

MASSACHUSETTS

- RGGI Member
- RPS: 15% by 2020 (+1%/year onward)
- 1.18% of US carbon emissions
- 2.8% of US GDP

The Commonwealth is addressing climate change through coordinated efforts across state government, with cities and towns, and with our regional partners. In 2016, the Baker-Polito administration committed to an integrated climate change strategy to address climate change mitigation and adaptation with the issuance of the Executive Order 569. Since that time the state also promulgated new regulations to ensure the state is on track to meet 2020 emission reduction targets, committed to a new Regional Greenhouse Gas Initiative Program plan, and rolled out a Municipal Vulnerability Preparedness program to cities and towns across the state.

Massachusetts is one of the first states in the nation to move forward with a comprehensive regulatory program to address climate change with passage of the Global Warming Solutions Act in 2008. In 2010, the Commonwealth set nation-leading, aggressive emissions limits of 25% below 1990 baseline level by 2020 and 80% by 2050. The latest Massachusetts greenhouse gas inventory shows that 2014 emissions in the Commonwealth are 21% below baseline level. Massachusetts is showing the way to a clean energy economy—and reaping direct benefits in economic growth—through the passage of the comprehensive energy diversity legislation (An Act Relative to Energy Diversity, H. 4568) and the development of smart, targeted policies in the Massachusetts Clean Energy and Climate Plan for 2020 (updated in 2015) that reduce emissions by promoting greater energy efficiency, developing renewable energy, and encouraging other alternatives to the combustion of fossil fuels. Progress in policy implementation—including estimates of greenhouse gas emission reductions from policies—is being tracked in the Massachusetts Clean Energy and Climate Performance Management System, based on the innovative Carbon Counts™ tool by Abt Associates.

FINANCE

- *The Regional Greenhouse Gas Initiative* – The country’s only regional cap and trade system comprised of a multi-state group will reduce regional power plant emissions 50% from 2005 levels by 2020 and 30% from 2021 to 2030 relatively to the RGGI 2020 levels. Since 2008, Massachusetts has reinvested more than \$300 million in auction proceeds to increase the energy efficiency of residences and businesses, provide clean-energy solutions to 185 “Green Communities,” and support the implementation of alternative energy resources. RGGI auction proceeds have helped Massachusetts earn the nation’s top ranking for energy efficiency six years in a row. Following a comprehensive 2012 Program Review, the RGGI states implemented a new 2014 RGGI cap of 91 million short tons. The RGGI CO₂ cap then declines 2.5 percent each year from 2015 to 2020. After 2020, the proposed RGGI Program Improvements would set the regional cap at 75,147,784 short tons in 2021, which will decline by 2.275 million tons per year thereafter, resulting in a total 30% reduction in the regional cap from 2020 to 2030. The RGGI CO₂ cap represents a regional budget for CO₂ emissions from the power sector. The RGGI participating states have each chosen to auction nearly all CO₂ allowances and to invest the proceeds in consumer benefit programs to build a clean energy economy. These investments reduce greenhouse gas emissions and generate important consumer benefits, including lower energy bills, greater electric system reliability, and more jobs.
- *Green Communities Designation and Grant Program* – This program helps Massachusetts municipalities navigate and meet their energy challenges and climate goals with clean energy and energy efficiency solutions. There are [five criteria](#) that are required for a municipality to adopt to become a Green Community, in turn qualifying them for grants that finance additional energy efficiency and renewable energy projects at the local level. More than 50% of Massachusetts municipalities are currently designated as Green Communities. Over \$35 million in Green Community grants has been awarded, with \$14 million in additional grants for energy projects. In addition, non-designated municipalities are eligible for technical assistance grants that assist with clean energy and energy efficiency project development.

