



# **Maryland Commission on Climate Change**

**November 2010**

## **Update to Governor and General Assembly**

**Prepared by:**

Maryland Department of the Environment on behalf of the Maryland Commission on  
Climate Change

Cover Photo: Still Pond Creek on the Upper Eastern Shore  
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## **Appendices:**

- **A – MWG Policy Plans for 2011**
- **B – ARWG Policy Plans for 2011**

## Introduction

In April of 2007, Governor Martin O'Malley established the Maryland Commission on Climate Change ("Commission") through Executive Order 01.01.2007.07. The order charged the Commission with the task of developing a Climate Action Plan ("Plan") to discuss the drivers and consequences of climate change, necessary preparations for its ensuing impacts on the State, and establish firm benchmarks and timetables for policy implementation. Secretary Shari Wilson of the Maryland Department of the Environment (MDE) chairs the Commission. The Plan was completed and submitted to the Governor and General Assembly in August of 2008. Maryland's Plan was the first plan in the country to connect cutting edge climate science with both climate mitigation and climate adaptation planning.

The Plan includes an integrated climate impact assessment prepared by the Commission's Scientific and Technical Working Group (STWG). The STWG's assessment recognizes how human activities such as coastal development, burning fossil fuels, and increasing greenhouse gas (GHG) emissions are contributing to the causes and consequences of climate change. It stresses the precarious position in which Maryland is poised regarding the impacts of climate change; with its extensive amount of coastline, Maryland is particularly vulnerable to sea level rise caused by climate change, and related issues such as shore erosion, coastal flooding, storm surge, and inundation. At the Plan's core is a suite of 61 policy options developed by the Greenhouse Gas and Carbon Mitigation Working Group (MWG) and the Adaptation and Response Working Group (ARWG).

Of the policies that were selected for the Plan, 42 come from the MWG, which focused on ways to mitigate GHG emissions. These mitigation measures covered the wide range of fields where greenhouse gas emissions can be reduced and/or carbon can be sequestered, such as energy supply, transportation, and agriculture, forestry and waste. The other 19 policies were developed by the ARWG and deal with responding and adapting to the impacts of climate change, such as sea level rise.

One of the Commission's policy recommendations from the MWG was to set a GHG reduction goal of 25% by 2020 from a 2006 baseline. This exact goal was then codified into law during the 2009 Legislative Session when the Maryland General Assembly passed the Greenhouse Gas Emissions Reduction Act of 2009 (GGRA). It states that by 2011 Maryland Department of the Environment (MDE) must develop a statewide greenhouse gas (GHG) inventory, a "business as usual" emissions projection for 2020, and a proposed GHG emission reduction plan for public comment. By 2012, Maryland must adopt a final GHG emission reduction plan that includes regulations and a timeline to implement necessary programs. This plan must also ensure no loss of manufacturing jobs, opportunities for new "green" jobs, and no adverse impact on the reliability and affordability of electricity. In 2015 MDE must then submit a report assessing progress towards the 25 percent reduction goal, benefits to the State's economy, public health, and the environment, any need for further reductions and the status of any federal GHG reduction program. Finally, in 2016, the Legislature will determine whether to continue, adjust, or eliminate the requirement to achieve a 25 percent reduction by 2020.

In order to meet the reduction goal mandated by the GGRA, the State will refine and implement a number of measures originating from the suite of 42 policy options identified in the Plan. Responsibility for continuing to refine the measures and implementation has been divided among the appropriate State agencies: the Department of Natural Resources (DNR), Maryland Department of Transportation (MDOT), Maryland Department of Planning (MDP), Maryland Energy Administration (MEA), the Department of Housing and Community Development (DHCD), Maryland Insurance Administration (MIA), Maryland Department of Agriculture (MDA), the Department of Business and Economic Development (DBED), the Public Service Commission (PSC), the Department of General Services (DGS), and Maryland Department of the Environment (MDE) leading on certain policies as well as continuing to oversee the process. Agencies meet on a monthly basis at “Interagency Climate Change-Sustainability Meetings” to report on progress being made on their respective climate change policies and discuss relevant issues.

### **Change in Maryland’s Economy**

Since the release of the Plan, Maryland has witnessed many changes in its economy and the federal landscape. During 2010, agencies worked to implement their respective policies based on the policy language which was approved by the Commission at its September 2009 meeting. While agencies continue to take steps independently to ensure that GHG reduction policies are thoroughly developed, common barriers have been identified that could potentially slow program development or change the effectiveness of a given policy.

### **Change in the Federal Landscape**

In recent years, the prospect of federal legislation requiring reduction of GHGs has been an effective driver for continued action by states to develop and implement programs that would decrease GHG emissions and link with pending federal action. In the past year, the federal push for GHG reductions has slowed.

A number of federal climate and energy bills were introduced in the 111<sup>th</sup> Congress, but as of this report none has made it through the entire legislative process. Without final action, they will die when Congress adjourns on January 3, 2011. This includes three cap and trade bills described below. The bills are:

- *Waxman-Markey* bill (H.R. 2454), was the only cap-and-trade bill to reach a floor vote in either chamber. Passed by the House of Representatives on June 26, 2009, it set GHG emissions reduction targets of 17% below 2005 levels by 2020 and 83% in 2050, covering about 85% of the U.S. economy.
- Its counterpart in the Senate, the *Kerry-Boxer* bill (S. 1733), set a more stringent 2020 reduction target of 20%. It passed the Senate Environment and Public Works Committee on November 5, 2009. Both *Kerry-Boxer* and *Waxman-Markey* put state and

regional cap-and-trade programs such as RGGI on hold from 2012 to 2017 but do not preempt states from regulating uncapped sources more stringently.

- The *Kerry-Lieberman* bill was released as a discussion draft on May 12, 2010, but was never formally introduced as a bill. It set GHG reduction targets of 17% by 2020 and 80% by 2050, and covered only utilities initially, gradually broadening to manufacturing and other sectors. It preempted state and regional cap and trade programs in perpetuity, but allowed states to regulate GHGs outside of cap and trade.

At present, continued momentum on federal cap-and-trade legislation seems doubtful. For states like Maryland, who are extremely vulnerable to sea-level rise, it is important to continue to implement state programs and continue to push for federal action. That said, the delay in federal action does make it more difficult for the state to push ahead alone. Maryland is among a small group that have a statewide GHG gas reduction target mandated by statute. Others include New Jersey, Massachusetts, Connecticut, Maine, Minnesota, California, Oregon and Washington. When compared to 1990 levels, Maryland's 2020 reduction target is comparable to or slightly more aggressive than those of New Jersey, California, Minnesota and Washington, which cap 2020 or 2025 emissions at 1990 levels. Maryland's target is less aggressive than those of Massachusetts, Connecticut, Maine and Oregon, whose 2020 targets range from 10% to 25% below 1990 levels. In addition, New Jersey, Connecticut, Massachusetts, Minnesota, Washington and Oregon also have statutory reduction targets for 2050 that range from 50% to 80% (with some variation in baseline years) – a step that Maryland has not yet taken although its 2020 planning process is laying the groundwork for longer-term reductions.

### **Status of RGGI, Empower, RPS and Clean Cars**

The process in 2007 and 2008 to develop the Plan involved over one hundred stakeholders and subject matter experts in addition to State staff. A private facilitating group moderated the Plan process and provided analyses for each policy in the Plan. State agencies continue to develop strategies for implementing their policies to achieve the assigned GHG reductions, though concerns over the actual design of the strategy and assigned GHG emissions reductions have been identified.

During the 2009 legislative session, which included the passage of GGRA, implementation of four key mitigation policies (RGGI, EmPOWER Maryland, the Renewable Portfolio Standard (RPS) and the Maryland Clean Cars Program) from the Plan were identified as having the potential to achieve 60% to 70% of the 2020 GHG emission reduction goal. The remaining mitigation policies from the Plan are predicted to achieve the remaining GHG reductions needed to reach the 2020 goal. Below is a summary of progress for the four key mitigation policies:

**RGGI** – Maryland remains an active member of RGGI and offers CO<sub>2</sub> allowances for sale in each quarterly auction. Eligible electricity generators continue to report quarterly CO<sub>2</sub> emissions and accumulate CO<sub>2</sub> allowances in preparation of the first compliance demonstration in early 2012. Auction proceeds are directed to the Strategic Energy

Investment Fund. At this point, implementation of this policy is on track for achieving anticipated 8.7 million metric tons GHG reductions.

**Maryland Clean Cars Program** – MDE and MDOT continue to work cooperatively to actively implement and manage the Maryland Clean Cars Program. Since this program requires more rigorous emissions standards beginning in vehicle model year 2011, it will start reducing GHG emissions in Maryland as early as 2010. Currently, it is anticipated that this program will be successful in achieving GHG reductions of about 6 million metric tons.

**EmPOWER** – MEA, the PSC and Maryland’s utilities continue to work diligently towards reaching the EmPOWER Maryland goals of reducing peak demand and overall per capita electricity consumption 15% by 2015. Reaching those goals will equate to saving nearly 6 million metric tons of GHG emissions. Based on the most recent reports from the electric utilities to the PSC, Maryland is behind schedule on implementing programs to achieve those goals. The PSC recently started proceedings to evaluate additional energy savings programs to accelerate Maryland’s progress. Furthermore, achieving the goals is contingent upon adequate funding of energy efficiency investments in the State. Proceeds from the RGGI auctions, which are the State’s primary source of energy efficiency and clean energy funding, have fallen drastically due to unforeseen market conditions. In addition, the legislature in FY 11 appropriated less than 20% of RGGI proceeds to energy efficiency and clean energy programs that will reduce the State’s carbon footprint. Additional funding sources must be found and RGGI proceeds must be returned to their intended purposes if the State is to reach its goals.

**RPS** –Achieving the RPS goal of 20% renewables by 2022 will equate to saving over 6 million metric tons of GHG emissions. Currently, Maryland’s electricity mix contains about 5% renewables. Major new renewable projects are coming online in the near future, including the State’s first two commercial scale onshore wind farms. Solar has also taken off this year and will continue to grow. While these developments in onshore wind and solar are significant, Maryland will not come close to achieving the 20% RPS target without developing its most abundant renewable resource--offshore wind. The State is actively working to attract this industry to Maryland and to speed its development.

## **The Economic Picture**

Since the development of the Plan in 2007 and 2008, Maryland, like the rest of the country, has experienced economic downturn. At the Maryland Commission on Climate Change meeting held on Friday, November 5, 2010, the Commission discussed the difficulties associated with achieving the goals of the GGRA during the economic downturn. These concerns are summarized below. As part of the process for developing the 2012 GGRA Plan, responsible agencies will also be identifying the funding mechanisms needed to successfully implement the control measures by 2020. The GGRA anticipated that new legislation may be needed and included a placeholder for such new legislation in the 2012 Plan.

## **Transportation Funding: MDOT's Economic Concerns related to Climate Plan Implementation**

Continued delays in the enactment of the next surface transportation authorization bill and the uncertainty over the long term solvency of the Federal Highway Trust Fund (HTF) have constrained MDOT'S ability to adequately plan for future transportation investments throughout the state. Forecasts indicate the HTF will not be able to sustain existing levels of funding, let alone allow for major new advocacy efforts. The majority of funds authorized by the federal government to Maryland are earmarked for projects already committed in MDOT's capital program and for unfunded system preservation needs. Over the last few years, MDOT has had to assume a very different revenue picture to finance its programs. The nationwide economic downturn continues to have an enormous impact on the revenue projections for both the State and MDOT.

Despite this challenge, MDOT is working to address climate change issues, reduce air emissions and manage transportation-related energy consumption. Even though safety and structural integrity is its first priority, MDOT continues to make significant investments in projects which benefit improving the environment. Over 40% of MDOT's Consolidated Transportation Program is for projects which improve the environment or help reduce transportation-related GHG emissions.

## **Low Natural Gas and Wholesale Electric Prices and Non-Carbon Generation**

Natural gas and wholesale electric prices have seen dramatic declines since the summer of 2008. Wholesale natural gas prices are less than half of their 2008 peak. Because natural gas is the marginal fuel for electric generation in PJM, wholesale electricity prices in the North-East and Mid-Atlantic have declined significantly since 2008. Reduced demand due to the recession provides a partial explanation for this drop in energy prices, but changes in the fundamentals of natural gas supply provide a more important explanation.

The natural gas industry is currently at the beginning of a revolution in production from shale formations. Shale gas resources may equal or exceed all prior natural gas sources. And because of advancements in technology, shale gas can be produced economically even at current gas price levels, and increased gas demand may be lowering the cost of production due to economies of production scale.

Although this production revolution is transforming natural gas markets worldwide, its importance is even greater in the North-East and Mid-Atlantic. Huge shale gas reserves in this region could significantly reduce the traditional regional reliance on gas from more distant production areas. Coincident with these new resources, interstate pipeline and storage capacity has also expanded at historic levels during 2009 and 2010. Consequently, the delivered cost of natural gas in this region has dropped even more than in the nation as a whole. A return to normal economic growth will probably put some upward pressure on natural gas prices, but these fundamental changes in natural gas supply are likely to keep natural gas prices low (compared to the price shocks of 2006 and 2008) for the foreseeable future, and quite possibly for at least a decade.

Low natural gas prices combined with aggressive energy efficiency and demand reduction programs in the region should moderate electric prices. New transmission projects (including one that will be in service next year) will also make more surplus power from the Mid-West available and further control the potential for increases in wholesale electric prices.

Lower electricity prices are a good thing for consumers. For those who seek to develop new sources of non-carbon-emitting electricity, however, the current on-peak wholesale electric prices in the range of 5-6 cents/kWh and off-peak prices around 4 cents/kWh present a very challenging business case compared to the 12 cent/kWh on-peak and 7-8 cent/kWh off-peak prices of just two years ago. Equally challenging is the very real possibility that electric prices could see very modest increases, no change or even further declines for many years in the future.

### **Role of Education and Climate Change**

In Maryland, the presidents' of 22 colleges and universities have signed the American College and University Presidents Climate Commitment (ACUPCC). The ACUPCC commitment requires each school to complete a GHG inventory, develop a climate action plan and implement strategies to reduce GHG emissions to achieve a set target. Thus far, eleven Maryland schools have committed to become climate neutral by a certain date, as established by each university. Climate neutrality requires GHG emissions sourced from the school, to be reduced or mitigated from a base year, with remaining emissions offset by purchasing carbon credits or other means.

In addition to taking action to mitigate climate change, Maryland schools are expected to implement climate change curriculum at all levels of the education system. The National Science Foundation has awarded a \$1M planning grant to the University System of Maryland to implement the Maryland and Delaware Climate Change Education, Assessment and Research (MADE-CLEAR) project in collaboration with University of Maryland Center for Environmental Science, the University of Maryland, and the University of Delaware.<sup>1</sup> The award funds Phase I Climate Change Education Partnership (CCEP), a two-year strategic planning process that will build on partnerships among the two states' universities, public schools, federal agencies, and public and private sectors to assess needs and identify key stakeholders and resources needed to implement an innovative P-20 climate change curriculum, develop new pathways for teacher education, and advance public education about climate change. The plans will be implemented in Phase II, expected to begin in FY12. The overall goal of the CCEP Phase I project is to establish a coordinated national network of partnerships devoted to increasing the adoption of educational programs and resources related to the science of climate change and its impacts.

