrics for Tracking Progress: Advanced Clean Fleets (ACF) would require specific high-priority fleets of medium and heavy-duty vehicles to transition to ZEVs.

PCAP MEASURE 8: Maryland Transportation Plan and Carbon Reduction Strategies

Geographic Location/Applicable Sector: Statewide/Transportation

Summary: The Maryland Department of Transportation (MDOT) recently published plans to advance the reduction of greenhouse gas emissions from the transportation sector. Specifically, MDOT's Carbon Reduction Strategy (CRS), required by the Bipartisan Infrastructure Law, documents existing strategies available to Maryland for transportation emissions reduction. MDOT also prepared a transportation-specific appendix to MDE's *Climate Pollution Reduction Plan* (CPRP) to help Maryland meet its goals of 60% reduction in GHG emissions statewide by 2031 from the Climate Solutions Now Act of 2022. The updated long-range Maryland Transportation Plan (MTP) provides overarching direction for MDOT actions and includes a goal to reduce per capita vehicle miles traveled (VMT) by 20%. Vehicle technology, vehicle fuel or energy use, and VMT are drivers of transportation sector GHG emissions. VMT has steadily increased in Maryland since 2014, with over 60 billion VMT in 2019. VMT dropped in 2020 due to the COVID-19 pandemic but has mostly rebounded to pre-pandemic levels. While MDOT anticipates that VMT will return to 2019 levels over the next five years, there is uncertainty regarding the exact timeline and pace of the recovery.

Reducing projected traffic on Maryland's roads is crucial to reducing GHG emissions from the transportation sector. Reduction of VMT will require implementation of numerous complementary strategies with a focus on trip reduction, trip consolidation, and mode shift. Examples include increased telework, broader deployment of transportation demand management (TDM) programs such as increased car sharing incentives and services and Commuter Choice Maryland, accelerating bicycle and pedestrian projects, transit-oriented development (TOD), and ensuring reliable and efficient public transportation networks. Maryland is also investing in transitioning its public transit bus fleet to ZEVs. This requires state-owned transit buses to transition to ZEVs.

Off-Road Zero-Emission Vehicle Upgrades - This measure also includes accelerating the widespread adoption of zero-emission off-road/non-road electric equipment at port facilities, aviation facilities, rail facilities and other non-road transportation modes. These vehicles include marine vessels, locomotives, airplanes, drones, and on-site equipment such as shuttles, fueling vehicles, and other vehicles necessary to operate non-road transportation facilities and hubs. It also includes transitioning government owned and operated equipment to electric.

Maryland Aviation Administration (MAA) has robust sustainability practices to reduce food waste from airport operations, convert its shuttle bus fleet to electric, and support wetland and environmental restoration efforts. In FY 2022, both its BWI Thurgood Marshall Airport and Martin State Airport received Federal Aviation Administration Airport Improvement Program awards to develop decarbonization strategies at both facilities. MAA has also invested in solar power generation and has recently completed the Solar PV Array Siting and Feasibility Study. The Study evaluated more than 50 sites on the BWI Marshall campus, including existing terminal structures.

The Maryland Port Administration (MPA) owns several public marine terminals that are the core of the greater Port of Baltimore, the 11th largest port in the nation. MPA works closely with tenants and shipping companies to advance emission reduction programs for off-road cargo handling equipment, including the Cargo Handling Equipment Replacement and Repower Program. This program helps owners replace existing diesel cargo handling equipment with zero emission equipment. Continuing to invest in the replacement of these pieces of equipment will improve air quality in nearby communities and reduce greenhouse gas emissions while also promoting the efficiency of cargo movement at one of the busiest ports on the east coast.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.684 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 1.089 MMTCO2e

Implementing agency or agencies: MDOT

Milestones for obtaining implementing authority, as appropriate: MDOT's 2050 Maryland Transportation Plan (MTP) includes an objective to reduce VMT per capita by 20%, which will guide transportation project selection and development. The MTP also includes an objective to minimize fossil fuel consumption, reduce greenhouse gas emissions, and improve air quality. MAA is developing a Decarbonization Roadmap analyzing the feasibility of a variety of decarbonization measures including but not limited to increasing renewable energy onsite, building a microgrid, electrifying fleet vehicles, reducing vehicle miles traveled by the public as well as airport employees, and increasing energy

efficiency. When finalized, MAA's Decarbonization Roadmap will provide metrics and specific project activities to track and measure progress.

Implementation Schedule: New VMT reduction measures will include investments to deliver more transportation choices as well as incentives to encourage the use of such options. Specifically, MDOT initiatives include launching new public transportation infrastructure such as rail and clean bus lines, making transit safe, efficient, and easy to use, and actively catalyzing transit-oriented-development (TOD) to help increase transit ridership and support housing and economic development. MDOT will ramp up investments and policies to accommodate bicyclists and pedestrians routinely and safely on our extensive road network by retrofitting streets with bike lanes, sidewalks, and traffic calming measures. MDOT will also increase our commitment to TDM measures. For example, Commuter Choice Maryland has helped expand IncenTrip statewide and is exploring options to implement a statewide vanpool incentive and support the Maryland Jobs Access Reverse Commute (MD-JARC) program.

Additionally, MDOT will seek federal funding support for the Maryland Transit Administration's Zero Emission Bus procurement and facilities conversion program, which seeks to convert 50% of its bus fleet to zero emission by 2030 as well as a complete reconstruction of the Eastern Bus Division to support this zero-emission transition.

Zero-Emission Transit Buses

- The first seven electric buses were delivered to the Maryland Transit Administration (MTA) in the Fall of 2023, and MTA is contracting for up to 350 more over the next five years. In addition, MTA is working closely with its electric utility provider, electric charging and power distribution suppliers, transit labor unions, and employees to ensure a seamless transition to zero emissions that maintains reliable bus service. Technology advances that increase the range of electric transit buses and increase hydrogen fuel availability will be important components to successful transit fleet conversions in Maryland.

Off-Road Zero-Emission Vehicle Upgrades - Actions to implement off-road zero-emission vehicle upgrades at port facilities, aviation facilities, rail facilities and other non-road transportation modes could include, but are not limited to:

- Expand or create new incentive and technical assistance programs to promote and spread the use of electric equipment.
- Investigate innovative low- or zero-emission vehicles and technologies at the Port of Baltimore and BWI Thurgood Marshall International Airport.

Metrics for Tracking Progress: The Maryland Transportation Plan aims to reduce vehicle miles traveled per capita by 20% through infrastructure and programmatic investments. Implementation of zero-emission off-road/non-road electric equipment measured in number of pieces of electric equipment or electric off-road vehicles procured by MDOT. MDOT MTA percentage of zero emission buses in fleet and number of bus facilities equipped for zero emission bus operations.

3.4.5 Buildings

PCAP MEASURE 9: Building Energy Performance Standards

Geographic Location/Applicable Sector: Statewide/Buildings

Summary: Building Energy Performance Standards (BEPS) applies to buildings in Maryland that have a gross floor area of 35,000 square feet or more (excluding the parking garage area). Historic properties, public and nonpublic elementary and secondary schools, manufacturing buildings, agricultural buildings, and federal buildings are exempt. There are approximately 9,000 covered buildings in Maryland located across all counties. The goal is to reduce direct GHG emissions and improve overall energy efficiency from Maryland's BEPS covered buildings. Maryland BEPS requires covered building owners to measure and report data to MDE. Maryland BEPS further requires that covered building owners meet specific net direct GHG emissions and energy use intensity (EUI) standards. This dual- standard system promotes efficient electrification to enable Maryland's clean energy transition, minimize electricity grid impacts, and achieve Maryland's goal of net-zero GHG emissions by 2045.

State Government Lead by Example: Requires all-electric new construction and other emission reduction measures for state-owned buildings. The Department of General Services' (DGS) Energy Office partnered with University System of Maryland (USM) to purchase over $165 million of electricity in FY 2023. Included in the energy commodity purchases are three 20-year Power Purchase Agreements (PPAs) of renewable energy from two utility-scale wind installations and one solar installation. In FY 2023, the state government spent approximately $19 million on renewable electricity, which accounted for 11.5% of the electricity cost for state operations.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.083 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.621 MMTCO2e

Implementing agency or agencies: MDE

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: MDE is in the process of adopting Building Energy Performance Standards (BEPS) for covered buildings to achieve a 20% reduction in net direct GHG emissions on or before January 1, 2030, as compared with 2025 levels for average buildings of similar construction, net-zero direct GHG emissions on or before January 1, 2040, and improve overall energy efficiency. Covered buildings are subject to interim performance standards before 2040 and to a final performance standard that must be achieved on an annual basis in 2040 and beyond.

Between 2025 and 2040, building owners whose buildings do not already meet the BEPS standards will be required to implement energy efficiency measures and/or electrification measures or pay alternative compliance fees in order to comply with BEPS. As building owners implement these measures, they will begin to save money from reduced energy costs. Savings from reduced energy costs will accumulate and increase over time and beyond the initial implementation period for BEPS.

Results from a 2023 study by the U.S. Department of Energy's Lawrence Berkeley and Pacific Northwest National Laboratories demonstrate that during BEPS implementation (2025-2040), all covered buildings combined will spend more on efficiency measures ($8.8B) and electrification measures ($6.4B) than the energy cost savings accrued in this period ($8.96B). However, on a longer time horizon (2025-2050),

energy cost savings increase to $22.3B, indicating net savings for Maryland's covered buildings. On average, over the 2025-2050 time horizon, covered buildings save $4.47 per square foot in energy costs. However, there is significant variation with 25% of covered buildings modeled to save more than $9.29 per square foot and 25% of covered buildings modeled to lose more than $4.43 per square foot.

The CSNA established, among many other provisions, the creation of the Building Energy Transition Implementation Task Force ("Buildings Task Force"). The Buildings Task Force met throughout 2023 to fulfill its mandate of providing recommendations to support the policies and decarbonization goals for Maryland's buildings. The Buildings Task Force recommendations reflect the reality that the building energy transition will require significant financial, technical, and practical solutions to help raise money, get money out the door, help owners invest their money in their buildings for maximum benefit, guide projects to high quality standards, provide long-term social and environmental benefits, and equitably benefit Maryland residents.

State Government Lead by Example: In 2022, DGS adopted an all-electric policy for planning and implementing new construction and major renovations. One of the first new all-electric buildings will be the Supreme Court of Maryland located in Annapolis. The building is approximately 215,000 square feet, will include electric vehicle charging infrastructure, and will attain Leadership in Energy and Environmental Design (LEED) Silver certification. Since 2020, DGS has also managed the replacement of nearly fifty thousand fluorescent light fixtures in state-owned buildings with high-efficiency LEDs and controls. Due to a strong focus on energy efficiency, overall energy use in state-owned buildings has declined nearly 12% since 2018.

Metrics for Tracking Progress: Certain buildings 35,000 square feet or larger must achieve specific energy efficiency and direct emissions standards, including achieving net-zero direct emissions by 2040.

PCAP MEASURE 10: EmPOWER

Geographic Location/Applicable Sector: Statewide/Buildings

Summary: In response to concerns relating to sufficient electricity supply and reliability, the Maryland General Assembly passed the Maryland Energy Efficiency Act of 2008, thereby establishing the EmPOWER Maryland Program. The EmPOWER energy efficiency programs are managed by the five largest electric utility companies and the Department of Housing and Community Development (DHCD). As reported in PSC's 2015 annual report to the General Assembly, the EmPOWER programs were successful at meeting initial goals relating to the reduction of per capita consumption and per capita demand. This first phase of EmPOWER was shown to have provided customer bill savings, lower wholesale energy prices due to the reduced need for infrastructure investments, and a reduction in GHG emissions.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.841 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.816 MMTCO2e

Implementing agency or agencies: PSC, DHCD, Electric Utility Companies

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current program.

Implementation Schedule: In 2015, PSC established a new target for the five participating electric utilities: 2% annual incremental energy savings based on gross electricity sales by 2020. In 2017, this percentage goal was codified into law by the General Assembly. The percent target is based on a rolling baseline using the data from the year before the current three-year program cycle. Not only does the PSC consider aspects of its general authority to regulate utilities, such as public safety and climate change in approving programs, but over time the Public Utilities Article has also required that the PSC consider cost-effectiveness to encourage and promote the efficient use and conservation of energy. Through a rigorous evaluation process, the PSC reviews progress on EmPOWER on a semi-annual basis and may request program and budget changes.

As of 2023, the EmPOWER Program is concluding its fifth three-year cycle (2021-2023) and includes both electric and gas utility companies and DHCD. EmPOWER programs are managed by the following companies: Baltimore Gas and Electric Company (BGE), Potomac Edison Company (PE), Delmarva Power & Light (Delmarva), Potomac Electric Power Company (PEPCO), Southern Maryland Electric Cooperative, Inc. (SMECO), and Washington Gas Light Company (WGL). DHCD also provides EmPOWER programs and is aiming to increase annual energy savings across all limited-income households.

The PSC's Future Programming Work Group recommended that a GHG reduction goal be established as the central goal under EmPOWER. *Maryland's Climate Pollution Reduction Plan* calls for legislation to establish GHG reduction goals and require EmPOWER programs to include beneficial electrification. Beneficial electrification refers to the use of electricity to replace the direct use of fossil fuels in buildings in a manner that reduces overall lifetime GHG emissions or customers' energy costs. In addition to the continuation of efficiency efforts for electric utilities, EmPOWER will likely evolve in alignment with other GHG reduction policies, the PSC's program processes, and in response to cost implications.

Metrics for Tracking Progress: The CSNA requires that the utility companies' EmPOWER programs meet increasingly higher energy savings goals: 2.25% annually in 2025 and 2026, and 2.5% annually in 2027 and thereafter. Additionally, in 2023, legislation was enacted that established energy savings goals for DHCD requiring energy savings of 0.53% in 2024, 0.72% in 2025, and 1% in 2026 for limited-income households.

PCAP MEASURE 11: Zero-Emission Heating Equipment Standard

Geographic Location/Applicable Sector: Statewide/Buildings

Summary: The Zero-Emission Heating Equipment Standard (ZEHES) is a new state policy that will require new heating systems installed in Maryland buildings to produce zero on-site emissions beginning later this decade. Zero-emission heating equipment including electric water heaters and heat pumps for space heating and cooling are already widely used across Maryland. New technologies, falling prices, and robust federal, state, and utility-sponsored incentives for heat pump water heaters and space heating/cooling systems make heat pumps the preferred solution for energy-efficient, low-cost, zero-emission buildings. Marylanders can currently take advantage of a federal tax credit providing up to $2,000 off the cost of installing a heat pump. Starting in 2024, MEA will offer rebates that provide up to $8,000 off the cost of installing a heat pump for some low-, moderate-, and middle-income households. As rulemaking begins in 2024, a comprehensive cost-benefit analysis will be conducted for ZEHES.

Supporting initiatives also include:

- Energy Codes and Standards: Requires the state to adopt the latest version of the International Energy Conservation Code, with possible amendment, within 18 months of issuance. The Maryland Building Performance Standards (MBPS) requires that Maryland jurisdictions implement the latest edition of building code requirements, including those pertaining to the International Building Code (IBC), the International Residential Code (IRC), and the International Energy Conservation Code (IECC). In Maryland, the Codes need to be considered for new construction as well as major renovations. According to Maryland law, the state may not adopt energy conservation requirements that are less stringent than the requirements in the IECC. Upon the MBPS being released, local jurisdictions are responsible for the modification and adoption of codes.

- EV-Ready and Solar-Ready Standards for New Buildings**:** Requires EV charging equipment to be installed during the construction of single-family detached houses, duplexes, and townhouses, and extends new requirements to multifamily buildings.

MEA is studying the cost, barriers, and impacts of requiring multifamily residential buildings to include EV-ready and EVSE-installed parking spaces. Pending the findings of MEA's study, *Maryland's Climate Pollution Reduction Plan* calls for the Maryland General Assembly to introduce legislation requiring EV-ready and EVSE-installed parking spaces in new multifamily buildings. Legislation should also require solar-ready standards for new buildings.

Additional state funding will be necessary for rapid building decarbonization in Maryland. The IRA rebates are among MEA's residential energy efficiency and electrification programs that will be supercharged with new funding from the state. New programs will be established to support efficiency and electrification projects in commercial, institutional, and industrial buildings, including those covered by BEPS or other state requirements that require building improvements. Some of the funding will also support projects in Maryland's elementary and secondary schools to reduce energy costs for local school districts and improve the health and well-being of students statewide.

State Incentives

- Using $137 million from the IRA, MEA will begin in 2024 offering two new rebate programs to reduce energy costs for people living in single-family and multi-family buildings. The Home Efficiency Rebates program will provide homeowners and landlords up to $4,000 or 50% of project costs for eligible efficiency upgrades that are projected to save at least 35% of a home's energy use and up to $2,000 or 50% of project costs for projects with modeled energy savings ranging from 20-34%. Higher rebate amounts are available for households with income levels less than 80% of the area median income (AMI).

- The Home Electrification and Appliance Rebates program will provide rebates to households with incomes up to 150% of AMI or multifamily buildings in which at least 50% of residents have incomes equal to or less than 150% AMI. Rebates will be provided to qualifying homeowners and multifamily building owners for specific electrification measures, which may include:
    - Heat pump air conditioning and heating system: not to exceed $8,000.
    - Electric panel upgrades: not to exceed $4,000.

  - Electric wiring: not to exceed $2,500.
  - Heat pump water heaters: not to exceed $1,750.

- MEA and other state agencies will work to ensure that Marylanders are aware of these rebate and tax incentive programs and can take advantage of them. Education of contractors, building owners, and customers will be critical to the achievement of these goals, as will the development of rebate application processes that are accessible to all Marylanders, including low-income building owners and occupants. It is also crucial that the new IRA rebate programs be coordinated with utility and DHCD-run EmPOWER programs and DHCD's weatherization and whole home repair programs.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.765 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 3.433 MMTCO2e

Implementing agency or agencies: MDE, MEA

Milestones for obtaining implementing authority, as appropriate: MDE is responsible for developing, adopting, and implementing regulations to enact and enforce ZEHES in Maryland. MDE will initiate a rulemaking process in 2024 to propose draft regulations based on existing statutory authority before 2025.

Implementation Schedule: Maryland is among several states moving to adopt zero-emission appliance/heating equipment standards. In September 2023, Maryland joined with 24 other states in the U.S. Climate Alliance in committing to quadruple the number of heat pumps installed by 2030. With ZEHES, new buildings will be constructed with zero-emission heating equipment and the existing building stock will transition to having almost all space and water heating demand provided by zero-emission heating equipment by 2045. Cooking equipment is not covered by this policy, but incentives will be provided to help Marylander's upgrade to electric cooking appliances, which can significantly improve indoor air quality compared to cooking with combustible fuels.

