# 2023 Implementation Report DELAVARE'S Climate Action Plan





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The 2023 Implementation Report was prepared by the Delaware Department of Natural Resources and Environmental Control

#### December 2023

A drone captures photos of flooding in Wilmington after hurricane Ida. Photo credit: DEMA Je.

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A boat landed on a field after a tornado swept through the Greenwood area. Photo credit: WAYNE BARRALL – USA TODAY NETWORK

#### **INTRODUCTION**

The State of Delaware is taking ambitious action to prepare for a changing climate and to reduce the emissions that are already creating serious challenges for our communities.

2023 was a year of unprecedented climate change-driven disasters in the United States and in Delaware. In the first eight months of 2023, the United States experienced 24 weather and wildfire disasters that had an economic cost of more than \$1 billion dollars each, the most ever recorded. In 2023, Delaware experienced its largest tornado ever, which caused a path of damage 14 miles long in Bridgeville and Ellendale. Also in 2023, Delaware and its neighboring states experienced record poor air quality days



*Wildfires in eastern Canada emitted particulate matter into the atmosphere, affecting air quality throughout Delaware.* Photo credit: DNREC

#### **Federal Funding Opportunities**

The federal Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA) provide states and municipalities with significant opportunities to invest in clean energy, energy efficiency, clean transportation and hazard reductions. These funds will accelerate our state's ability to reach goals for emissions and resilience. Examples include:

- \$10 million to use over five years for weatherization of housing units and workforce training through the Weatherization Assistance Program
- \$7 million over five years through the Grid Resiliency Grants program for Delaware utilities to improve resilience of electric grids
- \$33 million over five years for the Delaware Energy Office to develop and implement a Homeowner Managing Energy Savings (HOMES) rebate program
- \$33 million to use over five years for low- and moderate-income consumer discounts on the purchase of highefficiency electric home appliances through the High-Efficiency Electric Home Rebate Program
- \$809,000 one-time funding for Colonial School District to pilot three electric school buses through

the Clean School Bus Program

- \$18 million over five years to invest in a network of high-speed electric vehicle charging stations along major Delaware highways through the National Electric Vehicle Infrastructure Program
- \$44 million one-time funding through the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant program for new bike and pedestrian infrastructure.
- \$27 million over five years through the Carbon Reduction Program to invest in projects designed to reduce on-road transportation emissions
- \$3 million over five years to update Delaware's Climate Action Plan through the Climate Pollution Reduction Grant (CPRG) program

due to wildfire smoke from Canada. Nine of the top ten hottest summers recorded in Delaware have occurred in the past 20 years. Globally speaking, 2023 was the hottest year ever recorded in 173 years of NOAA recordkeeping. These events, along with extreme precipitation and chronic sunny day–flooding in coastal areas, will become increasingly frequent unless rapid progress is made to reduce the emissions that cause climate change. The State of Delaware, in partnership with federal and local governments, fellow states, businesses, universities and community organizations, is making rapid progress.

Delaware's first comprehensive Climate

Action Plan, released in 2021, served as a catalyst for climate change action in Delaware. As this report highlights, Delaware is making significant strides in preparing our communities and infrastructure for higher tides, extreme weather and heat waves. Delaware is also making significant inroads in deploying the clean energy technologies that reduce greenhouse gas emissions.

Delaware's General Assembly is also playing a role in modernizing laws to address the climate change challenge. Since 2021, numerous laws have been enacted that focus on climate change, resilience and energy. These include establishing greenhouse gas

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#### The Delaware Climate Change Solutions Act of 2023

The Delaware Climate Change Solutions Act of 2023 sets in place among the most ambitious statewide emissions targets in the nation, along with a series of requirements for tracking process and engaging with the public:

- Sets a statewide greenhouse gas emissions reduction target of 50% by 2030 and net zero by 2050
- Directs the Department of Natural Resources and Environmental Control (DNREC) to update the Climate Change Action Plan every five years and outlines requirements for the plan, including public engagement
- Requires a Climate Action Plan Implementation Report every two years
- Establishes an "all-of-government"

strategy for state agencies to achieve emissions targets and implement the Climate Action Plan, and requires state agencies to appoint a Climate Change Officer

- Directs DNREC to convene Technical Climate Advisers to evaluate and update planning scenarios for sea level rise, precipitation and temperature
- Directs state agencies to consider emissions when purchasing, designing and constructing infrastructure and issuing grants



#### What Is Net Zero?

Delaware's long-term greenhouse gas emissions goal is a recognition that it is vital to reduce our greenhouse gas emissions to as close to zero as possible by 2050 to avert the worst-case impacts of climate change. In many economic sectors this is achievable with current and emerging technologies. However, it is expected that by 2050, a few industries may still be in the process of transitioning away from fossil fuels. This is why, instead of *zero emissions*, we aim for *net-zero emissions*. Carbon sequestration actions, such as planting trees, restoring ecosystems, and investing in new carbon capture technology, can help remove excess carbon dioxide from the atmosphere. So long as the amount of carbon dioxide removed from the atmosphere is equal to the amount emitted—like draining a tub as fast as you are filling it—the level of carbon dioxide in the atmosphere won't rise. That's what we call net zero: a realistic, attainable goal that accounts for both the opportunities and limitations of current technology.



emissions reduction targets for Delaware, updating Delaware's code to facilitate solar installations on commercial buildings and electric vehicle (EV) charging in residential areas, and eliminating barriers to community solar deployment. Delaware's actions to reduce emissions and increase resilience to climate change impacts also received a boost from the federal Bipartisan Infrastructure Law and Inflation Reduction Act. These two pieces of legislation collectively represent

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a once-in-a-generation transformational opportunity: more than \$1 billion is headed to Delaware to invest in modernizing the electric grid, improving the resilience of roads, bridges, and clean water infrastructure, and reducing emissions through investments in EV charging stations, electric buses and energy efficiency.

#### **About This Report**

This report highlights projects, programs and policies that have been launched or improved since the publication of the 2021 Climate Action Plan. The report provides examples of the wide variety of activities undertaken to support the plan and isn't meant to serve as an exhaustive list.