### **Relationship of the Climate Commission Executive Order and the Greenhouse Gas Emissions Reduction Act**

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<sup>1</sup> National Science Foundation award information available at:  
<http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1043262>.

The Plan was the building block for Maryland's GHG reduction legislation, the Greenhouse Gas Emission Reduction Act of 2009 (GGRA). This law requires a 25% reduction in greenhouse gas emissions by 2020 and requires the development of an implementation plan by the end of 2012. This plan will describe the exact measures and policies that Maryland is implementing to achieve its emission goals. Many of the measures implemented will come from the 2008 Plan. Some of the programs will be implemented via regulation, some legislation, some through voluntary means, some through executive orders and a smaller subset will likely lay out a plan for legislation between now and 2020.

Since the building blocks for the GGRA plan come from the policies agreed upon by the Commission in their Plan, the final implementation strategy will reflect changes made by the lead implementing agencies behind the 2008 Climate Action Plan and the final 2012 GGRA Plan. The GGRA plan is the actual course of action the state is taking to reduce GHG emissions. There will also be new initiatives in the GGRA plan that were not mentioned in Commission's Plan. These are initiatives that were developed after the finalization of the Commission's Plan in 2008.

### **The Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change – Phase II**

A vital component of Plan is the Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change ("Strategy") which details the actions necessary to protect Maryland's future economic well-being, environmental heritage and public safety in the face of climate change and sea level rise. Maryland is one of a few states to include a climate change adaptation element in its state climate action plan. Since the release of the Strategy in 2008, Maryland has moved forward with implementation of key elements of Phase I of its adaptation strategy and has also completed development of its Phase II adaptation strategy, which is focused on building resilience among the following sectors: agriculture, water resources, bay & aquatic ecosystems, forest & terrestrial ecosystems, human health, and growth & land-use. All of this work combined has made Maryland a recognized national leader on climate change adaptation.

Maryland is also proving to be a national leader in regional-to-global climate change analysis and in technologies to mitigate emissions and allow prudent adaptation. The Comprehensive Assessment of Climate Change Impacts in Maryland produced by the Commission's Scientific and Technical Working Group served as the foundation for development of the Plan. The University of Maryland Center for Environmental Science helped to produce this great product, demonstrating that there is considerable, world-recognized expertise within our public universities. And, Maryland has the unmatched advantage of the location of the Goddard Space Flight Center, which leads the National Aeronautics and Space Administration's earth science program, at Greenbelt; the headquarters of the National Oceanic and Atmospheric Administration's (NOAA) line offices at Silver Spring and NOAA's Climate Prediction Center soon to be relocated to College Park; the National Institutes of Health in Bethesda; and the National Institute of Standards and Technology in Gaithersburg; among other federal agencies. In addition, Maryland has a robust private sector to support technology innovation and application, one that is also very experienced in providing services to the federal government. By

enhancing this university federal-private sector capacity, Maryland is continuing to improve climate change forecasting and impact assessments and finding effective means to mitigate and adapt to climate change.

## 2010 Implementation Progress Report: Mitigation Work Group

<b>Policy Number</b>	<b>Policy Name</b>	<b>Lead Agency</b>	<b>2010 Implementation Progress</b>
<i>CC-1</i>	GHG Inventory & Forecasting	MDE	MDE continued developing Maryland's 2006 inventory, utilizing CCS data, as well other methodologies (EIA and EPA).
<i>CC-2</i>	GHG Report & Registry	MDE	MDE reported 2008 calendar year emissions to The Climate Registry. These emissions have been independently verified and will be made public soon.
<i>CC-3</i>	Statewide GHG Reduction Goals & Targets	MDE	MDE completed first round of stakeholder meetings and continues coordinating lead agency meetings. Commenced coordination with agencies to develop 2010 MCCC report and draft 2012 GGRA Plan
<i>CC-4</i>	State & Local Government Lead-by-Example	DGS	Combined with RCI-4.
<i>CC-5</i>	Public Education & Outreach	MDE	MDE in co-operation with Education continues to evaluate outreach opportunities while limited by current budget constraints.
<i>CC-7</i>	Review Institutional Capacity	Commission	MDE has been coordinating the Governor's effort to track climate change efforts through the GDU process.
<i>CC-8</i>	Low Carbon Fuel Standard	MDE	The regional LCFS initiative is currently modeling feasibility of implementation and economic impacts for a regional standard.
<i>CC-9</i>	Promote Economic Development Activities	DBED	The Green Jobs and Industry Task Force issued its recommendations to Governor O'Malley in July, 2010. These recommendations lay the groundwork for future action by the State to promote economic recovery, green jobs and a sustainable environmental future.

<p>CC-10</p>	<p>“After Peak Oil”</p>	<p>MEA</p>	<ul style="list-style-type: none"> <li>• Since the vast majority of oil consumed in Maryland is for transportation use, MEA has focused on addressing the problem of after peak oil by creating programs to promote the transition from oil-powered vehicles to electric vehicles, hybrid vehicles, and biofuel-powered vehicles. Specifically, MEA is spending \$5.9 million in federal stimulus funds to help companies purchase 173 high-profile heavy duty hybrid trucks to stimulate the hybrid truck market. MEA is also spending \$1 million in federal stimulus funds to install approximately 65 electric vehicle charging stations around the state. Those funds will also help pay for nearly 250 truck stop electrification units that will allow trucks to use electric power to run their heat and AC instead of idling at truck stops. Furthermore, MEA supported legislation that passed in Maryland in 2010 to allow electric vehicles access to HOV lanes and to provide an excise tax credit for the purchase of electric vehicles. Finally, at the Maryland Clean Energy Center Summit in October 2010, MEA facilitated a session on electric vehicles and hybrids and another session on biofuels to learn from interested stakeholders what barriers to implementation exist in the market and what the MEA can do to help. For more information on MEA’s activities regarding biofuels, see Policy Number AFW-7b: In-State Liquid Biofuels Production.</li> </ul>
<p>CC-11</p>	<p>Public Health Risks</p>	<p>DHMH</p>	<ul style="list-style-type: none"> <li>• No current information provided for policy.</li> </ul>

<p><i>RCI-I</i></p>	<p>Improved Building and Trade Codes and Beyond-Code Building Design and Construction</p>	<p>DHCD</p>	<ul style="list-style-type: none"> <li>• April – May 2009 - <ul style="list-style-type: none"> <li>○ Reviewed the 2009 IBC and IRC along with the 2009 IECC and others published by the ICC for adoption into the MBPS</li> <li>○ Began the Maryland regulation process by submitting request to the Division of State Documents</li> </ul> </li> <li>• May – November 2009 <ul style="list-style-type: none"> <li>○ Submitted proposed regulations to adopt new I-Codes in Maryland through the Administrative Executive Legislative Review Committee (AELR) <ul style="list-style-type: none"> <li>• Process included: <ul style="list-style-type: none"> <li>• Public hearing and comment period</li> <li>• Incorporation of building and trade codes recommended by the Department of Labor, Licensing and Regulation (DLLR) and the State Fire Marshall</li> </ul> </li> </ul> </li> <li>○ Reviewed plans/actions by other states vulnerable to sea-level rise</li> <li>○ Participated in the 2009 ICC Annual Conference and Codes Development Hearings (October 24 – November 11, 2009)</li> <li>○ Prepared/conducted MBPS statewide training (new sessions began in November 2009)</li> <li>○ Submitted 3-year Projected Maryland Timeline for Code Review, Update and Training <ul style="list-style-type: none"> <li>• Timeline will take into account both RCI-1 and EBEI-8 recommendations as well as ongoing requirements of related State of Maryland initiatives and federal activities and legislation</li> </ul> </li> </ul> </li> <li>• January 2010 <ul style="list-style-type: none"> <li>○ MD adopted 2009 I-Codes into the MBPS along with the State of Maryland Performance Code (MPC) for industrialized/modular buildings</li> </ul> </li> <li>• July 2010 <ul style="list-style-type: none"> <li>○ Local code jurisdictions adopted the new version of the MBPS</li> </ul> </li> <li>• Identified opportunities to improve and expand much-needed training on building codes, especially those that will continue to be developed relating to energy efficiency and other green building standards.</li> </ul>
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			<ul style="list-style-type: none"> <li>▪ Partnership with MEA to continue and enhance energy code training, including assistance with ICC certifications for training on the new IECC 2009.</li> <li>• Identified funding for DHCD training programs to ensure that suitable training remains available statewide to local code authorities and other stakeholders. <ul style="list-style-type: none"> <li>▪ MEA funds (MOU with MEA)</li> <li>▪ U.S. DOE funds (part of competitive award under EECBG) for energy codes training and pilot program for database cooperation with local jurisdictions. This award for \$20 million included significant funding to allow for energy efficiency retrofits, including beyond code improvements, in single family and multifamily residential buildings, and in small businesses (Main St.) as well as a pilot purchasing cooperative. These programs are under development with DOE following the award in the summer of 2010.</li> </ul> </li> <li>• Continue to provide training on the new version of the Maryland Building Performance Standards (MBPS) to local jurisdictions, architects, engineers, green building professionals, and other stakeholders.</li> </ul>
<i>RCI-2</i>	Demand-Side Management & Energy Efficiency	MEA	<ul style="list-style-type: none"> <li>• See RCI-10: Energy Efficiency Resource Standard</li> </ul>
<i>RCI-3</i>	Low-Cost Loans for Energy Efficiency	MEA	<ul style="list-style-type: none"> <li>• See RCI-10: Energy Efficiency Resource Standard</li> </ul>
<i>RCI-4</i>	Government Lead-by-Example	DGS	<ul style="list-style-type: none"> <li>• Fourteen Energy Performance Contracts (EPCs) are in the active construction or energy saving &amp; repayment phase of the projects.</li> <li>• These projects have a total cost of approximately \$135 million, and provide annual energy savings of: <ul style="list-style-type: none"> <li>○ \$14.6 million</li> <li>○ 65 million kWh</li> <li>○ over 450,000 mmBTU</li> <li>○ over 110,000 tons of CO2</li> </ul> </li> <li>• DGS has entered into a Power Purchasing Agreement which will include the installation of solar electric panels (photovoltaic) on four DGS buildings.</li> <li>• In cooperation with the University System of Maryland, DGS is participating in the “Generating Clean Horizons” project, to procure solar and wind-generated electricity.</li> <li>• DGS has implemented the MD Energy Database to track energy usage by state agencies, an effort to identify additional energy saving opportunities.</li> </ul>

<p><i>RCI-7</i></p>	<p>More Stringent Appliance/Equipment Efficiency Standards</p>	<p>MEA</p>	<ul style="list-style-type: none"> <li>• During the 2010 Maryland legislative session, MEA advocated for legislation to establish efficiency standards for television, but unfortunately the legislation did not pass.</li> <li>• For more information on MEA’s efforts to promote energy efficient appliances, see RCI-10: Energy Efficiency Resource Standard</li> </ul>
<p><i>RCI-10</i></p>	<p>Energy Efficiency Resource Standard</p>	<p>MEA</p>	<ul style="list-style-type: none"> <li>• EmPOWER Maryland, enacted in 2007, requires utilities and the MEA to reduce overall electricity consumption in the state 15% by 2015. The utilities are in the process of implementing residential, commercial, and industrial sector programs to achieve the goal, and the MEA is implementing complementary programs, including: <ul style="list-style-type: none"> <li>○ EmPOWER Maryland State Agency Loan Program (SALP): a loan program for state agencies to expand the use of energy performance contracts to make state buildings more efficient;</li> <li>○ EmPOWER Maryland Empowering Finance Initiative: a loan program targeted at helping residential consumers afford clean energy improvements</li> <li>○ EmPOWER Maryland Appliance and Lighting Rebate Programs: rebate programs to incentivize the purchase of energy efficient appliances and light bulbs</li> <li>○ EmPOWER Maryland Industrial and Commercial Programs: various programs targeting the industrial and commercial sector, including a loan program to help finance the cost of energy efficiency projects in commercial and industrial facilities and a program to provide Maryland industries access to informational resources, workshops, technical support and energy assessment opportunities</li> <li>○ EmPOWER Maryland Residential Initiatives: various programs, including a grant program in coordination with DHCD to conduct energy efficiency retrofits in apartment units to reduce energy bills for low and moderate income families</li> </ul> </li> </ul>

<i>RCI-11</i>	Promotion and Incentives for Energy-Efficient Lighting	MEA	<ul style="list-style-type: none"> <li>• MEA, through its \$1.2 million general awareness campaign, has promoted not only the use of energy saving CFLs, but also other energy efficiency measures. MEA has also given away light bulbs at public events throughout the state. In addition, each county and city in the state has been offered Energy Efficiency Conservation Block Grant (EECBG) funds and most are using it, in part, for energy efficient lighting upgrades. Finally, as part of EmPOWER Maryland, utilities are also promoting energy efficient lighting. (For more details on EmPOWER Maryland, see RCI-10: Energy Efficiency Resource Standard).</li> </ul>
<i>ES-1</i>	Promotion of Renewable Energy Resources	MEA	<ul style="list-style-type: none"> <li>• See ES-7: Renewable Portfolio Standard</li> </ul>
<i>ES-2</i>	Technology-focused Initiatives for Electricity Supply	MEA	<ul style="list-style-type: none"> <li>• MEA has a program manager dedicated to biomass, biofuels and electric vehicles; a program manager dedicated to wind; and two program managers dedicated to solar. These program managers focus on providing support for the development and adoption of their respective technologies. For example, in October 2010, the program managers facilitated sessions at the Maryland Clean Energy Center Summit to identify potential solutions to financial, policy, and technological barriers for each technology.</li> <li>• Leading by example, MEA and DGS partnered with the University System to launch the Generating Clean Horizons Initiative, which resulted in Power Purchase Agreements with 3 new, utility scale renewable developments (65 MW of onshore wind and 17 MW of thin film solar).</li> <li>• In addition, MEA supported legislation that passed the Maryland General Assembly in 2010 to make fuel cells eligible for net metering.</li> <li>• For a more information on MEA’s clean energy programs, see ES-7: Renewable Portfolio Standard.]</li> </ul>
<i>ES-3</i>	Cap and Trade	MDE	Maryland participated in all RGGI auctions, held stakeholder meetings to amend the VERSA account, and commenced a MD CO <sub>2</sub> Budget Trading Program review for September 2010.
<i>ES-5</i>	Clean Distributed Generation	MEA	<ul style="list-style-type: none"> <li>• See ES-7: Renewable Portfolio Standard</li> </ul>