ZEHES will not require anyone to remove a working furnace, boiler, or other piece of heating equipment. Existing fuel-burning equipment can continue to be serviced and remain in place until the time the individual decides to replace their fuel-burning equipment. It is at this time of replacement that new equipment will need to meet the zero-emission standard. The effect of this policy will be, over time, to replace one-way air conditioning (AC) units with two-way heat pumps, which function as efficient AC and can reverse cycle to provide efficient heating. Modern heat pumps are more than capable of meeting 100% of the heating demand of Maryland buildings, as evidenced by the fact that heat pumps are already commonly used in buildings statewide.

<u>Energy Codes</u>

- Each local jurisdiction must implement and enforce the most current version of MPBS and any local amendments to MPBS. In addition, any modification to MBPS adopted by the state must be implemented and enforced by a local jurisdiction no later than 12 months after the modifications are adopted by the state. The building energy codes apply to all building owners undergoing new construction or large renovations, and the MBPS applies to all buildings and structures within the state for which a building permit application is received by a local government. Maryland's 23 counties are responsible for the adoption of new building energy

codes and related operational impacts. Impacted entities may include local governments, state governments, schools, residential property owners, and nonresidential property owners.

EV Ready and Solar-Ready Standards

- Beginning in October 2023, homebuilders in Maryland are required to include EV charging equipment during the construction of single-family detached houses, duplexes, and townhouses. Specifically, each new housing unit in Maryland must include one EVSE-installed or EV-ready parking space capable of providing level-2 charging in a garage, carport, or driveway. EVSE-installed means having an EV charging device that is fully installed and ready to use at a parking space. EV-ready means having electrical panel capacity and wiring in place to easily install a level-2 EV charger in the future.

As of July 1, 2023, Maryland House Bill (HB) 169 "Public Utilities - Energy Efficiency and Conservation Programs - Energy Performance Targets and Low-Income Housing" established the Green and Healthy Task Force to address the following: 1) to advance the alignment, branding, and coordination of resources to more effectively deliver green and healthy housing for low-income households in the State, 2) examine the public and private resources needed to address the housing needs of low-income communities, 3) develop policy and statutory recommendations to eliminate barriers to low-income households achieving healthy, energy-efficient, affordable, and low-emission housing and 4) engage with interested parties and collaborate with other entities that can help advance the goals of the task force, including experts in the field of healthy, energy-efficient, and low-emission housing.

In order to achieve the ambitious goals of building electrification in the state, a comprehensive, coordinated, and community-informed approach that will ensure equitable access to energy efficiency, electrification, and renewable energy technologies is needed.

Metrics for Tracking Progress: Quadruple the number of heat pumps installed by 2030; transition to having almost all space and water heating demand provided by zero-emission heating equipment by 2045.

Energy Codes: The CSNA required the state to adopt the IECC (2018 Edition) by January 2023 and to adopt each subsequent version of the IECC within 18 months after it is issued.

EV-Ready and Solar-Ready Standards: The state is in its third year of transitioning its 4,000-vehicle fleet to EVs. In parallel with purchasing EVs, DGS installs EV charging infrastructure across the state at all agencies. The goal is to install at least 2,000 EV charging ports by 2030.

PCAP MEASURE 12: Clean Heat Standard

Geographic Location/Applicable Sector: Statewide/Buildings

Summary: A Clean Heat Standard (CHS) is a performance-based approach to reducing GHG emissions from the building sector. CHS is designed to broadly decarbonize covered sectors in a manner that is market-based and friendly to customer choice in coordination with other programs. It complements and supports the achievement of other policies including energy codes and standards, EmPOWER, Building Energy Performance Standards (BEPS), and Zero-Emission Heating Equipment Standards (ZEHES). As a

sector-specific policy, it ensures that decarbonization proceeds at the pace needed to achieve the state's goals.

CHS requires natural gas utility companies and heating oil and propane importers to reduce the GHG emissions associated with their businesses following a schedule set by MDE. As a market-based performance standard, obligated parties can meet the requirements in several ways including but not limited to helping their customers save energy, helping their customers install heat pumps, and replacing fossil fuels with lower-impact fuels. Obligated parties can also work with third parties to deploy a range of clean heat measures that reduce emissions. Anything that reduces emissions from buildings helps the obligated parties meet the CHS requirements, so as customers take advantage of federal, state, and EmPOWER incentives for energy efficiency and electrification upgrades or take any other actions to reduce emissions from buildings, the customers' actions help the obligated parties achieve their requirements. As rulemaking begins in 2024, a comprehensive cost-benefit analysis will be conducted for CHS.

Other Supporting Initiatives:

- Gas System Planning: Requires natural gas utility companies to plan their gas system investments and operations for a net-zero emissions future. Respecting PSC's status as an independent state agency, MDE supports the call for PSC to oversee the development and implementation of gas system planning to achieve a structured transition to a net-zero emissions economy in Maryland.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.769 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.757 MMTCO2e

Implementing agency or agencies: MDE, PSC

Milestones for obtaining implementing authority, as appropriate: MDE is responsible for developing, adopting, and implementing regulations to enact and enforce CHS in Maryland. MDE will initiate a rulemaking process in 2024 to propose draft regulations based on existing statutory authority before 2025.

Implementation Schedule: CHS and ZEHES can work together to deliver the lowest-cost pathway for decarbonizing buildings. While ZEHES, electrification incentives, and other policies will transition almost all of Maryland's fuel-burning buildings to be all-electric by 2045, CHS layers on top of these policies to increase the pace of building sector decarbonization while improving building shells and transitioning the last bit of fuel demand to lower-impact fuels, especially for high-heat applications.

Metrics for Tracking Progress: Requires clean heat measures to be deployed in buildings at the pace required to achieve the state's GHG reduction requirements.

3.4.6 Industry

PCAP MEASURE 13: Hydrofluorocarbon Regulations

Geographic Location/Applicable Sector: Statewide/Industry

Summary: In November 2020, MDE adopted regulations to prohibit certain hydrofluorocarbons (HFCs) and HFC blends that have a high global warming potential (GWP) and pose a higher overall risk to human health and the environment. The regulations adopted specific prohibitions for HFCs in air conditioning and refrigeration equipment, aerosol propellants, and foam end-uses. The phase-out of HFCs encourages the use of available alternatives with lower GHG emissions.

MEA currently provides grants for energy efficiency and decarbonization projects at industrial facilities and, under *Maryland's Climate Pollution Reduction Plan*, the state will provide additional support for decarbonization activities across Maryland's industrial sector. Priority investments could include HFC reduction. MDE, MEA, and the Maryland Clean Energy Center (MCEC) will increase staff capacity to partner with industry to streamline access to grants and financing for emissions reduction projects.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.611 (MMTCO2e)

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 1.631 (MMTCO2e)

Implementing agency or agencies: MDE, MEA, MCEC

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: MDE's HFC regulations apply to any person who sells, offers for sales, installs, or introduces into commerce in Maryland any substance in end-uses identified in the regulations. The requirements focus on end-use prohibitions for the following sectors/categories: Aerosol Propellants, Air Conditioning, Refrigeration, and Foams. The effective prohibition phase-in dates range from January 1, 2021, to January 1, 2024. The regulations include a sell-through provision for products and equipment manufactured before the prohibition date. The regulation also allows continued use of existing products and equipment that contain banned substances acquired before the prohibition dates.

In July 2023, EPA finalized the Phasedown of Hydrofluorocarbons: Allowance Allocation Methodology for 2024 and Later Years, which spins off the regulation that was finalized by EPA in 2022 that created a framework to phasedown HFC production and consumption by 85% by the year 2036 through establishing the Allowance Allocation and Trading Program Under the American Innovation and Manufacturing (AIM) Act. On October 19, 2023, a Notice was published for the 2024 Allowance Allocation for Production and Consumption of Regulated Substances Under the AIM Act of 2020, and a Notice of Final Consequences. By October 1 of each calendar year, EPA must determine the quantity of allowances for the production and consumption of regulated substances that may be used for the following calendar year.

In October 2023, EPA finalized the Technologies Transition rule which restricts the use of certain higher-GWP HFCs in aerosols, foams, refrigeration and air conditioning, heat pump products, and equipment. The restrictions are to transition to alternatives listed by sector and subsector and would prohibit the manufacture and import of products containing restricted HFCs by January 1, 2025, in most cases, and would prohibit the sale, distribution, and export of products containing restricted HFCs a year later, which in most cases would be January 1, 2026. To support compliance with the prohibitions on the use

of HFCs in specific sectors and subsectors, EPA requires labeling, reporting, and recordkeeping requirements for companies that import, manufacture, sell, or offer for sale products using HFCs.

The EPA's AIM Act HFC Technologies Transition rule covers more end-use categories than Maryland's HFC regulations and lowers the GWP allowable limit significantly from Maryland's HFC regulations. Maryland's regulations help to reduce HFCs with compliance deadlines between 2021 and 2024. The EPA's new rules establish additional reductions from 2025 and beyond.

Additionally, the EPA has just proposed a rulemaking addressing existing sources, the Management of Regulated Substances, under subsection (h) of the AIM Act to maximize reclamation and reduce emissions of HFCs and their substitutes.

Maryland supports these national rules to achieve HFC reductions throughout the country. Maryland is exploring opportunities to develop a more robust workforce by offering training for technicians. Implementation would be supported by a CA F-gas Reduction Incentive Program (FRIP).

Metrics for Tracking Progress: Reduced HFC production and consumption

PCAP MEASURE 14: Control of Methane Emissions from the Natural Gas Industry

Geographic Location/Applicable Sector: Statewide/Industry

Summary: Maryland's Control of Methane Emissions from the Natural Gas Industry regulations affect new and existing natural gas compressor stations, one liquefied natural gas facility, and one underground storage facility in the transmission and storage segment. The regulations set requirements to mitigate methane emissions through fugitive emissions leak detection and repair, and control measure requirements to limit emissions from compressors and pneumatic devices.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.862 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 2.060 MMTCO2e

Implementing agency or agencies: MDE, EPA

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: Maryland began taking steps to restrict methane emissions from the value chain by establishing a law in 2017 to ban hydraulic fracturing in state operations that occur in the production segment. On October 23, 2020, Maryland finalized regulations to reduce vented and fugitive emissions of methane from both new and existing natural gas transmission and storage facilities. Beginning in 2021, EPA announced policies to strengthen the controls required for GHG emissions in the oil and gas industry. In November 2021, EPA proposed New Source Performance Standards Updates and Emissions Guidelines to Reduce Methane and Other Harmful Pollution from the Oil and Natural Gas Industry. The proposal would expand and strengthen emissions reduction requirements that are currently on the books for new, modified, and reconstructed oil and natural gas sources and would require States to reduce methane emissions from hundreds of thousands of existing sources nationwide.

In November of 2022, EPA proposed supplemental regulations to the 2021 action by adding requirements for abandoned and unplugged wells, improved performance to minimize malfunctions at flares, and improved tank truck loading operations. These proposals align with the current Maryland natural gas industry methane controls and add significant requirements beyond the Maryland rule for the extended gathering and processing of these fossil fuels that will achieve reductions in surrounding States.

Metrics for Tracking Progress: Requires methane emissions from natural gas transmission and storage facilities to be mitigated through fugitive emissions detection and repair. Facility-wide GHG emission data is required to be calculated and submitted to MDE annually. Additionally, owners and operators are required to notify MDE and the public during "blowdown events," which are the release of pressurized natural gas from stations, equipment, or pipelines into the atmosphere so that maintenance, testing, or other activities can take place.

PCAP MEASURE 15: Buy Clean

Geographic Location/Applicable Sector: Statewide/Industry

Summary: The Buy Clean Maryland Act was passed by the Maryland General Assembly in 2023. DGS will work in consultation with MDOT to analyze the environmental product declarations and establish maximum acceptable GWP values for each category of eligible materials used in certain construction projects.

In establishing the GWP for each category, DGS is required by the Buy Clean Maryland Act to base the maximum acceptable GWP on the industry average of GWP emissions for that material and determine the industry average of GWP emissions, which may include transportation-related emissions, by consulting nationally or internationally recognized databases of environmental product declaration. Contractors must submit facility-specific environmental product declarations for each eligible material before any installation. DGS can waive certain requirements if it determines that requiring the relevant eligible materials would be technically infeasible, result in a significant increase in project cost, result in a significant delay in project completion, or result in only one source or manufacturer being able to provide the necessary materials.

The Buy Clean Maryland Act includes an Environmental Product Declaration Assistance Fund, administered by the Department of Commerce, that awards grants to producers of eligible materials. This fund supports the development, standardization, and transparency of environmental product declarations for construction materials and products and consists of money appropriated in the state budget.

MEA currently provides grants for energy efficiency and decarbonization projects at industrial facilities and, under *Maryland's Climate Pollution Reduction Plan*, the state will provide additional support for decarbonization activities across Maryland's industrial sector. Priority investments could include cement manufacturing decarbonization. MDE, MEA, and the Maryland Clean Energy Center (MCEC) will increase staff capacity to partner with industry to streamline access to grants and financing for emissions reduction projects.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.299 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.464 MMTCO2e

Implementing agency or agencies: DGS, MDOT

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: The law requires producers of eligible materials to submit environmental product declarations to Maryland Department of General Services (DGS) by the end of 2024. Beginning in December 2025 and throughout each following year, DGS is required to submit an annual report to the Maryland General Assembly that includes what DGS has learned about how to identify and quantify embodied carbon in building materials, including life cycle costs. DGS must also report on any obstacles encountered by them, bidders, or offerors in identifying and quantifying embodied carbon in building materials. To ensure that the most appropriate calculations are used in developing the maximum acceptable GWP for each category of eligible materials, DGS must include in its report a detailed description of its methodology.

Maryland also joined the Federal-State Buy Clean Partnership, initiated by the Biden Administration in 2023. Through this partnership, the State will work with federal and other state partners to enhance adoption, implementation, and harmonization of Buy Clean policies and maximize regional, cross-jurisdictional solutions whenever possible.

Metrics for Tracking Progress: Producers of cement and concrete mixtures must submit environmental product declarations to the state and for the state to establish a maximum acceptable global warming potential values for each category of eligible materials.

3.4.7 Waste

PCAP MEASURE 16: Landfill Methane Regulations

Geographic Location/Applicable Sector: Statewide/Waste

Summary: MDE has concurred with recent research findings which show that Municipal Solid Waste (MSW) landfills in Maryland are the single largest source of the state's methane emissions, and these emissions are approximately four times higher than previously thought. These regulations require landfills to detect and repair landfill gas leaks and operate emission control systems to reduce methane emissions.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 2.280 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 2.280 MMTCO2e

Implementing agency or agencies: MDE

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: In 2021, MDE proposed to implement regulatory requirements for owners and operators of new and existing MSW landfills, which include surface emission monitoring, detecting, and repairing landfill gas leaks, recordkeeping and reporting requirements, and installing and operating emission control systems based upon regulatory applicability.

Additional climate change abatement strategies include MDE forming partnerships with state agencies, local jurisdictions, environmental advocacy groups, and the private and public sectors to limit the amount of methane-generating waste that enters landfills through waste diversion. Waste diversion combines both recycling and source reduction activities. These strategies have been effective in reducing methane emissions from landfills and helping to meet Maryland's climate goals.

Metrics for Tracking Progress: Emissions from MSW landfills are characterized and calculated using accepted industry standards along with some measured and reported figures. The methane and CO2 generation rates are modeled using EPA's Landfill Gas Emissions Model tool "Land GEM". Additional figures come from the landfill facility reporting to EPA Part 98 GHG reporting and from annual MDE emission certification Reports.

MDE used the 2020 GHG Inventory to calculate a range of anticipated emission reductions that will come from minimizing surface leaks and capturing and converting methane to CO2. By applying a range of emission reduction factors to the list of affected sources, MDE estimates a 25-50% reduction in CO2 (CO2 and CO2 equivalent – using a GWP of 28) emissions from the affected landfills subject to MDE's latest landfill regulations when fully implemented. The new requirements and standards for MSW landfills are either equivalent or more stringent than current federal requirements for MSW landfills, such as component leak testing, surface emission monitoring, gas collection and control systems (GCCS), and recordkeeping and reporting schedules. Furthermore, the new requirements and standards for MSW landfills are more stringent than those under Title 26, Subtitle 11, Chapter 19.20 of the Code of Maryland Regulations (COMAR 26.11.19.20) - Control of Landfill Gas Emissions from Municipal Solid Waste Landfills.

PCAP MEASURE 17: Sustainable Materials Management

Geographic Location/Applicable Sector: Statewide/Waste

Summary: Sustainable materials management (SMM) includes using and managing materials as efficiently and sustainably as possible throughout their entire life cycles. Through source reduction, reuse, and recycling, Maryland can extend existing disposal capacity, reduce the need to construct new or expanded solid waste disposal facilities, conserve natural resources including water and energy, increase the innovative reuse and beneficial use of dredged material, and support a productive economy through the recovery of valuable resources.

Maryland has undertaken key initiatives to strengthen recycling programs, including the establishment of clearer permitting pathways for composting facilities; adoption of more aggressive county and state government recycling rates; coordination of a statewide waste sort study; enhancement of electronics recycling education and outreach; and provision of recycling opportunities at apartments, condominiums, and special events. MDE recognizes the value of partnerships in achieving statewide recycling and source reduction goals, including cooperative efforts of waste generators, state agencies,

local governments, the waste industry, the recycling industry, environmental groups, boards of education, and other interested parties.

A supporting policy is the Food Residuals Diversion Law, which requires businesses that generate at least one ton of food residuals per week to separate the food residuals from other solid waste and ensure that the food residuals are composted. The law and regulations follow the traditional food recovery hierarchy: prevent waste before it occurs, provide food for people, animal feed, and/or recycle. The focus is to reduce the amount of GHG emitted from landfills, provide edible food to people at a free or low cost, and improve Maryland's soil and water quality.

Supporting local initiatives include:

- The creation and expansion of local, decentralized organics collection and composting programs through distributed infrastructure in partnership with local operators
- The establishment of a distributed network of food rescue systems, such as cold storage infrastructure, to reduce food loss, increase waste diversion, and fill hunger gaps.
- On-farm composting and compost utilization with technical assistance, financial support, and reduced barriers to operating which will support urban and rural farmers, build healthy soils, and enhance local food security.
- Public outreach and education programs to promote compost as a resource, reduce food loss and waste, and connect waste and food systems to climate change.

The state supports waste diversion programs in several ways. One example includes the School Waste Reduction and Composting Program, which awards grants to schools to reduce food waste and establish composting programs. Additionally, the Maryland Water Infrastructure Financing Administration (MWIFA) provides low-interest rate loans under the two Revolving Loan Fund Programs and grants under the State Bay Restoration Fund Program for water quality point source projects and non-point source pollution control projects, drinking water system upgrade projects, and septic system upgrade projects using best available technology to achieve nitrogen removal on onsite sewage disposal systems. Between FY21 and FY23, the Bay Restoration Fund provided $45 million in revenues for 2,567 Best Available Technology (BAT) installations and 497 connections to public sewers.