*Milford Riverwalk.* Photo credit: DNREC

#### REDUCING GREENHOUSE GAS EMISSIONS

Minimizing greenhouse gas emissions is an important component of Delaware's Climate Action Plan, and encompasses policies and programs aimed at reducing dependency on fossil fuels. This is achieved via investment in renewable energy, increasing energy efficiency, electrifying our transportation sector, reducing pollutants with high global warming potential such as methane, and offsetting greenhouse gas emissions within Delaware's natural and working lands sector. This section details progress on these action categories to enable Delaware to meet our new mid- and long-term greenhouse gas reduction goals.

#### Promoting Clean and Renewable Energy

#### Strengthening Delaware's Renewable Energy Portfolio Standards

In 2021, Delaware's Renewable Energy Portfolio Standards Act was modified to require that Delaware's utilities derive 40% of their energy from renewable sources such as wind and solar by 2035.

#### Increasing the number of on-site renewable energy systems in residential and commercial buildings

In 2023, the Governor's Energy Advisory Council (GEAC) was reconstituted to enable equitable programs, planning and workforce training to support the rapidly transforming energy sector. The Council established four working groups to help review past plans, study particular topics in greater detail and offer recommendations to the Council. Those working groups include focus areas on Renewable Energy and Clean Technologies, Energy Efficiency and Electrification, Grid Modernization, and Environmental Justice and Energy Equity.

The Green Energy Fund accelerates deployment of renewable energy systems in Delaware. Qualifying systems include solar photovoltaic systems, solar water heating systems, small wind turbines and geothermal heat pumps. In 2022, the fund deployed over 500 projects that added just under 6 megawatts (MW) of solar capacity. As of October 2023, over 1,000 Green Energy Fund applications were received, a 29% increase from recent years. Three hundred projects were funded, adding 3.2 MW in solar capacity.

#### Increasing the number of on-site renewable energy systems in industrial buildings

In 2023, a law was enacted to require most new large commercial buildings in Delaware to be constructed with a solar-ready zone on the roof. The solar-ready zone must be at least 40% of the roof area and must be designed and reserved for future installation of a solar photovoltaic or solar thermal system.

### Ensuring that Delaware is prepared for offshore wind energy opportunities

As marine resources off our coast are forced to adapt to changing sea levels, warming waters, and increased human activity, it's important to ensure balance between the uses of the ocean and bay and conservation. As of December 2023, Delaware's Ocean and Bay Plan is in outline form and will be a resource for decision makers and stakeholders to better understand and protect marine resources, ecological functions and emerging ocean and bay uses.

DNREC is engaging with PJM Interconnection, the regional energy transmission organization, on offshore wind transmission planning and consulting with other Delaware agencies and utilities including the Public Service Commission, the Delaware Division of the Public Advocate, Delmarva Power, the Delaware Municipal Electric Corporation and the Delaware Electric Cooperative.

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An installation completed for the Low- to Moderate-Income Solar Pilot Program. Photo credit: DNREC

### Addressing equity challenges in access to renewable energy

The Green Energy Fund's new Low- to Moderate-Income Solar Pilot Program provides cost-free rooftop solar installation for qualified low-income homes throughout the state. Qualifying moderate-income households pay one-third of the total cost for rooftop solar installation. As of October 2023, the program had added 160 kW of photovoltaic solar to underserved communities throughout the state.

Since the adoption of a state law in 2021 to eliminate barriers to community solar deployment in Delaware, many proposed projects—representing millions in private investment—have registered with utilities and submitted applications for a Preliminary Certificate to Operate to the Public Service Commission. Bringing these projects to fruition has been hampered by technical barriers to interconnection for projects of up to 4 MW. Overcoming the challenges hindering interconnection is a top policy priority for DNREC.

While solving interconnection issues remains

integral to the growth of solar in Delaware, increasing access to solar development in underserved communities remains another key focus area. This year, DNREC commissioned multiple studies to map the social, economic, and geographic landscape of solar adoption in Delaware. These studies will help DNREC identify gaps in community needs and program outreach.

#### **Increasing Energy Efficiency** Strengthening building energy codes

DNREC adopted the 2018 International Energy Conservation Code (IECC) and American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard 90.1-2016 in 2020. DNREC is in the process of evaluating the 2021 IECC and ASHRAE 90.1-2019, for possible adoption in 2024.

### Expanding energy efficiency programs for residential and commercial buildings

Energize Delaware designed six new programs that launched between 2022 and 2023. These include Electric Vehicle Fleet Grants for Local Governments, Energy Savings Performance Contract Grants for



Secretary Garvin and DNREC Climate, Coastal and Energy staff celebrate Weatherization Day with homeowners. Photo credit: DNREC

State Agencies and School Districts and Solar Grants for School Districts, and Libraries. They also launched a Small Business Performance Program. Five programs have been expanded by offering higher incentives and broadening eligibility. These programs include the highly successful Home Performance with ENERGY STAR®, Affordable Multifamily Housing, Faith Efficiencies, Non-profit Energy Assessment Program, and Pathways to Green Schools.

## Expanding energy efficiency opportunities for low- and moderate-income residents and small businesses

Delaware has received the first half of the \$10.2 million in Bipartisan Infrastructure Law funds to supplement Weatherization Assistance Program services, including \$1.8 million dedicated to workforce development; \$1 million dedicated to leveraging outside funding and partnerships; and \$4.5 million dedicated to continuing and enhancing existing Weatherization Assistance Program services. Those enhancements include multi-family high-rises, heat pumps, solar panels, ventilation systems, cool roofing, and health and safety improvements.

#### Improving industrial energy efficiency

In 2022, the Energy Efficiency Investment Fund (EEIF) program designed two new rebate pathways, an Appliances & Food Service Prescriptive Pathway and a New Construction Pathway, to better incentivize a broader array of energy efficiency projects. DNREC administers EEIF grants to provide Delaware non-residential buildings with financial incentives that help offset the costs associated with energy efficiency improvements and upgrades. Additionally, EEIF transitioned from a paper-based application process to a digital portal, which has greatly expedited the application creation and submittal processes, while also ensuring that applicants and contractors can locate program-specific information more efficiently.

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The Governor's Energy Advisory Council is developing an energy plan that ensures Delaware's electric grid is prepared for the integration of renewable energy and the transition to buildings and transportation electrification. Photo credit: Adobe Stock

Delaware code was updated in 2023 to allow the Energy Efficiency Investment fund to provide more financial support to a larger number of business entities with the end goal of reducing operating costs, conserving energy and mitigating climate change. Up to 60% of energy efficiency project costs are now eligible for rebates under the program.