<p>ES-6</p>	<p>Integrated Resource Planning</p>	<p>PSC</p>	<ul style="list-style-type: none"> <li>• The Commission performs an annual evaluation of the long-range plans of Maryland’s public electric companies regarding generating needs and means for meeting those needs <ul style="list-style-type: none"> <li>○ Submission of a <i>Ten Year Plan</i>, including current and projected efforts by electric companies including moderation of electric generation demand through energy conservation and use of alternative energy sources</li> </ul> </li> <li>• The EmPower Maryland Act calls for the State to reduce its per capita energy consumption and peak demand 15 percent by 2015 (utilities are responsible for 10 percent), using cost effective programs designed to promote the efficient use and conservation of energy by consumers, gas companies, and electric companies. Utilities file compliance plans every three years. <ul style="list-style-type: none"> <li>○ 2009-2011 utility plans are currently in effect for the four investor-owned utilities and Southern Maryland Electric Cooperative. The utilities file detailed quarterly progress reports that Commission Staff analyze in detail, and the Commission holds hearings to review the Companies’ progress against the EmPower Maryland Act goals.</li> <li>○ 2012-2014 utility plans currently under development for submission September 1, 2011</li> <li>○ Typical utility plans include: <ul style="list-style-type: none"> <li>▪ Lighting and appliance rebate programs</li> <li>▪ Residential retrofit programs</li> <li>▪ Residential new construction programs</li> <li>▪ Limited income programs</li> <li>▪ Heating and cooling equipment rebate programs</li> <li>▪ Commercial and industrial prescriptive measure programs</li> <li>▪ Commercial and industrial customer measure programs</li> <li>▪ Commercial and industrial building retrocommissioning</li> <li>▪ General awareness/education programs</li> </ul> </li> </ul> </li> </ul>
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			<ul style="list-style-type: none"> <li>• The Commission has taken initial regulatory action to encourage the development of distributed generation. <ul style="list-style-type: none"> <li>○ Standardized and streamlined grid interconnection requirements</li> <li>○ In Case No. 9149, 400 MW of DR was obtained for the years 2011 through 2013 and PSC Staff compiled a report discussing potential barriers and incentives for distributed generation</li> <li>○ Commission Case No. 9236 pertains to a demand response billing service that could be offered by electric utilities to federal end-use customers.</li> <li>○ The Commission has amended processes relating to the approval of CPCN exemptions for backup generators to encourage participation in PJM load reduction programs.</li> </ul> </li> <li>• The Commission has approved advanced metering infrastructure (AMI or smart grid) deployment with peak time rebate based pricing for BGE and PEPCO (Case Nos. 9208 and 9207).</li> <li>• The Commission has submitted initial and revised net metering regulations for publication and public comment.</li> <li>• The Commission has advocated at PJM and FERC for appropriate compensation and market participation rules for demand response and energy efficiency resources.</li> </ul>
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<p>ES-7</p>	<p>Renewable Portfolio Standard (RPS)</p>	<p>MEA</p>	<ul style="list-style-type: none"> <li>• The goal of Maryland's RPS is for the state to obtain 20% of its electricity from renewable resources by 2022, with intermediate targets of 7.5% by 2011 and 18% by 2020. To help Maryland reach these ambitious targets, MEA has focused on advocating for policies to promote renewable energy and on running programs to stimulate the renewable energy market.</li> <li>• This past year, MEA advocated for legislation, passed by the Maryland General Assembly, to amend the RPS to accelerate the solar RPS requirement in the near term (2011-2017), resulting in more incentives for solar development. MEA also advocated for legislation, passed by the Maryland General Assembly, to reauthorize the Maryland renewable energy production tax credit, offering up to \$2.5 million to eligible taxpayers for the production of renewable electricity.</li> <li>• Through its residential renewables grant program, MEA awarded hundreds of grants (ranging from \$1,000-10,000) to homeowners and businesses to offset the cost of installing wind, geothermal and solar PV systems. Demand has increased from 200 systems a year to 200 systems a month, even with significantly reduced incentives.</li> <li>• MEA also developed and implemented Project Sunburst, a program offering rebates of up to \$1,000 per KW of solar PV capacity installed on public buildings. The program will incentivize the building of about 10 MW of solar in Maryland over the next year, more than doubling current capacity in the state.</li> <li>• In addition, MEA worked with DGS and the University of Maryland to stimulate utility-scale renewable generation through the Generating Clean Horizons Program.</li> <li>• Finally, MEA administered the renewable energy production tax credit. Over the past three years, more than \$5 million in these credits have been claimed.</li> </ul>
<p>ES-8</p>	<p>Efficiency Improvements and Repowering Existing Plants</p>	<p>MEA</p>	<ul style="list-style-type: none"> <li>• Advocated for federal climate legislation that would establish a price on carbon which will in turn incentivize existing plants to operate more efficiently.</li> <li>• Tracked the development of regulations by the Environmental Protection Agency (EPA) which would mandate new plants and certain existing plants to install technologies to reduce greenhouse gas emissions.</li> </ul>
<p>ES-10</p>	<p>Generation Portfolio Standard</p>	<p>MDE</p>	<p>As per the Commission's preference, MDE has deferred state action pending the adoption of a national GPS.</p>

<p><i>AFW-1</i></p>	<p>Forest Management for Enhanced Carbon Sequestration</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• MDA and DNR coordinated on Emerald Ash Borer (EAB) and Gypsy Moth control efforts to protect deciduous forestland.</li> <li>• DNR led the Forestry Sub-committee of the NRCS State Technical Committee resulting in improvements to the EQIP landowner assistance program. EQIP supported forest improvements on 450 acres of private land in FY10.</li> <li>• Woodland Incentive Program supported forest improvements on 3,500 acres of private land in FY10.</li> <li>• Maryland DNR Forest Service Foresters provided direct assistance to 1,461 landowners impacting 36,450 acres of privately owned forest. Referred 432 landowners to private foresters, thereby enhancing green economic opportunities for rural professionals.</li> <li>• Advancement of carbon credit market aggregation is temporarily paused, awaiting Congressional action.</li> <li>• The Forestry for the Bay Program continues to expand its programming and popularity with forest landowners.</li> <li>• Completed development of Best Management Practices for harvesting forest biomass (prepared under DNR guidance by Pinchot Institute for Conservation on behalf of UMD Center for AgroEcology).</li> <li>• Amended NRA 5-304 Woodland Incentive Fund (WIF) to allow use with federal cost-share programs.</li> <li>• Amended Forest Products Operators NRA 5-608 to increase accountability of forest harvests and provide better data gathering of forest harvesting trends.</li> <li>• Prepared and adopted the Statewide Forest Assessment and Response plan, a 5-year strategic planning document enabling access to federal funds as mandated by 2008 Farm Bill. Plan was declared a model for other States to emulate.</li> </ul>
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<p><i>AFW-2</i></p>	<p>Managing Urban Trees and Forests</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• Urban Tree Canopy Assessments have been completed for 16 city/towns as well as 3 countywide assessments (Baltimore, Howard and Anne Arundel counties) where the counties oversee 66 census designated communities. Urban Tree Canopy Goals have been adopted in 6 towns. Adopting an Urban Tree Canopy goal is a difficult and lengthy process at the local level as it involves going through a public process and adoption by an elected official(s).</li> <li>• Through the Marylanders Plant Trees program, as of Sept. 17, 2010, 46,241 trees have been registered on our website. Trees are purchased through participating nurseries and cost \$50 prior to coupon use. Species eligible are listed on the Marylanders Plant Trees website and are native trees.</li> </ul>
<p><i>AFW-3</i></p>	<p>Afforestation, Reforestation and Restoration of Forests and Wetlands</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• State tree nursery produced and sold 3 million seedlings.</li> <li>• Natural Filters project planted 224 acres of new forest on DNR lands.</li> <li>• Forest Brigade project planted 494 acres of new forest on DNR lands.</li> <li>• Woodland Incentive Program improved forest management on 3,500 acres of private forestland.</li> <li>• BayBank and associated LandServer is now “live”.</li> <li>• Forest Service consulting with Prince George’s County, Charles County and Baltimore County on specific land use policies and ordinances affecting forestry and forest owners.</li> </ul>
<p><i>AFW-4</i></p>	<p>Protection and Conservation of Agricultural Land, Coastal Wetlands and Forested Land</p>	<p>MDA</p>	<ul style="list-style-type: none"> <li>• Decreased the conversion and development of agricultural land through the protection of productive farmland</li> <li>• Continued to pursue policies and programs that complement those of DNR and MDP by preserving existing forested, grassed, and wetland areas on agricultural land</li> <li>• Continued to pursue policies and programs promoting the installation of forest and grass buffers and wetlands on agricultural land</li> </ul>

<p><i>AFW-5</i></p>	<p>Buy-Local Program</p>	<p>MDA</p>	<ul style="list-style-type: none"> <li>• Sustained the extraordinary growth already evidenced by the “Buy Local” Program</li> <li>• Increased public awareness of the program</li> <li>• Received legislative authority to regulate the use of the terms “locally grown” and “local” to advertize or identify agricultural products</li> <li>• In cooperation with the University of Maryland and Maryland farmers’ market managers, MDA received a matching federal grant to assess the economic impact of farmers’ markets, identify ways to expand their customer base and increase sales, and explore the possibility of forming a statewide market association</li> <li>• Through a partnership including MDA, the University of Maryland School of Nursing, Future Harvest/Chesapeake Alliance for Sustainable Agriculture, the Southern Maryland Agricultural Development Commission, and the Maryland Organic Food and Farming Association, USDA funding was awarded to support the promotion of the use of locally-produced, sustainable protein foods in healthcare facilities and institutions</li> </ul>
<p><i>AFW-6</i></p>	<p>Expanded Use of Forest and Farm Feedstocks and By-Products for Energy Production</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• DNR Forest Service and MES working with Baltimore County to identify and rank County-owned facilities that are especially well suited to capture energy savings from converting to wood energy.</li> <li>• DNR Forest Service and University of Maryland Extension are leading a Wood Energy Workgroup consisting of several State agencies, non-profits and private sector. The purpose of group is to develop policy recommendations for the Governor’s cabinet to consider regarding the merits of advancing wood energy in Maryland.</li> <li>• The Pinchot Institute for Conservation has completed its investigation and report of wood energy opportunities and challenges in Maryland. This 200-page report concludes that substantial unrealized potential exists in all regions of Maryland for capturing cheap, clean and renewable energy from wood.</li> </ul>

<p><i>AFW-7</i></p>	<p>In-State Liquid Biofuels Production</p>	<p>MEA</p>	<ul style="list-style-type: none"> <li>• MEA promoted in-state liquid biofuels production by supporting the tax credit for cellulosic ethanol R&amp;D, administered by DBED, and the production credit for biodiesel and ethanol, administered by the MDA’s Renewable Fuels Incentives Board</li> <li>• MEA continued to be an active member of the Renewable Fuels Incentives Board</li> <li>• MEA continued to support the Maryland state mandate that requires government vehicles and heating oil used in state government buildings to come from biodiesel B5-blend at least 50% of the time.</li> </ul>
<p><i>AFW-8</i></p>	<p>Nutrient Trading with Carbon Benefits</p>	<p>MDA</p>	<ul style="list-style-type: none"> <li>• Continued to train state soil conservation staff and other interested third parties in the use of MDA’s online nutrient assessment tool, marketplace, and registry</li> <li>• Held public meetings across the state to provide an overview of both point source and nonpoint source policy, the salient features of the Maryland Nutrient Trading Program, and future carbon stacking opportunities</li> <li>• Continued to work with DNR, MDE, and other public and private stakeholders to develop menus, policies, and guidelines for use in a complementary program of carbon reduction that can be added to the nutrient trading platform</li> <li>• Joined with the World Resources Institute, NRCS’s contractor Texas Institute for Applied Environmental Research, the Interstate Commission on the Potomac River Basin, and the states of Pennsylvania, Virginia, and West Virginia in a successful effort to garner USDA/NRCS funding for the development, testing, and rollout of a multi-state water quality trading program, as well as a carbon estimation tool and a farm profit calculator to help landowners, producers, and service providers conduct cost benefit analyses of trading participation</li> <li>• Received an NRCS State Conservation Innovation Grant to use the nutrient calculation tool to assess and inventory voluntary agricultural conservation practices and determine compliance with TMDLs</li> </ul>

<p>AFW-9</p>	<p>Waste Management through Source Reduction and Advanced Recycling</p>	<p>MDE</p>	<ul style="list-style-type: none"> <li>• Participated in conference calls and meetings with State, Federal, and local organizations designed to improve waste diversion (<i>i.e.</i>, recycling and source reduction) programs.</li> <li>• Held regular County Solid Waste and Recycling Managers’ meetings designed to present Counties with technical information to assist in improving their waste diversion programs.</li> <li>• Reviewed County solid waste management plans to ensure inclusion of school recycling plans for recycling in all County public schools and colleges.</li> <li>• Continued to implement the Mercury Switch Removal from Vehicles law through written communications, site visits, and phone calls with vehicle recyclers and scrap recycling facilities, and participation in the National Vehicle Switch Removal Program conference calls.</li> <li>• Participated in conference calls and meetings on the proper disposal of pharmaceuticals.</li> <li>• Participated in conference calls and meetings with the Association of State and Territorial Solid Waste Management Officials Product Stewardship Task Force to increase awareness in Product Stewardship and Solid Waste Recycling Task Force to promote actions that reduce waste, conserve resources, prevent pollution, and foster sustainability through identifying recycling opportunities.</li> <li>• Formed a Solid Waste Study Group, as a result of the passage of 2010 House Bill 982, for the purpose of evaluating solid waste processes that reduce the solid waste stream.</li> <li>• Developed a State Agency Recycling Plan and implemented 2010 House Bill 595 that requires recycling of glass, paper, metal, and plastic at State-owned or State-operated buildings.</li> <li>• Reviewed County solid waste management plans to ensure they addressed the collection and recycling of fluorescent lights.</li> </ul>
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<p><i>TLU-2</i></p>	<p>Land Use &amp; Location Efficiency</p>	<p>MDP</p>	<ul style="list-style-type: none"> <li>• Completed the outreach and issue identification phase of PlanMD. MDP and numerous other state agencies worked collaboratively to conduct 13 public forums and proactively engaged over 20 local, regional and statewide organizations, collectively reaching over 1,000 people.</li> <li>• From these meetings and discussions, MDP established agreed upon issues and formulated potential options to address these issues.</li> <li>• Refined options for moving forward based on discussions with state agency and other stakeholder representatives.</li> </ul>
<p><i>TLU-3</i></p>	<p>Transit</p>	<p>MDOT</p>	<ul style="list-style-type: none"> <li>• Implement an electronic, single payment card (Charm Card) that allows riders to load cash or pass products and ride. This initiative will reduce the time it takes for riders to pay a fare, is more convenient, and can be used across multiple transit systems in Maryland.</li> <li>• MARC Improvements, including parking expansion, purchase of new railcars, improvements to station facilities and rail infrastructure, and locomotive replacements and overhauls.</li> <li>• Constructed a new transit customer service center at Mondawmin Service Center.</li> <li>• Implemented new service quality division at MTA to address service quality issues and on time performance.</li> <li>• Install bus start up switches at MTA bus yards, which start buses to automatically activate heater that warms engine coolant, idling is not needed to warm engine.</li> <li>• Replace buses past their useful service life with new hybrid buses equipped with an automatic shutdown feature that prevents excess idling. Planned fleet replacement of 50-100 buses for each of the next four years.</li> </ul>