The Energy-Water Infrastructure Program (EWIP) was established during the 2016 legislative session through MCCBL 2016, funded through a PSC order that provided $40 million in funding for programs that reduce GHG emissions and conserve energy. Between FY17 and FY20, MDE budgeted and awarded $40 million in grants to water and wastewater systems throughout the state of Maryland for alternative energy generation and upgrading to more energy-efficient equipment. EWIP provided funds for the planning, design, and construction of projects that benefited both the environmental and economic interests of the state.

This dual-pronged program provided reliable and resilient infrastructure for communities throughout Maryland by implementing energy efficiencies and reducing emissions and operating costs at water and wastewater treatment facilities. While EWIP was discontinued due to the lack of ongoing funding, it helped in planting the seeds and jump-starting the concept of energy-water infrastructure throughout the state of Maryland. The projects under this concept are eligible for and continue to be funded under MDE's Revolving Loan Fund Programs, which provide low-interest loans and principal forgiveness (grant). One such project is the WSSC Piscataway Bio-Energy Project, for which MDE has provided $168M in Revolving Loan Funds to date.

With new funding, the state will support additional decarbonization activities in Maryland's waste sector. Priority investments include landfill and wastewater treatment plant methane capture projects.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.129 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.426 MMTCO2e

Implementing agency or agencies: MDE, MDC, MDA, MEA, MPA, Counties

Milestones for obtaining implementing authority, as appropriate: No action needed as this is a current policy.

Implementation Schedule: In 2021, Maryland's recycling activities reduced the amount of CO2 equivalent by over 8.3 million tons, on a lifecycle accounting basis. While MDE is responsible for implementing the requirements of Executive Order 01.01.2017.13, Maryland Counties perform all recommended recycling and source reduction activities. The Executive Order defines the SMM policy for the state. MDE provided Waste Reduction and Resource Recovery Plan Goals and Metrics Recommendations in April of 2019. The voluntary statewide metrics and goal recommendations support the Maryland Recycling Act by defining specific material recycling goals for each county.

MDE continues to consult with relevant stakeholders to assess and improve the state's methodology for tracking waste generation, recycling, and source reduction in Maryland. MDE has pursued numerous partnerships to work towards the recycling and source reduction goals established in the SMM Executive Order 01.01.2017.13 and the recommendations made in April 2019.

Food Residuals Diversion Law: In 2021, the Maryland General Assembly passed House Bill 264/Senate Bill 483 entitled Solid Waste Management – Organics Recycling and Waste Diversion – Food Residuals, which requires "persons" that generate at least two tons of food residuals per week as of November 1, 2023, and one ton of food residuals per week as of November 1, 2024 to separate the food residuals from other solid waste and ensure that the food residuals are diverted from final disposal at landfill or incineration. MDE issued supporting regulations under COMAR 26.04.13 Food Residuals - Organics Recycling and Waste Diversion.

Metrics for Tracking Progress: As MDE works to develop markets for recyclables in Maryland, key partnerships with other Maryland agencies include:

- MDE and the Maryland Department of Commerce (MDC) work in cooperation with local and economic development agencies to identify local markets for recycled materials and provide siting, permitting, and technical assistance for innovative recycling and resource recovery businesses.
- MDE and the Maryland Department of Agriculture (MDA) work to support research and demonstration of innovative technologies for recovering nutrient resources in a manner protective of water quality.
- MDE and MEA work to research and promote methods of recovering energy from waste, including anaerobic digestion. These digesters would drastically reduce odors, increase renewable energy production, increase rural economic development, reduce air pollution from fossil fuel-based energy production, increase the grid stability of renewable energy production, and the digester biogas can be stored, with additional generators used to offset times of high-power load.

- MDE and the Maryland Port Administration work to develop technical screening criteria and guidance to support innovative reuse and beneficial uses of dredged material removed from the Port of Baltimore's shipping channels and other state-funded dredging projects. State agencies shall consider innovative reuse and beneficial uses of dredged material when economically feasible and in conformance with all appropriate environmental standards.

3.4.8 Agriculture

PCAP MEASURE 18: State Incentives for Agricultural Decarbonization

Geographic Location/Applicable Sector: Statewide/Agriculture

Summary: Provides additional funding for decarbonization activities in Maryland's agricultural sector. The state currently supports farmers implementing emission reduction measures in manure and nutrient management. The state would expect to increase the adoption of climate-smart agricultural practices with new focused funding to complement federal funds available to farmers from the U.S. Department of Agriculture.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: Enteric Fermentation: 0.123 MMTCO2e; Manure Management: 0.081 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: Enteric Fermentation: 0.123 MMTCO2e; Manure Management: 0.100 MMTCO2e

Implementing agency or agencies: MDA

Milestones for obtaining implementing authority, as appropriate: N/A

Implementation Schedule: Priority investments include manure management and feeding techniques that reduce enteric fermentation (leading to methane production) from livestock.

Metrics for Tracking Progress: Increased adoption of farming best practices to manage manure and nutrients in environmentally preferable ways.

3.4.9 Forestry and Land Use

PCAP MEASURE 19: Agricultural Resource Conservation and Management

Geographic Location/Applicable Sector: Statewide/Forestry and Land Use

Summary: MDA manages a range of agricultural resource conservation programs, which support farmers in adopting practices that improve soil health and increase carbon sequestration on agricultural lands. Maryland farmers lead the nation in their adoption of soil conservation practices. Building on existing Departmental programs, the 2017 Healthy Soils Act charged MDA with the development of a Healthy Soils Program to improve the health, yield, and profitability of Maryland's soils and promote the

further adoption of conservation practices that foster soil health while increasing carbon sequestration capacity.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.096 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.163 MMTCO2e

Implementing agency or agencies: MDA

Milestones for obtaining implementing authority, as appropriate: N/A

Implementation Schedule:

In 2022, MDA rolled out the Cover Crop Plus program, to leverage the success of cover cropping in the state and encourage earlier planting, later termination, and multi-year planning for soil health. A second program, the Healthy Soils Competitive Fund, was launched in 2023 to encourage innovative soil health management. This new Fund encourages continued learning in the farming community as Maryland agencies work to bolster agriculture's role as a climate solution. Both new programs capitalize on co-benefits for air and water quality, and carbon sequestration that build upon Maryland's nationally recognized progressive farming practices and programs.

Metrics for Tracking Progress: Adoption of best management practices is tracked by the State for both water quality and carbon mitigation purposes. MDA will continue to work with MDE to ensure all current and additional program outcomes are quantified and verified.

PCAP MEASURE 20: Afforestation and Improved Forest Management

Geographic Location/Applicable Sector: Statewide/Forestry and Land Use

Summary: The Maryland 5 Million Trees Initiative is the state's premier afforestation program. This initiative requires the state to plant and maintain five million native trees in Maryland by 2031, with at least 10% of these trees located in urban underserved areas of the state. In collaboration with state agencies and non-profit organizations, the 5 Million Trees Initiative leverages existing programs to increase, manage, and support tree planting projects statewide. This program provides one of the largest opportunities to grow the state's forest carbon sink and offset carbon sequestration declines over time due to aging forests.

Current state policy also promotes sustainable forestry management practices on Maryland's public and private forest lands. Enrolling unmanaged forests into forest management plans and implementing sustainable forest best management practices can enhance forest productivity by increasing the rate of carbon sequestration in forest biomass, maximizing carbon storage within harvested durable wood products, and minimizing the risk of forest pest and/or disease outbreak. This can translate to economic benefits for landowners and Maryland's forest products industry, demonstrating an annual economic impact of over $3.3 billion in 2019. Over 90% of state forests are dual certified for sustainable forest management and regularly implement sustainable practices on other state-owned lands like Wildlife Management Areas and State Parks. Only 40% of privately owned forests in Maryland are enrolled in forest management plans, presenting an opportunity to increase engagement with remaining landowners towards sustainable forest management.

Maryland also leads the nation in forest conservation and protection from development. The Forest Preservation and Retention Act, which requires replacement of forested lands lost to development through afforestation or compensatory conservation of existing forest. In 2023, the state's Forest Conservation Act of 2013 was updated with a new statewide goal of achieving net forest and tree canopy gain by requiring each county to achieve no net forest loss, measuring progress every 4 years. This policy can be achieved through mechanisms that strengthen tree loss mitigation requirements for developers, ensuring that cleared forested land for new construction is adequately replaced. This law also requires DNR to review local forest conservation plans more frequently to ensure alignment with state forest protection goals.

Complementing the state's forest goals is support for sustainable growth and land use/location efficiency to minimize GHG emissions from future land development; fosters transit use, walking, and biking; and reduces travel distances for daily mobility needs. The Maryland Department of Planning (MDP) is the lead agency for reducing emissions through sustainable growth and land use/location efficiency, which involves the private sector and various agencies and commissions at all levels of government within Maryland. This policy, coupled with the state's afforestation and forest management programs and ongoing coalition participation is critical for maintaining a healthy forest carbon sink through 2045. With new funding in place, the state will provide additional support for activities that promote enhanced carbon sequestration in Maryland's forestry and land use sector. Priority investments include tree plantings and forest management.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.225 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 1.469 MMTCO2e

Implementing agency or agencies: MDE, DNR, MDA, MDOT, MDP, Chesapeake Bay Trust

Milestones for obtaining implementing authority, as appropriate: MDE coordinates the tracking and implementation of the Maryland 5 Million Tree Initiative (5MT) in partnership with DNR, MDA, MDOT, and the Chesapeake Bay Trust. MDP works with other state agencies to advance smart growth planning.

Implementation Schedule: The Tree Solutions Now Act of 2021 (TSNA) includes a historic directive to plant and maintain 5 million native trees on public and private land by 2031 (also known as the Maryland 5 Million Trees Initiative (5MT)). To advance equity and environmental justice, 5MT directs that at least 10% (500,000) of these trees be planted in underserved urban areas, improving air and water quality and reducing urban heat island effects. Foundational to this Initiative is support for long-term maintenance and management to ensure trees and forests are healthy and resilient for decades to come.

Many local governments in Maryland are already implementing more sustainable land use and transportation policies and programs that are:

- promoting green building and compact, transit-oriented development;
- improving walkability;
- reducing aggregate vehicle miles traveled (VMT) and auto dependency;
- preserving vegetated/forested lands, which sequester carbon; and
- protecting agriculture.

In support of these programs, the Smart Growth Subcabinet, led by MDP, makes recommendations to the Governor regarding changes in state law, regulations, and procedures needed to create, enhance, support, and revitalize sustainable communities across Maryland; and facilitates interagency coordination to ensure successful statewide community reinvestment and compact development initiatives are integrated and balanced to achieve multiple benefits that advance equity, economic growth and environmental regeneration.

Metrics for Tracking Progress: Eligible plantings and forest management activity is tracked across all state-funded programs and through the participation of many private planting partners. All carbon outcomes related to 5MT, and ongoing forest conservation and management activities are quantified and integrated within the state's GHG inventory using advanced science capabilities supported by the University of Maryland.

PCAP MEASURE 21: Coastal Wetland Management

Geographic Location/Applicable Sector: Statewide/Forestry and Land Use

Summary: Blue carbon in Maryland refers to the carbon captured by the ocean and coastal ecosystems, including coastal salt marshes and seagrasses. State policy maximizes blue carbon sequestration and coastal resilience benefits by protecting and restoring coastal wetlands. For the Maryland GHG inventory, blue carbon stocks and fluxes comprise the state's estuarine wetlands and seagrasses, otherwise referred to as submerged aquatic vegetation (SAV). Ongoing restoration of SAV in the Chesapeake Bay is primarily advanced through the shared goals of the Chesapeake Bay Program.

Restoration of coastal wetlands has not been widely implemented in Maryland, apart from island restoration projects where dredge material is used to build up islands that are partially composed of wetlands. While coastal wetlands are vital ecosystems that provide important ecosystem services like erosion prevention and wildlife habitat, restoration of these systems is quite expensive, frequently exceeding $50,000 per acre restored.

The gap in current State efforts towards coastal wetland restoration presents a unique opportunity for the State to maximize avoided emissions and enhance sequestration in the blue carbon sector. Maryland is equipped to scale adoption of blue carbon restoration and preservation projects through targeted project implementation at the State and regional level. Prioritizing high carbon coastal regions and areas at risk of sea level rise also enable the State to capitalize on multiple long-term co-benefits such as improved water quality, climate resiliency, and enhanced biodiversity.

Estimate of the quantifiable GHG emissions reduction benefit in 2031: 0.005 MMTCO2e

Estimate of the quantifiable GHG emissions reduction benefit in 2045: 0.009 MMTCO2e

Implementing agency or agencies: DNR

Milestones for obtaining implementing authority, as appropriate: Current Policy

Implementation Schedule: DNR has partnered with The Nature Conservancy and ESA, Inc. to conduct a blue carbon feasibility study of several existing or potential wetland restoration projects in Maryland. The study is ongoing but preliminary results indicate that the sale of blue carbon credits would not be able to support the costs associated with project implementation, even if the price of carbon were to rise dramatically. Under certain price points, the sale of credits can fund a portion of the cost of

maintaining the project. Given project costs, it is likely that projects will be done for reasons other than blue carbon, like enhancing coastal resiliency or ensuring habitat for endangered species, but blue carbon will remain an important co-benefit of this work.

Metrics for Tracking Progress: Acres of wetlands created or restored in the mesohaline or polyhaline regions of the Maryland portions of the Chesapeake Bay and the Atlantic Coastal Bays. Acres of wetlands impacted by a tidal reconnection project in those salinity zones. Acres of submerged aquatic vegetation restored anywhere within the Maryland portions of the Chesapeake Bay or Atlantic Coastal Bays.

3.5 BENEFITS ANALYSIS

Accounting for the societal costs and benefits of state and federal policies and achieving our climate goals is a priority of the state. The new policies included in *Maryland's Climate Pollution Reduction Plan* are modeled to reduce statewide GHG emissions by 646 MMTCO2e between now and 2050. The societal benefit of this level of emissions reduction is estimated to be $135 billion based on estimates for the social cost of GHG emissions. The EPA's November 2023 Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances provides updated estimated values for the social cost of GHG emissions. EPA's updated approach is particularly timely as policymakers await findings from the Interagency Working Group on the Social Cost of Greenhouse Gases (IWG), reestablished by President Biden in January 2021, whose current interim estimates – based on work conducted between 2010 and 2016 – are outdated and substantially underestimate climate costs. An accurate societal benefit of GHG emissions reduction policy provides a strong foundation to fully assess the benefits of *Maryland's Climate Pollution Reduction Plan*, which are not included in the public health and economic analysis that follows.

Specific benefits by sector are listed below:

Table 4. Impact and benefits, including co-benefits, by sector.

Sector	Impact/Benefits
Electricity	The new policies are modeled to reduce electricity sector GHG emissions by 128.9 MMTCO2e between now and 2050. The societal benefit of this level of emissions reduction is estimated to be $29 billion.
Transportation	The new policies are modeled to reduce transportation sector GHG emissions by 88.1 MMTCO2e between now and 2050. The societal benefit of this level of emissions reduction is estimated to be $20 billion.

Buildings	The new policies are modeled to reduce building sector GHG emissions by 75.2 MMTCO2e between now and 2050. The societal benefit of this level of emissions reduction is estimated to be $17 billion.
Industry	The new policies are modeled to reduce industrial sector GHG emissions by 181.6 MMTCO2e between now and 2050. The societal benefit of this level of emissions reduction is estimated to be $34 billion.
Waste	The new policies are modeled to reduce waste sector GHG emissions by 18.1 MMTCO2e between now and 2050. The societal benefit of this level of emissions reduction is estimated to be $600 million.
Agriculture	The new policies are modeled to reduce agricultural sector GHG emissions by 5.7 MMTCO2e between now and 2050. The societal benefit of this level of emissions reduction is estimated to be $184 million.
Forestry and Land Use	The forestry and land use sector collectively has the potential to offset statewide GHG emissions by 238 to 263 MMTCO2e between now and 2050. Expanding statewide adoption of agricultural conservation practices and scaling forest conservation and restoration beyond current levels offers an opportunity to increase carbon removal from the atmosphere. Ongoing implementation of current forest policies and programs is expected to remove 7.6 MMTCO2e annually by 2045. However, expanding implementation across 400,000 acres of feasible plantable area could increase the carbon sequestration benefit to an annual removal of 9.1 MMTCO2e. Current levels of adoption in agricultural best management practices, including commitments under the state's Phase III Watershed Implementation Plan, are already expected to remove 0.7 MMTCO2e annually by 2045. Scaling the adoption of practices to 80% of cropland statewide could increase the annual removal to 0.9 MMTCO2e.

State Economic Benefits

Meeting Maryland's climate targets can bring positive economic impacts to the state. Between now and 2031, up to 27,400 additional jobs will be generated under the new policies of *Maryland's Climate Pollution Reduction Plan*; total personal income will increase by $2.5 billion; and Gross Domestic Product (GDP) will increase by $5.3 billion.

The economic impacts of *Maryland's Climate Pollution Reduction Plan* were evaluated with the Regional Economic Models, Inc., (REMI) PI+ model, a high-end dynamic modeling tool used by various federal and state government agencies in economic policy analysis. It allows for the creation of a sophisticated model that is calibrated to the specific demographic features of the study, in this case, Maryland. This

model enumerates the economic and fiscal impacts of each dollar earned and spent by the following: employees relating to the economic events; other supporting vendors (business services, retail, etc.); each dollar spent by these vendors on other firms; and each dollar spent by the households of the event's employees, other vendors' employees, and other businesses' employees. The REMI PI+ model also accounts for changes to the economy over time, including tax changes, inflation, recessions, and sequestration.

To estimate the impact of *Maryland's Climate Pollution Reduction Plan*, the difference between the Current Policies and Current + Planned Policies scenarios was calculated in terms of capital costs, electricity generation costs, and energy consumption costs. The results consider three important measures: employment, personal income, and GDP, which together provide a comprehensive look at how the policies will impact the economy.

On average, over the first decade of implementation (2024 – 2035) roughly 5,505 jobs will be created annually relative to the reference case. Over the long term (2024 – 2050), approximately 10,048 jobs per year can be sustained with gains peaking in 2040 at 20,322 jobs. The majority of job gains are shown in the construction and transportation occupations, followed by installation/maintenance/repair and management.

Personal income (the sum of total wages and salaries, supplements, property income, and personal current transfer receipts) follows a similar but more muted trajectory to employment. Between 2024 and 2035, an annual average of $600 million in personal income is added relative to the reference case. Annual impacts peak in 2040 at $2.5 billion, with impacts generally declining through 2050.

GDP is the value of all final goods and services produced in the state, or the sum of personal consumption expenditures, investment, government spending, and net exports. Over the next decade (2024 to 2035), an annual average of $1.0 billion will be added to the state's economy relative to the reference case, peaking in 2040 at $3.5 billion. Additionally, the cumulative estimated value of avoided mortality benefits is approximately $950 million through 2035, and over $4 billion through 2050.