- Mass Clean Energy Center* – Helps innovative clean energy companies bring their promising technologies to the marketplace, makes direct equity and venture debt investments in Massachusetts clean energy companies, and provides funding for clean energy companies developing new technologies. As a publicly-funded agency, MassCEC is dedicated to accelerating the success of clean energy technologies, companies and projects in the Commonwealth—while creating high-quality jobs and long-term economic growth for the people of Massachusetts. Since it began operating in 2009, MassCEC has helped clean energy companies grow, supported municipal clean energy projects and invested in residential and commercial renewable energy installations, creating a robust marketplace for innovative clean technology companies and service providers. MassCEC’s objective is to increase the statewide adoption of renewable energy, while driving down the costs of renewable energy and delivering financial and environmental benefits to ratepayers. To do so, MassCEC works closely with residents, businesses and municipalities to develop programs that provide renewable energy solutions for their energy needs. MassCEC’s programs also connect communities with the most viable clean energy and water technologies and reduce the energy burden on low- and moderate-income residents, with the hope of fostering the success of the Commonwealth’s dynamic clean energy sector. These investments are producing results. The 2016 Massachusetts Clean Energy Industry Report showed a six percent increase in clean energy jobs between 2015 and 2016. Jobs in the clean energy industry have grown by 75 percent since 2010, and the clean energy sector now employs 105,212 workers in the Commonwealth. Clean energy represents 2.5 percent of the overall Massachusetts economy and 2.9 percent of the state's overall workforce. Established by Chapter 23J of the General Laws, MassCEC receives funding from the Renewable Energy Trust Fund, which was created by the Massachusetts Legislature in 1997 as part of the deregulation of the electric utility market. The trust is funded by a systems benefit charge paid by electric ratepayers of investor-owned utilities in Massachusetts, as well as municipal electric departments that have opted to participate in the program.
- Property Assessed Clean Energy (PACE)* – PACE is a set of new mechanism to finance energy improvements, such as energy-efficiency projects, renewables, and gas line extensions, on commercial and industrial properties in Massachusetts. PACE financing will be available in late 2017.
- Green Bonds* – In 2013, Massachusetts became the first municipal issuer of green bonds in the nation, with the proceeds being used to fund environmentally beneficial projects across the Commonwealth. The Commonwealth has since then issued 2 additional series of Green Bonds to great interest from retail and institutional investors. The 3rd issue of Green Bonds saw significant demand due in part to its index eligibility, its taxable status, and its Green label. With five times as many orders as available bonds, the Commonwealth was able to set final pricing at 100 bps over the 30-year Treasury in an extremely volatile market. All proceeds of the 2014 Series E issue of Green Bonds have been spent, with \$204.3 million in Energy Efficiency & Conservation Projects in State Buildings Spending, \$100.6 million in Land Acquisition, Open Space Protection & Environmental Remediation Spending, \$76.6 in New Bedford Marine Commerce Terminal Spending, \$14.5 million in Clean and Drinking Water Spending, and \$3.7 million in River Revitalization & Preservation and Habitat Restoration Spending.
- Mass Solar Loan* – Massachusetts developed and is currently operating a \$30 million residential solar loan program, which aims to support Massachusetts lenders in providing loans between \$3,000 and \$60,000 with low, fixed interest rates to homeowners across the state. The increase of direct solar electric ownership provides economic benefit to the Commonwealth, and the Mass Solar Loan program is expected to deliver approximately \$100 million in savings for Massachusetts residents that take advantage of the program. For residents, Mass Solar Loan widens the range of energy financing available via low interest rate solar loans and by making those loans also accessible to borrowers with lower credit scores or incomes. For local lenders, Mass Solar Loan opens up new lending opportunities. For solar installers, the program provides a long-term financing program for customers. Direct solar ownership of solar electricity keeps more energy dollars in Massachusetts, while keeping energy generation local, and helping to achieve the Commonwealth’s goal of 1,600 megawatts of solar by 2020.