<p><i>TLU-5</i></p>	<p>Intercity Travel</p>	<p>MDOT</p>	<ul style="list-style-type: none"> <li>• MDOT formed an “Intermodal Advisory Group” and “Freight Stakeholder Advisory Group” to discuss and coordinate freight issues as outlined in the Maryland freight plan. Discussions will include how GHG emission benefits can be achieved and measured.</li> <li>• Worked with CSX to obtain federal grant funds to repower a diesel locomotive for emission reduction pilot testing in the Baltimore region.</li> <li>• Completed a statewide rail plan.</li> <li>• MARC service extension from Point of Rocks to City of Frederick including downtown Frederick and suburban stations connecting to the Brunswick Line and providing access to Washington, D.C.</li> <li>• Solar power in the 200-500 KW range has been installed at the main terminal at BWI; LED lights have been installed on the runway.</li> <li>• CNG buses are operating at the BWI terminal.</li> <li>• Widen key highways that facilitate truck movement and modal interface activities. Such as highway access improvements in SE Baltimore and construct a new highway-railroad grade separated crossing and intersection improvements in Bladensburg.</li> </ul>
<p><i>TLU-6</i></p>	<p>Pay-As-You-Drive Insurance</p>	<p>MIA</p>	<ul style="list-style-type: none"> <li>• Analysis of “Pay-As-You-Drive” Insurance was conducted by the group and a report was issued in September 2009.</li> <li>• Based on the analysis, the following recommendations were made: <ul style="list-style-type: none"> <li>▪ Even though it is unclear to what extent the “Pay-As-You-Drive” Program will reduce GHG production, it is beneficial to encourage the expansion of these programs in the state in that they offer more options to consumers. Based on this, it is recommended that meetings be held with insurance carriers to discuss whether they would consider offering “Pay-As-You-Drive” programs in the state.</li> </ul> </li> <li>• A survey of the top carriers was conducted to determine whether “Pay-As-You-Drive” in Maryland in the future. A report based on these findings was issued on September 22, 2010 and can be found at the MIA website (<a href="http://www.mdinsurance.state.md.us/sa/documents/PAYDSurveyReport09-22-10.pdf">http://www.mdinsurance.state.md.us/sa/documents/PAYDSurveyReport09-22-10.pdf</a>).</li> </ul>

<p><i>TLU-8</i></p>	<p>Bike &amp; Pedestrian Infrastructure</p>	<p>MDOT</p>	<ul style="list-style-type: none"> <li>• Continued investment in the area-wide recreational trails program intended to develop and maintain recreational trails through redesign, reconstruction, non-routine maintenance, or relocation of trails to benefit the natural environment.</li> <li>• Streetscape and functional improvements on the Charles Street Gateway from 25<sup>th</sup> Street to University Parkway including new sidewalks, lighting, crosswalks, ADA ramps, and aesthetic improvements</li> <li>• Where appropriate, bike / pedestrian improvements were included in the widening of MD 45 from Cavan Dr. to Ridgely Rd.</li> <li>• Accommodated bicycles on newly constructed 2-lane limited access Hampstead Bypass.</li> <li>• Added 2.4 miles to the Jones Falls trail from Woodbury Light rail station to Cylburn Arboretum.</li> <li>• Completion of the Maryland Trails Plan entitled “Maryland Trails-A Greener Way to Go”. The plan is designed to guide the development of pedestrian, trails and bicycle development activities in the future.</li> </ul>
<p><i>TLU-9</i></p>	<p>Incentive, Pricing &amp; Resource Measures</p>	<p>MDOT</p>	<ul style="list-style-type: none"> <li>• The Guaranteed Ride Home program has been expanded to the Baltimore Region Cecil County and St. Mary’s County.</li> <li>• Continued funding support provided to the Washington region’s Commuter Connections Program, which includes the commuter operations center, GRH program, marketing, monitoring and evaluation, employer outreach, telecommute project, and ridesharing.</li> <li>• Provided funding support to local rideshare coordinators to strengthen ridematching and ridesharing coordination services to both commuters and employers in the Baltimore region.</li> </ul>

<p><i>TLU-10</i></p>	<p>Transportation Technology</p>	<p>MDE</p>	<ul style="list-style-type: none"> <li>• MDE processed administrative changes to the Clean Car regulations to incorporate changes made by California. Model year 2011 vehicles (start year for Maryland's Clean Car Program) began arriving at dealerships. MDE began receiving compliance reports from automobile manufacturers.</li> <li>• Signal synchronize along US 29 from MD 410 to Wayne Avenue.</li> <li>• Installation and pilot testing of wind power, geothermal power, and other alternative energy sources to reduce carbon footprint at selected MDOT locations in the state.</li> <li>• Installation of higher speed toll lanes (NB/SB) at the Fort McHenry Tunnel toll plaza.</li> <li>• The computer-aided dispatch and automated vehicle locations (CAD/AVL) project which provides radio data channel expansion to improve bus fleet voice and data communication. Also included are the design and construction of electronic signs to aid and advise patrons of next bus arrival information at 200 bus stop locations.</li> </ul>
<p><i>TLU-11</i></p>	<p>Evaluate GHG from Major Projects</p>	<p>MDOT</p>	<p>At present, MDOT is evaluating the various proposals for potential future GHG evaluation in conjunction with the other AASHTO and NASTO states.</p>

## 2010 Implementation Progress Report: Adaptation and Response Work Group

Policy Number	Policy Name	Lead Agency	2010 Implementation Progress
ARWG-1	Public Awareness, Outreach, Training & Capacity Building	DNR	<ul style="list-style-type: none"> <li>• DNR partnered with MDE to host two living shorelines training workshops for industry professionals.</li> <li>• DNR partnered with MDE and the Coastal Training Program to host a second Living Shorelines Workshop for Homeowners in St Mary’s County.</li> <li>• Collaborated with NOAA, EPA and CBNEMO to host a two-day climate change adaptation workshop for the Chesapeake Watershed Forum.</li> <li>• Launched the <i>CoastSmart</i> Communities Online Resource Center (<a href="http://www.dnr.state.md.us/CoastSmart">http://www.dnr.state.md.us/CoastSmart</a>) .</li> <li>• Completed a compilation of MARCO State climate change planning and policy approaches and implementation plans, and identified best practices to enhance adaptation at the regional scale</li> <li>• Hosted a coastal flooding and sea level rise forum on Kent Island in partnership with the Queen Anne’s League of Women Voters.</li> <li>• Partnered with NOAA Coastal Service Center and the Coastal Training Program to conduct a two-day Coastal Inundation Mapping Course, hosted primarily for local government staff in Maryland’s coastal zone.</li> <li>• DNR launched the Coastal Atlas in June 2010 using new web portal on DNR website (<a href="http://dnr.maryland.gov/ccp/coastalatlus">http://dnr.maryland.gov/ccp/coastalatlus</a>). Additional details listed under FBEI-6, GIS Mapping, Modeling and Monitoring.</li> <li>• DNR's climate change efforts profiled in new book, "A Sustainable Chesapeake: Better Models for Conservation" <a href="#">A Sustainable Chesapeake: Better Models for Conservation</a>, published by The Conservation Fund.</li> </ul>

<p><i>ARWG-2</i></p>	<p>Local Government Planning Guidance</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• Awarded technical assistance and funding for 4 <i>CoastSmart</i> Communities projects: City of Annapolis, Anne Arundel County, Caroline County and the Town of Queenstown.</li> <li>• DNR launched the CoastSmart Communities Online Resource Center in June 2010 to assist businesses, communities and local governments access available products and services to address the current risks associated with coastal hazards and the potential increased impacts of those hazards in the future due to climate change.</li> <li>• Began compiling information and resources leading to the development of the <i>CoastSmart</i> Communities Scorecard, a self-assessment tool designed to walk communities through the process of determining their current ability to address sea level rise and to provide guidance on specific adaptation strategies that can be incorporated into local planning frameworks and regulations.</li> <li>• DNR launched the Coastal Atlas in June 2010 using new web portal on DNR website (<a href="http://dnr.maryland.gov/ccp/coastalatlus">http://dnr.maryland.gov/ccp/coastalatlus</a>). Additional details listed under FBEI-6, GIS Mapping, Modeling and Monitoring.</li> </ul>
<p><i>ARWG-3</i></p>	<p>Future Adaptation Strategy Development</p>	<p>U of MD</p>	<p>In 2009, UMCES and DNR jointly led an effort that pulled together six different teams to develop an adaptation strategy on the impacts of climate change for the State of Maryland. The strategy focuses on six different areas: Human Health; Agriculture; Forest and Terrestrial Ecosystems; Bay and Aquatic Environments; Water Resources; and Growth and Infrastructure. This report is ultimately the product of over 80 experts from the governmental, non-profit, and private sectors that held a series of meetings to draft report chapters. The <i>Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change: Phase II</i> was presented to the Maryland Commission on Climate Change at its fall 2010 meeting.</p>
<p><i>FBEI-1A</i></p>	<p>Integrated Planning - State</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• DNR advocated for the consideration of climate change and sea level rise impacts during development of Plan Maryland.</li> <li>• DNR drafted agency policy, "Building Resilience to Climate Change" to provide direction and guidance regarding the Department's practices related to: land investments; facility/infrastructure siting and design; habitat restoration; government operations; research, monitoring and assessment; resource planning; and advocacy.</li> </ul>
<p><i>FBEI-1B</i></p>	<p>Integrated Planning - Local</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• DNR awarded technical assistance and funding for 4 <i>CoastSmart</i> Communities projects: City of Annapolis, Anne Arundel County, Caroline County and the Town of Queenstown.</li> </ul>

<i>FBEI-2</i>	Adaptation-Stat	DNR	In accordance with the Executive Order, an annual progress report and implementation plan was submitted to the Governor and General Assembly in January 2010.
<i>FBEI-5</i>	Climate Change Insurance Advisory Committee	MIA	<ul style="list-style-type: none"> <li>• In September 2008, the Maryland Insurance Commissioner convened the Climate Change Insurance Advisory Committee (CCIAC).</li> <li>• The CCIAC issued its Final Report on October 2010. The report includes the following: <ul style="list-style-type: none"> <li>• A review of the adequacy of the data available to insurers to assess the risk posed by climate change;</li> <li>• An examination of whether adaptive options are available to help mitigate losses and whether rating can be structured to provide an incentive for these options; and</li> <li>• A review of ways to promote partnerships with policyholders for loss mitigation.</li> </ul> </li> </ul>
<i>FBEI-6</i>	GIS Mapping, Modeling and Monitoring	DNR	<ul style="list-style-type: none"> <li>• DNR's Chesapeake &amp; Coastal Program partnered with the Chesapeake Bay National Estuary Research Reserve Coastal Training Program and NOAA's Coastal Services Center to host a two-day, hands-on course providing an introduction of coastal inundation and coastal inundation mapping.</li> <li>• MES completed development and testing of the Coastal Atlas' Shorelines mapper having compiled the new and existing data layers and deployed the application on the MD iMap infrastructure, currently housed at TUGIS.</li> <li>• TUGIS completed development and testing of the Coastal Atlas' coastal resources mapping applications and deployed them on the MD iMap infrastructure, currently housed at TUGIS.</li> <li>• DNR launched the Coastal Atlas in June 2010 using new web portal on DNR website (<a href="http://dnr.maryland.gov/ccp/coastalatlus">http://dnr.maryland.gov/ccp/coastalatlus</a>).</li> </ul>
<i>FBEI-8</i>	Economic Development Initiative	DBED	DBED is implementing this policy recommendation in coordination with implementation of the MCCC's Mitigation Working Group (MWG) policy option CC-9, which is aimed at promoting economic development opportunities associated with reducing greenhouse gas emissions in Maryland.

<p><i>EBEI-2</i></p>	<p>Integrated Observation Systems</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• On May 12, 2009, President Obama signed an Executive Order for the Chesapeake Bay Protection and Restoration. In accordance with the EO, the Federal Oversight Committee released its Strategy for Protecting and Restoring the Chesapeake Bay Watershed in May 2010. The Strategy includes an element on “Responding to Climate Change,” which details recommendations for enhancing integrated observation systems to detect, monitor and advance our scientific understanding of climate change.</li> <li>• Maryland joined the Mid-Atlantic Regional Council on the Ocean (MARCO), a cooperative partnership focused on addressing shared priorities, including preparing the region’s coastal communities for the impact of climate change.</li> </ul>
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<p><i>EBEI-3</i></p>	<p>Adaptation of Vulnerable Coastal Infrastructure</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• DNR drafted agency policy to guide the siting and design of infrastructure and facilities vulnerable to sea level rise.</li> <li>• The Maryland Historical Trust (MHT) completed the first phase of its analysis of Maryland’s historical, archaeological and cultural resources vulnerable to sea-level rise and presented its findings to the interagency climate change staff workgroup. A presentation is planned for the 2010 Climate Change Commission meeting.</li> </ul> <p><u>MDOT</u></p> <p>All MDOT modal administrations have formally incorporated consideration of sea level rise and storm surge into their existing planning frameworks, so that future development and rehabilitation projects will be automatically assessed as to their vulnerability. Each modal has pursued the process most suited to the geographic range and immediate vulnerability of their infrastructure.</p> <p><u>State Highway Administration (SHA) and Maryland Transportation Authority (MDTA):</u></p> <ul style="list-style-type: none"> <li>• Formed a Climate Adaptation Team ,</li> <li>• Developed a draft strategic plan for Climate Change Adaptation identifying short and long term actions,</li> <li>• Developed a GIS application for identifying asset vulnerability</li> <li>• Began infrastructure analysis</li> <li>• Provided GIS vulnerability mapping assistance to other state agencies.</li> </ul> <p><u>Maryland Port Administration (MPA)</u></p> <ul style="list-style-type: none"> <li>• Completed a Climate Change Vulnerability Assessment Report to estimate the effects of local sea level rise and storm surge for multiple scenarios for facilities owned, managed or planned by MPA.</li> </ul> <p><u>Maryland Aviation Administration</u></p> <ul style="list-style-type: none"> <li>• Added inundation boundary layers for SLR and storm surge to the Draft Airport Layout Plan (ALP) for Martin State Airport, submitted to the FAA for approval in 2010.</li> </ul> <p><u>Maryland Transit Administration</u></p> <ul style="list-style-type: none"> <li>• Initiated procurement of GIS capability to support vulnerability assessment. Full GIS implementation is scheduled for December 2010.</li> </ul>
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<p><i>EBEI-8</i></p>	<p>Building Codes</p>	<p>DHCD</p>	<ul style="list-style-type: none"> <li>• DHCD is charged with adopting the statewide building code known as the Maryland Building Performance Standards (MBPS) the Public Safety Article, Title 12, Subtitle 5 of the Annotated Code of Maryland (the “MBPS Statute”).</li> <li>• Reviewed the 2009 IBC and IRC along with the 2009 IECC and others published by the ICC for adoption into the MBPS.</li> <li>• Began the Maryland regulation process by submitting request to the Division of State Documents.</li> <li>• Submitted proposed regulations to adopt new I-Codes in Maryland through the Administrative Executive Legislative Review Committee (AELR).</li> <li>• Reviewed plans/actions by other states vulnerable to sea-level rise.</li> <li>• Participated in the 2009 ICC Annual Conference and Codes Development Hearings (October 24 – November 11, 2009).</li> <li>• Prepared/conducted MBPS statewide training (new sessions began in November 2009).</li> <li>• Submitted 3-year Projected Maryland Timeline for Code Review, Update and Training</li> <li>• In January 2010, MD adopted 2009 I-Codes into the MBPS along with the State of Maryland Performance Code (MPC) for industrialized/modular buildings.</li> <li>• Local code jurisdictions adopted the new version of the MBPS in July 2010.</li> <li>• Identified opportunities to improve and expand much-needed training on building codes, especially those that will continue to be developed relating to energy efficiency and other green building standards. <ul style="list-style-type: none"> <li>▪ Partnership with MEA to continue and enhance energy code training, including assistance with ICC certifications for training on the new IECC 2009.</li> </ul> </li> <li>• Identified funding for DHCD training programs to ensure that suitable training remains available statewide to local code authorities and other stakeholders.</li> <li>• Continued to provide training on the new version of the Maryland Building Performance Standards (MBPS) to local jurisdictions, architects, engineers, green building professionals, and other stakeholders.</li> <li>• As required under Section 2 of the Omnibus Coastal Property Insurance Reform Act of 2009 (Act), Chapter 540 (House Bill 1353), DHCD conducted reviews and prepared a report to members of the Senate Finance Committee and House Economic Matters Committee (Members) on “...enhanced building codes for coastal regions of the State</li> </ul>
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			that promote disaster-resistant construction in the coastal regions of the State...”. As required under HB 1353, the report is scheduled for delivery to Members by October 1, 2010; the report will also be provided to “planning boards of the counties in the coastal areas of the State.”
<i>EBEI-10</i>	Disclosure	DHCD	Staff from DHCD, DNR, and OAG held a meeting to discuss suitable recommendations for a disclosure or advisory statement to inform prospective coastal property purchasers of potential impacts of climate change and sea level rise on the property being transferred.
<i>RRI-1</i>	Natural Resource Protection Areas	DNR	<ul style="list-style-type: none"> <li>• DNR jointly hosted a workshop with NOAA to begin identifying climate change adaptation strategies by sector that could be addressed through land conservation efforts. A variety of key experts and conservation practitioners attended the workshop “Coastal Land Conservation and Climate Change.” The strategies produced during the workshop were further refined and specific criteria for landscape and parcel level applications were developed.</li> <li>• DNR identified wetland migration corridors as the primary targeting criteria. Two sea-level marsh migration models were assessed for their targeting and modeling capabilities.</li> <li>• DNR refined Sea-level Affecting Marsh Migration (SLAMM) model parameters and data inputs for Maryland specific needs under advice from wetland experts. Began running SLAMM model for the eastern shore counties of Maryland.</li> <li>• DNR began developing a targeting model (Model #1) using the outputs of SLAMM, Maryland’s Blue and Green Infrastructure targets. This will provide new land conservation priorities with climate change in mind.</li> <li>• MDE worked in partnership with EPA and other State and federal partners on the Watershed Resource Registry, a comprehensive approach to identifying priority restoration and protection areas.</li> </ul>