### Supporting the long-term transition to building electrification

The Governor's Energy Advisory Committee Energy Efficiency and Electrification working group is exploring current energy efficiency programs, transportation electrification, building electrification, reliability and other topics to ensure that Delaware's electric grid is prepared for increased load from the transition to electric home heating and EVs.

The DNREC Division of Climate, Coastal and Energy applied for grants from the HOMES Efficiency Program and HOMES Electrification Program under the Inflation Reduction Act, targeted to low-to moderate-income

#### Energize Delaware's ZeMod Program

To fully implement existing code requiring residential new construction to be net-zero energy-capable, it's important to have examples of efficient building systems in practice. In 2022, Energize Delaware's ZeMod Program and Beracah Homes won the U.S. Department of Energy's Zero Energy Home's Housing Innovation Award. These zero-energy modular homes use highly efficient heat-pump technology, ENERGY STAR® rated appliances, and lighting coupled with rooftop solar to produce as much energy as they use which means no electric or fuel costs for the homeowner.

Delawareans. The two programs provide approximately \$66 million in funding over the next five years. HOMES Efficiency Program will offer whole-house rebates for energy efficiency improvements and HOMES Electrification Program will provide electric appliance rebates. Grant applications are currently under review by the U.S. Department of Energy.

#### **Clean Transportation** Strengthening consumer adoption of electric vehicles

Delaware's Clean Transportation Incentive Program, coupled with federal tax incentives through the federal Inflation Reduction Act, continues to help make EVs an affordable choice for Delaware families. Delaware's rebate program for purchase and lease of new EVs provided 777 rebates in 2022 and 738 in the first six months of 2023. There are now more than 8,000 EVs registered in Delaware.

In 2023, Delaware's Clean Vehicle Rebate Program was codified into state law to incentivize the purchase and lease of new and used EVs by Delaware residents. DNREC will continue to implement the rebate program and revise incentive levels over time to respond to market trends and emerging technologies.

University of Delaware's Institute for Public Administration partnered with DNREC to offer a four-part webinar series to train Delaware's local government officials on EVs, charging infrastructure and EV-related codes and ordinances.

To assist local governments in adopting EV technologies, Energize Delaware launched Grants for Local Government EV Fleets. Through this program, counties and municipalities in Delaware could receive up to \$500,000 for feasibility studies and the purchase of EVs, riding lawn equipment, charging stations, utility upgrades, installation and special training for the use of new EV equipment.

#### Capitalizing on the transition to zeroemission vehicles to stimulate innovation and provide jobs

Delaware Department of Transportation (DelDOT) convened a working group of state agencies and education professionals to collaborate on workforce development opportunities for EVs and charging stations.

#### Delcastle Technical High School Installs EV Charging Stations

Delcastle Technical High School electrical trade students, with the help of the welding, auto tech and technical drafting students, installed two dual-port EV charging stations on their campus for public use. These are the first charging stations in Delaware installed by high school students, serving as a model for other high schools across the state. The district plans to add EV charging stations to three other schools in future years; Hodgson, Howard and St. Georges High Schools.



Bryan Bryant, the electrical trades teacher at DelCastle Technical High School plugs in. Photo credit: DNREC

### Expanding charging infrastructure for electric and plug-in hybrid vehicles

In 2021, New Castle County amended codes to expand EV charging by requiring new residential construction be EV-capable. This included requirements for EV-capable parking spaces and for builders to install electrical panels that accommodate EV charging equipment.

DNREC relaunched its popular rebate program for Level 2 EV charging stations in 2023. Businesses, schools, nonprofits and governments can receive cash rebates for purchase of public or workplace Level 2 EV charging stations, and owners of multi-unit dwellings qualify for additional funding for installation costs. As of October 2023, there are 133 public Level 2 charging station locations in the state hosting 281 charging ports.

Delaware is rapidly increasing the availability of DC Fast Charging stations throughout the state. In 2022, DNREC provided \$1.4 million in grant funding to businesses to develop 14 DC Fast Charging station locations across the state. DelDOT will receive \$17.6 million over five years through the National Electric Vehicle Infrastructure (NEVI) Formula Program to build out a network of DC Fast Charging stations along Interstate 95, Route 1, Route 113 and Route 13. As of October 2023, there are 46 public DC Fast EV charging station locations in the state hosting 176 charging ports.

In 2023, a law was enacted to require that newly constructed single-family and multifamily residential dwellings include EV charging infrastructure. This reduces barriers to EV charging for Delawareans and saves them money in the long-term, because retrofitting sites with EV charging equipment can be much more expensive than adding EV-capable equipment to new construction.

#### Improving accessibility of low-carbon transportation options for all Delawareans

To improve access to EVs in apartments and townhomes, DNREC expanded its incentive program for multifamily dwellings under the Electric Vehicle Charging Equipment Rebate Program. This program provides funding to owners of multifamily dwellings to offset the purchase and installation of Level 2 EV chargers for use by residents, with higher incentive levels in disadvantaged communities.

To simplify the process for charging station installation, DNREC produced the <u>Guidebook</u> to <u>Installing Electric Vehicle Charging</u>. <u>Stations</u><sup>1</sup> in 2023. The guidebook introduces readers to EVs and assists them in assessing options for choosing and installing EV charging stations. It also discusses considerations for station planning and design and financial costs, and provides step-by-step instructions for moving forward.

### Ensuring that electric and plug-in hybrid vehicles contribute to grid stability

Delaware electric utilities offer programs for drivers of EVs who charge during times when the demand for electricity is low. The Delaware Electric Cooperative offers a "Beat the Peak" program, which includes a onetime billing credit of \$100 and a monthly credit to participating EV drivers. Similarly, Delmarva Power offers an EV program that provides a discounted time-of-use rate specifically for EV drivers.

### Reducing vehicle miles traveled by 10% by 2030

Delaware is building infrastructure to make biking and walking a safe and convenient alternative to cars. In 2023, Delaware received two U.S. Department of Transportation RAISE grants to support interconnecting

<sup>1</sup> URL: https://documents.dnrec.delaware.gov/energy/transportation-program/Electric-Vehicle-Charging-Station-Installation-Guide.pdf



The Guidebook to Installing Electric Vehicle Charging Stations simplifies the process.

bike paths and trails. The New Castle County Government was awarded \$23 million for a shared-use path connecting Newport to the Jack A. Markell Trail in Wilmington. \$21 million was awarded to DelDOT for the final phase of a shared-use path connecting Georgetown to Lewes.