State Public Health Benefits

In addition to reducing GHG emissions and growing jobs, personal income, and GDP, *Maryland's Climate Pollution Reduction Plan* also yields significant benefits for air quality and public health through emissions reductions of co-pollutants. Overall, *Maryland's Climate Pollution Reduction Plan* delivers additional health benefits of $142 million to $321 million in 2031 compared to current policies.

These impacts were modeled using the EPA's Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA). A screening model used regularly in the research community, COBRA is a free, easy-to-use EPA model employed as a preliminary analysis of health impacts and monetized benefits from environmental policy changes. COBRA models the incidence rate and corresponding economic impact of twelve health outcomes due to five different co-pollutants. These co-pollutants include fine particulate matter 2.5 micrometers in diameter and smaller (PM2.5) and precursor chemicals for PM2.5, which COBRA converts in its calculations.

The added health benefits of *Maryland's Climate Pollution Reduction Plan*, as compared to a current policies scenario, in 2031 are summarized in Table 5. The largest contributors in terms of monetized

benefits across the state are reductions in mortality, nonfatal heart attacks, and minor restricted activity days. More than 95% of the economic value is from reductions in mortality due to the high value of a statistical life. Reductions in minor restricted activity days have the highest reduction in incidence rate, meaning the benefits are experienced by the largest number of people.

The numbers in Table 5 represent the estimated number of avoided cases for each adverse health impact and the corresponding monetary savings due to the additional policies in *Maryland's Climate Pollution Reduction Plan*, beyond what is already included in current policies. While most incidence values represent impacts occurring in 2031, the avoided mortality is over the next 20 years (2031-2051).

Table 5. Additional health benefits of Maryland's Climate Pollution Reduction Plan compared to current policies in 2031.

Health Impact		Annual Incidence	Economic Value
Total Health Benefits	*low estimate*	-	$142,431,000
	high estimate	-	$320,512,000
Mortality (over 20 years, 2031-2051)	*low estimate*	11.0	$139,907,293
	high estimate	24.9	$316,442,114
Infant Mortality		0.06	$883,703
Nonfatal Heart Attacks	*low estimate*	1.1	$186,578
	high estimate	9.9	$1,732,999
All Respiratory Hospital Admits		2.9	$117,978
Cardiovascular Hospital Admits (except heart attacks)		2.5	$140,645
Acute Bronchitis		15.6	$10,988
Upper Respiratory Symptoms		283	$13,807
Lower Respiratory Symptoms		198	$6,122
Emergency Room Visits, Asthma		6.2	$3,939
Minor Restricted Activity Days		8,189	$820,064
Work Loss Days		1,395	$315,169
Asthma Exacerbation		290	$24,547

The health benefits of policy action are not equally distributed across the state due to differences in population density and exposure to pollutant sources. This leads to well-known differences in health outcomes between different communities with implications for environmental equity. COBRA uses PM2.5 concentration changes, determined within the COBRA model, to estimate the resulting health outcomes at the county level, which allows for a more granular analysis of state-level policies. Table 5 above is the aggregate totals of all the county-level results from the COBRA model. Figure 15 below shows the reduction of PM2.5 concentration under *Maryland's Climate Pollution Reduction Plan* versus a current policies scenario in individual counties. For reference, the 2031 COBRA results show the county-level average concentration of PM2.5 to be 6.95 µg/m3 in the current policies scenario and 6.92 µg/m3 under *Maryland's Climate Pollution Reduction Plan*.

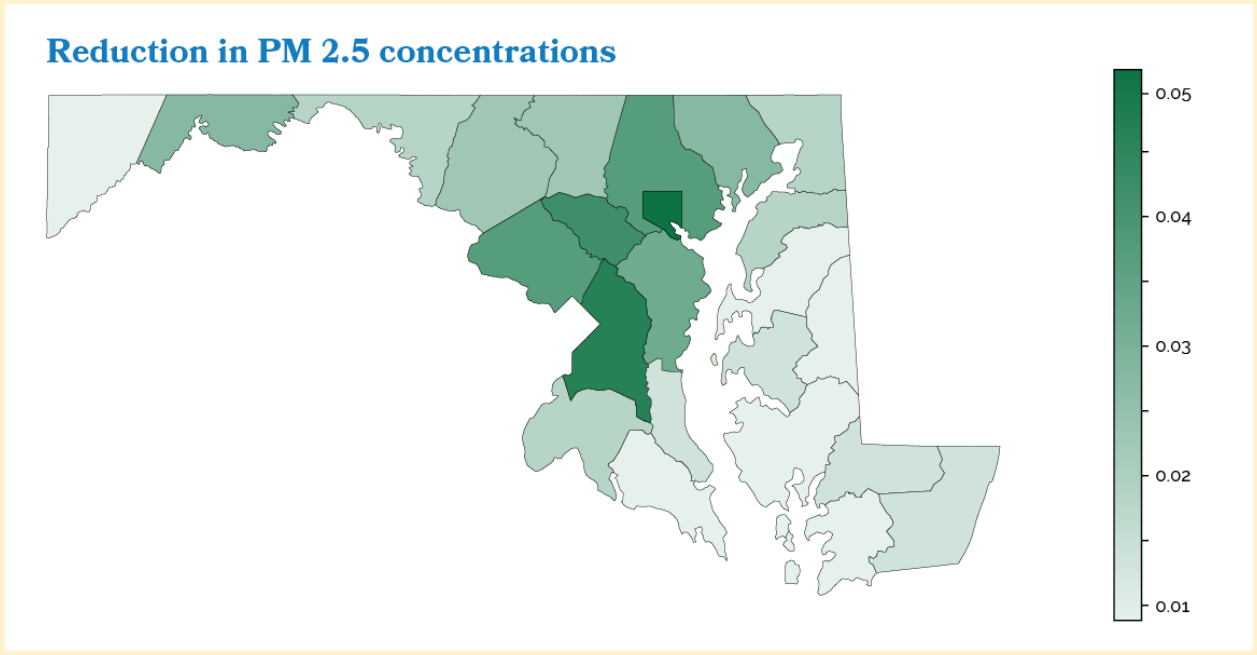

Figure 15. Reduction in PM2.5 concentration (µg/m3) by county under Maryland's Climate Pollution Reduction Plan compared to current policies. Higher numbers indicate greater reductions and greater resulting health benefits.

The reductions in PM2.5 tend to cluster in population centers where there are more sources of emissions, with particularly significant benefits accruing to communities in the Baltimore City area, which includes many historically disadvantaged communities. This remains true even when adjusted for population, with total health benefits showing a similar pattern. There are also notable benefits in counties along Maryland's Eastern Shore. Specifically, on a per capita basis, Baltimore City, Baltimore County, Prince George's, and Allegany counties have the greatest estimated total health benefits from *Maryland's Climate Pollution Reduction Plan*. However, even Garrett County, a rural county in the westernmost area of Maryland, is estimated to see significant total health benefits delivered in 2031 ($233,000 - $525,000), despite having the lowest $/person benefit.

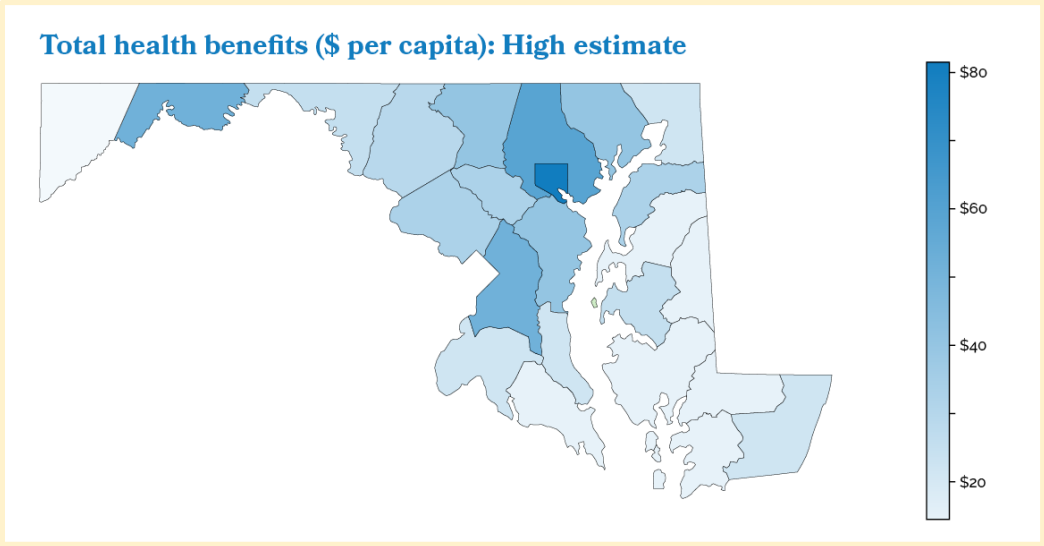

Figure 16. Total monetized health benefits in $/person realized through Maryland's Climate Pollution Reduction Plan compared to current policies. Values are for the high estimate of benefits.

There are also differences in the reduction of incidence rate for various symptoms and outcomes across counties. Prince George's County, a diverse county that is densely populated with an estimated population of 1,031,691 in 2031, is expected to have 289 fewer work loss days in 2031 compared to the current policies scenario. Baltimore City, a focus area for environmental justice issues, is estimated to have 40 fewer incidents of asthma exacerbation in 2031. Additionally, *Maryland's Climate Pollution Reduction Plan* is anticipated to have the largest per capita reduction in asthma exacerbation in Baltimore City. Baltimore City, Prince George's County, and Howard County will see the greatest reduction in minor restricted activity days per capita. Minor restricted activity days are days in which activity is reduced, but not so far as missing work. Howard County, Prince George's County, and Baltimore City are expected to see significant benefits in all categories. As shown in Figure 17, the incidence of upper respiratory symptoms is expected to reduce greatly for Baltimore City and the areas south and west of Baltimore.

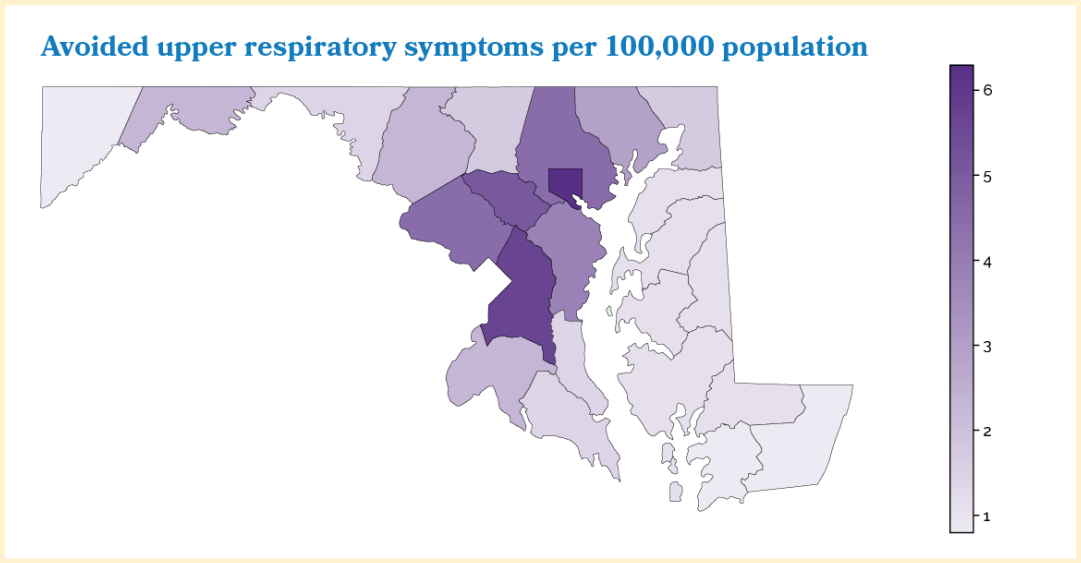

Figure 17. Reduction in the incidence of upper respiratory symptoms under Maryland's Climate Pollution Reduction Plan compared to current policies. Higher numbers indicate larger reductions, therefore fewer cases of symptoms.

The monetized benefits associated with these health improvements were also used as input for modeling the overall economic impact of the *Maryland Climate Pollution Reduction Plan*.

Lower and More Predictable Household Energy Costs

The annual energy cost for a typical all-electric household with EVs is around $2,600 lower than the annual energy cost for a typical gas-heated household with gasoline-powered vehicles. The majority of these savings are due to the lower fueling costs of an EV as compared to a gasoline-powered vehicle. Savings for the all-electric household increase to around $4,000 annually compared to homes that are heated with oil or propane. Consumers should keep these energy cost savings in mind when they consider the cost of purchasing vehicles and heating equipment. Marylanders who have already moved away from fossil fuels and gone all-electric not only enjoy lower energy costs but are also shielded from fossil fuel price fluctuations, which are highly variable and often influenced by geopolitical situations. *Maryland's Climate Pollution Reduction Plan* will help all Marylanders enjoy the benefits of living without dependence on fossil fuels.

Utility Rate Impacts

Electricity prices have historically been much less volatile and more predictable than natural gas, heating oil, and propane prices and that trend is expected to continue. E3's 2021 Maryland Building Decarbonization Study projected that a high-electrification policy scenario that resembles the policies presented in the *Maryland Climate Pollution Reduction Plan* would have a minimal impact on electricity prices through 2050, increasing retail rates by just $0.01 per kilowatt-hour (kWh) per decade, relative to business-as-usual. Federal clean energy investments through the Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA), which were authorized after the E3 study concluded, could further reduce electricity rates by increasing energy efficiency and efficient electrification. On the other hand, ongoing

developments in PJM's wholesale electricity markets and transmission planning operations could raise electricity prices in the near term. A revised electricity rate impact analysis will be run once the state's new Clean Power Standard is developed. Ultimately, electric rates will be driven by utility investments to meet the needs of the state and are subject to Public Service Commission's (PSC) jurisdiction.

The cost of natural gas utility service has risen dramatically over the past few years for two reasons. First, gas utilities have significantly increased spending on their distribution infrastructure. Second, after a decline during the early years of widespread hydraulic fracturing, gas commodity costs have also risen while becoming more volatile. Gas utility rates are expected to continue to increase significantly over the coming decades. In every scenario that E3 modeled for the Maryland Building Decarbonization Study, gas rates doubled or more by 2035.

Policies such as a Clean Heat Standard could put additional upward pressure on natural gas rates if fossil fuel companies pass their cost of compliance on to their customers. However, the rate impacts of the new policies in the *Maryland Climate Pollution Reduction Plan* are expected to be less than the savings that gas customers will see if natural gas utility companies are directed to scale back plans to rebuild their gas distribution systems. One study shows that if gas utility companies decreased gas system capital investments by 75% relative to projected spending - a reduction that is consistent with a transition away from fossil fuels in the building sector - then gas customers would save approximately $22 billion between 2025 and 2045. That level of savings could more than offset the rate impacts of new policies presented in *Maryland's Climate Pollution Reduction Plan*. These possible impacts highlight the need for comprehensive gas planning, which is currently being considered by the PSC.

Electricity System Impacts

One often-discussed factor that can influence electricity rates is the buildout of the electricity grid to handle periods of system peak demand, when overall consumer demand on the grid is the highest. The electricity grid is constructed to handle peak demand and, to the extent that peak demand increases, then additional investments may be needed to increase grid capacity.

Studies show that electrification paired with energy efficiency and load flexibility can lessen growth in peak demand. E3's Maryland Building Decarbonization Study found that Maryland's grid will shift from summer to winter peaking around the end of this decade and peak demand will grow very gradually through 2045 with efficient electrification.

A study by the Lawrence Berkeley National Laboratory (LBNL) found similar results when looking at the impact of electrification policy on large buildings in Maryland. LBNL found that MDE's Building Energy Performance Standards (BEPS) regulation, due to its combination of energy efficiency and emissions standards, is modeled to decrease peak electricity demand for covered buildings by 6% by 2040, whereas a hypothetical BEPS policy that excludes energy efficiency standards would increase peak demand by 24% by 2040. LBNL's findings are especially relevant in the context of E3's study, which found that commercial building electrification has a larger impact on peak demand growth than residential building electrification. In other words, because BEPS is modeled to decrease, not increase, peak demand, there is even more confidence that peak demand impacts from residential electrification can be similarly managed through the state's new policies.

The Climate Solutions Now Act (CSNA) directed PSC to conduct a study "assessing the capacity of each company's gas and electric distribution systems to successfully serve customers under a managed transition to a highly electrified building sector" including the following requirements for this study:

- Use a projection of average growth in system peak demand between 2021 and 2031 to assess the overall impact on each gas and electric distribution system;
- Compare future electric distribution system peak and energy demand load growth to historic rates;
- Consider the impacts of energy efficiency and conservation and electric load flexibility;
- Consider the capacity of the existing distribution systems and projected electric distribution system improvements and expansions to serve existing electric loads and projected electric load growth; and
- Assess the effects of shifts in seasonal system gas and electric loads.

The draft results of the study performed by the Brattle Group were provided to PSC's Electrification Study Work Group in November 2023, and the final report was completed in early January 2024. The following is a summary of the results:

- In aggregate, Maryland's electric systems would see a load growth in the range of 0.6-2.1% per year through 2031 under a high electrification scenario assuming utility energy efficiency plans consistent with the CSNA and existing demand response plans.
- The Maryland electric system, which is currently summer peaking, would switch to winter peaking around 2026-2027.
- Pursuing policies to incentivize efficient electrification, such as using cold climate heat pumps and load flexibility measures, could result in significant mitigation of load growth by 2031 to 0.2-1.2% compound annual growth per year.
- Historically in Maryland, there was significant load growth in the 1980s of 4.9% per year and more moderate growth of 1.2-1.5% from 1990 to 2010. Load declined between 2010 and 2020.
- These results show that peak load growth through 2031 with high electrification of the building sector will be comparable to or less than the growth rate the Maryland system has seen over the past 40 years.

The studies mentioned above by Brattle, E3, and LBNL highlight the importance of energy efficiency and peak-shifting measures to mitigate electric system costs as electrification proceeds. These studies also show that the policies in *Maryland's Climate Pollution Reduction Plan* can be implemented while growing the electric system at rates below historic level.

3.6 Low Income and Disadvantaged Communities Benefits Analysis

This Low income and disadvantaged Communities (LIDAC) Benefits Analysis contains the following elements, per CPRG planning guidance:

- Identification of LIDACs using Census tract and block IDs (see Appendix B and Appendix C).
- Specific climate impacts or risks to which LIDACs are vulnerable.
- Expected benefits to LIDACs associated with PCAP GHG reduction measures.
- A summary of planned and/or ongoing engagement with representatives and residents of LIDACs to inform PCAP and CCAP development and implementation.

Everyone deserves clean land, clean water, and clean air. However, many low income and communities of color, located next to industry, have been disproportionately burdened with pollution. MDE is committed to addressing injustices that have occurred throughout history in these communities. We must ensure that communities of every culture, race, ethnicity, and socioeconomic background get fair protection from environmental and health hazards, as well as equal access to the decision-making process for environmental policies.