- In addition to the Regional Greenhouse Gas Initiative, Massachusetts also requires electric suppliers in the Commonwealth to comply with both a Renewable Energy Portfolio Standard as well as a Clean Energy Standard. Massachusetts is also conducting two large scale clean energy procurements that is scheduled to lead to a contract approval process in 2018.
 - The *Renewable Energy Portfolio Standard (RPS)* – Requires energy suppliers (both regulated distribution utilities and competitive suppliers) to obtain an increasing percentage of electricity from qualifying units for their retail customers. Fifteen percent of electricity is to come from qualified new renewable generation units in 2020 and 45% in 2050.
 - The *Clean Energy Standard* – Promulgated in August of 2017 in Massachusetts, the CRS requires utilities and competitive suppliers in the Commonwealth to obtain a minimum of 16% of electricity from clean energy sources in 2018. The percentage increases 2% annually to 20% in 2020 and 80% in 2050.
 - *An Act Relative to Energy Diversity (H. 4568)* – Ensures that utilities in the Commonwealth are competitively soliciting contracts for approximately 9,450,000 MWh of clean energy generation (base load hydropower, onshore wind and solar supported by hydropower, standalone onshore wind, solar, or other Class I renewable resources) and approximately 1,600MW of offshore wind. Both clean energy generation contracts and offshore wind are scheduled to be considered for contracting in 2018.
- *Alternative Portfolio Standard (APS)* – Offers an opportunity for Massachusetts businesses, institutions, and governments to receive an incentive for installing eligible alternative energy systems that contribute to the Commonwealth's clean energy goals by increasing energy efficiency and reducing the need for conventional fossil fuel-based power generation. By 2020, 5% of the Commonwealth's electric load is to be met by eligible technologies, which for APS include Combined Heat and Power (CHP), flywheel storage, coal gasification, and efficient steam technologies.
- *Solar Massachusetts Renewable Target (SMART) Program* – SMART provides a new long-term sustainable solar incentive program that will facilitate an additional 1600MW of solar capacity in Massachusetts. The program would also provide a specific incentive to pair energy storage with solar.
- *Energy Storage Initiative* – The Energy Storage Initiative commits \$10 million to analyze opportunities to support Commonwealth storage companies and develop policy options to encourage energy storage deployment, and up to an additional \$10 million in funding for energy storage demonstration projects. Massachusetts has recently set a 200 MWh energy storage target to be achieved by January 1, 2020.
- *Affordable Access to Clean and Efficient Energy Initiative (AACEE)* – Helps low and moderate-income residents access cost-saving, clean and efficient energy technologies. The initiative included an inter-secretariat working group that reviewed the barriers to clean energy investment for the Commonwealth's low- and moderate-income residents and suggested improvements in policies and programs to increase their impact. The AACEE also includes a \$15 million commitment for clean energy programs to expand opportunities for low- and moderate-income residents.

- *Massachusetts ZEV Action Plan* – Massachusetts is committed to work with California, Connecticut, Maryland, New York, Oregon, Rhode Island, and Vermont to increase Zero Emission Vehicles (ZEVs) on the road to a collective target of at least 3.3 million vehicles by 2025 and to establish a fueling infrastructure that will adequately support these vehicles. The eight-state action plan identifies the joint cooperative actions that the signatory states must undertake in order to achieve the cumulative goal, but each state must take steps within its own jurisdiction to achieve its specific goal. Massachusetts' participation in this plan sets a bold goal of 300,000 ZEVs or 15% of projected registered vehicles in the state by 2025. The number of ZEVs sold in Massachusetts since 2011 has reached 9,956, which includes battery, plug-in hybrid, and fuel cell electric vehicles.
 - *Massachusetts Offers Rebates for Electric Vehicles (MOR-EV)* – This rebates program has issued more than \$10 million in consumer rebates for the purchase or lease of more than 5,000 new battery electric, plug-in hybrid electric, and fuel cell electric vehicles.
 - *Massachusetts Electric Vehicle Incentive Program (MassEVIP)* – Has awarded more than \$2.3 million in grant funds to acquire 231 electric vehicles and 78 dual-port charging stations at 69 separate entities, and more than \$1.4 million in funding for the deployment of Level 1 and Level 2 electric vehicle charging stations at workplaces across the Commonwealth.
- *Massachusetts Low Emission Vehicle (LEV) Program* – Requires all new passenger cars, light-duty trucks and medium-duty vehicles with 7,500 or fewer miles on their odometers to be equipped with factory-installed California-certified advanced emission control systems in order to be sold and registered in Massachusetts. The requirement specifically applies to all model year 1995 and newer passenger cars and light-duty trucks up to 6,000 pounds, and all model year 2003 and newer medium-duty vehicles weighing from 6,001 to 14,000 pounds.
- *All Electric Tolling (AET)* – Implemented on the Massachusetts Turnpike in October 2016, AET has improved safety, reduce congestion, and improve air quality by removing toll booths and allowing customers to move at highway speeds and be tolled without stopping or slowing down.
- *MassDOT Solar PV Energy Program* – Under this program, contractors can lease properties of the Massachusetts Department of Transportation (MassDOT) to develop, design, construct, commission, operate and maintain the solar facilities. MassDOT has procured solar PV generation facilities at multiple parcels within the State highway layout with a minimal of 6 MW aggregated capacity, which could generate 7,800,000 kW hours of electricity per year while reducing 6.8 million pounds of CO₂ emission reduction annually and generating at least \$15 million in savings/revenue (aggregated cash flow) over the 20-year contract period.
- *Smart Growth* – Massachusetts has a set of Sustainable Development Principles that guide the creation and implementation of state agency policies and programs, as well as investments in land and infrastructure. Municipalities are also asked to modify their planning, regulatory, and funding actions to achieve consistency with the Principles. Massachusetts' Sustainable Development Principles include promoting clean energy, in the form of energy efficiency and renewable power generation, in order to reduce greenhouse gas emissions and consumption of fossil fuels. They also encourage the creation of "pedestrian-friendly" districts and neighborhoods that mix commercial, civic, cultural, educational, and recreational activities with parks and homes. The Commonwealth also provides expertise and assistance, as well as funding, to communities that would like to plan, design, regulate, invest, and/or build smart growth/smart energy. The Smart Growth/Smart Energy Toolkit is a focal point for state technical assistance efforts, providing communities with information to understand whether a particular zoning technique will help meet their goals, and to adopt regulations that have been adapted to their unique circumstance.

