



Maryland Department of the Environment

The 2015 Greenhouse Gas Emission Reduction Act (GGRA) Plan Update



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Mitigation Workgroup Meeting - November 19, 2015



Presentation Overview

- The general message from the 2015 GGRA Update
- Summary of the 2012 GGRA Plan
- Summary of the 2015 GGRA Update Report
- A Path Forward - Beyond 2020
- Emerging Issues





The General Message

From the 2015 Update

- Generally good news and a path forward
 - The GGRA Plan appears to have us on a pace to meet or exceed the 25% reduction by 2020 greenhouse gas (GHG) emission reduction requirement
 - This is good news
 - We have achieved these reductions in a way that has a positive impact on Maryland’s economy and on job creation
 - The state should move beyond the 2020 GHG goal by adopting a “next step” of incremental progress towards the deeper reductions needed by 2050
 - This next phase should include an increased focus on a healthy economy and generating more jobs in Maryland
 - There are emerging issues that should be built into ongoing and future planning and analyses
 - Methane leakage, fast acting climate changers, innovative financing, regional and local partnerships, enhancements to efforts on transportation, renewable energy and energy efficiency

Summary of the 2012 GGRA Plan

- The GGRA was adopted in 2009
- Required that Maryland develop and implement a plan to reduce GHG emissions by 25% by 2020
- The law also requires that the plan support a healthy economy and create new jobs
- Required a status report from MDE in October of 2015
 - The report must provide a 2015 update on the status of the plan
 - Emissions
 - Economic benefits and jobs
 - How to move forward
 - Numerous other issues



The 2015 GGRA Plan Update

- Shows we are on target to exceed the 25% reduction goal by 2020
 - Emission reduction goal of 34.66 MMtCO₂e
 - 38.37 MMtCO₂e of reductions generated
- Updates economic benefit and job creation analyses
 - GGRA Plan will generate economic benefits between \$2.5 billion and \$3.5 billion
 - GGRA Plan will create and maintain between 26,000 and 33,000 new jobs
- As required in the law, also discusses where the State may want to go next
 - How to improve the 2020 effort?
 - Beyond 2020 Goal?
 - Lessons learned from past 10 years?





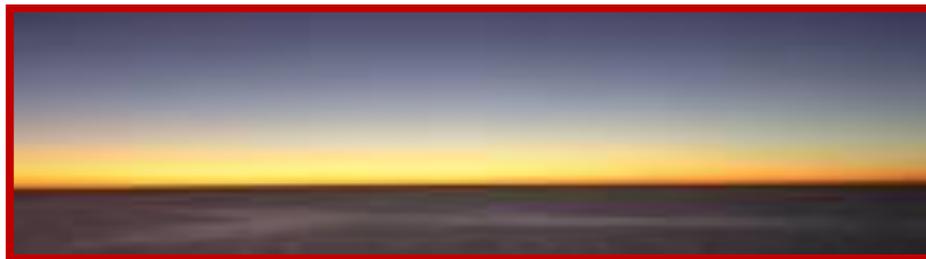
Why is the 2015 Update Important?

- The Maryland General Assembly must take an action on the law in 2016
 - Without action, the requirements of the law sunset
- The 2015 GGRA Plan Update and the Maryland Climate Change Commission's (MCCC) report due in November are intended to provide information related to this decision
- Options include:
 - Changing, maintaining, or eliminating the 25% by 2020 GHG reduction requirement
 - Looking beyond 2020



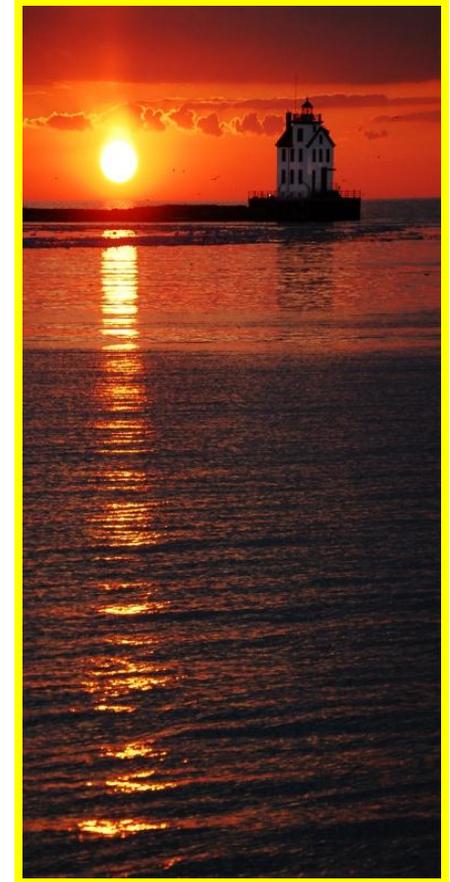
2015 GGRA Plan Update Contents

- Background on the GGRA of 2009 and the 2012 GGRA Plan
- A status report on how we are doing with GHG emission reductions, job creation and enhancing Maryland's economy
- Summary of the 50+ GHG emission reduction programs
 - 2020 emissions reduction estimates for each program
- An update on how the GGRA Plan will help Maryland with economic development and job creation
 - Towson Universities Regional Economic Studies Institute (RESI) report completed and included as an Appendix