Our state is increasingly dealing with severe storms and other effects of climate change, such as extreme heat events and poor air quality from wildfires. The people most affected by these environmental challenges are our most underserved and overburdened communities in Maryland. Environmental justice is defined under Maryland state law as "equal protection from environmental and public health hazards for all people regardless of race, income, culture, and social status."

3.6.1 Maryland's LIDACs

Under the Climate Pollution Reduction Grant Program, EPA defines low-income and disadvantaged communities as any community that meets at least one of the following characteristics:

- Any census tract that is included as disadvantaged in the Climate and Economic Justice (CEJST);
- Any census block group that is at or above the 90th percentile for any of EJScreen's Supplemental Indexes when compared to the nation or relevant state; or,
- Any geographic area within tribal lands as included in EJScreen. (The CPRG program considers that federally recognized tribes meet the definition of disadvantaged communities for the purposes of this grant program.)

EPA recognizes that these areas may include a wide range of communities, such as communities with environmental justice concerns, traditional energy communities, and rural communities. EPA provides a GIS map layer that combines the CEJST and EJScreen information above to facilitate identification of low-income and disadvantaged communities (as defined for EPA IRA programs). This map layer can be found on the EJScreen website.

Although Maryland has state-specific definitions of low-income and disadvantaged communities, EPA requires use of the above for CPRG implementation grants. Therefore, for this PCAP, MDE used the federal Climate and Economic Justice Screening Tool (CEJST) to identify census tracts that the tool

designates as disadvantaged in the state and the EJScreen EPA IRA Disadvantaged Communities layer to identify census block groups that are at or above the 90th percentile for any of EJScreen's Supplemental Indexes (see Figures 18 - 21).

The Council on Environmental Quality developed the CEJST tool to help identify disadvantaged communities that will benefit from programs included in the Justice40 Initiative. In Maryland, 261 census tracts (18.6%) are identified as disadvantaged by the CEJST tool, including a population of 930,142 Marylanders. In Maryland, 1,128 census block groups (28.7%) are identified as disadvantaged by the EPA EJ Screen IRA Disadvantaged Communities tool, including a population of 1,412,787 Marylanders. The full list of the census tract and census block IDs that are identified as LIDACs in Maryland are included in Appendix B and Appendix C. Figures 18 - 21 display LIDACs in Maryland as Identified Using CEJST and EPA IRA Disadvantaged Communities.

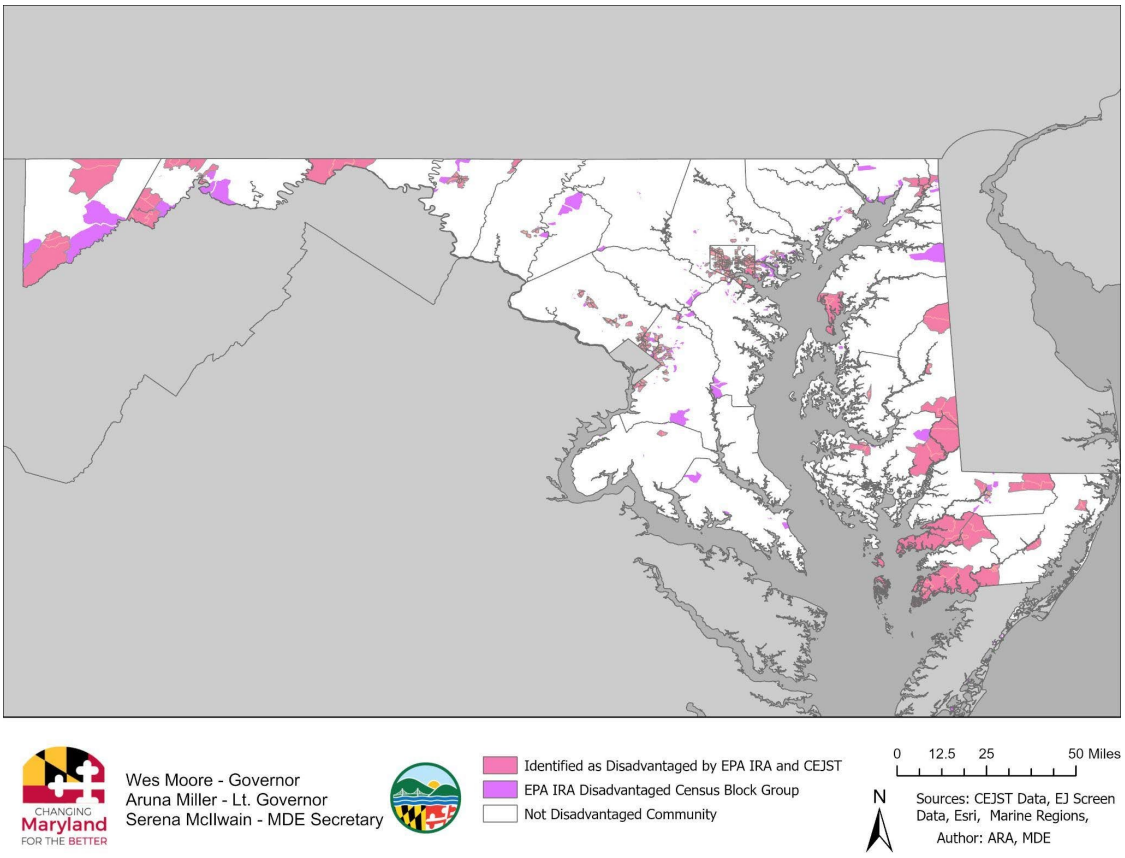

Figure 18. State of Maryland LIDACs in Maryland as Identified Using CEJST and EPA IRA Disadvantaged Communities

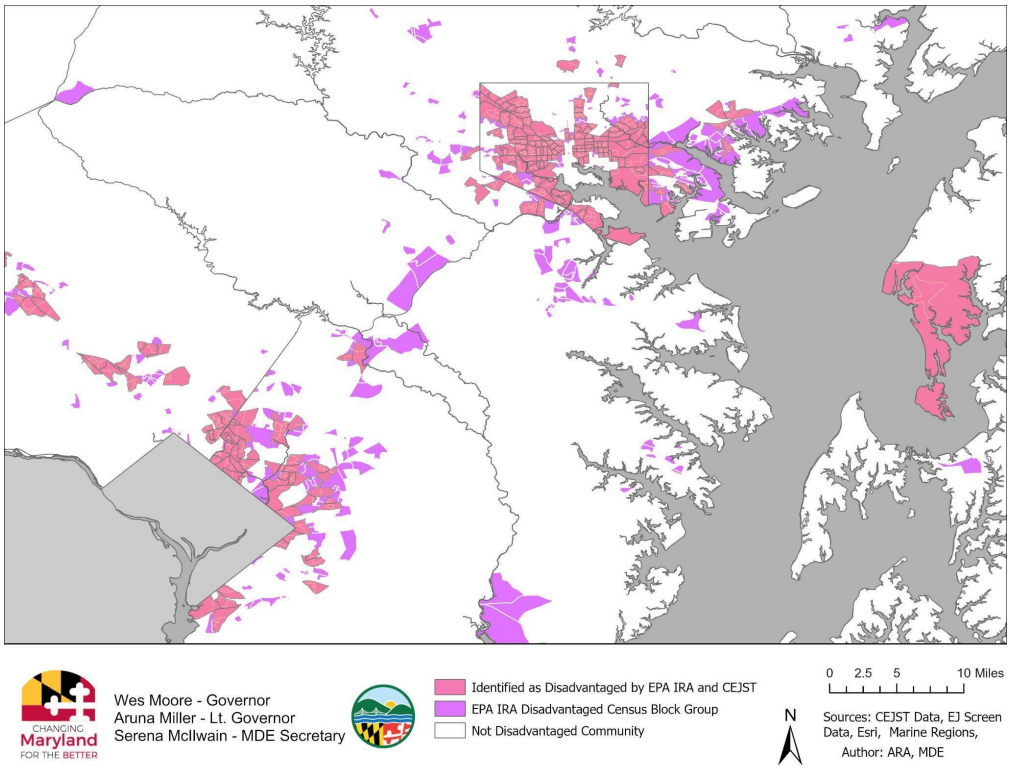

Figure 19. Central Maryland LIDACs in Maryland as Identified Using CEJST and EPA IRA Disadvantaged Communities

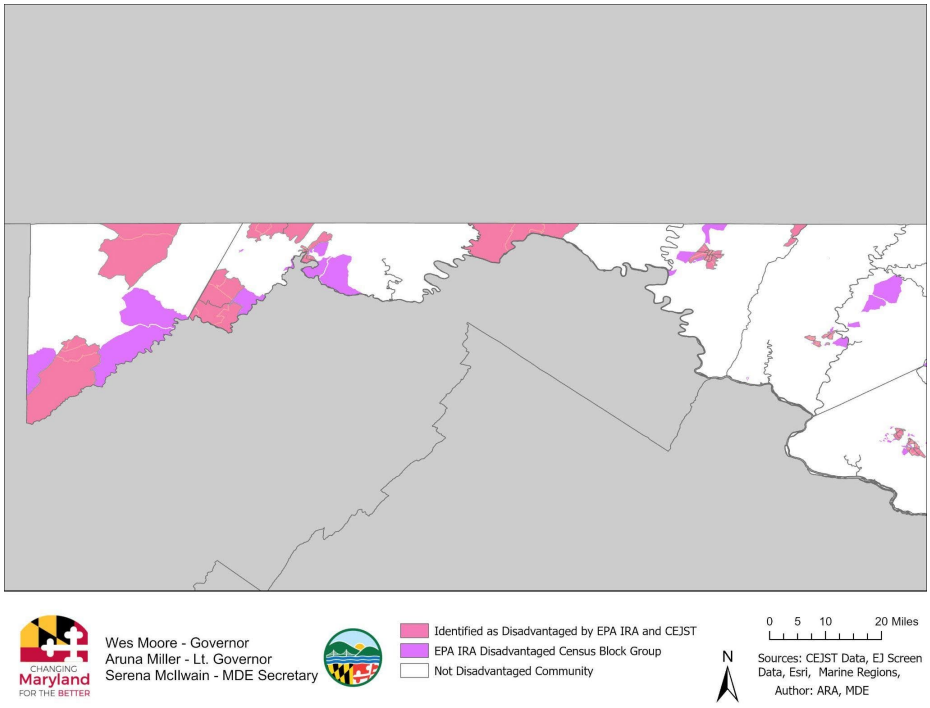

Figure 20. Western Maryland LIDACs in Maryland as Identified Using CEJST and EPA IRA Disadvantaged Communities

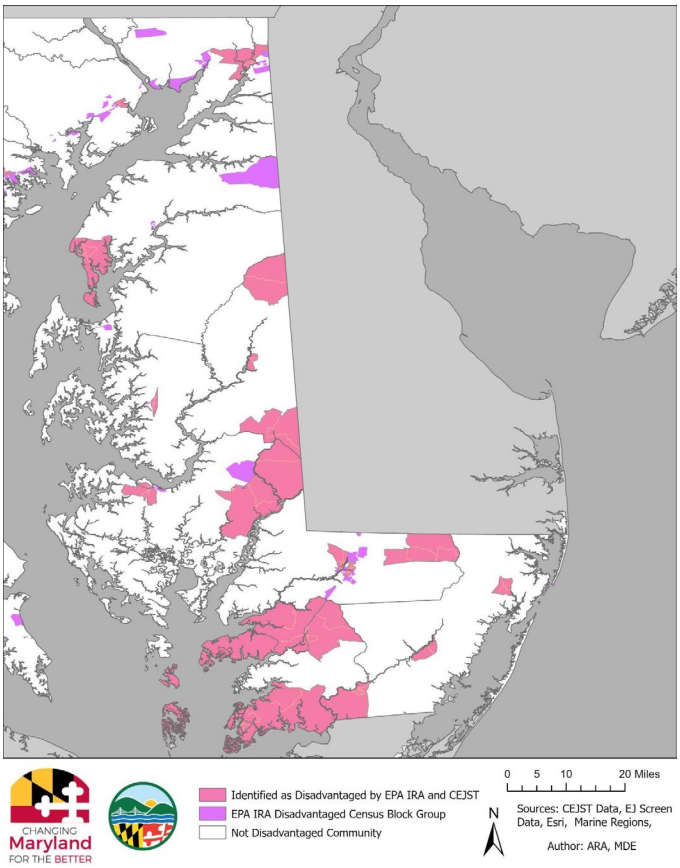

Figure 21. Eastern Maryland LIDACs in Maryland as Identified Using CEJST and EPA IRA Disadvantaged Communities

3.6.2 Climate Impacts and Risks to Maryland's LIDACs

MDE is currently developing a Climate Vulnerability Map to identify communities disproportionately affected by climate impacts in Maryland and will be available on the MDE EJ Screening Tool. MDE, in consultation with the Commission on Environmental Justice and Sustainable Communities, has developed a methodology for identifying communities disproportionately affected by climate impacts. Per the CSNA, this methodology at minimum includes:

(1) Underserved communities,
(2) Overburdened communities, and
(3) Areas that are vulnerable to climate impacts, such as flooding, storm surges, and urban heat island effects.

This method uses an established climate change vulnerability framework, which establishes the possibility of harm from climate impacts, or hazards, as a function of the 1) degree of exposure to the hazard, 2) existing sensitivity to the hazard, and 3) adaptive capacity, or the degree to which the affected community could mitigate the potential for harm by taking action.

To understand the geographical distribution of risk, this methodology uses existing spatially explicit climate and equity data developed and/or used by MDE and the Maryland Department of Natural Resources (DNR). Climate hazard data was also sourced from the Environmental Protection Agency's (EPA) Environmental Justice Screening and Mapping Tool.

3.6.3 Benefits of GHG Reduction Measures to Maryland's LIDACs

Everyone deserves clean land, clean water, and clean air. However, many low income and communities of color, located next to industry, have been disproportionately burdened with pollution. MDE is committed to addressing injustices that have occurred throughout history in these communities. The *Maryland's Climate Pollution Reduction Plan* ensures LIDACs get fair protection from environmental and health hazards and equal access to the decision-making process for environmental policies.

State Economic Benefits in LIDACs

It is necessary to recognize that all households are not impacted equally by the proposed policies. Low-income Marylanders spend 10 percent more of their income on energy cost compared to the state average. *Maryland's Climate Pollution Reduction Plan* will help all Marylanders enjoy the benefits of living without dependence on fossil fuels. In LIDACs, the cost of natural gas utility service continues to rise. LIDACs in Maryland currently do not have the infrastructure or programs in place to easily transition to an all-electric household. The policies outlined in *Maryland's Climate Pollution Reduction Plan* make it possible for LIDACs to receive the benefits of lower energy cost from transitioning away from fossil fuel.

Income inequalities impact the implementation of energy saving techniques in low- and moderate-income households across the state. Energy-saving opportunities such as weatherization, rooftop solar, and building electrification are often inaccessible for LIDACs. Therefore, the policies outlined in the *Climate Pollution Reduction Plan* provide equitable assistance to help low-income households ease the burden of energy costs. As Maryland advances GHG reductions and climate goals, these policies ensure no Marylanders are left behind.

In the next 8 years (2024-2032), up to 27,400 additional jobs will be generated under the new policies. Job growth is modeled to be most significant in the LIDACs in Baltimore County, Baltimore City, Allegany County, and Prince George's County. LIDACs are at the center of the climate action plan and will receive most of the economic investment from the new policies outlined in the plan. Over the long term (2024 – 2050), approximately 10,048 jobs per year will be generated, with a majority of job gains in the construction and transportation occupations, followed by installation/maintenance/repair and management. Marylanders will experience a $2.5 billion increase in their personal income and residents of LIDACs will benefit from significant wage increases throughout Maryland.

State Public Health Benefits in LIDACs

The most significant economic benefits Marylanders will experience under *Maryland's Climate Pollution Reduction Plan* are savings related to health care and health outcomes. With the implementation of *Maryland's Climate Pollution Reduction Plan*, residents will experience reductions in mortality, nonfatal heart attacks, and minor restricted activity days. Burdens such as transportation, access, and cost impact residents of LIDACs acutely when accessing health care. By improving public health through emissions reduction, *Maryland's Climate Pollution Reduction Plan* will improve health outcomes in LIDACs and across the state. Preventing adverse health impacts under these policies will deliver additional health benefits of $142 million to $321 million by 2031. LIDACs stand the most to gain because they will receive the dual benefits of reduced health care expenditures and lower incidence of adverse health outcomes.

Using COBRA modeling, Baltimore City, Baltimore County, Prince George's, and Allegany counties have the greatest estimated total health benefits from *Maryland's Climate Pollution Reduction Plan* per capita. Most of the census tracts that are identified in the State of Maryland under the CEJST tool are in the same counties.

The reductions in PM2.5 will have the most dramatic impact in urban population centers, particularly Baltimore City, due to a higher number of emission sources and industrial co-pollutants. LIDACs in urban areas, particularly Baltimore City, will experience significant improvement to public health under the GHG reduction plan. Baltimore City is estimated to have the largest per capita reduction in asthma exacerbation overall. Additional decreases in adverse respiratory symptoms are expected to be significant in Baltimore City and the communities south and west of the city.

LIDACs in Baltimore City, Prince George's County, and Howard County will see the greatest reduction in minor restricted activity days per capita. These benefits are not limited to urban LIDACs; there are also notable benefits in rural counties along both Maryland's Eastern Shore and Garrett County in western Maryland that are estimated to see significant total health benefits delivered in 2031 ($233,000 - $525,000).

In Maryland, 18.6% of census tracts and 28.7% of census block groups are identified as disadvantaged. Providing benefits to LIDACs is central to the success of the GHG reduction plan. The health burdens of climate change, such as severe storms and extreme heat are heavier in LIDACs. These burdens are compounded by unequal pollution from industry and poor air quality from wildfires and result in higher rates of high health impacts. The people most affected by these environmental challenges are our most underserved and overburdened communities in Maryland. The GHG plan targets LIDACs and works toward environmental justice in Maryland.

3.6.4 Engaging with Maryland's LIDACs

Maryland's CPRG for Planning will advance the goals of the Justice40 Initiative set forth in Executive Order 14008, which aims to deliver 40 percent of the overall benefits of relevant federal investments to disadvantaged communities. MDE acknowledges that many minority, low-income, and limited English

proficiency communities are overburdened by the exposure of pollution. MDE's top priority is to correct this injustice through new financial investments in communities with EJ concerns, increased inspections and compliance, the development of new regulations which address cumulative impact, and expanded opportunities for community engagement in program design and implementation.

Maryland's CPRG for Planning work will align with the state and agency-wide EJ focus to allow those living in low-income and disadvantaged communities to participate in meaningful engagement opportunities and provide feedback throughout this important process.