- *Complete Streets Program* – MassDOT recognizes the importance of providing safe and accessible options for all travel modes — walking, biking, transit, and motorized vehicles. In 2006 MassDOT was one of the first state transportation agencies to adopt a Complete Streets approach with the release of the Project Development and Design Guide, which is still in use. Designing streets accordingly contributes toward the safety, health, economic viability and quality of life in a community — and reduces GHG emissions — by encouraging pedestrian and bike travel. To inspire communities to adopt policies and to build infrastructure consistent with complete streets, the Complete Streets Funding Program was begun in 2016. The program requires a community to pass through three stages to access funding: adoption of a qualifying Complete Streets Policy, completion of a Prioritization Plan, and approval of a project. To date, 170 (of 351) municipalities have registered to participate, 133 cities and towns have approved complete streets policies, and 69 have approved Prioritization Plans. Also, about \$10 million has been awarded to 26 communities to assist in building “Complete Streets” infrastructure such as improved or new separated bike lanes, sidewalks, curb ramps, traffic signals that prioritize transit, crosswalks, and improved lighting. In addition, approximately \$2.7 million in technical assistance grants have been awarded and MassDOT has worked closely with municipalities to promote smart designs to make streets safe for pedestrians, cyclists, transit users and drivers.
- *Transportation Climate Initiative* – The Commonwealth has been active in a number of regional efforts including the Transportation Climate Initiative of Georgetown University, which is a collaboration of transportation, energy and environmental agencies from the Northeast and Mid-Atlantic states, working to develop the clean energy economy and reduce GHG emissions from the transportation sector.
- *Transportation Capital Investments and Climate Change* – The current state transportation Capital Investment Plan (CIP) reflects the ongoing transformation of the CIP process as the state seeks to reinvent capital planning for the Commonwealth’s statewide, multi-modal transportation system in order to realize goals that include addressing climate change mitigation and adaptation. Improvements to the capital planning process include alignment with the State Transportation Improvement Plan (STIP) in order to provide greater transparency and coordination, and ensure full leveraging of federal resources. Moreover, they include project selection criteria that not only consider the quantified GHG implications of each project, but also explicitly support land use policies that are consistent with smart growth and promote multi-modal travel.
 - The investments in the current CIP are organized into three important priority areas: system reliability, asset modernization, and capacity expansion that form the foundation not only of the Plan, but of a vision to provide all residents and businesses with access to safe and reliable transportation options.
 - The allocation of funds contained in this CIP reflects the new priority-driven investment strategy, and advances climate change related goals. About 57 percent of the \$17.3 billion in total capital investments over the next five years will go to improve the reliability of the core transportation system. Another 19 percent is to modernize existing assets so that they can better accommodate current or anticipated growth and meet 21st century demands, such as increased accessibility and safety requirements that may have not existed when these assets were initially planned and constructed. Overall, only 13 percent of this CIP has been set aside for the physical expansion of the transportation system. Of that approximately \$2 billion, about \$1.5 billion is set aside for the Green Line Extension project. In other words, system expansion is very limited, and mostly in transit. The vast majority of investments support better state of repair of existing infrastructure, and enhanced service to currently developed areas, consistent with climate change policy.