Expansion of broadband access statewide helps all families access remote work opportunities and virtual healthcare options, helping to reduce vehicle miles traveled. Delaware is using more than \$100 million in federal funds from the Bipartisan Infrastructure Law to bring internet to all Delawareans, with a focus on deploying high speed broadband to underserved households.

### Improving the efficiency of freight delivery

DNREC provided \$1.9 million in grant funds to businesses and schools to purchase electric heavy-duty vehicles and off-road equipment in 2021 and 2022. These vehicles include an electric school bus, five electric garbage trucks and six electric forklifts. These EVs and equipment replaced older-model diesel vehicles that have been taken out of service, providing air quality benefits especially in neighborhoods near roads with heavy traffic.

The Delaware Freight Plan details key projects and strategies to maximize efficiency and reliability of freight transportation networks. The Freight Plan was updated in 2022 to incorporate climate change considerations. The updated plan references specific strategies from Delaware's Climate Action Plan that could influence or affect freight operations, such as flood resilience and fleet electrification.

In 2023, a new state law establishes targets for annual purchases of electric school buses by the Department of Education. The law requires that 30% of school bus purchases be electric by 2030.

The Colonial School District successfully competed for grant funding from the U.S. EPA to purchase three electric school buses. The Red Clay Consolidated School District received funding from DNREC for one electric school bus. These districts will be the first school districts to add fully electric buses to their fleets.

### Promoting increased vehicle fuel efficiency

DNREC finalized regulations to adopt the Advanced Clean Car II program which will improve air quality and increase availability of EVs for consumers. The Advanced Clean Cars II regulation updates and modernizes Delaware's low-emission vehicle and greenhouse gas standards for light- and medium-duty vehicles. In addition, it requires that auto manufacturers deliver a certain annual percentage of zero-emissions vehicles to Delaware, making zero-emission options including battery-electric, plug-in



Bicyclists cross a bridge on the Jack A Markell Trail. Photo credit: WRA, LLP

hybrid electric, and fuel cell electric vehicles more accessible across the state. Under the finalized regulation, starting with model year 2027, 43% of new cars and trucks sent to Delaware for sale will be zero-emission vehicles. The percentage will increase to 82% in 2032.

#### Leading by example in state government operations to reduce transportation emissions

The state is on track to convert 20% of its state-owned light-duty vehicle fleet to electric by 2025. As a component of this effort, a team from four state agencies worked together to complete engineering designs to install charging stations for fleet vehicles at five locations statewide. Construction will commence in 2024.

#### **Reducing High Global Warming Potential Greenhouse Gases** Reducing emissions from hydrofluorocarbons (HFCs)

DNREC developed a regulation prohibiting the use of certain HFCs. The regulation applies to any person in Delaware who "sells, offers for sale, leases, rents, installs, uses, or manufactures" any product or equipment that uses an affected HFC. Existing products or equipment containing a prohibited HFC may continue to be used if they were acquired prior to the assigned prohibition date unless an existing system is retrofit.

### Reducing methane emissions through expanded methane capture

Delaware Solid Waste Authority collects and uses the energy capacity of the landfill gas at



An electric vehicle charges at a DC Fast Charger. Photo credit: DNREC

all three active landfill facilities (Cherry Island Landfill in New Castle County, Sandtown Landfill in Kent County, and Jones Crossroads Landfill in Sussex County). Across the state, the agency partners with companies that operate a total of 15 beneficial use engines and three boilers to generate up to 16 MW of electricity, as well as heat, both of which support local businesses and homes. This use of landfill gas to generate energy diverts the use of fossil fuel energy sources, including coal, natural gas and oil.

#### Increasing renewable natural gas production and incentivizing markets for its use as a fuel

The first renewable biogas project in Delaware is under consideration by state and county agencies. This project would process organic wastes from the poultry industry and transform it into stable compost used to replace chemical fertilizers. The byproduct biogas, or renewable natural gas—would be injected into natural gas pipelines for use by the utility's Sussex County customers.

#### **Reducing methane emissions by diverting** waste from landfills through increased recycling and waste diversion

DNREC will receive \$530,000 from the Solid Waste Infrastructure for Recycling Grant, funded by the Bipartisan Infrastructure Law, to increase the rate of waste diversion in Delaware.

In 2021, DNREC unveiled <u>Recyclopedia<sup>2</sup></u>, a quick and easy online search tool to find out how and where to properly dispose of recyclables.

#### **Offsetting Greenhouse Gas Emissions with Natural and Working Lands** Supporting best management practices on agricultural lands

The Delaware Department of Agriculture put 1,211 acres into Agricultural Conservation Easements in 2022, with almost double that acreage anticipated to be secured in 2023.

DNREC developed a pilot riparian forest buffer cost share program in the Chesapeake Bay watershed, with hopes to eventually offer the program statewide. One full-time staff member is now dedicated to planting riparian buffers and other best management practices in the Chesapeake Bay.

URL: https://dnrec.alpha.delaware.gov/waste-hazardous/recycling/what/#/



Workers plant trees at the Tree for Every Delawarean Event. Photo credit: DNREC

### Supporting conservation and restoration of forest lands

In 2021, Governor John Carney launched the Tree for Every Delawarean Initiative (TEDI) with a goal of planting one million trees in the state by 2030. Working with various stakeholders, TEDI provides technical support and funding sources—some outside of TEDI—for tree planting projects throughout Delaware. An annual competitive grant program provides opportunities for state agencies, local governments, and nongovernmental organizations to plant trees, which are also tracked on an online public interface. As of October, 182,184 trees have been planted across The First State.

In 2023, the Delaware General Assembly provided \$500,000 in additional funding toward TEDI. The increase in funding enhanced program implementation and stakeholder interest.

DNREC Division of Fish and Wildlife along with the Division of Parks and Recreation



A community greenspace at the Milford Riverwalk. Photo credit: DNREC

purchased 130 acres. ALSO... 411 acres in 2023, totaling 542 acres over two years. During that timeframe, an additional 19 acres were put into conservation easements.