<p><i>RRI-2</i></p>	<p>Forest and Wetland Protection</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• Completed the final near-shore Blue Infrastructure assessment and updated targeting criteria with the feedback from resource managers about the preliminary assessment outputs. These results have been integrated into natural resource protection efforts through land acquisition and project review.</li> <li>• DNR began developing additional land conservation targeting criteria in response to the Science and Technical Working Group high emission sea level rise scenario of 3.4 ft of rise by 2100. This new criteria combines marsh migration corridors, wetland rarity, and blue and green infrastructure data layers and will provide new land conservation priorities with climate change in mind.</li> <li>• DNR partnered with the Conservation Fund, the National Oceanic and Atmospheric Administration and the Northern Virginia Regional Commission to offer the pilot-course: Planning for Climate Change Using a Green Infrastructure Approach in April 2010. The hands-on course offered participants the opportunity to examine potential climate change impacts (storm surge/sea level rise, changes in precipitation and temperature) and to learn methods for using a green infrastructure approach to guide development of effective adaptation and mitigation strategies.</li> </ul>
<p><i>RRI-3</i></p>	<p>Shoreline and Buffer Area Management</p>	<p>DNR</p>	<ul style="list-style-type: none"> <li>• The Maryland Critical Area Commission Buffer Regulations were effective on March 8, 2010. The new Buffer Regulations establish comprehensive standards and procedures for the treatment of the Critical Area Buffer. The new regulations create standards for delineating the Buffer, measuring the Buffer, and mandatory expansion for contiguous sensitive areas. All aspects of Buffer implementation, including Buffer establishment, protection, maintenance, mitigation, and enforcement are covered.</li> <li>• DNR partnered with MDE to host two living shorelines training workshops for industry professionals.</li> <li>• DNR partnered with MDE and the Coastal Training Program to host a second Living Shorelines Workshop for Homeowners: St Mary's County in January 2010.</li> </ul>
<p><i>RRI-4</i></p>	<p>Resource-Based Economic Initiative</p>	<p>DBED</p>	<p>No progress. Implementation of this policy is dependent on funding availability.</p>

<i>HHSW-1</i>	Health Impact Assessments	DHMH	Although no additional health impact assessments have been conducted, DHMH has been working with MDE to improve the capabilities of its Environmental Public Health Tracking (EPHT) infrastructure. EPHT, an online tool that presents both health and environmental data at various levels, can be used by the public and, in a secure fashion, by health department personnel, to present detailed information about health and environmental data at a detailed level sufficient to be useful for health impact assessment.
<i>HHSW-2</i>	Inter-Agency Coordination	DHMH	DHMH has strengthened its coordination with DNR and MDE related to monitoring and reporting of Chesapeake Bay-related health concerns, specifically with respect to harmful algal blooms (HABs).
<i>HHSW-9</i>	Vector-borne Disease Surveillance and Control	DHMH	<p>Maryland State officials continue to track the spread of WNV and other arboviral activity in the State in vector species, host animals, and humans. This allows for ongoing enhancement and deployment of effective tools to support surveillance, prevention, and control of West Nile virus and other arthropod-borne viruses, including novel or emerging pathogens that threaten the health of Maryland residents.</p> <p>In addition, the Mid-Atlantic Zoonotic and Vector Borne Disease Inter-Agency Workgroup (MAZV), a collaboration between DHMH, DNR, MDA, and researchers, practitioners, and federal agency partners meets regularly to monitor and discuss vector borne disease activities in Maryland and the surrounding regions.</p>

# APPENDIX A

## MWVG POLICY PLANS FOR 2011

# Mitigation Working Group Policies

**Option: CC-1**

**Lead Agency: MDE**

**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified**

**GHG Inventories and Forecasting (CC-1)** *MDE, with assistance from other state agencies, would prepare a statewide inventory and forecast of GHG sources and sinks, both anthropogenic and natural, which would provide information on trends, opportunities for mitigation, and the efficiency of Climate Action Plan policies.*

**Future Actions** Maryland 2006 GHG Inventory and Forecast to be completed by June 1, 2011.

**Option: CC-2**

**Lead Agency: MDE**

**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified**

**GHG Reporting and Registry (CC-2)** *Led by MDE, the State government would establish and oversee a GHG reporting system for GHG emitting sources to help them reduce emissions, prepare for possible GHG mandates, and support the construction of GHG inventories. State government would establish a GHG registry to enable sources to record GHG reductions as a foundation for a trading program.*

**Future Actions** MDE is preparing calendar year 2009 emissions for submittal to The Climate Registry.

**Option: CC-3**

**Lead Agency: MDE**

**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified**

**Statewide GHG Reduction Goals and Targets (CC-3)** *As a core element of its climate action plan, the state would adopt the science-based GHG emission reduction goals recommended by the Commission in its Interim Report. These are: a 25-50% consumption-based reduction in GHG emissions below 2006 levels in 2020; a 90% regulatory reduction below 2006 levels in 2050 to drive R&D off climate-neutral technology; and interim, non-regulatory targets of 10% below 2006 levels by 2012 and 15% below 2006 levels by 2015.*

**Future Actions** Initial draft of 2012 GGRA Plan to be available for stakeholder comment summer of 2011 and then provided to Governor and General Assembly by December 31, 2011.

**Option: CC-4**

**Lead Agency: DGS**

**Bin: 1**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified**

**State and Local Government Lead by Example (CC-4)** *State and local government agencies would promote energy efficiencies and GHG reductions through procurement and purchasing practices. This policy would work together with the "Government Lead-by-Example" policy of building and operating energy efficient government buildings (RCI-4) to reduce government's GHG footprint and encourage the private sector to follow suit.*

**Future Actions** Combined with RCI-4.

<b>Option: CC-5</b> <b>Lead Agency: MDE</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO2e): Not Quantified</b>
<b>Public Education and Outreach (CC-5)</b> <i>The State government would build on its current educational and action campaigns on climate change and combine them with community action and economic incentives and disincentives provided by other State climate change policies to create the foundation for behavioral and lifestyle changes by MD citizens.</i>	
<b>Future Actions</b> MDE will continue with the one-day conferences for regional public media representatives on the state of climate change mitigation in Maryland and the level of attainment of State GHG goals in addition to periodic lessons on Coastal Bays and Clean Air Partners (CAP) "On the Air".	

<b>Option: CC-7</b> <b>Lead Agency: Commission</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO2e): Not Quantified</b>
<b>Review Institutional Capacity to Address Climate Change Issues Including Seeking Funding for Implementation of Climate Action Panel Recommendations (CC-7)</b> <i>This policy calls for engagement at the highest levels of the executive branch of State government to develop the governance, organizational capacity, and funding to execute GHG mitigation and adaptation policies, implement programs, monitor and analyze results, and modify and update policies and programs over time.</i>	
<b>Future Actions</b> Maryland continues to review staffing and the relationship to all of Maryland's climate initiatives.	

<b>Option: CC-8</b> <b>Lead Agency: MDE</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO2e): Not Quantified</b>
<b>Participate in Regional, Multi-State, and National GHG Reduction Efforts: Low Carbon Fuel Standard (CC-8)</b> <i>MD would continue to implement this policy through its own leadership example of implementing aggressive GHG reduction programs, by participating in and encouraging regional programs like Low Carbon Fuel Standard and, through its elected leadership, by working with Congress and the Federal government to significantly reduce GHG emissions nationally and internationally.</i>	
<b>Future Actions</b> Maryland supports the regional LCFS initiative which includes plans for a 2011 regional MOU and program implementation in 2012	

**Option: CC-9**  
**Lead Agency: DBED**  
**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified**

**Promote Economic Development Opportunities Associated with Reducing GHG Emissions in Maryland (CC-9)** *The State would work with public and private entities to develop green industries and jobs in the areas of building construction and operation, energy efficiency, public transportation, renewable energy sources, and clean technology R&D.*

**Future Actions** Next steps, to be pursued jointly with the Office of the Governor, will include:

- Prioritize recommendations, placing greatest emphasis on those with the most potential to create jobs and promote economic recovery immediately
- Develop an action plan to implement these recommendations
- Outline the budgetary and workforce resources necessary to implement these changes
- Quantify potential return on investment through the number of jobs created or retained, revenue generated and kept in-state, and other benchmarks
- Draft legislation for consideration for the 2011 General Assembly session to implement recommendations requiring legislative action
- Convene short-term public-private working groups to handle specific issues raised within the recommendations

Throughout this process, the State will continue to work closely with the private sector, including the Task Force members who invested considerable time and effort into developing these recommendations. As evidenced by the nature of the recommendations, the continued involvement and input of private organizations will be critical to advancing a sustainable economy in Maryland.

**Option: CC-10**  
**Lead Agency: MEA**  
**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified**

**Create Capacity to Address Climate Change in an "After Peak Oil" Context (CC-10)** *Take a proactive approach to address the after peak oil. Establish a State After-Peak Oil Advisory Council consisting of experts and stakeholders. The Advisory Council would review and evaluate all proposed climate change and energy related policies and legislation so as to avoid the potential of increased Green House Gas (GHG) emissions for inexpensive oil alternatives such as coal.*

**Future Actions** • MEA will continue to administer the hybrid trucks program and the electric vehicle charging station and truck stop electrification program and to work with interested stakeholders to identify market barriers and solutions to the widespread transition away from oil-dependent vehicles.

**Option: CC-11**  
**Lead Agency: DHMH**  
**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified**

**Evaluate Climate Change Policy Options to Determine Projected Public Health Risks/Costs/Benefits (CC-11)** *A Commission-based work group would be established to systematically review the health risks, costs, and benefits of proposed climate change and energy-related policies and legislation before they move forward, with particular attention to policy impacts on vulnerable populations in MD.*

**Future Actions** No current information received for policy.

**Option: RCI-1**  
**Lead Agency: DHCD**  
**Bin: 1**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 2.4**

**Improved Building and Trade Codes and Beyond (RCI-1)** -- *Code Building Design and Construction in the Private Sector (RCI-1)* This policy option would reduce energy consumption in new or renovated residential and commercial buildings through improvement and enforcement of building and trade codes, updated periodically to reflect state-of-the-art practices.

**Future Actions**

- Continue to improve, assess, and adopt the latest building codes following the International Code Council (ICC) three-year cycle of development of the I-Codes, including the energy code.
- Continue to participate in the ICC process to improve and develop building codes on a national level, including participation in annual conferences and code development hearings, as funding permits.
- Continue to identify opportunities to improve and expand much-needed training on building codes, especially those that will continue to be developed relating to energy efficiency and other green building standards.
- Identify funding for DHCD training programs to ensure that suitable training remains available statewide to local code authorities and other stakeholders.
- Continue to provide training on the new version of the Maryland Building Performance Standards (MBPS) to local jurisdictions, architects, engineers, green building professionals, and other stakeholders.

By 2011:

- Approximately 60 local jurisdictions to adopt the latest, nationally-accepted, building and trade codes into the Maryland Building Performance Standards (MBPS). DHCD will track local jurisdictions as they complete their required adoptions of the latest MBPS.
- As needed, hold additional public stakeholder event(s) to solicit input on enhanced building codes, particularly for coastal communities.
- Pilot program established and a usable database accessible for tracking state and local processes for building code adoption, implementation, training, compliance, and development.
- Train approximately 1,100 people (i.e., local jurisdiction representatives and other stakeholders) each year on the latest MBPS, as funding permits.

By 2020:

- State and local adoption of the latest, nationally-accepted, building and trade codes into the Maryland Building Performance Standard (MBPS). This future version of the MBPS will incorporate the latest energy codes from the International Code Council (ICC), which should be the 2018 version of the IECC.