MDE's stakeholder engagement processes are supported by the Maryland Chesapeake Conservation and Climate Corps program, managed by the Chesapeake Bay Trust. The Corps program promotes and protects the environment by providing young adults with opportunities to gain career skills and become more engaged through meaningful community service. Specifically, the expanded programmatic focus on climate change is designed to promote climate justice, assist Maryland in achieving its GHG emissions reduction targets and mobilize, educate, and train young adults to deploy clean energy technology and mitigate. The Climate Corps member will support the development of the outreach and engagement plan and develop outreach materials. This program also supports Governor Moore's priorities on public service and green workforce development.

MDE is addressing these environmental disparities by building relationships with communities and making sure they have the tools and knowledge to be involved in the processes. MDE has developed partnerships with community groups in Cheverly, Turner Station, and Curtis Bay, three distinct disadvantaged communities according to CEJST and MD EJScreen, to develop community led hyper-local air monitoring networks. With funding from the American Rescue Plan (ARP) MDE is engaging directly with residents in LIDACs to understand air quality concerns and build community science capacity.

The department has taken following actions to engage with LIDACs in Maryland:

- Appointed an Assistant Secretary for Environmental Justice, an Environmental Justice Coordinator and a Community Liaison responsible for helping communities have seat at the table when environmental decisions are made in their communities and ensuring when it comes to funding, permits, authorization, enforcement and outreach no one is left behind.
- Collaborated with the Curtis Bay community on the "Collaborative Investigation of Coal Dust, Air Pollution, and Health Concerns in Curtis Bay, South Baltimore, Maryland, USA, 2022-2023" report, a scientific study documenting coal dust in the air around the CSX coal terminal.
- Participated in community advisory boards to create spaces for collaboration in Baltimore City, Baltimore County and Prince George's County.
- Developed guidelines for an enhanced public participation process at the request of community residents to increase honesty and transparency in agency actions.
- Partnered with community members to develop data sharing guidelines to increase community control of air quality research and ensure outcomes are being properly reported.
- Secured one of the largest environmental crime fines in state history by securing $1.75 million in criminal fines against a biomedical waste incinerator in Curtis Bay.

MDE is conducting environmental justice (EJ) listening sessions throughout the state to hear and learn about residents' lived experiences, discuss concerns, and identify opportunities and key actions that MDE and other state and local agencies can undertake to address inequities and ensure direct benefits to communities. These listening sessions are one of several channels of communication that MDE has opened to increase agency transparency and include communities in the decision-making process.

MDE supports and coordinates with the Commission on Environmental Justice and Sustainable Communities (CEJSC) to advance environmental justice. CEJSC is a twenty-member body that is tasked with advising the State government on environmental justice and analyzing the effectiveness of State and local government laws and policies to address issues of environmental justice and sustainable communities.

3.7 Review of Authority to Implement

All the PCAP measures seek to reduce GHG emissions in order to meet the ambitious climate goals of the state, criteria air pollutants to attain and maintain the National Ambient Air Quality Standards and prevent significant deterioration of air quality in areas cleaner than the standards and reduce levels of air toxics that are known or suspected to cause serious health or adverse environmental effects.

MDE has broad authority to regulate air pollution, including GHG emissions, in Maryland. Maryland Code, Environment Article, § 2-1205 requires MDE to develop plans, adopt regulations, and implement programs that reduce statewide GHG emissions to achieve the emissions reduction requirements of the state. Maryland Code, Environment Article § 2-301 authorizes MDE to adopt rules and regulations for the control of air pollution in this State. § 2-103(b) gives MDE general authority to regulate emissions into the air and ambient air quality in this State. Maryland Code, Environment Article, §1-404(b) gives the MDE Secretary the authority to adopt rules and regulations to carry out the provisions of law that are within the jurisdiction of the Secretary.

MDE's regulatory function occurs through a coordinated effort. Both internal as well as external reviews are performed. The review process helps to ensure participation from within MDE as well as from our stakeholders, other agencies, the general public and other units affected by our regulations. Areas of involvement may include regional public meetings, public hearings, media publications, etc. Draft regulations are also brought before the Air Quality Control Advisory Council or the Radiation Control Advisory Board for advice and adoption recommendations.

Each newly proposed regulation is published in the Maryland Register, an official publication of the State of Maryland that is published every two weeks. Every proposal describes how and when to submit comments. Additional published information includes comparison to Federal Standards, and economic impacts on agencies, industries, and small businesses.

MDE and other agencies mentioned in *Maryland's Climate Pollution Reduction Plan* will use existing statutory authority to implement the following regulatory and programmatic actions:

<u>MDE</u>

1. Adopt a Zero-Emission Heating Equipment Standard – In 2024, MDE will initiate a rulemaking to propose a draft regulation by the end of 2024 and adopt a final regulation by the end of 2025.

2. Adopt a Clean Heat Standard – In 2024, MDE will initiate a rulemaking to propose a draft regulation by the end of 2024 and adopt a final regulation by the end of 2025.

3. Modify the Regional Greenhouse Gas Initiative program – In 2024, MDE will work with the other Regional Greenhouse Gas Initiative (RGGI) states to establish a new regional cap. Maryland is currently advocating for the cap to be strengthened to be consistent with states' 100% clean energy goals. MDE will also eliminate underutilized components of Maryland's program under RGGI, including offsets and the Limited Industrial Exemption Set Aside when it updates its CO2 Budget Trading Program regulation in 2024.

4. Evaluate a Cap and Invest program – In 2024, MDE will explore how expanding Maryland's current cap and invest program (RGGI) to cover additional sources could work.

5. Determine if Maryland should adopt the Advanced Clean Fleets regulation – In 2024, MDE will work with stakeholders and consultants to determine if adopting ACF would result in emissions reductions beyond those expected by Maryland's adoption of the Advanced Clean Trucks (ACT) regulation.

MEA

6. Determine a legal framework for a Clean Power Standard – In 2024, MEA will finalize a conceptual framework for the Clean Power Standard and determine if all or part of a Clean Power Standard (CPS) can be implemented through existing authority.

7. Determine if additional state action is needed to accelerate solar power deployment – In 2024, MEA will take the outcomes of the Task Force to Study Solar Incentives and take steps to overcome barriers to solar power deployment in Maryland.

8. Launch a consumer education campaign – With new funding or its regular budget, MEA will launch a public information campaign to promote consumer rebates and tax credits funded by federal and state investments.

9. Expand the Climate Transition and Clean Energy Hub – With new funding, MEA will expand its capacity to provide technical support on building decarbonization projects to building owners.

10. Provide new EVSE incentives – Once new funding is secured, MEA will begin providing point-of-sale rebates for purchasing EV supply equipment (EVSE) as described in *Maryland's Climate Pollution Reduction Plan*.

11. Provide new building decarbonization incentives – Once new funding is secured, MEA will begin providing point-of-sale rebates for energy efficiency and electrification projects and distribute funding to the Maryland Clean Energy Center (MCEC) to scale up green bank lending.

12. Provide new industrial, public infrastructure, and nature-based solutions incentives – Once new funding is secured, MEA will utilize and distribute funds to MDE, MCEC, DNR, MDA, and local governments for a wide range of emission reduction and sequestration projects in Maryland's industrial, waste, agricultural, and forestry & land use sectors.

MDOT

13. Implement the Zero-Emission Vehicles Infrastructure Plan – In 2024, MDOT in consultation with partner agencies will implement round 1 of the National Electric Vehicle Infrastructure (NEVI) Program to deploy charging along Maryland's 23 EV Alternative Fuel Corridors (AFC).

14. Implement the Maryland Transportation Plan and Carbon Reduction Strategies– In 2024, MDOT will begin implementing the updated Maryland Transportation Plan and Carbon Reduction Strategies, including making investments in new infrastructure projects and programs that will reduce vehicle miles traveled and enhance transportation choices in the state.

15. Provide new EV incentives – Once new funding is secured, Maryland Motor Vehicle Administration (MVA) will begin providing point-of-sale rebates for purchasing EVs as described in *Maryland's Climate Pollution Reduction Plan*.

PSC

16. Initiate a gas system planning proceeding – In 2024, the PSC should initiate a proceeding to require natural gas utility companies to develop plans to achieve a structured transition to a net-zero emissions economy in Maryland.

Labor

17. Expand workforce development programs – Building on existing programs, significant federal investments, such as the $23 million Good Jobs Challenge Grant for Maryland Works for Wind, and with additional new funding, the Department of Labor will expand investments in apprenticeship and workforce development programs for electricians, heat pump installers, and other jobs needed for the clean energy transition.

DSCI

18. Expand service-to-career pathways – Growth of the Maryland Climate Corps efforts through the Department of Service and Civic Innovation will increase the number of individuals who are exposed and prepared for green jobs of the future.

All Agencies

19. Apply for federal funding – Under the leadership and coordination of the Governor's Federal Office, all agencies will apply for federal funding to implement actions that support the achievement of *Maryland's Climate Pollution Reduction Plan*. State agencies will work closely with local governments, nonprofits, and community-based organizations to ensure Maryland is competitive for federal climate action implementation funds and to build capacity for local-level implementation. State agencies will

offer support to Maryland's businesses and private sector to ensure they are competitive for historic federal investments.

3.8 INTERSECTION WITH OTHER FUNDING AVAILABILITY

3.8.1 Funding Sources

The state will need to decide which one or more of these or other funding solutions are best for Maryland. New funding should provide at least $1 billion annually to ensure that the state can achieve its goals.

- Green Revenue Bonds - Provides near-term funding to jump-start the investments described in *Maryland's Climate Pollution Reduction Plan*. Revenue bonds could be repaid with revenue from any of the funding sources below and do not impact taxes or the state's capacity to use general obligation bonds to fund other state priorities.
- Cap and Invest - Requires polluters to reduce climate pollution and buy emission allowances for the emissions they produce. Allowance prices are determined by a market-based mechanism. Revenue from the sale of allowances would go into the Strategic Energy Investment Fund (SEIF) to fund the investments described in *Maryland's Climate Pollution Reduction Plan*. A portion of the funding provided by this program could offset potential fossil fuel price impacts for low-income households. This policy would expand Maryland's existing and successful cap and invest program, RGGI, by extending coverage of emissions sources beyond fossil fuel power plants.
- Carbon Fee - Requires polluters to pay a fee for emissions produced based on a fee rate set by the government. The government adjusts the fee rate to achieve the state's goals. Fee revenue would go into SEIF to fund the investments described in *Maryland's Climate Pollution Reduction Plan*. A portion of the funding provided by this program could offset potential fossil fuel price impacts for low-income households.
- Hazardous Substance Fee - Requires companies to pay a fee for the hazardous substances transported in the state, including fossil fuels used in or exported from the state, based on a fee rate set by the government. Fee revenue would go into SEIF to fund the investments described in *Maryland's Climate Pollution Reduction Plan* and help MDE pay for remediation efforts to clean up the release of hazardous substances. A portion of the funding provided by this program could offset potential fossil fuel price impacts for low-income households.
- Clean Air Toll - Requires interstate drivers who drive through Maryland, pollute the air in Maryland, but do not otherwise contribute to paying for pollution mitigation efforts in Maryland, to pay a toll-by-mail for the pollution they created in Maryland. This policy should be coupled with one of the other policies listed in this section to ensure that the state would be assessing a pollution fee on out-of-state drivers that is comparable to a pollution fee paid by Maryland drivers.
- Pollution Fee on Fuel-Burning Vehicles - Requires owners of fuel-burning vehicles to pay a pollution mitigation fee during vehicle registration. If the state decides to increase registration fees for EVs, which the state is currently considering because EV drivers do not pay motor fuel

taxes that currently fund road maintenance projects, then the fee increase on fuel-burning vehicles should be at least as much as the fee increase on EVs.

Green Bank Investments

Green banks are mission-driven financial institutions that leverage private capital to promote clean energy projects. They exist in Maryland both at the state and local levels. The state's green bank, the Maryland Clean Energy Center (MCEC), was established by statute in 2008. Its mission is to encourage the transformation of the energy economy with programs that catalyze the growth of business, increase related green-collar jobs, and make clean energy technologies, products, and services affordable, accessible, and easy to implement.

MCEC supports financial partnerships among public and private organizations by promoting the deployment of technologies, serving as an incubator for development, evaluating available industry data, supporting community outreach, and providing technical assistance. Financial initiatives include the Clean Energy Advantage (CEA) Loan Program, the Maryland Clean Energy Capital Program (MCAP), the Maryland Energy Innovation Accelerator (MEIA), and the Maryland Commercial Property Assessed Clean Energy (MDPACE) Program. The Climate Solutions Now Act also created the Climate Catalytic Capital (C3) Fund, which will receive millions of dollars of state budget funding and will be combined with private donations, federal grants, financing repayments from the fund, and proceeds from sales of collateral and assets.

Two other green banks are operating in Maryland: the Montgomery County Green Bank, a publicly chartered nonprofit serving Montgomery County, and the Climate Access Fund, an independent nonprofit based in Baltimore and operating throughout Maryland.

The Montgomery County Green Bank was founded in 2016 using an estimated $18 million in funding from the merger of Potomac Electric Power Company (PEPCO) and Exelon corporations. It advances energy efficiency, renewable energy, and clean energy investment through residential financing opportunities as well as commercial sector opportunities. For the commercial sector, several offerings include the Affordable Multi-Family Housing Electric Vehicle Charging Infrastructure Program, Commercial Property Assessed Clean Energy (C-PACE), Solar Power Purchase Agreement, Technical Assistance Program, and Small Business Energy Savings Solutions.

The Climate Access Fund was created in 2017 and focuses on delivering community solar energy access to low- and moderate-income residents. The Climate Access Fund provides two main financial mechanisms for developers: a solar bill guarantee, which receives funding from MEA, and low-cost financing, as well as direct economic benefits to communities served through project ownership access and paid apprenticeships and contractor opportunities.

Federal Grants

The BIL and IRA reflect the largest federal investment in infrastructure, clean energy, and climate action in U.S. history. As of January 2024, $11.9 billion in BIL and IRA funding has been announced for Maryland with over 174 projects identified for funding. Approximately $10.8 billion has been announced for transportation – to invest in roads, bridges, public transit, ports, and airports – and roughly $307 million

has been announced for clean water. $273 million has been announced for Maryland through grants, rebates, and other initiatives to accelerate the deployment of clean energy, clean buildings, and clean manufacturing. This does not include clean energy tax incentives from the IRA.

Maryland's state agencies collaborate through the Governor's Federal Investment Team, which is tasked with determining the best strategies Maryland can implement to leverage federal funds for the state. The Federal Investment Team is responsible for tracking notices of funding opportunities, keeping the Administration updated on these funding opportunities, working collaboratively through inter-agency coordination, and mitigating any problems or concerns that arise in a timely manner. The Federal Investment Team also supports state and local governments to identify gaps in funding to determine how federal dollars can be used to address them.

The first year of these historic federal investments has spurred the clean energy transition nationwide. Maryland is in a lead position to leverage these once-in-a-generation federal investments to further accelerate its continued response to the climate crisis and transition to a clean energy economy in a way that is robust, equitable, and inclusive. The new and expanded federal investments are available to Maryland through loans, grants, and tax incentives for consumers, private industry, and for the first time direct-pay tax incentives for tax-exempt and governmental entities—such as states, local governments, tribes, territories, and nonprofits.

Table 6 summarizes key federal grant programs that have already begun to deliver support to Maryland to achieve its climate action goals:

Table 6. Notable Federal Grants for Climate Action

Sector	IRA/BIL Grant Programs	2023 Maryland Highlight
Environmental Justice	- EPA Emerging Contaminants in Small or Disadvantaged Communities Grant Program - EPA Fenceline Air Monitoring and Screening Air Monitoring - EPA Pollution Prevention Grants	MDE is taking a lead role to support Maryland communities with EJ concerns. In 2023, MDE was awarded three competitive grants to improve environmental quality and community resilience.
	- EPA Environmental Justice Thriving Communities Technical Assistance Centers	EPA has selected 16 Environmental Justice Thriving Communities Technical Assistance Centers (EJ TCTACs) to provide training and other assistance to build capacity for navigating federal grant application systems, writing strong grant proposals, and effectively managing grant funding.
	- DOC Broadband Equity, Access, and Deployment State Grants	As of Nov 6, $768.1M in federal funding to provide affordable, reliable high-speed internet to everyone in Maryland.
Workforce Development	- DOC Good Jobs Challenge	Maryland Works for Wind (MWW) is a nearly $23 million federally funded program that creates a pipeline of skilled talent to support the emerging

		offshore wind industry. In partnership with leading employers, this regional workforce training system will place and/or upskill more than 3,800 individuals into good paying careers by the end of 2025.
	- Department of Energy (DOE) State-Based Home Energy Efficiency Contractor Training Program (also known as Training for Residential Contractors)	DOE is providing $2.5 million to Maryland to provide contractor training support for the type of residential improvements that will be occurring under the HOMES and HEAR programs.
Economy-wide	- EPA Climate Pollution Reduction Grant	MDE is leading the State of Maryland Climate Pollution Reduction Grant for Planning and coordinating with Maryland's jurisdictions in the CPRG Planning grants for the Philadelphia, Baltimore, and Washington DC metropolitan statistical areas. There will be competitive CPRG Implementation grants available for climate pollution reduction measures represented in Priority Climate Action Plans developed under the Planning Grants.
Electricity	- DOE Energy Efficiency and Conservation Block Grant Program - DOE Energy Efficiency Revolving Loan Fund Capitalization Program - DOE Preventing Outages and Enhancing the Resilience of the Electric Grid, Grants to States and Tribes - DOE State Energy Program	As the State Energy Office, the MEA leverages a number of important DOE federal grant programs to assist Maryland and its local governments in implementing strategies to reduce energy use, to reduce fossil fuel emissions, to improve energy efficiency, and enhance the electrical grid.
Transportation	- DOT Advanced Transportation Technologies and Innovative Mobility Deployment Program (ATTAIN) - DOT - FAA Airport Terminal Program - DOT - FRA Consolidated Rail Infrastructure and Safety Improvement Grants (CRISI) - Charging and Fueling Infrastructure (CFI) Grant Program	The most significant funding from the BIL has provided key investments in Maryland's roads, bridges, rail, public transit, ports, and airports.
	- DOT - FHWA National Electric Vehicle Infrastructure Formula Program	The National Electric Vehicle Infrastructure Formula Program ("NEVI Formula") provides funding to States to strategically deploy EV charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability. Maryland's original NEVI Plan was submitted to the Federal Highway Administration (FHWA) on July 15, 2022.
	- DOT - FHWA Carbon Reduction Program	The Carbon Reduction Program (CRP) provides funds for projects designed to reduce transportation

		emissions, defined as carbon dioxide (CO2) emissions from on-road highway sources. The CRP will send an estimated $94 million to Maryland over 5 years. 1
	- EPA Clean School Bus Program	EPA's Clean School Bus Program provides $5 billion over five years (FY 2022-2026) to replace existing school buses with zero-emission and low-emission models. In 2022, Baltimore City Schools received $9.4 million for 25 buses.
Buildings	- DOE Home Electrification and Appliance Rebates (HEAR) Program - DOE Home Efficiency Rebates Program (HOMES)	MEA will be the recipient of the HOMES and the HEAR Program being funded by the DOE through the IRA. The HOMES program is focused on whole-home energy efficiency upgrades, while the HEAR program addresses home electrification. DOE requires that both the HOMES and HEAR programs contain dedicated allocations for low-income households; additionally, the federal legislation establishing the HEAR electrification program limits electrification incentives to only households with incomes that meet the definitions of low-income or moderate-income
	- DOE Weatherization Assistance Program	Department of Housing and Community Development (DHCD) leads Maryland's WAP to assist income-eligible homeowners and renters in Maryland by reducing heating and cooling costs through energy-conservation measures, while also addressing health and safety issues in their homes.
	- DOE Assistance for Latest Building Energy Code Adoption	Maryland Department of Labor will lead the state's application for the DOE Assistance for Latest Building Energy Code Adoption grants to support states and local jurisdictions in adopting, implementing, and enforcing the latest model, zero energy codes, or equivalent codes and standards, improving residential and commercial new construction and retrofits, and transitioning the building stock to more efficient, decarbonized buildings for all.
	- DOE Renew America's Schools Grant Program	Department of Energy's (DOE) Renew America's Schools grant provided funding for infrastructure upgrades at K–12 public school facilities. Baltimore County Public Schools was selected for funding in 2023.
Industry	- DOE State Manufacturing Leadership	Maryland's Manufacturing Asset Deployment for Energy (MADE 4.0) Program will support Maryland small- and medium-sized manufacturers through a combination of smart manufacturing technology

		applications and community workforce training, leading to energy, production, and quality efficiency gains in their facilities.
Waste	- EPA Solid Waste Infrastructure for Recycling	MDE received an EPA grant to inform the public about residential or community recycling or composting programs, provide information about the materials that are accepted as part of residential or community recycling or composting programs, and increase collection rates and decrease contamination in Maryland. Additionally, Baltimore City received $4 million to develop a solar-powered, scalable composting facility co-located with the new East Side Transfer Station at Bowleys Lane.
Agriculture	- USDA Agricultural Conservation Easement Program - USDA Conservation Stewardship Program (CSP) - USDA Conservation Technical Assistance - USDA Environmental Quality Incentives Program (EQIP)	USDA funds numerous financial assistance programs to incentivize Maryland's farmers and forest landowners to conserve the nation's soil, water, air, and other natural resources. All programs are voluntary and offer science-based solutions that benefit both the landowners and the environment.
Forestry and Land Use	- USDA Urban and Community Forestry Program - USDA Regional Conservation Partnership Program	Maryland Department of Natural Resources (DNR) is leading federal grants to promote conservation, plant Maryland forests, implement land management practices to address water quality in the Chesapeake Bay and its tributaries, and increase resiliency.