### Supporting local communities' enhancement of urban green spaces

Every year a portion of TEDI funding is dedicated to the Delaware Forest Service's Urban and Community Forestry (UCF) Program, a long-standing program with multiple funding sources. UCF provides annual grants to communities for tree planting projects in urban areas. UCF staff provide technical support including site-specific tree recommendations. A total of 3,193 urban trees were planted in 2022.

### Improving methods for measuring and tracking carbon sequestration

DNREC convened a team of natural lands experts to explore emerging technologies for carbon accounting and will continue to work with partners to find the most suitable tool for application in Delaware.



The intersection of 16th & Thatcher Street in Wilmington was completely flooded after heavy rainfall from remnants of Hurricane Ida. Photo credit: William K. Clark – USA TODAY NETWORK

#### MAXIMIZING RESILIENCE TO CLIMATE CHANGE IMPACTS

Delawareans are threatened by inland flooding, coastal storms, sea level rise, and changing climate conditions. These effects can challenge the environment and economy, as well as the social framework of communities. We know that our most vulnerable populations will feel the impact of climate change, worst and first. By proactively taking action now to increase our resilience, we can better support Delaware's communities to be vibrant, healthy and prepared to meet the challenges of a changing world.

Each category contains several strategies for increasing resilience and lists examples of specific actions that can be taken within that strategy. The following sections highlight key progress made within each category and strategy, but are not inclusive of all the diverse resilience work happening across the state.

#### Updated and New State Regulations

### Update regulations to reduce risk to properties from climate change

State agencies continue to update regulations to incorporate increasing risks from climate change. Delaware's Climate Change Solutions Act of 2023 will help to facilitate this process by establishing a timeline for issuing climate change planning scenarios for sea level rise, precipitation and temperature. These scenarios are a key consideration for any future regulation updates.

In 2022, DelDOT published the most recent edition of their Road Design Manual, which provides guidance for the design of any new roadway construction or reconstruction of existing roadways. The updated design manual now references the changing climate and the need to adapt transportation projects to increased flooding risks due to sea level rise, changing weather patterns and the low-lying elevation of the state. The 2022 Road Design Manual encourages DelDOT to consider the effects of sea level rise when designing projects, as well as overall resilience and sustainability considerations. The Bridge Design Manual also references sea level rise and Federal **Emergency Management Agency (FEMA)** flood zones when making decisions related to roadway and bridge elevations. These updates will ensure that road construction projects in low-lying and flood-vulnerable areas are designed for future risks of flooding and inundation.

#### Delaware's First Resilience Hub

In early September 2021, unprecedented flooding along Brandywine Creek in Wilmington displaced residents from one of the most vulnerable neighborhoods, leading to the creation of Delaware's first resilience hub. Resilience hubs are pre-existing community facilities, augmented to sustainably support residents, designed to meet the community's needs before, during, and after a hazard event and empower the community. After volunteer efforts and community planning events, the Delaware Resilience Hub opened at Wilmington's Police Athletic League in the summer of 2023. Since opening, the Delaware Resilience Hub has worked to set up cooling centers in the area, offered first aid/CPR training, and provided supplies for resilience kits and many other community services. Building on community efforts, a non-profit organization, Green Building United, was awarded an U.S. EPA planning grant, while DNREC's Delaware Coastal Programs helped to provide education on resilience hubs and learn more about resident needs.

## Update regulatory processes to allow for greater inclusion of climate impacts in permit decisions

The Coastal Zone Act now requires a Sea Level Rise and Coastal Storm Plan for certain projects. In this plan, the applicant must describe and map the current and future flood risks, then describe the measures they intend to take to reduce these risks. The plan must also include measures for dealing with coastal erosion and sustained winds over 95 mph. The regulatory changes that were included in this action can serve as a model for inclusion of climate change considerations into other regulations.



#### Support for Communities and Stakeholders

### Increase grant opportunities for climate change adaptation projects

Towns and municipalities often need assistance to find and access grant funding to help with their resilience projects. To address this need and to make sure that Delaware local governments can access the historic funding opportunity from the 2021 Bipartisan Infrastructure Law, Delaware established the Grant Assistance Program (GAP) at the University of Delaware's Institute for Public Administration. The GAP is a state-funded program that works with local governments and other partners to identify potential projects, find funding opportunities and compete for grants. GAP also hosts an <u>online portal</u><sup>3</sup> for funding opportunities.

The efforts of GAP are complemented by long-term ongoing efforts of Delaware's Resilient and Sustainable Communities League (RASCL). RASCL is a partnership that fosters collaboration between resilience practitioners, community members, and decision makers. In 2021, RASCL established the Project Guidance Group. This service brings technical experts together to assist Delaware communities in initiating and planning resilience-related projects. Since its inception, RASCL has helped multiple communities on resilience projects, including Dewey Beach, Fenwick Island, and the Town of Milton.

#### Assist local governments, homeowners, industries and utilities in increasing their resilience to climate change

DNREC's Resilient Community Partnership (RCP) continues to help local governments assess their vulnerabilities to climate change, prioritize resilience and planning options, and implement their plans. Since 2021, RCP projects have included: providing a facilitation process in Lewes to develop draft language for real estate disclosure, updating vulnerability assessments in Fenwick Island, designing shoreline protection measures in Milton and a flooding study in Little Creek. This baseline work is an important component to helping communities competitively apply for implementation grants.

RASCL continues to build on its success providing training and assistance to local governments to increase their resilience to climate change. The annual RASCL Summit hosts hundreds of participants to network and share best practices for resilience and sustainability, and quarterly coffee hours are offered throughout the state focused on resilience topics. In addition, in 2023, RASCL published a new guidance document outlining steps and considerations for local governments developing a community sustainability plan. This guidance document and many other resources can be found on the <u>RASCL</u>. <u>Resources</u><sup>4</sup> page.

#### Support programs and initiatives that help frontline communities adapt to climate change

Urban areas are often more vulnerable to extreme heat waves than rural areas, due to the way that materials such as concrete and asphalt absorb and retain heat during the day, as well as the lack of trees to provide shade and cooling. Unequal access to urban green spaces is also an important environmental equity issue. Working together with DNREC and the National Integrated Heat Health Information System, staff of the University of Delaware Climate Change Hub engaged in a community science mapping project<sup>5</sup> in July 2023. Project staff worked with community volunteers to collect temperature data from neighborhoods across Wilmington and surrounding areas. These data will be used to identify the hottest neighborhoods and to inform future pilot projects on potential solutions such as green roofs, pavement coatings and urban tree planting.

