Executive Summary

Background

The Greenhouse Gas Emissions Reduction Act of 2009 and the 2012 Plan

In 2009 the Greenhouse Gas Emissions Reduction Act (GGRA) was signed into law. The GGRA requires the State to achieve a minimum 25 percent reduction in Statewide greenhouse gas (GHG) emissions from 2006 levels by 2020. The State was also required to demonstrate that the reduction goal could be achieved in a way that has a positive impact on Maryland's economy, protects existing manufacturing jobs and creates significant new jobs in Maryland.

To achieve this goal, the GGRA required the Maryland Department of the Environment (MDE) to develop a proposed Statewide GHG reduction plan, to solicit public comment on the proposed plan from interested stakeholders and the public, and to adopt a final plan by 2012.

To achieve a 25 percent reduction in Maryland's GHG emissions from 2006 levels by 2020 while fostering a healthy economy and creating new jobs, the State developed a comprehensive, multi-sector, multi-agency plan with input from more than a dozen state agencies and non-governmental organizations. The *2012 GGRA Plan* lays out a blueprint which, when fully implemented, will achieve the 25 percent GHG reduction required by the GGRA, with positive job and other economic benefits. The *2015 GGRA Plan Update* will also provide additional environmental benefits by helping the State restore the Chesapeake Bay, improve air quality, and preserve agricultural and forest lands.

The *2015 GGRA Plan Update*

The GGRA requires MDE to submit an updated report to the Governor and General Assembly by October 1, 2015. This report updates the information contained within the *2012 GGRA Plan*. The *2015 GGRA Plan Update* summarizes the State's progress toward achieving the 2020 emissions reduction goal established by the GGRA and shows that Maryland is on target to not only meet, but to exceed the emission reduction goal of 34.66 $MMtCO_2e$ by generating 38.37 $MMtCO_2e$ of reductions. The reduction programs outlined in the *2015 GGRA Plan Update* have worked well, but changes in the energy market and travel behavior have also helped Maryland achieve the goals of the GGRA. While this is a positive first step to combating climate change in Maryland, efforts to continue the progress will be needed because scientific consensus is that worldwide GHG reductions as high as 72 percent by 2050, or earlier, are needed to minimize the impacts of climate change. As discussed in Chapter 2, Maryland is already experiencing loss of land from sea level rise, which has risen over one foot in the last 100 years. Maryland has also experienced floods, heavy rains, heat, and strong winds over the past three years, which have led to millions of dollars in property losses and the loss of human life.

Maryland Commission on Climate Change

On May 12, 2015 the Maryland Climate Change Commission Act of 2015 was signed into law. MDE has worked with the Maryland Commission on Climate Change (MCCC) on the *2015 GGRA Plan Update* and will continue to work through the Commission on both implementation of the *2012 GGRA Plan* through 2020 and any beyond 2020 efforts to continue to address climate change.

The Commission is chaired by MDE Secretary Ben Grumbles and is supported by four working groups who all assisted in the development of the *2015 GGRA Plan Update*. The MCCC Greenhouse Gas Mitigation Working Group (MWG) focuses on regulatory, market-based and voluntary programs to reduce GHG emissions while supporting economic development and job creation. The Adaptation and Response Working Group (ARWG) is charged with developing a comprehensive strategy for reducing Maryland's climate change vulnerability through both short- and long-term measures that State and local governments may use to plan for and adapt to a rise in sea levels due to climate change. The Scientific and Technical Working Group (STWG) has prepared much of the material in this report on the science of climate change. The Education, Communication and Outreach Working Group (ECO) assisted with the public outreach and public meetings on climate change. All of the Workgroups have provided valuable input on the *2015 GGRA Plan Update*.

Status of the *2012 GGRA Plan* – Are We Meeting 2020 Goals?

Maryland Jobs and the Economy

The *2015 GGRA Plan Update* will support new industry and will accelerate investments in green technologies in Maryland by encouraging investments in the energy, transportation, and land use sectors of our economy. Implementing the *2015 GGRA Plan Update* will lead to increased investments in energy efficiency, green buildings, renewable energy and low emission vehicles. Investing in Maryland's green economy now will encourage smarter investments and support more sustainable economic growth for generations to come. Current analyses project that the *2012 GGRA Plan* will result in estimated economic benefits of between $2.5 billion and $3.5 billion in increased economic output by 2020 and help create and maintain between 26,000 and 33,000 new jobs.

Updated Estimates of 2020 GHG Emission Reductions

The *2015 GGRA Plan Update* summarizes the various strategies, programs and initiatives that the State is developing and employing to meet the GGRA's emission reduction and economic benefits goals. The State is already implementing the *2015 GGRA Plan Update* and as implementation continues, there may be opportunities to enhance emission reductions and economic and job creation benefits through additional legislative, budgetary or regulatory action.

The suite of programs have been updated for 2015 to include revised benefits from program enhancements to date, refined estimated emissions reductions, revised estimated economic and job benefits, summaries of progress including current implementation efforts and where applicable, recommendations for enhancements by the lead implementing agency.

Through the process used to develop the *2015 GGRA Plan Update*, the 25 percent reduction in Statewide GHG emissions from 2006 levels by 2020 goal of the GGRA was calculated to be 34.66 $MMtCO_2e$. The combined emissions reductions of all programs in the *2015 GGRA Plan Update* are projected to yield a total of 38.37 $MMtCO_2e$ in emissions reductions. This will exceed the GGRA 2020 goal by 3.71 $MMtCO_2e$. Figure ES-1 illustrates the *2015 GGRA Plan Update's* emissions reductions in a dashboard format grouped by sector.