- *All Cost-Effective Energy Efficiency* – The Green Communities Act (GCA) of 2008 created a framework to promote additional investments in building energy improvements. Taken together, the first nine years of pursuing all cost effective energy efficiency are expected to return more than \$20 billion in ratepayer benefits, as well as providing the largest source of greenhouse gas reductions in the buildings sector. The 2016-2018 Three Year Energy Efficiency Plans establish nation-leading savings levels for both electricity (2.93% of retail sales) and gas (1.24% of retail sales) that ensure continued growth of energy efficiency in the Commonwealth primarily through the Mass Save® programs. The Mass Save® statewide efficiency programs are the primary delivery mechanism, and serve residential (including low income), commercial, and industrial buildings. The Plans is expected to deliver an estimated \$8 billion in economic, environmental and energy benefits and to reduce statewide carbon emissions by 1.95 million metric tons annually.
- *Advanced Building Energy Codes* – Massachusetts adopted in 2008 a requirement that building energy codes meet or exceed the latest International Energy Conservation Code (IECC) and stay current with its three-year update cycle. In addition, the Commonwealth developed one of the first “stretch” energy codes. The stretch code moves away from the traditional code approach that prescribes specific energy requirements for new building components (levels of wall insulation, rates of air leakage, etc.), toward a performance-oriented code that mandates a percentage reduction in total building energy use, while allowing developers to make their own design choices on how to achieve that reduction. Close to 60% of Massachusetts municipalities have adopted the Board of Building Regulations and Standards (BBRS) Stretch Code.
- *Leading by Example (LBE) Program* – The LBE program sets aggressive targets in greenhouse gas emission reductions, energy conservation and efficiency, renewable energy, green buildings, and water conservation for facilities and vehicle fleets owned and operated by the Commonwealth of Massachusetts. Energy targets for state agency buildings, as set forth in Executive Order 484, include: (1) greenhouse gas emissions resulting from state government operations must decrease by 40% by 2020 and 80% by 2050; (2) overall energy consumption at state owned and leased buildings must decrease by 35% by 2020; (3) 30% of agency annual electricity consumption must be procured from renewable sources by 2020; (4) all new construction and major renovations must meet the Massachusetts LEED Plus green building standard established by the Commonwealth of Massachusetts Sustainable Design Roundtable. State vehicle fleets are subjected to annual declining carbon dioxide emissions limits as set forth in 310 CMR 60.06.