2015 GGRA Plan Update Contents

- Emissions Inventory and Forecast
 - Updated emissions inventories including all in-state emissions and imported electricity
- How Maryland is adapting to climate change
 - From the MCCC Adaptation Working Group - How Maryland can better understand and address potential risks posed by climate change
- An update to the “Cost of Inaction” work included in the 2012 GGRA Plan
 - Supported by report completed by Center for Climate and Energy Solutions (C2ES) - report included as an Appendix



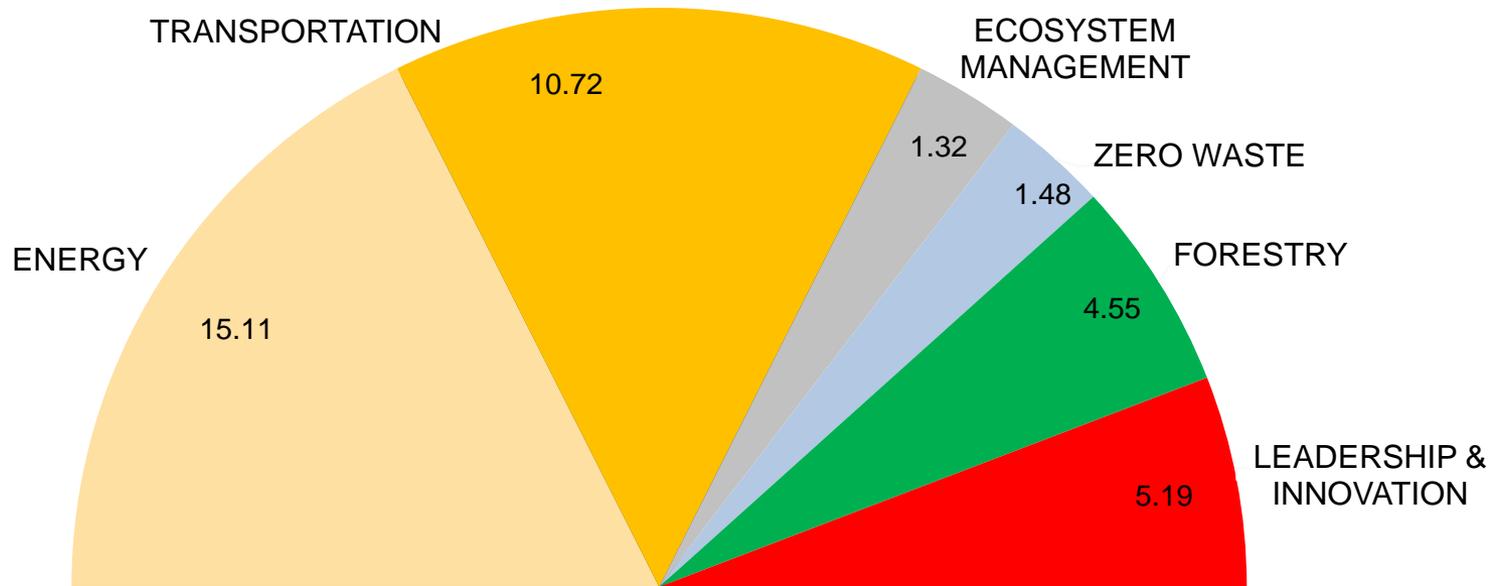


What Else is in the 2015 GGRA Plan Update?

- Update on climate change science included as an Appendix
- Summary of emerging technologies
- How the GGRA will impact the manufacturing sector in Maryland
 - RESI Manufacturing Study
- Multi-Pollutant Benefits - Ozone, fine particles, more
- How might Federal actions impact MD's progress
 - Clean Power Plan, new EPA vehicle standards, etc.
- MDE Recommendations and next steps



GGRA Bottom Line – Current Status



The 2015 GGRA Plan Update results in reductions that are slightly greater than the reductions required to achieve the 25% reduction by 2020. The Plan is expected to over-achieve by 3.71 MMtCO₂e.