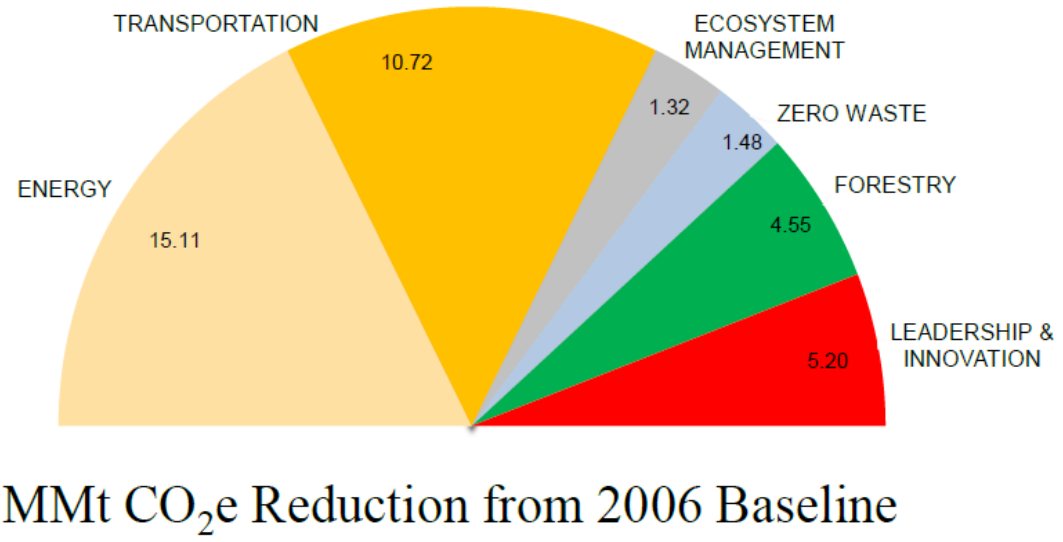

Figure ES-1. GHG Emission Reduction Dashboard.

Table ES-1, provides a more detailed summary of the GHG emissions reductions associated with the major program groups contained in the *2015 GGRA Plan Update* and how those reductions are projected to meet the requirements of the law. It includes refined estimates of emission reductions for each program and updates to projected GHG emissions growth through 2020.

Table ES-1. GHG Reductions by Major Program Groups.

Program	**Projected 2020 GHG Emission Reductions ($MMtCO_2e$) Revised for 2015**
EmPOWER Maryland	7.24

The Maryland Renewable Energy Portfolio Standard (RPS)	4.13
The Regional Greenhouse Gas Initiative (RGGI)	3.60
Other Energy Programs	0.14
Transportation Technologies	6.88
Public Transportation	1.85
Pricing Initiatives	1.99
Other Innovative Transportation Strategies/Programs	Included in F
Forestry and Sequestration	4.55
Ecosystems Markets	0.68
Building and Trade Codes in Maryland	3.15
Zero Waste	1.48
Leadership-By-Example	1.78
Maryland's Innovative Initiatives	0.21
Future or Developing Programs	0.02
Land Use Programs	0.64
Outreach and Public Education	0.03
Total Reductions	**38.37**
GGRA 2020 Emission Reduction Goal	**34.66**
Meeting the 2020 Goal?	**Yes. 3.71 MMtCO_2e above required reductions.**

The Public Review/Comment Process

The ECO Working Group of the MCCC held a series of five public meetings across Maryland between July and August of 2015. The purpose of these meetings was to inform the public of the mission and actions of the MCCC, the purpose of the GGRA and the content of the *2015 GGRA Plan Update*, and to take public comment on relevant issues of concern regarding climate change in Maryland.

Time was allotted during each meeting for attendees to address members of the MCCC with comments, and written comments were collected at the conclusion of each meeting. While these comments addressed a wide range of topics related to climate change, comments addressing the dangers of climate change and Maryland's vulnerability, the Cove Point natural gas facility, hydraulic fracturing in Maryland, amending Maryland's Renewable Portfolio Standard (RPS) and the renewal of the GGRA occurred with the greatest frequency.

Beyond 2020

An Update on the Science of Climate Change

The *2015 GGRA Plan Update* includes an update from the MCCC's STWG on how climate change is already impacting Maryland and what additional future GHG reductions need to be considered to continue the State's progress in reducing GHG emissions.

MDE Recommendations on Continuing Progress

The GGRA requires MDE to provide recommendations in the *2015 GGRA Plan Update* on how the State should move forward on climate change. The law requires the General Assembly to take an action in 2016 or the requirements of the GGRA sunset. The *2015 GGRA Plan Update* is intended to provide the General Assembly with the information they need to determine how the State should move forward. MDE's recommendations include the following:

- Continue to implement and enhance the programs in the *2012 GGRA Plan* with a increased focus on finding ways to continue emission reductions that also support economic development and job creation.
    - Work through the MCCC and the Workgroups to develop these enhancements where appropriate.
- Move beyond 2020 by adopting a "next step" of incremental progress towards the deeper reductions needed by 2050. This next step should also increase the emphasis on improving Maryland's economy by establishing quantitative goals for economic growth, job creation and wages linked to the GHG reduction efforts.
- Continue efforts to analyze issues linked to continuing the progress the State has made in reducing GHGs that have been identified by MDE over the past ten years, the MCCC Workgroups and stakeholders. These emerging issues include:
    - Enhanced efforts on renewable energy, energy efficiency and transportation that seek to further reduce emissions in a way that fosters economic development, creates new jobs and protects consumers
    - Continuing analyses of new scientific and technical issues like life-cycle analysis, hydraulic fracturing and other natural gas related topics, fast acting climate changers, and other emerging issues related to the science and mitigation of climate change.
- Increase the emphasis on adaptation, resilience and preparedness.