- Mitigating and adapting to climate change is a pillar of Massachusetts’ land use and land conservation policies and programs, and the Commonwealth’s efforts in these areas are significant. For example, over just the last two years Massachusetts permanently conserved 26,515 acres, or 41 square miles, and we are investing \$1 million annually in grants to improve local land use practices.
- Beginning with the Commonwealth’s land conservation policies and investments, climate change is a factor in the realization of all four state priorities: Sustainable Forestry, Stewardship, Habitat Conservation, and Landscape Connectivity. Carbon sequestration is a key consideration as we manage state land holdings and implement our forest policies. Our Stewardship investment of \$2.5 million per year endeavors to ensure that, among other things, conserved land owned by the Commonwealth is managed in a way that takes impacts of climate change, such as more frequent and intense storms and the presence of new and more numerous invasive species, into account.
- *Habitat Conservation* – Massachusetts invests our funds in the acquisition of parcels next to existing protected land and in the purchase of inholdings in order to create large blocks of protected open space, knowing that they are more resilient to change. Also, our habitat criteria incorporate the Nature Conservancy’s data and tools in regard to terrestrial resilience. In other words, our land agents and grant program managers assess all potential projects to determine how important they are to providing resilience in the face of climate change. In addition, we fund land conservation projects that create and protect wildlife corridors out of recognition that connectivity is critical ecologically, and that corridors that allow migration and genetic exchange between populations reduce risk and make species more robust in the face of climate change and other threats. By way of results, over the last two years the Commonwealth and its partners have protected 7,675 acres of land ranked as resilient by the Nature Conservancy’s Resilient Landscape mapping tool.
- To realize these goals, EEA invests conservation funds in two ways. First, in grants from the following programs, which have totaled more than \$52 million over the last two years:
 - *The Local Acquisitions for Natural Diversity Program* – Assists municipal conservation commissions in acquiring land for natural resource protection and passive outdoor recreation purposes. Grants provide reimbursement funding for the acquisition of land or a conservation restriction, as well as for associated acquisition costs. Lands acquired may include forests, fields, wetlands, wildlife habitat, unique natural, historic or cultural resources, and some farmland.
 - *The Conservation Partnership Program* – Provides funding to assist non-public, not-for-profits (e.g. land trusts) in acquiring interests in lands for conservation or passive recreation.
 - *The Landscape Partnership Program* – Seeks to preserve large, unfragmented, high-value conservation landscapes including working forests and farms, expand state-municipal-private partnerships, increase leveraging of state dollars, enhance stewardship of conservation land, and provide public recreation opportunities. The program offers competitive grants to municipalities, non-profit organizations, and state agencies acting cooperatively to permanently protect a minimum of 500 acres of land.
 - *The Federal Land & Water Conservation Fund (P.L. 88-578)* – This fund provides up to 50% of the total project cost for the acquisition, development and renovation of park, recreation or conservation areas by municipalities, special districts and state agencies. Nearly 4000 acres have been acquired and hundreds of parks renovated using the \$95.6 million that Massachusetts has received from the state side portion of the federal program since 1965.
 - *Conservation Assistance for Small Communities* – A grant program providing funding to communities with a population of 6,000 people or fewer for the preparation of real property appraisals, Open Space & Recreation Plans, other planning in support of land conservation, and/or development of Open Space Residential Design/Natural Resources Protection Zoning.
- Direct agency acquisition of property is the second major way we expend our land conservation funds. Over the last two years the Commonwealth has invested in excess of \$25 million to expand our state park system (the Dept. of Conservation and Recreation), protect critical water supplies (the Dept. of Environmental Protection), add to our wildlife management areas (the Dept. of Fish and Game/MassWildlife), and to protect farmland (Dept. of Agricultural Resources). Of these efforts, the additions to our state parks and wildlife areas are particularly important to addressing climate change through implementation of the priorities described above.

- Furthermore, land acquisitions also attempt to address coastal resilience through the acquisition of properties that will allow the inland migration of coastal marsh and other habitat types. We also have emphasized projects with multiple purposes, such as a project that protects land subject to flooding, provides recreational open space, and incorporates green infrastructure to address storm water runoff from nearby impervious surfaces.
- Turning to land use, in addition to the policies described under smart growth in the transportation section, Massachusetts has budgeted \$1 million annually for the next five years to provide grants to help communities draft and implement land use plans and regulations (e.g. zoning) that reduce GHG emissions and result in better resilience to climate changing. Funding is specifically “set aside” to pay for:
 - Actions that implement the results of a climate vulnerability assessment;
 - Mitigation of climate change through zoning and other regulations that reduce energy use and GHG emissions via a better mix of land uses, more compact growth, enhanced design, etc.;
 - Zoning that results in permanent land conservation; and
 - Zoning for sustainable housing production (e.g. transit oriented development or smart growth zoning).
- Another aspect of the Commonwealth’s land use related efforts is an initiative to track changes in terrestrial carbon. In order to do so, carbon profiles were developed for all the cover types in the National Land Cover Database (NLCD). Going forward, changes in land cover will be tracked and quantified, so that the efficacy of policies intended to reduce the loss of natural land cover types (e.g. forests) that store carbon can be evaluated. In a related effort, a Blue Carbon Calculator was developed. The Calculator is Massachusetts’ first-generation tool which will be used by ecological restoration practitioners to assess GHG impacts of aquatic ecological restoration projects, with a focus on coastal wetlands.
- *Greening the Gateway Cities* – With a defined goal to increase urban tree canopy to 5-10% of land area in select neighborhoods in each Gateway City – former industrial cities identified for targeted redevelopment efforts – the program is expected to reduce heating and cooling costs by 5-10% for an average household, once the trees reach maturity. In the past three years, the program has planted over 8,000 trees along streets and in yards in 12 Gateway Cities. Planting will continue, with a budget of \$8 million per year, there until targets are met, then plantings will begin in the remaining 14 Gateway cities. In addition to energy efficiency, communities will see a reduction in storm water runoff, better air quality, an increase in property values and tax receipts, and a safer, healthier environment for residents.