**Option: RCI-2**  
**Lead Agency: MEA**  
**Bin: 1**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 4.5**

**Demand-Side Management Energy Efficiency Programs (RCI-2)** *Promote increasing investment in electricity and natural gas demand-side management programs run by MEA, energy service companies (ESCOs), utilities and others to meet demand reduction and energy consumption reduction goals. Consideration should be given to DSM activities that can work in tandem with other strategies and can encourage energy efficiency improvements.*

**Future Actions** • See RCI-10: Energy Efficiency Resource Standard

**Option: RCI-3**  
**Lead Agency: MEA**  
**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 0.5**

**Low-Cost Loans for Energy Efficiency (RCI-3)** *Establish revolving low-interest loan fund(s) for small-scale residential and commercial energy efficiency projects. The fund(s) targets distribution service areas that are not covered by existing utility programs, and is intended to complement existing energy efficiency programs and those being considered as a part of RCI-2 and RCI-10.*

**Future Actions** • See RCI-10: Energy Efficiency Resource Standard

<b>Option: RCI-4</b> <b>Lead Agency: DGS</b> <b>Bin: 1</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 1.3</b>
<b>Government Lead-by-Example (RCI-4)</b> <i>State and local governments would adopt practices beyond established building codes to obtain high performance and energy efficient buildings in government-owned and leased buildings.</i>	
<b>Future Actions</b> • Ten additional EPCs are in the development, proposal, or evaluation stage • DGS is considering an additional “Clean Horizons II” program	

<b>Option: RCI-7</b> <b>Lead Agency: MEA</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 0.2</b>
<b>More Stringent Appliance/Equipment Efficiency Standards (RCI-7)</b> <i>Appliance efficiency standards reduce the market cost of energy efficiency improvements by incorporating technological advances into base appliance models, thereby creating economies of scale. Appliance efficiency standards can be implemented at the state level for appliances not covered by federal standards, or where higher-than-federal standard efficiency requirements are appropriate. Regional coordination for state appliance standards can be used to avoid concerns that retailers or manufacturers may either resist supplying equipment to one state that has advanced standards, or focus sales of lower efficiency models on a state with less stringent efficiency standards.</i>	
<p><i>There are federal standards for 19 residential products and 19 pieces of commercial equipment, as well as 14 lighting standards. Laws require the U.S. Department of Energy (DOE) to set minimum appliance efficiency standards that are technologically feasible and economically justified. However, there are many appliances not covered by federal standards for which state standards can play a role.</i></p> <p><i>Options related to state standards include:</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Lobbying for more stringent appliance standards at the federal level,</i></li> <li><input type="checkbox"/> <i>Establishment and enforcement of higher-than-federal state-level appliance and equipment standards (or standards for devices not covered by federal standards), and</i></li> <li><input type="checkbox"/> <i>Joining with other states in adopting higher standards.</i></li> </ul>	
<b>Future Actions</b> • MEA will continue to advocate for legislation to increase efficiency standards for televisions, as well as other appliances.	

<b>Option: RCI-10</b> <b>Lead Agency: MEA</b> <b>Bin: 1</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 11.9</b>
<b>Energy Efficiency Resource Standard (RCI-10)</b> <i>Establish mandatory utility electricity and natural gas reduction targets and utility plans to achieve energy savings of at least 15% of per capita demand by 2015.</i>	
<b>Future Actions</b> • MEA will continue to implement its EmPOWER Maryland programs and to support the utilities in the implementation of their EmPOWER Maryland programs, with the ultimate goal of reaching the 15% reduction in electricity consumption by 2015 EmPOWER Maryland goal. Achieving that goal will equate to CO <sub>2</sub> savings of 5.7 mmt/yr.	

**Option: RCI-11**  
**Lead Agency: MEA**  
**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2e</sub>): 1.1**

**Promotion and Incentives for Energy-Efficient Lighting (RCI-11)** Leverage incentives and an aggressive marketing campaign to encourage Maryland residents to choose screw-in compact fluorescent light bulbs, or other high efficiency lighting, as a replacement to screw-in incandescent light bulbs.

**Future Actions** • MEA will continue to educate consumers about the benefits of switching to energy saving lighting, to provide incentives through the EECBG program for lighting upgrades, and to support utility programs that promote energy efficient lighting. All of the energy savings achieved will help Maryland reach its 15% electricity reduction by 2015 EmPOWER Maryland goal.

**Option: ES-1**  
**Lead Agency: MEA**  
**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2e</sub>): 0.5**

**Promotion of Renewable Energy Resources (ES-1)** Identify and devise strategies to reduce or remove regulatory and financial barriers to large scale centralized and onsite generation and to ensure that any state resource planning process includes consideration of renewable energy projects.

**Future Actions** • See ES-7: Renewable Portfolio Standard

**Option: ES-2**  
**Lead Agency: MEA**  
**Bin: 2**

**Est. GHG Reduction by 2020 (MMtCO<sub>2e</sub>): Not Quantified**

**Technology-focused Initiatives for Electricity Supply (ES-2)** Provide technology focused initiatives that support the development of biomass co-firing, energy storage, fuel cell, landfill gas, and clean energy supply; and that increase the rates of technology adoption that can contribute to green house gas reductions and help position Maryland as a world leader in climate-related technology development and deployment.

**Future Actions** • MEA will continue dedicating resources to support the development and adoption of a wide range of clean energy technologies and will work to implement solutions to financial, policy and technological barriers.

**Option: ES-3**  
**Lead Agency: MDE**  
**Bin: 1**

**Est. GHG Reduction by 2020 (MMtCO<sub>2e</sub>): 6.95**

**Cap and Trade (ES-3)** Support Maryland's continued active participation in RGGI and consider expansion of RGGI beyond the power sector if the Federal government fails to enact a credible national cap and trade program in 2009.

**Future Actions** The RGGI process will continue with auctions in 2011 and the revised VERSA regulation to be effective by April 1, 2011.

<b>Option: ES-5</b> <b>Lead Agency: MEA</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):</b> <b>Distributed Generation = 1.1</b> <b>Combined Heat/Power = 1.0</b>
<p><b>Clean Distributed Generation (ES-5)</b> <i>Provide financial incentives and other strategies that encourage investment in distributed energy and combined heat and power systems such that by 2020, 1% of all electricity sales are from distributed renewable generation and 15% of CHP technical potential is recognized at commercial and industrial facilities. Goal was established as a result of the Commission on Climate Change final report and it can be consistent with RPS goals, depending on growth of distributed resources.</i></p>	
<p><b>Future Actions</b> • See ES-7: Renewable Portfolio Standard</p>	

<b>Option: ES-6</b> <b>Lead Agency: PSC</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): Not Quantified</b>
<p><b>Integrated Resource Planning (ES-6)</b> <i>The regulatory and planning process that evaluates meeting future electricity demands and selects the optimal mix of resources that minimizes the cost of electricity supply while meeting reliability needs, aligning environmental and energy supply policies, and other objectives. Under this policy option, an objective review of energy supply options from both conventional and renewable energy sources as well as energy efficiency options would be considered prior to approving utility expansions of electricity generation or transmission. IRP would better align GHG emissions reductions and other environmental goals and energy supply policies by requiring consideration of more options than under current law and a longer time horizon in making resource decisions.</i></p>	
<p><b>Future Actions</b> Demand Side Management (DSM), including various methods of energy efficiency and conservation (EE&amp;C), advanced metering infrastructure (AMI)/Smart Grid, demand reduction (DR), and distributed generation (DG), is expected to become an important source of meeting the State's needed electricity supply. DSM supports system reliability, energy security, energy and capacity price mitigation (i.e., reducing overall energy costs), and energy market competitiveness and may reduce environmental impacts. The EmPower Maryland Act mandated that the Commission require each utility to propose cost-effective energy efficiency and conservation programs and services with per capita energy reductions and peak energy demand reductions of at least 5 percent by the end of 2011 and 10 percent by the end of 2015. Utility plans are filed every three years. The 2012 plans should include estimates of GHG reductions resulting from EE&amp;C, DR, AMI, and DG programs. A Baseline study and the first evaluation, monitoring and verification results for the 2009 utility plans will be available in 2011.</p>	

<b>Option: ES-7</b> <b>Lead Agency: MEA</b> <b>Bin: 1</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 13.8</b>
<p><b>Renewable Portfolio Standard (ES-7)</b> <i>Increasing renewable energy development by requiring electricity providers to obtain a minimum percentage of electricity sales from renewable energy sources, escalating annually to a standard of 20% by 2022.</i></p>	
<p><b>Future Actions</b> • MEA will continue to support policies and to implement programs to help Maryland obtain 20% of its electricity from renewable resources by 2022, with an intermediate target of 18% by 2020. Achieving the 2020 goal will equate to CO<sub>2</sub> savings of 6.7 mmt/yr.</p>	

<b>Option: ES-8</b> <b>Lead Agency: MEA</b> <b>Bin: 3</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 2.0</b>
<b>Efficiency Improvements and Repowering Existing Plants (ES-8)</b> <i>Identify and pursue cost effective emissions reductions from existing generating units through improving their operating efficiency, adding biomass or other fuel changes such that by 2014, 8% of total energy input to coal fired plants is biomass.</i>	
<b>Future Actions</b> By 2011 <ul style="list-style-type: none"> <li>• Work with MDE to implement EPA's forthcoming regulations</li> </ul> By 2020: <ul style="list-style-type: none"> <li>• Achieve 2 million tons of carbon reductions from efficiency improvements at new and existing plants.</li> </ul>	

<b>Option: ES-10</b> <b>Lead Agency: MDE</b> <b>Bin: 3</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 6.6</b>
<b>Generation Portfolio Standard (ES-10)</b> <i>Require load serving entities to acquire electricity on an average portfolio basis that meets a per-unit GHG emission rate below a specified standard (in lb per Mwh). This policy complements Efficiency Improvements and Repowering Existing Plants (ES-8).</i>	
<b>Future Actions</b> Through 2011, MDE will continue tracking the progress of federal climate change legislation in the 112th session of Congress as it pertains to GPS.	

<b>Option: AFW-1</b> <b>Lead Agency: DNR</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 0.09</b>
<b>Forest Management for Enhanced Carbon Sequestration (AFW-1)</b> <i>Through a mix of legislative, programmatic, education/outreach, and market measures, promote sustainable forestry management practices in existing Maryland forests on public and private lands in order to increase CO<sub>2</sub> sequestration in forest biomass, carbon storage in durable wood products, and available biomass for energy production.</i>	
<b>Future Actions</b> DNR will continue to promote sustainable forestry management practices in existing Maryland forests on public and private lands. DNR will work with the General Assembly and various State agencies (MDE, MDA, and SHA), as well as local governments, conservation organizations, private landowners, sawmills, arboreal industries and others to implement this strategy. Specific actions include: <ul style="list-style-type: none"> <li>• Use NRCS funds to leverage cost-share assistance for improving 500 acres of private forest by 2011.</li> <li>• Achieve Woodland Incentive Fund underwrites improvements to 3,000 acres of private forest by 2011.</li> <li>• By 2011, document results of amending legislation relevant to Woodland Incentive Fund, Forest Products Operators, and Sediment &amp; Erosion Control.</li> <li>• Present Woodland Incentive Fund Regulations for public comment.</li> <li>• Present Forest Products Operators Regulations for public comment.</li> <li>• Continue to work together with MDA on Emerald Ash Borer (EAB) and Gypsy Moth control efforts</li> <li>• Explore potential of establishing a carbon credit market aggregation service with private entities.</li> <li>• Support the Forestry for the Bay Program, which reaches forest owners with management message.</li> <li>• Partner with the Pinchot Institute with support from Center for AgroEcology to develop best management protocols for forest harvests associated with expected biomass markets.</li> </ul>	

<b>Option: AFW-2</b> <b>Lead Agency: DNR</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 1.9</b>
<p><b>Managing Urban Trees and Forests for Greenhouse Gas Benefits (AFW-2)</b> <i>Recognizing that urban trees sequester CO<sub>2</sub>, reduce cooling and heating energy demands in buildings by reducing summertime temperatures and cold winds, and slow the formation of ground level ozone and volatile organic compounds (VOCs) from vehicle emissions, this policy would maintain and improve the health and longevity of urban trees and increase urban tree canopy throughout the state through POS funds, measures to protect against invasive species, outreach-education, and planning measures.</i></p>	
<p><b>Future Actions</b> DNR will continue to work with the General Assembly and various State agencies (MDE, MDA, and SHA), as well as local governments, conservation organizations, private landowners, sawmills, arboreal industries and others to implement this strategy. Specific actions include:</p> <ul style="list-style-type: none"> <li>• Continue to work with local communities to secure funding for conducting urban tree canopy assessments.</li> <li>• Continue encouraging communities and counties to obtain urban tree canopy assessments, the first step in developing an urban tree canopy goal.</li> <li>• Encourage the adoption and implementation of urban tree canopy goals by local communities.</li> <li>• Provide outreach and education on the significance of trees and their role in the built environment and control methods for invasive species.</li> <li>• Continue promoting the Marylanders Plant Trees program.</li> </ul>	

<b>Option: AFW-3</b> <b>Lead Agency: DNR</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):</b> <b>Afforestation = 0.6</b> <b>Riparian Areas = 0.05</b>
<p><b>Afforestation, Reforestation, and Restoration of Forests and Wetlands (AFW-3)</b> <i>Promote forest and wetland CO<sub>2</sub> sequestration - both ecosystems being natural carbon "sinks" - using a suite of strategies including green infrastructure planning, reforestation offsets under RGGI, tax incentives, fee-in-lieu payments, and acquisition of landward properties to allow migration of coastal wetlands at risk of inundation from sea level rise.</i></p>	
<p><b>Future Actions</b> .DNR will continue to implement this policy by promoting carbon sequestration efforts using a using a suite of strategies including green infrastructure planning, reforestation offsets under RGGI, tax incentives, fee-in-lieu payments, and direct plantings of afforested lands and tidal and non-tidal buffers. Specific actions to be achieved by 2011, include:</p> <ul style="list-style-type: none"> <li>• Achieve afforestation and/or reforestation of 2,183 acres.</li> <li>• Expand streamside forest buffers by 433 acres on public lands.</li> <li>• Restore 525 acres of wetlands on public lands.</li> </ul>	

<b>Option: AFW-4</b> <b>Lead Agency: MDA</b> <b>Bin: 2</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):</b> <b>Agricultural Land = 0.28</b> <b>Coastal Wetlands = Not Quantified</b> <b>Forested Land = 2.7</b>
<p><b>Protection and Conservation of Agricultural Land, Coastal Wetlands, and Forested Land (AFW-4)</b> <i>Map, designate, prioritize, and conserve existing forests, agricultural land, and wetlands - all major carbon sinks - to sequester additional carbon and to avoid GHG emissions from development, degradation, and clearing. Strategies include purchase of land or development rights, tax incentives, zoning, POS funds, and bond initiatives.</i></p>	
<p><b>Future Actions</b></p> <ul style="list-style-type: none"> <li>• By 2011 <ul style="list-style-type: none"> <li>o Protect an additional 21,600 acres of productive farmland from development</li> <li>o Meet two-year CREP milestone for 12,800 acres of forest and grass buffers, wetland creation, and protected erodible land</li> </ul> </li> <li>• By 2020 <ul style="list-style-type: none"> <li>o Protect 962,000 acres of productive farmland from development</li> </ul> </li> </ul>	

Option: AFW-5  
Lead Agency: MDA  
Bin: 2

Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):  
Farmers' Market = 0.03  
Local Produce = Not Quantified  
Locally Grown/Processed Lumber = Not Quantified

**Buy Local Programs for Sustainable Agriculture, Wood, and Wood Products (AFW-5)** State agencies would work with local governments, farmers' markets, lumber mills, etc. to promote the sustainable production and consumption of locally produced agricultural and durable wood products, displacing high-energy products and reducing GHG emissions from long-distance travel to market.