Updated Economic Benefits and Jobs

- The 2015 GGRA Plan Update includes refined estimates of the economic benefits and job creation driven by the Plan
- Each program analyzed individually by RESI with the assistance of implementing State agency
 - Program by program benefits included
- Report also includes real world examples of economic benefits and jobs
 - For example ... the top three new jobs are architecture and engineering positions, construction, and research and development
- Win, Win, Win programs are abundant – programs where we see reductions in GHG emissions, net economic benefits and additional new jobs
- More sophisticated analysis of economic benefits and employment estimates are planned for the future (an opportunity for outside resources to assist)

	2012 Plan	2015 GGRA Update
Net Economic Benefit in 2020	\$1.6 Billion in economic output	\$2.5 to \$3.5 Billion in economic output
Jobs Created and Maintained in 2020	30,000 jobs	26,000 to 33,000 jobs



GGRA Reduction Requirement

The 25% by 2020 reduction goal requires not only a 25% reduction from 2006 levels but also that all growth between 2006 and 2020 be offset

The 2020 goal (25% below 2006 Baseline) = **80.42**
million metric tons of CO₂e

Where will we be in 2020 with no action?
Emissions = **115.08**
million metric tons of CO₂e

Reduction Required to meet 2020 goal = **34.66**
(115.08 - 80.42 = 34.66)
million metric tons of CO₂e



Challenges of Estimating Reductions

- There is significant uncertainty over how to quantify emission reductions from many of the GGRA Programs
 - GHG emission quantification is a brand new area
 - There is no long history of emission factors, GHG programs often overlap, etc.
- To account for this uncertainty, a 30% discount factor (based upon MDE and independent contractor research) has been applied to many of the emission reduction estimates
- More recent research indicates that a 30% uncertainty discount may be too cautious and that a 10% uncertainty discount factor may be more appropriate



GGRA Policy / Program	REDUCTIONS (MMtCO2e)		
	2012 Plan (30% Uncertainty Factor Discount)	2015 Update (30% Uncertainty Factor Discount)	2015 Update (10% Uncertainty Factor Discount)
Energy	15.41	15.11	15.14
A. The Regional Greenhouse Gas Initiative (RGGI)	0	3.60	3.60
B. EmPOWER Maryland	8.42	7.24	7.24
C. The Maryland Renewable Energy Portfolio Standard (RPS)	6.86	4.13	4.13
D. Other Energy Programs	0.13	0.14	0.17
Transportation	10.51	10.72	10.72
E. Transportation Technologies	8.1	6.20	6.20
F. Public Transportation	2	2.57	2.57
G. Pricing Initiatives	0.41	1.95	1.95
H. Other Innovative Transportation Strategies/Programs			
Zero Waste	1.48	1.48	1.78
K. Zero Waste	2.8	1.48	1.78
Ecosystem Management	0.74	1.32	1.58
I. Ecosystems Markets	0.2	0.68	0.82
N. Land Use Programs	0.54	0.64	0.77
Leadership and Innovation	4.86	5.19	6.23
L. Outreach and Public Education	0.03	0.03	0.04
M. Building and Trade Codes in Maryland	3.15	3.15	3.78
O. Maryland's Innovative Initiatives	0.21	0.21	0.25
P. Leadership-By-Example	1.45	1.78	2.14
Q. Future or Developing Programs	0.02	0.02	0.02
Forestry	4.55	4.55	5.46
J. Forestry and Sequestration	4.56	4.55	5.46
TOTAL	--	38.37	40.91
GGRA 2020 GOAL	--	34.66	34.66
2020 REDUCTIONS	--	+3.71	+6.25

Market Driven Changes to Projections

- Changes in the way the energy market works and driving behavior have played a major role in helping the State meet the goals of the GGRA
- Since the 2006 baseline year, CO₂ emissions in Maryland have decreased significantly because electricity generation and industrial sources are using more natural gas instead of coal
 - Natural gas emits half as much CO₂ as coal when used to make electricity
- Changes in driving behavior (partially linked to a slow economy) also contributed to the decline in CO₂ emissions from transportation, manufacturing, and electricity generation
- Other changes related to growth included:
 - Per-capita waste generation
 - Recycling and reuse rates
 - Several other issues





MDE Recommendations - Goals

- Continue to implement and enhance the programs in the 2012 GGRA Plan with an increased focus on finding ways to continue emission reductions that also support economic development and job creation.
 - Work through the MCCC and the Working Groups 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 MD’s economy by establishing quantitative goals for economic growth, job creation, and wages linked to the GHG reduction efforts.





Recommendations - Emerging Issues

- 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 Working Groups 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.



Recommendations ...

... Adaptation, Resilience and Preparedness



- Increase the emphasis on adaptation, resilience, and preparedness
 - MCCC Adaptation Working Group
 - A major area of effort and coordination between the MWG and the AWG



What Happens Next?

- The MCCC is working on a report due to the Governor and General Assembly soon
 - Will build from the MDE 2015 GGRA Update report
 - More later today
- General Assembly takes action in 2016 session
- Mitigation Workgroup develops and recommends 2016 workplan to the Commission
 - The Mitigation Workgroup will play a critical role looking at and analyzing the “emerging issues” identified in the MDE and the MCCC reports



Discussion