Greenhouse Gas Reduction Fund

The second-largest allocation in the IRA was the creation of the $27 billion Greenhouse Gas Reduction Fund (GGRF). EPA is managing the GGRF through three concurrent, competitive grant competitions. The goal of the GGRF is a historic investment to mobilize financing and private capital to address the climate crisis, ensure our country's economic competitiveness, and promote energy independence while delivering lower energy costs and economic revitalization to communities that have historically been left behind.

The three competitions include the National Clean Investment Fund, Clean Communities Investment Accelerator, and Solar for All. The $14 billion National Clean Investment Fund competition will provide grants to 2–3 national nonprofit clean financing institutions capable of partnering with the private sector to provide accessible, affordable financing for tens of thousands of clean technology projects across the country. The $6 billion Clean Communities Investment Accelerator competition will provide grants to 2-7 hub nonprofits that will, in turn, deliver funding and technical assistance to build the clean financing capacity of local community lenders working in low-income and disadvantaged communities—so that underinvested communities have the capital they need to deploy clean technology projects. The $7 billion Solar for All competition will award up to 60 grants to states, territories, Tribal governments, municipalities, and eligible nonprofit recipients to expand the number of low-income and disadvantaged

communities primed for distributed solar investment—enabling millions of low-income households to access affordable, resilient, and clean solar energy. Grantees will use funds to expand existing low-income solar programs or design and deploy new Solar for All programs nationwide.

Several Maryland-based non-profits have submitted applications under the National Clean Investment Fund and Clean Communities Fund Competition. Maryland's green banks participated in all three Greenhouse Gas Reduction Fund (GGRF) competitions, including the state's application to the Solar for All Competition, led by the Maryland Clean Energy Center. Results from these competitions will be announced in 2024 by EPA and will result in significantly added financial resources to advance Maryland's clean energy transition.

Clean Energy Tax Incentives

The Inflation Reduction Act (IRA) introduced and expanded tax credits for clean energy technologies and provided new provisions that will enable tax-exempt and governmental entities such as states, local governments, Tribes, territories, and nonprofits to benefit from these tax credits to further accelerate the clean energy transition. For the first time through the IRA's "elective pay" or "direct pay" provisions, tax-exempt and governmental entities will be able to receive a payment equal to the full value of tax credits for building qualifying clean energy projects.

Unlike competitive grant and loan programs, in which applicants may not receive an award, elective pay allows entities to get their payment if they meet the requirements for both elective pay and the tax credit. The entities eligible for elective pay would not normally owe federal income tax. However, by filing a return and using elective pay, these entities can receive tax-free cash payments from the IRS for clean energy tax credits earned. Applicable entities can use elective pay for 12 of the Inflation Reduction Act's tax credits. Additionally, there are bonuses to the tax credits that increase the value of the tax credit when certain criteria are met such as Prevailing Wage and Apprenticeship Requirements, Domestic Content Bonus, Energy Communities Bonus, and Low-Income Communities Bonus Credit Program.

The proposed guidance also includes a new rule that would enable entities to combine grants and forgivable loans with tax credits. An example provided by the Department of the Treasury is that a school district receives a tax-exempt grant in the amount of $300,000 to purchase an electric school bus, such as from the EPA Clean School Bus Program. Under the IRA, clean commercial vehicles are eligible for a tax credit of up to $40,000. The school district purchases the bus for $400,000, using the grant and $100,000 of the school district's unrestricted funds. The school district's basis in the electric bus is $400,000 and the school district's section 45W credit is $40,000. Since the amount of the restricted tax-exempt grant plus the amount of the section 45W credit ($340,000) is less than the cost of the electric bus, the school district receives the full 45W credit of $40,000. Therefore, the school district can access the $400,000 bus with $60,000.

3.8.2 Cost Estimates

Maryland's Climate Pollution Reduction Plan calls for at least $1 billion annually in new state spending for investments in the following priority measures:

- Home Energy Efficiency and Electrification Incentives - MEA will expand its offerings of consumer point-of-sale rebates and contractor incentives.
- Commercial, Multifamily, and Institutional Building Incentives - MEA and MCEC will scale up the distribution of grants and low-interest loans for projects in large buildings.
- EV Incentives - MVA and MEA will provide point-of-sale rebates to help consumers purchase EVs and EV charging equipment.
- Industry, Public Infrastructure, and Nature-Based Solutions Incentives - MEA, MCEC, MDE, DNR, DGS, and MDA will use and distribute funds in the form of grants and loans for different types of emissions reduction and sequestration projects.
- Workforce Development - The Department of Labor will expand investments in apprenticeship and workforce development programs for electricians, heat pump installers, and other jobs needed for the clean energy transition.
- Consumer Education Campaign - MEA will amplify its promotion of rebates and tax credits that are funded by federal and state investments.
- Climate Transition and Clean Energy Hub - MEA will add capacity to provide technical support to building owners on building decarbonization projects.

3.9 Workforce Planning Analysis

The Maryland Department of Commerce's Office of Strategic Industries and Entrepreneurship is focused on the growth and development of the state's strategic industry sectors. The energy sector is a target sector for growth, and Commerce's staff includes an Energy Program Manager dedicated to supporting the industry. Commerce has two primary areas of focus for growing the energy industry sector and supporting the creation of jobs:

- Encouraging the formation and growth of clean energy startups and technology development – Innovation in the clean energy sector is one way to grow the industry and spur job creation in Maryland. Commerce works directly with clean energy entrepreneurs and startups to connect them with resources to support their growth. Specifically, Commerce administers the Innovation Investment Tax Credit program, which fosters the growth of Maryland's technology sectors by incentivizing investment in early-stage companies to increase the number of companies developing innovative technologies in Maryland, increasing overall investments in current and emerging technology sectors, and increasing the number of individual investors actively investing in Maryland technology companies.

- Business attraction – Commerce actively works to attract clean energy companies to Maryland. Commerce attends several clean energy conferences throughout the year, meeting with companies to pitch Maryland as a location of choice for new business investment. Commerce has several incentive programs available to support the attraction of clean energy jobs to the state, including Advantage Maryland conditional loans, More Jobs for Marylanders tax credit program, Job Creation tax credit program, and Partnership for Workforce Quality workforce training grants.

In December 2021, PSC awarded offshore wind renewable energy credits to two developers who will build off the coast of Maryland. In the decision, PSC attached conditions to the approval that included that developers create a minimum of 10,324 direct jobs during their development, construction, and operating phases of their offshore wind projects. To foster the development of a workforce to support the emerging offshore wind industry, the Department of Labor developed a strong talent pipeline through the Good Jobs Challenge grant. The nearly $23 million grant supports both entry-level and mid-level training programs to grow and sustain the state's offshore wind workforce.

By investing in high-quality, locally led workforce systems with training in manufacturing, transportation, logistics, and skilled trades, the Maryland Works for Wind program creates and upskills electricians, carpenters, ironworkers, and many other jobs needed for the clean energy transition. With emerging technologies in mind, training programs continue to enhance their curriculum to meet the demands for offshore wind. Upon completion of the grant, over 3,800 individuals will have benefited from a workforce development program related to offshore wind and placed into high-quality jobs.

The Department of Service and Civic Innovation (DSCI) was established by the Serving Every Region Through Vocational Exploration (SERVE) Act of 2023 to promote service and volunteerism in the state of Maryland. The Act also called for the creation of the Maryland Climate Corps to "conserve and restore State and local parks and engage in other climate or environmental projects." In addition to coordinating with existing conservation programs already working in the state, DSCI will work with other state agencies to:

- Prepare Marylanders for high-demand climate jobs - Maryland's first of a kind service-to-career pathways (Maryland Corps and Service Year Option) emphasize exposure and skills required for green jobs of the future. In the SERVE Act, the climate is listed as a call-out area to ensure that members are placed in roles aligned with high-demand jobs aligned with the needs of Maryland. The DSCI's service programs will help to recruit, train, and retain talent in careers in the clean energy sector.

- Partner to braid funding streams to meet shared climate and workforce goals - The Maryland Climate Corps is an opportunity for interagency collaboration between DSCI and partner state agencies to braid state and federal climate, workforce, and service funds to create workforce pathways for frontline communities into the green jobs of the future. Potential federal grant funding can be braided with existing service and AmeriCorps funding streams to maximize climate workforce preparation.

4 NEXT STEPS

Comprehensive Climate Action Plan (CCAP) Development Approach

Maryland's CCAP will expand on the *Maryland's Climate Pollution Reduction Plan* and PCAP and continue to incorporate county, local, and community feedback with focus on economy-wide GHG emission reduction projects. The CCAP is due to the EPA July 2025 and will include the following elements (Table 7):

Table 7.
CCAP Elements and Timeline

CCAP Element	**Approach**
GHG inventory	The inventory includes all GHG emissions and sinks by emission source and sink category and follows commonly accepted protocols.
GHG emissions projections	Near-term (2031) and long-term (2045) projections of GHG emissions will be included in the CCAP. The analysis will include a "reference case" and a scenario where the plan is fully implemented with sector-based projections.
GHG reduction targets	Maryland is required by the Climate Solutions Now Act of 2022 to reduce GHG emissions by 60% by 2031 and achieve net-zero emissions by 2045. MDE will apply these targets to measures identified in the CCAP.
Quantified GHG reduction measures	The CCAP will include implementation measures identified to meet Maryland's GHG reduction target across all GHG emission sectors.
A benefits analysis (for the full geographic scope and population covered by the plan)	The EPA Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA) tool models the emission and dispersal of PM2.5, SO2, NOX, NH3, and VOCs and translate emissions into health effects at the state level, with the potential for county-level data. Additionally, MDE will continue to work with its coordinating entities, local government partners, and stakeholders to determine meaningful broader assessments of other benefits associated with GHG reduction measures, including but not limited to analysis of air quality improvements (e.g., criteria air pollution and air toxics), improved public health outcomes, economic benefits, increased climate resilience, or other environmental benefits.
Low-income and disadvantaged communities' benefits analysis	MDE will use CEJST and EPA EJScreen Tool to confirm if any low-income and disadvantaged communities have been identified since the PCAP and provide an updated benefits estimate based on the same methodology used in the PCAP and best practices identified by the EPA. To the extent possible, MDE will evaluate the extent to which any GHG reduction measures in the CCAP will deliver co-pollutant emissions reductions and other benefits to low-income and disadvantaged communities.
Review of authority to implement	For each measure included in the CCAP, MDE will indicate which relevant state or local government has/will have authority to implement the measure, indicate whether they have existing statutory or regulatory authority to implement the measure, or whether such authority still must be obtained. If applicable, Maryland's CCAP will include a schedule of milestones for actions needed by key entities (e.g., legislature, administrative agency, etc.) for obtaining any authority needed to implement.
Intersection with other funding availability	MDE will provide an update on federal funding applied for and received since the PCAP and new funds identified for CCAP measures.
Workforce planning analysis	Based on results from the collaborative workforce planning efforts to be led by the Maryland Commission on Climate Change (MCCC) Just Transition Working Group, MDE will conduct a workforce planning analysis in support of the CCAP. This analysis will describe potential workforce shortages and identify potential solutions and partners that could help address those challenges.

CCAP Interagency and Intergovernmental Coordination:

MDE will continue its interagency and intergovernmental processes from the PCAP development and improve on general interagency coordination, sector-specific interagency coordination, intergovernmental coordination, and CPRG Metropolitan Statistical Area (MSA) coordination in the development of the CCAP.

CCAP Public and Stakeholder Engagement:

MDE will evaluate the public and stakeholder engagement processes from the PCAP development to create an outreach and engagement plan for the CCAP. The CCAP will use and improve on the three concurrent PCAP stakeholder engagement processes:

1. Ongoing public and stakeholder engagement through MDE's existing commissions, working groups, and task force. Ongoing monthly and quarterly meetings of these advisory groups are open to the public and materials from these meetings are available on the MDE website.

2. Public outreach will be improved and expanded based on feedback and lessons learned from public outreach in the first year of the CPRG for Planning. MDE will plan public forums for discussion, feedback, questions, and concerns. MDE will update the webpage for this effort with outreach dates and details, webinar links and recordings, and a comments form.

3. Environmental Justice Listening Sessions: MDE, led by the MDE Secretary and the Assistant Secretary for EJ, will evaluate, improve and continue communication with communities with EJ concerns. This direct citizen feedback will inform Maryland's CCAP and methods for how to assess benefits and direct financial resources.

Follow-up and evaluation: MDE will facilitate sharing of regular updates with communities and provide an opportunity for the public to provide feedback on the agency's approach to stakeholder engagement. Similarly to the PCAP, this process will also include follow-up opportunities for MDE to update communities on the plan's progress.

Status Report development approach: Maryland's Status Report will include the implementation status of the quantified GHG reduction measures included in the CCAP, relevant updated analyses or projections supporting CCAP implementation, and next steps and future budget/staffing needs to continue CCAP implementation. Maryland will also update emissions analyses, GHG reduction measures, or other items as needed to reflect recent and forecasted changes in programs and emissions in mid-2027. The CPRG Status Report is due to the EPA in June 2027.

5 APPENDICES

Appendix A.

COUNTY PLANS REVIEWED FOR GHG EMISSIONS REDUCTION MEASURES UNDER MARYLAND CPRG LOCAL SUPPORT PROGRAM FOR COUNTIES NOT COVERED BY CPRG MSA PLANNING GRANT

County	Plan
Garrett	Comprehensive Plan 2022
Garrett	Energy Conservation Plan 2012
Garrett and Allegany	Mountain Maryland Energy Advisory Committee Final Report 2015
Allegany	Comprehensive Plan 2014
Allegany	Hazard Mitigation Plan Update 2018
Caroline	Upper Choptank River Watershed Based Plan 2010
Caroline	Comprehensive Plan 2010
Wicomico	Comprehensive Plan 2017
Wicomico	Hazard Mitigation and Resilience Plan 2022
Calvert	Comprehensive Plan 2022
Calvert	All-Hazard Mitigation Plan 2017
St. Mary's	Comprehensive Plan 2010
St. Mary's	Hazard Mitigation Plan 2017
Talbot	Hazard Mitigation & Community Resilience Plan 2022
Washington	Comprehensive Plan 2040
Washington	Hazard Mitigation Plan 2017
Dorchester	Comprehensive Plan 2021
Dorchester	Hazard Mitigation Plan Update 2017
Kent	Comprehensive Plan 2018
Kent	Hazard Mitigation Plan 2021
Somerset	Comprehensive Plan 1996
Somerset	Multi-Hazard Mitigation Plan Update 2022
Worcester	Comprehensive Development Plan 2006
Worcester	Hazard Mitigation & Resilience Plan 2020

Appendix B.