**Future Actions** • By 2011

- o Raise the number of farmers' market by 2%
- o Increase direct sales (buyer/grower) by 2%
- o Develop a measurement survey and report direct sales figures

• By 2020

- o Raise the number of farmers' markets by 20%
- o Establish a state farmers' market association
- o Increase direct sales (buyer/grower) by 20%

Option: AFW-6  
Lead Agency: DNR  
Bin: 4

Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):  
Biomass = 0.5  
Methane Utilization = 0.04

**Expanded Use of Forest and Farm Feedstocks and By-Products for Energy Production (AFW-6)** Promote the use of local biomass from sustainable supplies of chicken litter, methane, switchgrass, corn stalks, food processing waste, etc. for generating electricity and thermal energy. Strategies include installing community manure digesters, Fuels for Schools and biomass loan programs, and amendment of MD's RPS to include Biomass.

**Future Actions** By 2011:

- Complete findings and recommendations to Baltimore County for wood energy opportunities.
- Continue to educate agency leadership about the untapped potential of wood energy in Maryland.
- Continue to encourage managers of state energy incentive programs to support thermal energy applications fueled by renewable wood sources.

Option: AFW-7b  
Lead Agency: MEA  
Bin: 4

Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 0.17

**In-State Liquid Biofuels Production (AFW-7b)** Promote sustainable in-state production and consumption of transportation biofuels including ethanol and bio-diesel from agriculture or agro-forestry feed-stocks to displace the use of fossil fuels. The purpose is to improve the GHG profile of in-state liquid biofuel production and consumption. This initiative is to be combined with policies to reduce the overall transportation fuel consumption in order to gain a true reduction in Green House Gas (GHG) emissions. Support and development for localizing the distribution of biofuel from production to point of use will lower embedded Carbon Dioxide from saving transportation of the fuels. Note: these policies are to exclude feed-stocks that could be used as food supplies (human and animal).

**Future Actions** • MEA will continue serving as a strong advocate for state policies that promote in-state liquid biofuels production at the R&D, production and purchasing levels.

Option: AFW-8  
Lead Agency: MDA  
Bin: 4

Est. GHG Reduction by 2020 (MMtCO<sub>2e</sub>): 0.14

**Nutrient Trading with Carbon Benefits (AFW-8)** *Add carbon credits and enhanced nitrogen credits to the Upper Chesapeake Bay incipient nutrient trading program, which encourages farmers and other non-point and point sources to reduce their nutrient loads - chiefly nitrogen and phosphorus - through practices which also increase soil carbon sequestration and reduce formation of nitrous oxide, a potent GHG.*

**Future Actions** • By 2011

- o Establish an active nutrient trading market in Maryland
- o In cooperation with DNR, MDE, and other stakeholders, adopt a menu of carbon sequestration practices and relevant policies and guidelines

- By 2020
  - o Participation by 10% of farmers and landowners in providing nutrient and carbon credits to an active environmental trading market in Maryland
  - o Establish commonalities among Bay state trading programs and create a shared platform to facilitate interstate trades
  - o Serve as a model for basin-wide trading programs in other parts of the country

Option: AFW-9  
Lead Agency: MDE  
Bin: 1

Est. GHG Reduction by 2020 (MMtCO<sub>2e</sub>): 29.27

**Waste Management Through Source Reduction and Advanced Recycling (AFW-9)** *Reduce MD's waste stream through programs that reduce waste production, expand recycling and "up-cycling," and enhance re-use of components and manufacturers' lifetime warranty responsibility. Strategies include preferential purchasing by state and local government agencies, identifying incentives to reduce use of raw materials in manufacturing, and phasing out subsidies that encourage wasteful manufacturing practices.*

**Future Actions** .MDE will continue to refine and implement as many practices as possible to meet the goals of this policy. MDE will continue to stress the need for Counties to continue to operate recycling programs and perform activities designed to reduce the amount of waste generated. MDE will work to implement any recommendations of the 2010 House Bill 982 Solid Waste Study Group.

Option: TLU-Area 1  
Lead Agency: MDOT  
Bin: 3

Est. GHG Reduction by 2020 (MMtCO<sub>2e</sub>):  
Climate Action Plan Total = 16.7

**Reduce VMT's Contribution to GHG Emissions (TLU Area 1)** *TLU Area 1 is a suite of policy options aimed at reducing vehicle miles traveled (VMT) as a means of reducing GHG emissions in the transportation sector. Because the strategies in this area are highly inter-related, multiple strategies implemented through a coordinated approach will realize more significant GHG reductions. Therefore, the strategies are intended to be deployed as a bundle. As the bundle is implemented, some of the strategies in the bundle may become more important and some less important. Individual policy option summaries in Area 1 follow.*

**Future Actions** Described individually for each associated policy.

**Option: TLU-2**  
**Lead Agency: MDP**  
**Bin: 3**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):**  
**Climate Action Plan Total = 4.6**

***Integrated Planning for Land Use and Location Efficiency (TLU-2)*** *Implement integrated land use and transportation planning, investment incentives and other strategies to promote compact, transit-oriented development (TOD) and other growth management objectives that encourage less driving while ensuring a competitive economy and affordable house opportunities.*

**Future Actions** • By 2011:

- o Recommendations will be developed from potential options and a draft set of these recommendations will be presented at public meetings in the spring of 2011.
- o From comments received at these public meetings, a final draft of PlanMaryland will be prepared.

• By 2020:

- o Achieve a reasonable percentage (to be determined by MDE contractor) of the maximum possible percent reduction in Maryland's mobile source GHG emissions resulting from implementation of smart growth (as defined by MDP below).

• Definition of Smart Growth. For purposes of estimating the potential climate change mitigation benefits of widespread implementation of smart growth, specifically the GHG reductions from mobile emissions sources that could result, "smart growth" means the following.

o Geographic and spatial relationships between origins and destinations. Residences, job centers, retail and commercial development and services, and educational and recreational opportunities are very close to each other and are connected through efficient mass transit options and sidewalks and bikeways. Residents can access most of their daily life needs within reasonable and short travel distances and timeframes. Residences comprise a balanced supply of diverse but relatively dense, affordable work force housing.

o Governance of transportation, land use and development. The ways in which land use, development and transportation are planned, managed, and regulated by the state, MPOs and local government guide and enable public and private sector investments to achieve the described geographic and spatial relationships between origins and destinations. In addition to targeting investments to designated growth areas, the priorities used to select these investments are critical. For example, there is a critical need for investments in local street networks and non-motorized facilities/design treatments that emphasize accessibility over vehicular mobility. Also very critical is to apply greater scrutiny to local planning and development decisions that revise plans, create new zoning, and approve building projects without realistic demonstration of infrastructure impacts and needs and how (and when) those needs will be met.

o Functional and social integration of transportation modes. It is generally convenient, safe and relatively easy to walk or use bicycles (and less importantly, automobiles) in conjunction with convenient and efficient mass transit to move between most origins and destinations. In conjunction with geographic and spatial relationships between origins and destinations, this integration of transportation modes limits reliance on automobiles to relatively few and short routine trips for most of the population, with the exception of those employed in rural-resource based businesses or living in small rural towns or villages relatively distant from employment centers and larger metropolitan and transitional areas. In addition to work trips, this integration of transportation modes must impact the 80% of household trips (and VMT) associated with non-work travel since a high percentage can be favorably impacted (shorter trip lengths, many non-motorized) through community or activity center designs that move land uses closer together and then support access with better design and local infrastructure.

o Mass transit efficiency and affordability. Efficient mass transit between origins and destinations, with convenient walk access on both ends, is widespread and affordable to the vast majority of the population, with the exception of those employed in rural-resource based businesses or living in small rural towns or villages relatively distant from employment centers and larger metropolitan and transitional areas.

**Option: TLU-3**  
**Lead Agency: MDOT**  
**Bin: 3**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):**  
**Climate Action Plan Total = 2.8**

**Transit (TLU-3)** *Shift passenger mode choice to transit and carpooling by improving transit service and expanding transit infrastructure through increased funding and planning, focusing development on transit-served corridors, and expanding transit marketing and promotion.*

**Future Actions**

- Bus Tracker System: Presently under study for implementation. Allows riders to receive transit arrival information via cell phone.
- Complete construction and open Silver Spring Transit Center to service.
- Implement express bus service on Intercounty Connector between Montgomery County park-and-ride lots to BWI Airport, MARC Penn Line stations, and Ft. Meade.
- Continue to advance the following system expansion projects:
  - The Red Line- Construct an east-west, 14-mile, rapid transit system corridor from Woodlawn to Bayview in the Baltimore region.
  - The Purple Line- Construct a 16-mile corridor from New Carrollton to Bethesda in the Washington region.
  - Corridor Cities Transitway- Establish a bus rapid transit line along a 14-mile corridor from Rockville to Clarksburg.
- Continue to provide funding, through the Locally Operated Transit Systems Capital Procurement Program, to rural and small jurisdictions for transit vehicles, equipment and facilities.
- Promote Transit Oriented Development (TOD) through encouraging private-public partnerships now and in the future. Successful legislation in 2008 and 2009 created a platform for the official designation of TOD zones which were announced 6/21/2010. These include development at 14 MARC, AMTRAK and METRO stations.

TOTAL ANTICIPATED EXPENDITURE IN FY 2010 ON PROJECTS THAT INCLUDE TLU-3 RELATED IMPROVEMENTS: \$6.2 billion +/-

**Option: TLU-5**  
**Lead Agency: MDOT**  
**Bin: 3**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 0.3**

**Intercity Travel: Aviation, Rail, Bus, and Freight (TLU-5)** *Enhance connectivity of non-automobile transportation modes between cities through infrastructure and technology investments, focusing in particular on rail expansion to reduce short-range air travel and to increase rail freight transportation.*

**Future Actions**

- MDOT is working with other states, CSX to improve rail service between the south and Midwest through Maryland. Project is estimated to shift an estimated 14 million truck miles to rail.
- Federal Funds obtained to repower a tug boat with a cleaner engine.
- Hybrid vehicles being obtained at MDOT headquarters and modal agencies.
- MDOT working with other transportation and air-quality agencies in the north east to develop and implement GHG emission reduction scenarios on a multi-state basis along the I-95 corridor, including electric vehicle charging stations.
- Improvements (ongoing) on the MARC Camden line, Brunswick and Penn lines to ensure quality of service.
- Major roadway improvements to reduce congestion and improve vehicular flow, particularly for truck movements and intermodal activities.

TOTAL ANTICIPATED EXPENDITURE IN FY 2010 ON PROJECTS THAT INCLUDE TLU-5 RELATED IMPROVEMENTS: \$3.1 billion +/-

<b>Option: TLU-6</b> <b>Lead Agency: MIA</b> <b>Bin: 3</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): 4.3</b>
<b>Pay-as-You-Drive Insurance (TLU-6)</b> <i>The Maryland Insurance Administration (MIA) would lead a work group with MDOT, MDE, the insurance industry, consumer advocacy groups, and other stakeholders to explore options for implementing and marketing insurance policies that tie the cost of premiums to miles or hours driven.</i>	
<b>Future Actions</b> The MIA will continue to monitor the company's to see if they will offer "Pay-As-You-Drive."	

<b>Option: TLU-8</b> <b>Lead Agency: MDOT</b> <b>Bin: 3</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):</b> <b>Included in TLU-3 Quantification</b>
<b>Bike and Pedestrian Infrastructure (TLU-8)</b> <i>State government would work with local governments and private stakeholders to develop infrastructure planning and design tools, and would provide financial incentives to local governments, to improve, expand, and promote bicycle and pedestrian travel.</i>	
<b>Future Actions</b> <ul style="list-style-type: none"> <li>• Connect Union Bridge to Westminster via the construction of the Little Pipe Creek Trail.</li> <li>• West Baltimore MARC neighborhood improvements including sidewalk rehabilitation, pedestrian lighting, additional trees and tree pits, new crosswalks, and ADA ramps.</li> <li>• Incorporate intersection improvements and bike / pedestrian accommodations where appropriate along access routes to Ft. Meade, Bethesda Naval Center, and Aberdeen Proving Grounds.</li> <li>• Construct sidewalks and parallel hiker/biker path on new Burtonsville Access Road from MD 198 and School Access Rd.</li> <li>• Continuation of the SHA sidewalk pedestrian improvement program.</li> </ul>	
TOTAL ANTICIPATED EXPENDITURE IN FY 2010 ON PROJECTS THAT INCLUDE TLU-8 RELATED IMPROVEMENTS: \$1.2 billion+/-	

<b>Option: TLU-9</b> <b>Lead Agency: MDOT</b> <b>Bin: 3</b>	<b>Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):</b> <b>Climate Action Plan Total = 4.7</b>
<b>Incentives, Pricing, and Resource Measures (TLU-9)</b> <i>Establish GHG emission-based road user fees, time-of-day cordon pricing, parking pricing, and fuel fees based on carbon-intensity, and use revenues to fund transportation programs that advance GHG reduction goals.</i>	
<b>Future Actions</b> <ul style="list-style-type: none"> <li>• Construct the Intercounty Connector in Montgomery and Prince George's County between I-270 and I-95/US 1. Time of day/congestion pricing will be included in this toll road.</li> <li>• I-95 is being reconstructed to include two express toll lanes in each direction on I-95 from I-895 to north of MD 43.</li> </ul>	
TOTAL ANTICIPATED EXPENDITURE IN FY 2010 ON PROJECTS THAT INLCUDE TLU-9 RELATED IMPROVEMENTS: \$2 billion+/-	

**Option: TLU-10**  
**Lead Agency: MDE/MDOT**  
**Bin: 3**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e):**  
**Climate Action Plan Total = 0.44**

**Transportation Technologies (TLU-10)** - Reduce GHG emissions from on- and off-road vehicles (e.g. marine, rail, construction equipment) by providing incentives for purchasing fuel-efficient vehicles, adopting a "Green Port" strategy for Baltimore area port facilities, adopting state government contracting and fleet standards, and developing state-level "smart transportation" system management mechanisms.

**Future Actions**

- Update of Clean Car Regulations to incorporate any changes made by California. Follow California's adoption of the next generation of the Clean Car Program called CALEV-3.
- Continue investment in areawide congestion management through the employment of variable message signs, video for traffic management (CCTV), traffic movement detectors, signal system coordination and remote timing, permanent congestion monitoring systems employed by the CHART program, and deployment of local jurisdiction intelligent transportation system (ITS) projects.
- Develop specifications and construct enhancements or additions of ADA compliant public address and LED sign systems for LRT and Metro.

TOTAL ANTICIPATED EXPENDITURE IN FY 2010 ON PROJECTS THAT INLCUDE TLU-10 RELATED IMPROVEMENTS: \$0.35 billion +/-

**Option: TLU-11**  
**Lead Agency: MDOT**  
**Bin: 3**

**Est. GHG Reduction by 2020 (MMtCO<sub>2</sub>e): N/A**

**Evaluate the GHG Emissions from Major Projects (TLU-11)** Require state agencies and other large capital project sponsors to conduct an evaluation of the resulting transportation and land use GHG emissions related to state and local major capital projects such as major road construction or modifications.