Nonprofit organizations—from faith-based organizations, to food pantries to community support—have a vital role to play in providing services to Delawareans in frontline communities. Many of these organizations will be impacted directly or indirectly by climate change, whether through increased demand for services, economic impacts, or a

<sup>3</sup> URL: https://www.bidenschool.udel.edu/ipa/serving-delaware/grant-assistance

<sup>4</sup> URL: <u>https://www.derascl.org/resources</u>

<sup>5</sup> URL: https://sites.udel.edu/climatechangehub/events/wist-heat-watch-2023/

need to pivot to more resilient and sustainable strategies. In fall 2023, DNREC partnered with the Delaware Alliance for Nonprofit Advancement to bring a series of interactive climate change webinars to Delaware nonprofits, focused on the key information they need to know about climate change. The first of these trainings was held in October 2023.

In an effort to better integrate environmental justice into its decision-making and programs, including climate change, DNREC launched a new map-based tool to identify communities disproportionately impacted by agency decisions and environmental issues. The **DNREC El Area Viewer**<sup>6</sup> allows users to explore locations that may be impacted by a program or decision and study environmental and social factors in a holistic way.

#### Provide training, tools and technical assistance on climate change impacts and accompanying resilience actions



The <u>Delaware Coastal Dashboard</u><sup>7</sup>, launched in 2023, combines existing

resources into a one-stop shop, putting maps and forecast data from across the web into a single, easy-to-use dashboard. The new dashboard will significantly improve capacity to prepare for impending storms and plan for future storm events. The Delaware Coastal Dashboard was made possible by grant funding through NOAA and a partnership between DNREC, Delaware Geological Survey and the University of Delaware Center for Environmental Monitoring and Analysis.



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#### The Delaware Flood Planning Tool<sup>8</sup>

was updated to incorporate sea level rise inundation maps, which were previously available on a separate mapping site. Now, Delawareans wanting to

better understand their flood risk can view the FEMA flood maps and long-term sea level rise in one place.



#### The Delaware Coastal Flood

Monitoring System<sup>9</sup> is a web-based tool and alert system designed to provide emergency managers, planners and others with the information on the extent, timing and severity of upcoming coastal flood conditions. It provides information on maximum forecasted water levels, community maps, 48-hour tidal forecasts and road elevation profiles. Each community can set configurable alerts for forecasted water level conditions that cross pre-set thresholds. The original tool, released in 2011, included communities along the Delaware Bay Coast from New Castle to Lewes. As of 2023. communities south of Lewes within the Inland Bays are now also included. The tool now also includes a predictive statistical model that uses three years of water levels collected by the University of Delaware Center for Environmental Monitoring and Analysis from 2017 to 2019.

#### **Management Plans Incorporate climate change impacts** and adaptation considerations into strategic plans

DelDOT developed the Delaware Resilience Improvement Plan to serve as a roadmap for thoughtful investment in critical infrastructure, and to tailor both adaptation and mitigation measures toward the agency's resilience goals. The Delaware Resilience Improvement Plan aims to provide a safer, more resilient and more equitable transportation system for everyone using the transportation network in Delaware. The plan focuses on segments of the transportation network that are most vulnerable to flooding

<sup>6</sup> URL: https://dnrec.maps.arcgis.com/apps/instant/sidebar/index.html?appid=c639c1d1be634591b8e14d3f3205f753

URL: https://cema.udel.edu/applications/dashboard

<sup>8</sup> URL: https://floodplanning.dnrec.delaware.gov/

<sup>9</sup> URL: https://coastal-flood.udel.edu/

across the state, a threat that's expected to continue to increase with sea level rise and increasing extreme weather events.

The Office of State Planning Coordination issues the Delaware Strategies for State Policies and Spending every five years. Last issued in 2020, this statewide strategy helps to align spending for public infrastructure with state goals for growth, development and preservation. The 2020 plan incorporated considerations for sea level rise and increased flooding. The office's annual reporting now includes components of the Climate Action Plan, and staff are working with DNREC to begin laying the foundation for incorporating the Climate Action Plan into the 2025 update.

## Update emergency response and hazard reduction plans to incorporate future climate projections

In August 2023, the Delaware Emergency Management Agency and FEMA Region 3 announced the approval of Delaware's Hazard Mitigation Plan. The plan, updated every five years, details risks faced by Delawareans and key vulnerabilities to those risks, and offers strategies to increase resilience. Natural hazards covered by the plan include coastal erosion, coastal flooding, dam/levee failure flooding, drought, earthquakes, extreme temperatures, inland flooding, local earth movement, severe thunderstorms and tornadoes, severe winter weather, tropical cyclones, and wildfire. By developing and adopting the plan, Delaware communities are now eligible for certain types of FEMA funding, including Hazard Mitigation Assistance grants.

### Update or create management plans to incorporate future climate projections

DelDOT is developing a <u>Resiliency Plan<sup>10</sup></u> for the State Route 1 (SR1) corridor from Dewey Beach to the Maryland state line. The corridor serves as the primary evacuation route for Bethany Beach, South Bethany, Fenwick Island and Ocean City. Closures to this route from accidents, flooding or other events result in an 18-mile detour. The SR1 Resiliency Plan will evaluate the impacts of climate change and sea level rise to the Route 1 corridor and will outline roadway improvement projects that will increase the resilience of the area. Planning work for this project began in 2021 and public workshops were held in September 2022 and May 2023. When the plan is completed, DelDOT will begin prioritizing projects for construction. DelDOT is also developing a Resiliency Plan for the State Route 9 corridor from New Castle to Little Creek.

DelDOT developed their first Transportation Asset Management Plan (TAMP) in 2019 for National Highway System pavements and bridges, and then subsequently updated the TAMP in December 2022. In the 2022 TAMP, DelDOT includes weather and climate change in the risk management process for transportation assets. For example, Delaware is at risk from severe coastal storms, which are expected to increase in intensity and frequency. The TAMP suggests risk management strategies, including a "storm fund" to speed up repairs after a storm. DelDOT also expects to reduce the risks posed by sea level rise by establishing a policy for abandoning highly vulnerable roadways and addressing the impacts of abandonment.