- In addition to the natural resource based programs described above that help build resiliency, the Commonwealth has also developed a number of new programs and priorities to focus on adaptation to climate change impacts across the state.
- *The Municipal Vulnerability Preparedness (MVP) Program* – Launched in 2017, the MVP program is designed to help cities and towns that are on the front lines of climate change plan and prepare and build more resilient communities. In its first year, Massachusetts has granted awards totaling over \$1.1 million to 20% of the communities in the state from the Berkshires to the Cape and Islands. Funding through this program will allow communities to develop action-oriented resiliency plans using an accessible, tested approach that can be employed in any community. The program will also include access to a pool of state-certified technical service providers, a consistent toolkit for assessing vulnerability and developing strategies, use of the state climate change website, and the best available statewide climate projections and data. To help communities complete this program, the Executive Office of Energy and Environmental Affairs, working in strong partnership with the Nature Conservancy has put together a training program and a new community resilience building guide that will walk cities and towns through the climate change projections and the planning process for assessing risk and identifying priority actions. In addition to helping communities plan and prepare for climate change, the MVP program will provide state government with a window into the challenges communities face and help frame coordinated statewide efforts and align state programs with the critical challenges facing communities. Communities who have completed these vulnerability assessments and action plans will receive designation as an MVP community which will help them compete for other state grant programs and funding opportunities.
- *State Climate Change Adaptation and Natural Hazard Mitigation Plan* – Executive Order 569 called for a climate adaptation plan that would use the best science and data to understand vulnerability across state agencies and prepare to adapt to climate impacts. The Executive Offices of Energy and Environmental Affairs and Public Safety and Security are taking the lead on developing and implementing a statewide comprehensive climate adaptation plan to provide a blueprint for protecting our built and natural environment. This plan, led by the Massachusetts Emergency Management Agency and the Executive Office of Energy and Environmental Affairs is a first of its kind integrated State Hazard Mitigation and Climate Adaptation Plan, based in the best science and data to develop operational, on-the-ground strategies that will safeguard communities, protect natural resources, and sustain a vibrant economy.
- *Coastal Resiliency Grants* – The Massachusetts Office of Coastal Zone Management (CZM) administers the Coastal Resiliency Grant Program to provide financial and technical support for local efforts to increase awareness and understanding of climate impacts, identify and map vulnerabilities, conduct adaptation planning, redesign vulnerable public facilities and infrastructure, and implement non-structural (or green infrastructure) approaches that enhance natural resources and provide storm damage protection. Managed through CZM’s StormSmart Coasts program, grants are available for a range of coastal resiliency approaches—from planning, public outreach, feasibility assessment, and analysis of shoreline vulnerability to design, permitting, construction, and monitoring.
- *StormSmart Coasts* – The Massachusetts Office of Coastal Zone Management (CZM) StormSmart Coasts program provides information, strategies, and tools to help communities and people working and living on the coast to address the challenges of erosion, flooding, storms, sea level rise, and other climate change impacts. The program also promotes effective management of coastal landforms, such as beaches and dunes.
- *Culvert Replacement Municipal Assistance Grant Program* – These grants support local culvert replacement projects that improve municipal infrastructure and river health. The grants are provided by the Department of Fish and Game’s Division of Ecological Restoration (DER) to encourage and help municipalities to replace existing culverts with crossings that meet improved design standards for fish and wildlife passage, river health, and storm resiliency. Nearly half of Massachusetts’ estimated 30,000 culverts are undersized and/or poorly positioned and act as barriers to fish and wildlife. Undersized culverts are also a serious risk to public safety, as increased rainfall can cause flood waters to overtop roads, resulting in washouts and road closures. Installing culverts that meet the Massachusetts Stream Crossing Standards allows waterways to flow more naturally with lower risk of flood damage. Recent studies have found that culverts designed to meet these Standards are often less expensive than in-kind culvert replacements over the lifespan of the structure.

- *Dam and Seawall Repair or Removal Program* – Offers financial resources to qualified applicants for projects that enhance, preserve, and protect the natural resources and the scenic, historic, and aesthetic qualities of the Commonwealth of Massachusetts. Established in 2013 by the Massachusetts Legislature to promote public health, public safety, and ecological restoration, the program builds upon the Baker-Polito Administration’s commitment to strengthen the resilience of communities throughout Massachusetts by coordinating assistance to cities and towns as they prepare for the impacts of climate change.