**Future Actions** It has been proposed that the FHWA will include a form of the TLU-11 evaluation process in the new Federal reauthorization. In addition, a process is being considered as part of federal Climate Change legislation.

# APPENDIX B

## ARWG POLICY PLANS FOR 2011

# Adaptation and Response Working Group Policies

**Option: ARWG-1**

**Lead Agency: DNR**

**Public Awareness, Outreach, Training & Capacity Building (ARWG-1)** Utilize new and existing educational, outreach, training and capacity building programs to disseminate information and resources related to climate change and sea level rise.

- Future Actions**
- DNR will conduct outreach, training, and surveys for the Coastal Atlas to begin increasing the user base, assessing the user experience, and identifying new or missing data layers needed to conduct sound coastal management.
  - DNR will continue to conduct live demonstrations at meetings and conferences (International Coastal Atlas Network-Great Lakes Workshop, International Submerged Lands Management Conference, Coastal Zone 2011 Conference, and various state and local-level meetings when invited or when opportunities exist).
  - DNR will continue efforts with MDE and the Coastal Training Program to host trainings and workshops for Living Shorelines.
  - DNR is developing living shorelines content to incorporate into the CoastSmart Communities Online Resource Center.
  - DNR will continue to provide outreach, education and training in conjunction with CoastSmart Communities projects.
  - MDE will complete updated sample plans for a variety of projects, including “living shorelines.”
  - MDE and DNR will coordinate to develop training classes for marine contractors to fulfill the requirements of SB382 for Marine Contractor Licensure and Regulations.

**Option: ARWG-2**

**Lead Agency: DNR**

**Local Government Planning Guidance (ARWG-2)** Develop state-wide sea level rise planning guidance to advise adaptation and response planning at the local level.

- Future Actions**
- DNR to continue efforts to develop CoastSmart Communities Scorecard. DNR will seek feedback from state agency partners, including MDP, during scorecard development and will identify 1-3 communities with which to pilot and refine the scorecard for relevance and improved usability.
  - DNR to coordinate with other agencies and programs, including the CBNERR Coastal Training Program and MD Sea Grant to assess the perceptions, obstacles and needs of coastal communities to put measures in place to become more resilient towards the negative consequences of climate change, including sea level rise and increasing coastal storms.
  - DNR will continue a second year of CoastSmart projects with the City of Annapolis, Anne Arundel County and the Town of Queenstown. Additionally, dedicated CoastSmart funds have been awarded to Talbot County and the Town of Queen Anne.
  - MDP will review and provide feedback on the draft DNR Coast-Smart Communities scorecard.
  - MDP will serve on the review committee for the next round of climate change adaptation grants provided by the DNR Coastal Communities Initiative.

**Option: ARWG-3**

**Lead Agency: UMD**

**Future Adaptation Strategy Development (ARWG-3)** Pursue the development of adaptation strategies to reduce climate change vulnerability among affected sectors, including agriculture, forestry, water resources, aquatic and terrestrial ecosystems, and human health.

- Future Actions**
- State lead-agencies to develop detailed implementation plans for the six sector-based adaptation strategies of the Comprehensive Strategy for Reducing Maryland’s Vulnerability to Climate Change: Human Health; Agriculture; Forest and Terrestrial Ecosystems; Bay and Aquatic Environments; Water Resources; and Growth and Infrastructure.
  - DNR and UMCES to aid State agencies and select local governments to implement key adaptation strategies, most importantly the development of new laws, policies or management practices that reduce vulnerability to climate change.

**Option: FBEI-1A****Lead Agency: DNR**

**Integrated Planning - State (FBEI-1A)** *Require the integration of coastal erosion, coastal storm and sea level rise adaptation and response planning strategies into existing state government policies and programs.*

**Future Actions** • To guide implementation of its agency climate change policy, DNR to: (1) develop land conservation-climate change evaluation; (2) develop facilities and infrastructure siting and design criteria; (3) compile a compendium of best management practices for habitat restoration project design; (4) conduct a GIS-based audit of DNR-owned lands to identify habitat restoration potential for enhancing ecosystem resilience and/or increasing on-site carbon sequestration; (5) establish greenhouse gas and energy reduction and efficiency goals and develop a reduction strategy; (6) assess gaps in knowledge or information and identify and prioritize new research, monitoring and analysis efforts; (7) integrate consideration of climate change into new or updated resource management assessments and strategic planning documents; and (8) develop climate change screening criteria and a compendium of recommended best management practices for environmental review.

- DNR to create a State Sea Level Rise Policy Committee (DNR, DHCD, DGS, DBM, MDE, MDOT, MDP, and others TBD) to explore extension of DNR’s “Lead by Example” Policy to address infrastructure investments of other State Agencies.
- DNR to explore development of Critical Area Program regulations to address climate- related impacts.

**Option: FBEI-1B****Lead Agency: DNR**

**Integrated Planning - Local (FBEI-1B)** *Require the integration of coastal erosion, coastal storm and sea level rise adaptation and response planning strategies into existing local government policies and programs.*

**Future Actions** • As the Caroline County CoastSmart project wraps up in December 2010, DNR will continue to work with the County to ensure adoption of the updated Floodplain and Stormwater Management Programs and rezoning in the floodplain.

- DNR will continue a second year of CoastSmart projects with the City of Annapolis, Anne Arundel County and the Town of Queenstown. Additionally, dedicated CoastSmart funds have been awarded to Talbot County and the Town of Queen Anne.
- DNR will continue efforts to develop CoastSmart Communities Scorecard. DNR will seek feedback from state agency partners, including MDP, during scorecard development and will identify 1-3 communities with which to pilot and refine the scorecard for relevance and improved usability.
- MDP will review and provide feedback on the draft DNR Coast-Smart Communities scorecard.
- MDP will serve on the review committee for the next round of climate change adaptation grants provided by the DNR Coastal Communities Initiative.
- MDE will work with the counties on updating floodplain ordinances and new FEMA floodplain maps.

**Option: FBEI-2****Lead Agency: DNR**

**Adaptation-Stat (FBEI-2)** *Develop and implement a system of performance measures to track Maryland’s success at reducing its vulnerability to climate change and sea level rise.*

**Future Actions** The MCCC Executive Order calls for annual reporting to the Governor and General Assembly on or before November 1 of each year on the Climate Action Plan, including an update on implementation timetables and benchmarks. Adaptation and response performance measures will be a component of this reporting requirement.

**Option: FBEI-5****Lead Agency: MIA**

**Climate Change Insurance Advisory Committee (FBEI-5)** *Establish an independent Blue Ribbon Advisory Committee to advise the State of the risks that climate change poses to the availability and affordability of insurance.*

**Future Actions** • The CCIAC to hold meeting(s) with stakeholders to discuss implementation of report recommendations

Option: FBEI-6

Lead Agency: DNR

**GIS Mapping, Modeling, and Monitoring (FBEI-6)** *Update and maintain state-wide sea level rise mapping, modeling, and monitoring products.*

**Future Actions** • Continue to refine and update Coastal Atlas mapping products.

- DNR will conduct outreach, training, and surveys for the Coastal Atlas to begin increasing the user base, assessing the user experience, and identifying new or missing data layers needed to conduct sound coastal management.
- DNR will continue to conduct live demonstrations at meetings and conferences (International Coastal Atlas Network-Great Lakes Workshop, International Submerged Lands Management Conference, Coastal Zone 2011 Conference, and various state and local-level meetings when invited or when opportunities exist).

Option: FBEI-8

Lead Agency: DBED

**Economic Development Initiative (FBEI-8)** *Recruit, foster, and promote market opportunities related to climate change adaptation and response.*

**Future Actions** None listed.

Option: EBEI-2

Lead Agency: DNR

**Integrated Observation Systems (EBEI-2)** *Strengthen federal, state, local, and regional observation systems to improve the detection of biological, physical, and chemical responses to climate change and sea level rise.*

**Future Actions** • DNR to continue to work with MARCO to address the shared priority for enhancing the coordination and sharing of climate change data and information.

- DNR to work with NOAA and other federal partners in the Chesapeake Bay to support overall policy recommendation and to further development and implementation of recommendations contained in the Strategy for Responding to Climate Change.

Option: EBEI-3

Lead Agency: DNR

**Adaptation of Vulnerable Coastal Infrastructure (EBEI-3)** *Develop and implement State and local adaptation policies (i.e., protect, retreat, abandon) for vulnerable public and private sector infrastructure.*

**Future Actions** • DNR to develop specific siting and design criteria for facilities and infrastructure vulnerable to sea level rise.

- MHT will complete additional phases of the vulnerability analysis as funding and staff resources allow and as directed by the Maryland Climate Change Commission.

- MDOT

SHA: SHA will develop a Climate Action Plan for infrastructure, continue GIS tool development and continue assistance to other state agencies.

MPA: MPA will use its 2010 Climate Change Vulnerability Assessment Report to update its Strategic Plan, Marine Terminal Development Plan, and Dredged Material Management Plan.

MAA: MAA will continue to incorporate inundation mapping on future amendments to Martin ALP.

MTA: Upon full implementation of GIS capability, MTA will develop vulnerability assessment report for existing infrastructure and begin including inundation profiles in environmental feasibility analysis for new projects.

**Option: EBEI-8****Lead Agency: DHCD****Building Codes (EBEI-8)** *Strengthen building codes and construction techniques for new infrastructure and buildings in vulnerable coastal areas.*

**Future Actions**

- Continue to improve, assess, and adopt the latest building codes following the International Code Council (ICC) three-year cycle of development of the I-Codes, including the energy code.
- Continue to participate in the ICC process to improve and develop building codes on a national level, including participation in annual conferences and code development hearings, as funding permits.
- Continue to identify opportunities to improve and expand much-needed training on building codes, especially those that will continue to be developed relating to energy efficiency and other high performance and green building standards.
- Identify funding for DHCD training programs to ensure that suitable training remains available statewide to local code authorities and other stakeholders.
- Continue to provide training on the new version of the Maryland Building Performance Standards (MBPS) to local jurisdictions, architects, engineers, green building professionals, and other stakeholders.

**Option: EBEI-10****Lead Agency: DHCD****Disclosure (EBEI-10)** *DHCD and DNR, as lead agencies, will assemble a small group of key state agency staff to discuss a development of a Maryland sea-level rise disclosure and advisory statement relating to the transfer of real property to inform prospective coastal property purchasers of the potential impacts that climate change and sea level rise may pose to a particular piece of property.*

**Future Actions** DHCD and DNR to continue discussion and development of a 2011/2012 timeline for next steps and recommendations for a suitable disclosure or advisory statement(s) for future property purchasers, recognizing that a thoughtful, measured approach that includes stakeholder input, legal consultation and possible new legislation is needed to avoid undue harm to economic interests in vulnerable coastal areas.

**Option: RRI-1****Lead Agency: DNR****Natural Resources Protection Areas (RRI-1)** *Identify high priority protection areas and strategically and cost-effectively direct protection and restoration actions.*

**Future Actions**

- Continue running SLAMM modeling for all coastal counties.
- Completion of Model #1 – ecological conservation targeting using marsh migration corridors, wetland rarity, blue and green infrastructures data layers.
- Incorporation of Model #1 into GreenPrint priority targeting.
- Coordinate with MDE to begin development of Model #2 that will incorporate human ecology aspects that include the benefits wetlands provide for communities such as, storm surge abatement, water quality, storm water retention, erosion control, etc. This will be another landscape level targeting model that addresses the ecosystem benefits provided to human communities.
- MDE will work with DNR and other state and federal partners on the utility of incorporating SLAMM into the Watershed Resource Registry.
- Partnering agencies will apply the Watershed Resource Registry Statewide to produce maps that identify priority wetland and water resource areas for preservation and restoration.

**Option: RRI-2****Lead Agency: DNR****Forest and Wetland Protection (RRI-2)** *Develop and implement a package of appropriate regulations, financial incentives, educational, outreach, and enforcement approaches to retain and expand forests and wetlands in areas suitable for long-term survival.*

**Future Actions** • Upon completion, DNR will incorporate new targeting criteria for land conservation into State priority protection areas under the GreenPrint application.

**Option: RRI-3**

**Lead Agency: DNR**

***Shoreline and Buffer Area Management (RRI-3)*** *Promote and support sustainable shoreline and buffer area management practices.*

**Future Actions** • DNR will increase coordination efforts with MDE and the Coastal Training Program to host trainings and workshops for Living Shorelines.  
• DNR is developing living shorelines content to incorporate into the CoastSmart Communities Online Resource Center.  
• MDE will promulgate regulations to implement the Living Shoreline Protection Act of 2008.  
• MDE is developing a Living shoreline and Erosion Control Workbook for homeowners and contractors on MDE regulations and requirements.  
• MDE is preparing Living Shoreline Protection Act waiver and worksheet to assist homeowners and contractors about design considerations based on site characteristics.  
The information will be used to promote consistency with site review and recommendations.

**Option: RRI-4**

**Lead Agency: DBED**

***Resource-Based Economic Initiative (RRI-4)*** *Develop and implement long-range plans to minimize the economic impacts of sea level rise to natural resource-based industries.*

**Future Actions** Once funding is allocated or staff is identified, implementation will occur over several phases. Phase 1 will focus on research and data collection, followed by Phase 2, which will be a strategic planning exercise. The first step in this process will be the development of several research teams, each comprised of individuals with expertise in sector-based issue areas. These teams will be coordinated by the lead agencies and will work over a two-year time frame to evaluate key vulnerabilities and potential economic impacts of climate change on resource-based industries (fisheries, forestry, aquatic, and agriculture) and to develop appropriate adaptation and response strategies.

**Option: HHSW-1**

**Lead Agency: DHMH**

***Health Impact Assessments (HHSW-1)*** *Conduct Health Impact Assessments to evaluate the public health consequences of climate change and sea level rise-related projects and/or policies.*

**Future Actions** DHMH is working with the Commission on Environmental Justice and Sustainable Communities, MDE, and the Maryland Department of Planning on the introduction of health indicators that could be used by MDP and other agencies to evaluate the potential impacts of climate change adaptation or mitigation strategies, as well as the potential health consequences of projects related to adaptation to sea level rise.

**Option: HHSW-2**

**Lead Agency: DHMH**

***Inter-Agency Coordination (HHSW-2)*** *Strengthen coordination and management across Agencies responsible for human health and safety.*

**Future Actions** None listed.

**Vector-borne Surveillance and Control (HHSW-9)** *Develop a coordinated plan to assure adequacy of Vector-borne Surveillance and Control Programs.*

**Future Actions** The Center for Zoonotic and Vector Borne Diseases will work with the Center for Environmental Health Coordination to expand existing analyses of the spatial distribution of vector borne disease in Maryland, a potential early indicator of climate-related health impacts.

DHMH/CZVBD will pursue further collaborations with academic institutions and other partners to conduct research examining associations between climate change events and vector-borne disease incidence. Education and outreach activities will be maintained to emphasize the need for ongoing support of vector-borne disease surveillance efforts.