The Christina-Brandywine River Remediation Restoration and Resilience plan aims to make the Christina and Brandywine Rivers fishable, swimmable and drinkable in the shortest possible timeframe. The plan incorporates two projects: a sediment remediation feasibility study and a plan to restore the rivers. The feasibility study resulted in the publication of a Preliminary Data Evaluation and

#### **Comprehensive Plans**

Local governments are also planning for climate change in their management plans. Several local governments have updated their comprehensive development plans since the CAP was released, and many of these plans incorporate climate change adaptation into the community's plans for the coming decade:

- New Castle County's updated comprehensive plan, NCC@2050, was approved in July 2022. Two of the main goals outlined in the plan include designing the county's built environment to limit greenhouse gas emissions and protect from the impacts of climate change, and pursuing a net-zero-emissions built environment. There are numerous objectives and strategies outlined within the plan to work toward these goals. For example, the plan calls for adjusting zoning and design standards to promote resilience and recommends requiring that all new development in the county account for sea level rise and other potential climate threats.
- The City of Rehoboth Beach adopted a new comprehensive plan in June 2022. The new comprehensive plan incorporates references to statewide efforts on climate change, including the Climate Action Plan, vulnerability to climate change and recommendations for Rehoboth Beach to develop and implement a city Climate Action Plan.

- The towns of Middletown and Odessa both adopted updated comprehensive plans in 2022.
  Both include a variety of recommendations to promote climate adaptation, such as limiting development in floodplains and wetlands, considering the impact of climate impacts on future planning, and ensuring that buildings are up to code for cooling systems.
- "Resilient Wilmington," the City of Wilmington's resiliency and sustainability plan, was published in June 2022. The plan was funded by the DNREC Division of Climate, Coastal and Energy's Sustainable Communities Planning Grant. Wilmington is the largest city in Delaware and is a major transportation hub, yet much of the city lies within the 100-year floodplain. The plan outlines four "visions" for the city: smart and resilient economic growth, resilient sewer and stormwater infrastructure, resilient and clean transportation systems and resources for residents to keep them safe in a changing climate.

Conceptual Site Model Report in September 2022. In 2023, "A Plan for Restoring Wilmington's Rivers" was published. One of the main goals outlined in the plan was to increase community resilience in Wilmington. The plan identified numerous strategies to advance this goal, such as updating structure requirements for sea level rise and flooding and planting trees. The plan also details a series of projects around the Wilmington area, all of which incorporate resilience benefits.

Climate change is also incorporated into management plans at the regional level. As an example, the Chesapeake Bay Program, a regional partnership between the U.S. EPA



A monitoring station at the St. Jones Research Reserve. Photo credit: DNREC

and seven jurisdictions including Delaware, published the Climate Resiliency Outcomes Management Strategy and Logic and Action Plan. Goals of the plan include increased climate resilience in the Chesapeake watershed, continuous monitoring and assessment of climatic and sea level conditions in the bay and the design and construction of restoration and protection projects around the bay.

#### **Facility Design and Operation** Update facility construction guides and standards to increase resilience to climate change impacts

Delaware's state agencies continue to use best available flood maps and sea level rise scenarios when siting and designing stateowned and operated buildings. New state buildings are designed using U.S. Green Building Council LEED Silver standards. LEED is a green building rating system used around the globe to improve the sustainability and health of buildings. In addition, parking areas of new state and renovated buildings are designed to provide a minimum number of publicly available EV charging stations.

### Prepare state facilities and equipment for climate change impacts

State facility managers piloted two green infrastructure demonstration projects to increase resilience. The Department of Agriculture completed a green infrastructure project at their building in Dover and DNREC led an effort to reduce impervious surfaces at its boat ramp parking lot in Bowers Beach. Delaware's Climate Change Solutions Act of 2023 builds on these and other ongoing efforts of state agencies to increase resilience and requires state agencies to consider resilience in the siting, construction and maintenance of state buildings and the planning, design and operation of state infrastructure.

#### **Research and Monitoring** Continue and expand research on climate change impacts in Delaware

Delaware's Climate Change Solutions Act establishes Technical Climate Advisers tasked with issuing climate change planning scenarios every five years. DNREC previously issued planning scenarios in 2012 and 2017. In anticipation of issuing updated



#### **The Southbridge Wilmington Wetlands Park**

In response to resident concerns about persistent flooding and development in Southbridge, a team consisting of the City of Wilmington, the Southbridge Civic Association, DNREC, The Nature Conservancy, the Wilmington Area Planning Council, RK&K Engineering, BrightFields, Inc., Oasis Design Group and the Wilmington Housing Authority came together to design and construct the Southbridge Wilmington Wetlands Park. The park, which opened in 2022, not only provides green space that connect residents to local amenities and each other, but also remediated legacy contaminated properties, restored and enhanced wetlands in the area and serves as a stormwater management facility.

scenarios, University of Delaware's Center for Environmental Monitoring and Analysis, in partnership with DNREC, hosted a technical workshop in 2023. This workshop brought together technical experts to discuss specific data and data product needs for eventual users of the climate projection data. Planning scenarios for sea level rise, precipitation and temperatures are foundational for research on climate impacts.

The DNREC Division of Water is expanding saltwater intrusion monitoring throughout the state. In 2023, three saltwater intrusion

monitoring well sites were selected and drilled at the Town of Slaughter Beach and four existing wells at the St. Jones Reserve have been selected for monitoring. Monitoring equipment installation and data collection for the saltwater intrusion model are slated to begin in fall 2023.

The Brandywine Conservancy, in partnership with the Chester County Water Resources Authority and the University of Delaware Water Resources Center, launched the Brandywine Flood Study in August 2023. Expected to be completed by June 2024, the study will investigate where flooding occurs along the main stem of the Brandywine Creek, conduct hydrologic/hydraulic watershed modeling and identify potential flood solutions.

The Delaware Environmental Monitoring Coordination Council seeks to reduce redundancy and enhance connectivity by fostering collaboration between environmental monitoring entities in the State of Delaware. Established in 2019, the council hosts semiannual meetings and a larger Delaware Environmental Monitoring Summit.