IDENTIFICATION OF LOW INCOME AND DISADVANTAGED COMMUNITIES (LIDAC) IN MARYLAND FROM CEJST

County	State	Census Tract ID
Allegany County	Maryland	24001002100
Allegany County	Maryland	24001001502
Allegany County	Maryland	24001000700
Allegany County	Maryland	24001000800
Allegany County	Maryland	24001001000
Allegany County	Maryland	24001001100
Allegany County	Maryland	24001002200
Allegany County	Maryland	24001000400
Allegany County	Maryland	24001001503
Baltimore City	Maryland	24510260403
Baltimore City	Maryland	24510260303
Baltimore City	Maryland	24510260800
Baltimore City	Maryland	24510271801
Baltimore City	Maryland	24510260201
Baltimore City	Maryland	24510260401
Baltimore City	Maryland	24510270802
Baltimore City	Maryland	24510271802
Baltimore City	Maryland	24510280101
Baltimore City	Maryland	24510280402
Baltimore City	Maryland	24510250103
Baltimore City	Maryland	24510280102
Baltimore City	Maryland	24510160600
Baltimore City	Maryland	24510260605
Baltimore City	Maryland	24510100200
Baltimore City	Maryland	24510150800
Baltimore City	Maryland	24510170300
Baltimore City	Maryland	24510271002
Baltimore City	Maryland	24510260402
Baltimore City	Maryland	24510280404
Baltimore City	Maryland	24510090100
Baltimore City	Maryland	24510200300
Baltimore City	Maryland	24510250203
Baltimore City	Maryland	24510150400
Baltimore City	Maryland	24510200600
Baltimore City	Maryland	24510200701
Baltimore City	Maryland	24510271600
Baltimore City	Maryland	24510280302
Baltimore City	Maryland	24510200702
Baltimore City	Maryland	24510250205

County	State	Census Tract ID
Baltimore City	Maryland	24510250402
Baltimore City	Maryland	24510260501
Baltimore City	Maryland	24510271001
Baltimore City	Maryland	24510272006
Baltimore City	Maryland	24510272007
Baltimore City	Maryland	24510280500
Baltimore City	Maryland	24510060100
Baltimore City	Maryland	24510090600
Baltimore City	Maryland	24510080301
Baltimore City	Maryland	24510100300
Baltimore City	Maryland	24510120400
Baltimore City	Maryland	24510160200
Baltimore City	Maryland	24510160400
Baltimore City	Maryland	24510160700
Baltimore City	Maryland	24510170200
Baltimore City	Maryland	24510180100
Baltimore City	Maryland	24510260302
Baltimore City	Maryland	24510260700
Baltimore City	Maryland	24510261000
Baltimore City	Maryland	24510271900
Baltimore City	Maryland	24510090900
Baltimore City	Maryland	24510100100
Baltimore City	Maryland	24510150100
Baltimore City	Maryland	24510200400
Baltimore City	Maryland	24510200500
Baltimore City	Maryland	24510260404
Baltimore City	Maryland	24510271700
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Baltimore City	Maryland	24510080500
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Baltimore City	Maryland	24510140100
Baltimore City	Maryland	24510150500
Baltimore City	Maryland	24510030100
Baltimore City	Maryland	24510030200
Baltimore City	Maryland	24510070100
Baltimore City	Maryland	24510200100
Baltimore City	Maryland	24510160300
Baltimore City	Maryland	24510250204
Baltimore City	Maryland	24510250500
Baltimore City	Maryland	24510260301
Baltimore City	Maryland	24510070200

County	State	Census Tract ID
Baltimore City	Maryland	24510070300
Baltimore City	Maryland	24510070400
Baltimore City	Maryland	24510080400
Baltimore City	Maryland	24510130100
Baltimore City	Maryland	24510200200
Baltimore City	Maryland	24510080800
Baltimore City	Maryland	24510080102
Baltimore City	Maryland	24510080200
Baltimore City	Maryland	24510130400
Baltimore City	Maryland	24510140300
Baltimore City	Maryland	24510170100
Baltimore City	Maryland	24510180200
Baltimore City	Maryland	24510190300
Baltimore City	Maryland	24510250301
Baltimore City	Maryland	24510250401
Baltimore City	Maryland	24510080700
Baltimore City	Maryland	24510270701
Baltimore City	Maryland	24510080600
Baltimore City	Maryland	24510090400
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Baltimore City	Maryland	24510150600
Baltimore City	Maryland	24510160500
Baltimore City	Maryland	24510151000
Baltimore City	Maryland	24510151200
Baltimore City	Maryland	24510160100
Baltimore City	Maryland	24510210200
Baltimore City	Maryland	24510260203
Baltimore City	Maryland	24510260604
Baltimore City	Maryland	24510060200
Baltimore City	Maryland	24510090500
Baltimore City	Maryland	24510090800
Baltimore City	Maryland	24510150701
Baltimore City	Maryland	24510150300
Baltimore City	Maryland	24510150702
Baltimore City	Maryland	24510151100
Baltimore City	Maryland	24510151300
Baltimore City	Maryland	24510190100
Baltimore City	Maryland	24510190200
Baltimore City	Maryland	24510250207
Baltimore City	Maryland	24510250303

County	State	Census Tract ID
Baltimore City	Maryland	24510260202
Baltimore County	Maryland	24005421000
Baltimore County	Maryland	24005430101
Baltimore County	Maryland	24005490605
Baltimore County	Maryland	24005430900
Baltimore County	Maryland	24005452300
Baltimore County	Maryland	24005491600
Baltimore County	Maryland	24005401301
Baltimore County	Maryland	24005451402
Baltimore County	Maryland	24005492300
Baltimore County	Maryland	24005420401
Baltimore County	Maryland	24005451300
Baltimore County	Maryland	24005430300
Baltimore County	Maryland	24005408506
Baltimore County	Maryland	24005492500
Baltimore County	Maryland	24005420701
Baltimore County	Maryland	24005420702
Baltimore County	Maryland	24005421300
Baltimore County	Maryland	24005450504
Baltimore County	Maryland	24005421101
Caroline County	Maryland	24011955302
Caroline County	Maryland	24011955000
Caroline County	Maryland	24011955600
Cecil County	Maryland	24015030400
Cecil County	Maryland	24015030503
Charles County	Maryland	24017850901
Dorchester County	Maryland	24019970100
Dorchester County	Maryland	24019970500
Dorchester County	Maryland	24019970600
Frederick County	Maryland	24021750503
Frederick County	Maryland	24021750505
Frederick County	Maryland	24021750702
Frederick County	Maryland	24021750801
Frederick County	Maryland	24021750300
Garrett County	Maryland	24023000200
Garrett County	Maryland	24023000700
Harford County	Maryland	24025302901
Kent County	Maryland	24029950500
Montgomery County	Maryland	24031701702
Montgomery County	Maryland	24031700717
Montgomery County	Maryland	24031700719
Montgomery County	Maryland	24031702101
Montgomery County	Maryland	24031700724

County	State	Census Tract ID
Montgomery County	Maryland	24031700721
Montgomery County	Maryland	24031701900
Montgomery County	Maryland	24031702301
Montgomery County	Maryland	24031700832
Montgomery County	Maryland	24031700833
Montgomery County	Maryland	24031700834
Montgomery County	Maryland	24031701219
Montgomery County	Maryland	24031700904
Montgomery County	Maryland	24031700713
Montgomery County	Maryland	24031703301
Montgomery County	Maryland	24031702000
Montgomery County	Maryland	24031703214
Montgomery County	Maryland	24031703501
Montgomery County	Maryland	24031701509
Montgomery County	Maryland	24031701602
Montgomery County	Maryland	24031701102
Montgomery County	Maryland	24031703215
Montgomery County	Maryland	24031703207
Montgomery County	Maryland	24031700704
Montgomery County	Maryland	24031703213
Prince George's County	Maryland	24033803613
Prince George's County	Maryland	24033800211
Prince George's County	Maryland	24033801405
Prince George's County	Maryland	24033803900
Prince George's County	Maryland	24033804002
Prince George's County	Maryland	24033805904
Prince George's County	Maryland	24033800210
Prince George's County	Maryland	24033804801
Prince George's County	Maryland	24033804802
Prince George's County	Maryland	24033805906
Prince George's County	Maryland	24033805907
Prince George's County	Maryland	24033805908
Prince George's County	Maryland	24033806714
Prince George's County	Maryland	24033804001
Prince George's County	Maryland	24033805500
Prince George's County	Maryland	24033805602
Prince George's County	Maryland	24033806602
Prince George's County	Maryland	24033805601
Prince George's County	Maryland	24033805700
Prince George's County	Maryland	24033805801
Prince George's County	Maryland	24033805202
Prince George's County	Maryland	24033802301
Prince George's County	Maryland	24033801707

County	State	Census Tract ID
Prince George's County	Maryland	24033802404
Prince George's County	Maryland	24033802901
Prince George's County	Maryland	24033804300
Prince George's County	Maryland	24033804900
Prince George's County	Maryland	24033807305
Prince George's County	Maryland	24033803100
Prince George's County	Maryland	24033806601
Prince George's County	Maryland	24033803612
Prince George's County	Maryland	24033803401
Prince George's County	Maryland	24033806501
Prince George's County	Maryland	24033807000
Prince George's County	Maryland	24033802700
Prince George's County	Maryland	24033803801
Prince George's County	Maryland	24033805000
Prince George's County	Maryland	24033805101
Prince George's County	Maryland	24033801704
Prince George's County	Maryland	24033801906
Prince George's County	Maryland	24033803200
Prince George's County	Maryland	24033803509
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Prince George's County	Maryland	24033802600
Prince George's County	Maryland	24033803402
Prince George's County	Maryland	24033801500
Prince George's County	Maryland	24033805201
Prince George's County	Maryland	24033805802
Somerset County	Maryland	24039930101
Somerset County	Maryland	24039930102
Somerset County	Maryland	24039930200
Somerset County	Maryland	24039930500
Somerset County	Maryland	24039930600
Talbot County	Maryland	24041960400
Washington County	Maryland	24043010100
Washington County	Maryland	24043000500
Washington County	Maryland	24043010700
Washington County	Maryland	24043000302
Washington County	Maryland	24043000900
Washington County	Maryland	24043000301
Washington County	Maryland	24043000400
Washington County	Maryland	24043000602
Washington County	Maryland	24043000601
Washington County	Maryland	24043000800
Washington County	Maryland	24043000700
Wicomico County	Maryland	24045000300

County	State	Census Tract ID
Wicomico County	Maryland	24045000500
Wicomico County	Maryland	24045010604
Wicomico County	Maryland	24045000100
Wicomico County	Maryland	24045010200
Worcester County	Maryland	24047951000
Worcester County	Maryland	24047951300
Worcester County	Maryland	24047951500

APPENDIX C.

IDENTIFICATION OF LOW INCOME AND DISADVANTAGED COMMUNITIES (LIDAC) IN MARYLAND FROM EPA IRA DISADVANTAGED COMMUNITIES

State	County	Census Block Group ID
MD	Allegany County	240010002001
MD	Allegany County	240010002003
MD	Allegany County	240010005001
MD	Allegany County	240010005002
MD	Allegany County	240010006002
MD	Allegany County	240010007001
MD	Allegany County	240010007002
MD	Allegany County	240010008001
MD	Allegany County	240010008002
MD	Allegany County	240010010001
MD	Allegany County	240010010002
MD	Allegany County	240010011001
MD	Allegany County	240010011002
MD	Allegany County	240010013002
MD	Allegany County	240010015021
MD	Allegany County	240010015031
MD	Allegany County	240010015032
MD	Allegany County	240010015033
MD	Allegany County	240010018003
MD	Allegany County	240010020003
MD	Allegany County	240010021001
MD	Allegany County	240010021002
MD	Allegany County	240010021003
MD	Allegany County	240010022001
MD	Allegany County	240010022002
MD	Allegany County	240010022003
MD	Allegany County	240010023001
MD	Allegany County	240010023002
MD	Anne Arundel County	240037011031

State	County	Census Block Group ID
MD	Anne Arundel County	240037025002
MD	Anne Arundel County	240037061022
MD	Anne Arundel County	240037064032
MD	Anne Arundel County	240037064041
MD	Anne Arundel County	240037064042
MD	Anne Arundel County	240037065001
MD	Anne Arundel County	240037066003
MD	Anne Arundel County	240037080041
MD	Anne Arundel County	240037080042
MD	Anne Arundel County	240037080043
MD	Anne Arundel County	240037302043
MD	Anne Arundel County	240037302051
MD	Anne Arundel County	240037302052
MD	Anne Arundel County	240037302062
MD	Anne Arundel County	240037304011
MD	Anne Arundel County	240037304031
MD	Anne Arundel County	240037304032
MD	Anne Arundel County	240037304041
MD	Anne Arundel County	240037305082
MD	Anne Arundel County	240037305111
MD	Anne Arundel County	240037305132
MD	Anne Arundel County	240037305141
MD	Anne Arundel County	240037305142
MD	Anne Arundel County	240037313033
MD	Anne Arundel County	240037313123
MD	Anne Arundel County	240037402041
MD	Anne Arundel County	240037501011
MD	Anne Arundel County	240037501012
MD	Anne Arundel County	240037501013
MD	Anne Arundel County	240037501014
MD	Anne Arundel County	240037501021
MD	Anne Arundel County	240037501022
MD	Anne Arundel County	240037502012
MD	Anne Arundel County	240037508012
MD	Anne Arundel County	240037508013
MD	Anne Arundel County	240037508014
MD	Anne Arundel County	240037508034
MD	Anne Arundel County	240037509001
MD	Anne Arundel County	240037510001
MD	Anne Arundel County	240037510002
MD	Anne Arundel County	240037510003
MD	Anne Arundel County	240037511034

State	County	Census Block Group ID
MD	Anne Arundel County	240037515001
MD	Anne Arundel County	240037515002
MD	Anne Arundel County	240037515003
MD	Baltimore County	240054001002
MD	Baltimore County	240054009001
MD	Baltimore County	240054011012
MD	Baltimore County	240054011013
MD	Baltimore County	240054013011
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MD	Baltimore County	240054013013
MD	Baltimore County	240054015042
MD	Baltimore County	240054015052
MD	Baltimore County	240054015063
MD	Baltimore County	240054015073
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MD	Baltimore County	240054023034
MD	Baltimore County	240054024043
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MD	Baltimore County	240054025032
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MD	Baltimore County	240054034023
MD	Baltimore County	240054034024
MD	Baltimore County	240054042022
MD	Baltimore County	240054042023
MD	Baltimore County	240054042024
MD	Baltimore County	240054042025
MD	Baltimore County	240054044032
MD	Baltimore County	240054085061
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MD	Baltimore County	240054204021
MD	Baltimore County	240054204022
MD	Baltimore County	240054205001

State	County	Census Block Group ID
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MD	Baltimore County	240054301012
MD	Baltimore County	240054301042
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State	County	Census Block Group ID
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MD	Baltimore County	240054505041
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MD	Baltimore County	240054513001
MD	Baltimore County	240054513002
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MD	Baltimore County	240054515002
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MD	Baltimore County	240054516001
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State	County	Census Block Group ID
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MD	Baltimore County	240054927003
MD	Baltimore County	240054927004
MD	Caroline County	240119550001
MD	Caroline County	240119550002
MD	Caroline County	240119553021
MD	Caroline County	240119553022
MD	Caroline County	240119553023
MD	Caroline County	240119556001
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MD	Caroline County	240119556003
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MD	Cecil County	240150309084
MD	Cecil County	240150312023
MD	Cecil County	240150313022
MD	Charles County	240178502021
MD	Charles County	240178507094
MD	Charles County	240178508011

State	County	Census Block Group ID
MD	Charles County	240178509011
MD	Charles County	240178509012
MD	Charles County	240178509013
MD	Charles County	240178510041
MD	Dorchester County	240199701001
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MD	Dorchester County	240199706001
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MD	Dorchester County	240199706003
MD	Frederick County	240217503001
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MD	Frederick County	240217505051
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MD	Frederick County	240217735002
MD	Frederick County	240217754004

State	County	Census Block Group ID
MD	Frederick County	240217754005
MD	Garrett County	240230002001
MD	Garrett County	240230002002
MD	Garrett County	240230004001
MD	Garrett County	240230004002
MD	Garrett County	240230006014
MD	Garrett County	240230007001
MD	Garrett County	240230007002
MD	Garrett County	240230007003
MD	Garrett County	240230007004
MD	Harford County	240253013023
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MD	Harford County	240253016023
MD	Harford County	240253017052
MD	Harford County	240253024002
MD	Harford County	240253028012
MD	Harford County	240253028023
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MD	Harford County	240253061001
MD	Harford County	240253062002
MD	Howard County	240276011071
MD	Howard County	240276012031
MD	Howard County	240276012032
MD	Howard County	240276012042
MD	Howard County	240276028001
MD	Howard County	240276066071
MD	Howard County	240276069011
MD	Kent County	240299501002
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MD	Kent County	240299503004
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MD	Montgomery County	240317003102
MD	Montgomery County	240317003135
MD	Montgomery County	240317006134
MD	Montgomery County	240317007062
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MD	Montgomery County	240317007131
MD	Montgomery County	240317007132

State	County	Census Block Group ID
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MD	Montgomery County	240317007203
MD	Montgomery County	240317007211
MD	Montgomery County	240317007212
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MD	Montgomery County	240317008185
MD	Montgomery County	240317008193
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MD	Montgomery County	240317008332
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MD	Montgomery County	240317009042
MD	Montgomery County	240317011021
MD	Montgomery County	240317011022
MD	Montgomery County	240317011023
MD	Montgomery County	240317011024

State	County	Census Block Group ID
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MD	Montgomery County	240317012191
MD	Montgomery County	240317012192
MD	Montgomery County	240317014221
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MD	Montgomery County	240317032072
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MD	Montgomery County	240317032131
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MD	Montgomery County	240317032133

State	County	Census Block Group ID
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MD	Montgomery County	240317040001
MD	Montgomery County	240317060121
MD	Prince George's County	240338001023
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MD	Prince George's County	240338001091
MD	Prince George's County	240338001093
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MD	Prince George's County	240338002063
MD	Prince George's County	240338002091
MD	Prince George's County	240338002092
MD	Prince George's County	240338002101
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MD	Prince George's County	240338002111
MD	Prince George's County	240338002112
MD	Prince George's County	240338002182
MD	Prince George's County	240338004081
MD	Prince George's County	240338004121
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State	County	Census Block Group ID
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MD	Prince George's County	240338017071
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MD	Prince George's County	240338029011
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State	County	Census Block Group ID
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MD	Prince George's County	240338032001
MD	Prince George's County	240338032002
MD	Prince George's County	240338033001
MD	Prince George's County	240338033003
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MD	Prince George's County	240338034031
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MD	Prince George's County	240338034033
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State	County	Census Block Group ID
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MD	Prince George's County	240338040022
MD	Prince George's County	240338041021
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MD	Prince George's County	240338058011
MD	Prince George's County	240338058012
MD	Prince George's County	240338058021
MD	Prince George's County	240338058022
MD	Prince George's County	240338059041

State	County	Census Block Group ID
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MD	Prince George's County	240338059061
MD	Prince George's County	240338059062
MD	Prince George's County	240338059071
MD	Prince George's County	240338059072
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MD	Prince George's County	240338067141
MD	Prince George's County	240338067142
MD	Prince George's County	240338068001
MD	Prince George's County	240338069001
MD	Prince George's County	240338069002
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MD	Prince George's County	240338070004
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MD	Prince George's County	240338073052
MD	Prince George's County	240338074043
MD	Prince George's County	240338074052
MD	Prince George's County	240338074072
MD	Prince George's County	240338074093

State	County	Census Block Group ID
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MD	Prince George's County	240338075003
MD	Prince George's County	240339800001
MD	Queen Anne's County	240358107003
MD	Queen Anne's County	240359902000
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MD	St. Mary's County	240378754002
MD	St. Mary's County	240378759051
MD	St. Mary's County	240378760012
MD	Somerset County	240399301011
MD	Somerset County	240399301012
MD	Somerset County	240399301013
MD	Somerset County	240399301014
MD	Somerset County	240399301021
MD	Somerset County	240399301022
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MD	Somerset County	240399306002
MD	Somerset County	240399306003
MD	Talbot County	240419603002
MD	Talbot County	240419604001
MD	Talbot County	240419604002
MD	Talbot County	240419604003
MD	Talbot County	240419604004
MD	Washington County	240430003011
MD	Washington County	240430003012
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