#### Increase the number of resilience pilot projects and demonstration sites in Delaware

In response to extreme heat in Wilmington, the Delaware Resilience Hub began partnering with local faith organizations in the area, such as the Resurrection Center, to open cooling stations to help residents beat the summer heat. Delaware Interfaith Power and Light also received a grant from Delmarva Power to support the Salem United Methodist Church in serving as a cooling station during official heat emergencies in Newark. The cooling stations provided water, snacks, and important information on heat safety and the services cooling centers can provide. The Delaware Resilience Hub is continuing to work with local churches to provide similar services this winter, keeping folks warm during extremely cold conditions.

#### **Outreach and Education** Develop targeted communication tools and messages about climate change

The Delaware Department of Health and Social Services created the Delaware Environmental Public Health Tracking Network, also known as My Healthy Community. My Healthy Community covers topics including chronic disease, mental health, community safety, environmental health, and infectious disease. In summer



Stacey Henry of the Delaware Resilience Hub participate in the WiST Urban Heat Watch data collection effort. Photo credit: DNREC

2023 the Climate and Health section of My Healthy Community underwent a major overhaul to better integrate with climate change information on the DNREC website, as well as to include a broader range of climate-related data, such as future climate projections, health outcomes and flood hazard zones.

Libraries serve as a valuable community hub and repository of knowledge for Delawareans. DNREC, Green Building United and Energize Delaware have partnered with libraries across Delaware to produce a series of webinars on how libraries can incorporate climate adaptation and sustainability into their new construction and retrofit buildings design.

### Increase the availability of climate change educational programming



Delaware's Coastal Training Program hosts events to help communities prepare for flooding. Photo credit: DNREC

DNREC's <u>Coastal Training Program</u><sup>11</sup> provides current scientific information and access to technologies and skill-building opportunities to Delawareans responsible for making decisions about the state's coastal resources. The Coastal Training Program's activities include technical assistance, seminars, hands-on skill training and participatory workshops, field experiences and community engagement. Since October 2022, Delaware's Coastal Training Program has provided climate change and coastal resilience-based trainings and workshops for 282 coastal decision makers.

In 2021, the University of Delaware created the Gerard J. Mangone Climate Change Science and Policy Hub to foster greater collaboration between climate scholars across colleges and disciplines. The Climate Change Hub established a Climate Scholars program for undergraduates that trains students not just in climate science, but also in local community-building and engagement, culminating in a capstone project addressing a climate challenge. The Climate Scholars program has trained 75 students across 21 majors.

#### **Agency Support** Increase the capacity of all state agencies to build resilience to climate change

In April 2022, Governor John Carney announced the Delaware <u>Climate Leadership</u> <u>Academy</u>.<sup>12</sup> The academy provides professional training on basics of climate science, greenhouse gas accounting, risk assessment and organizational change. This 40-hour, twomonth long program is free for state workers and employees of local governments, Delaware-based businesses and nonprofits. Completion of the training can lead to a professional certification through the Association of Climate Change Officers. Daytime and evening cohorts in spring and fall of 2022 and 2023 trained 193 participants.

In 2021, DelDOT created a new Division for Transportation Resiliency and Sustainability. This division coordinates closely with DNREC and other agencies to implement transportation actions in the Delaware Climate Action Plan. The new division has worked on several

<sup>11</sup> URL: https://dnrec.alpha.delaware.gov/coastal-programs/planning-training/coastal-training/

<sup>12</sup> URL: https://dnrec.alpha.delaware.gov/climate-plan/academy/



A breakout group of Delaware Climate Leadership Academy participants discuss barriers to climate action. Photo credit: DNREC

climate mitigation and adaptation initiatives since 2021, including the updates and creation of DelDOT project guidance documents detailed in other sections.

#### Improve information sharing across state agencies to support regulatory and policy decisions

The Climate Action Plan calls for engaged, empowering and equitable climate action. In 2023, DNREC hired its first Environmental Justice Coordinator to bring new focus to underserved communities. New equity mapping tools released by DelDOT and DNREC help identify areas where Delaware families may be underserved by infrastructure, overburdened by pollution or have a high population of people whose first language is not English. Access to these tools helps state agencies better understand the specific concerns of the communities they are working within.

#### Act as climate change adaptation leaders

The Delaware Climate Change Solutions Act of 2023 requires that each key state agency designate a Climate Change Officer who will work with their state agency counterparts to support implementation of the Climate Action Plan and track progress over time. Climate officers from each state agency will meet at least twice a year and strengthen coordination and management actions across state agencies. The designation process for climate officers is underway and the first meeting of the group will be in 2024.

Delaware continues to be an active member of the U.S. Climate Alliance, a bipartisan coalition of 25 governors working together to advance state-led high-impact climate action. Staff from member states and territories exchange knowledge and best practices, which helps all participating states achieve their climate goals more quickly and efficiently. The alliance maintains a Policy Database<sup>13</sup> tracking state climate policies across the United States, making it easy to find answers to questions such as how many states have net-zero targets or how our Mid-Atlantic neighbors are tackling renewable energy policy.



A vehicle navigates a flooded roadway. Extreme precipitation events and sunny day–flooding in coastal areas will become increasingly frequent in Delaware unless rapid progress is made to reduce the emissions that cause climate change. Photo credit: Adobe Stock

#### **MOVING FORWARD**

The steps Delaware has already taken to address climate change built the foundation for achieving the state's longer term climate change goals and poised the state to capitalize on the once-in-a-generation investments from the Bipartisan Infrastructure Law and the Inflation Reduction Act.

Moving forward, the state will continue deploying innovative programs for greenhouse gas emissions reductions, including new consumer programs for EVs and energy-efficient homes. The state will facilitate deployment of the necessary infrastructure for resilient communities and clean energy sources. This includes job training and education to foster the growth of a skilled clean energy and resilient workforce, with a focus on equitable opportunities for underrepresented groups. An updated Climate Action Plan for Delaware is due by the end of 2025. The updated plan will outline a path for Delaware to reach its ambitious and achievable greenhouse gas emissions goals for 2030 and 2050. It will highlight additional actions that can be taken to further improve the resilience of Delaware's communities to the increasing severity of climate impacts in our state. There will be multiple opportunities for the public, technical experts and businesses to engage on the development of the plan over the next two years.

Achieving ambitious but attainable goals and keeping our communities safe from the worst impacts of climate change will require action by not just state government, but by businesses, community organizations, schools, municipalities and individuals acting alone or in partnership with one another.







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