



Department of the Environment

Global Warming Programs in Maryland



Brian Hug, MDE

December 3, 2009



Why are we here?

- Stakeholder input
- Seeking ideas on ways to reduce our GHG emissions
- Transparent process
- We will be having these meetings across the state over the course of the next year



Topics Covered

- Background
- Ongoing greenhouse gas reduction efforts in Maryland
 - Greenhouse Gas Reduction Act of 2009
 - Maryland Climate Change Commission
 - Regional Greenhouse Gas Initiative (RGGI)
 - Clean Cars
 - EmPOWER Maryland
 - Other recent legislation



Background



- Concern over global warming and climate change has increased dramatically over the past few years
 - Likely to become the dominant air issue for the foreseeable future
- Scientists are pushing policy makers to move ahead quickly with control programs
- Over the past 3 years, Maryland has moved ahead very aggressively to begin to address global warming
- Ultimate solution needs to be global
 - State action to “lead the way” is critical

Greenhouse Gases (GHG)

- The debate related to the science of global warming is now over
- The time to act is now
- Major concerns in MD:
 - Rise in coastal waters
 - 4th most vulnerable state
 - Loss of aquatic life (impacts to oysters, crabs and the bay ecosystem)
 - Potential for extreme weather conditions
 - More ...



Western MD Impacts

Potential impacts include:

Temperature and Precipitation

- Warmer, wetter winters and hotter, drier summers
- 3°F annual average temperature increase by mid-century
- Summer temperatures increase as much as 9°F and extended heat waves
- Summer droughts lasting several weeks
- More winter precipitation, with more falling in extreme events

Water Resources & Aquatic Environments

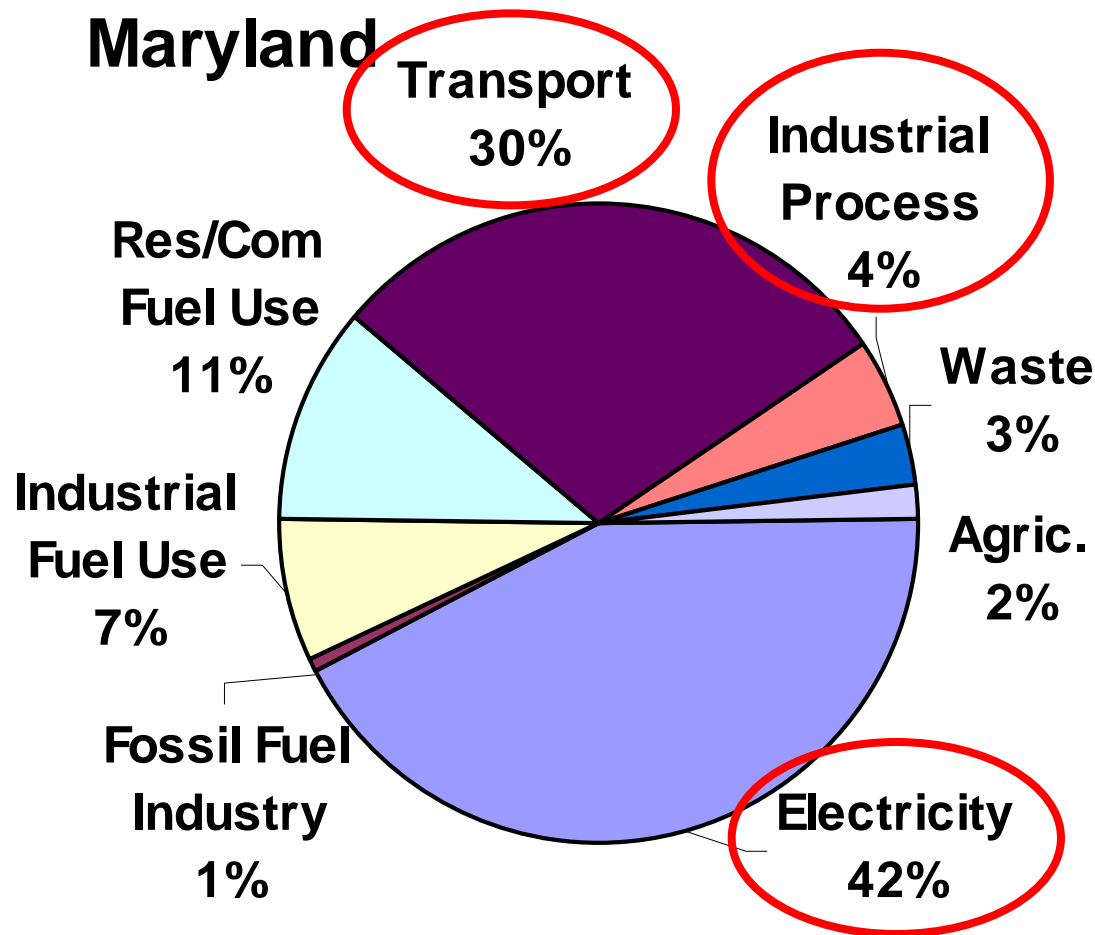
- More intense rainfall resulting in urban flooding, stream degradation, and transmittal of more nutrients and sediments into the Maryland's waterways

Farms & Forests

- Reduced crop, dairy and poultry production in second half of century
- Reduced biodiversity of animals and plants
- Loss of Baltimore oriole



Maryland's Emissions



- 70% of Maryland's GHG emissions come from the combination of the electricity consumption and transportation sectors

- Electricity consumption includes the >25% of electricity created outside of Maryland's borders

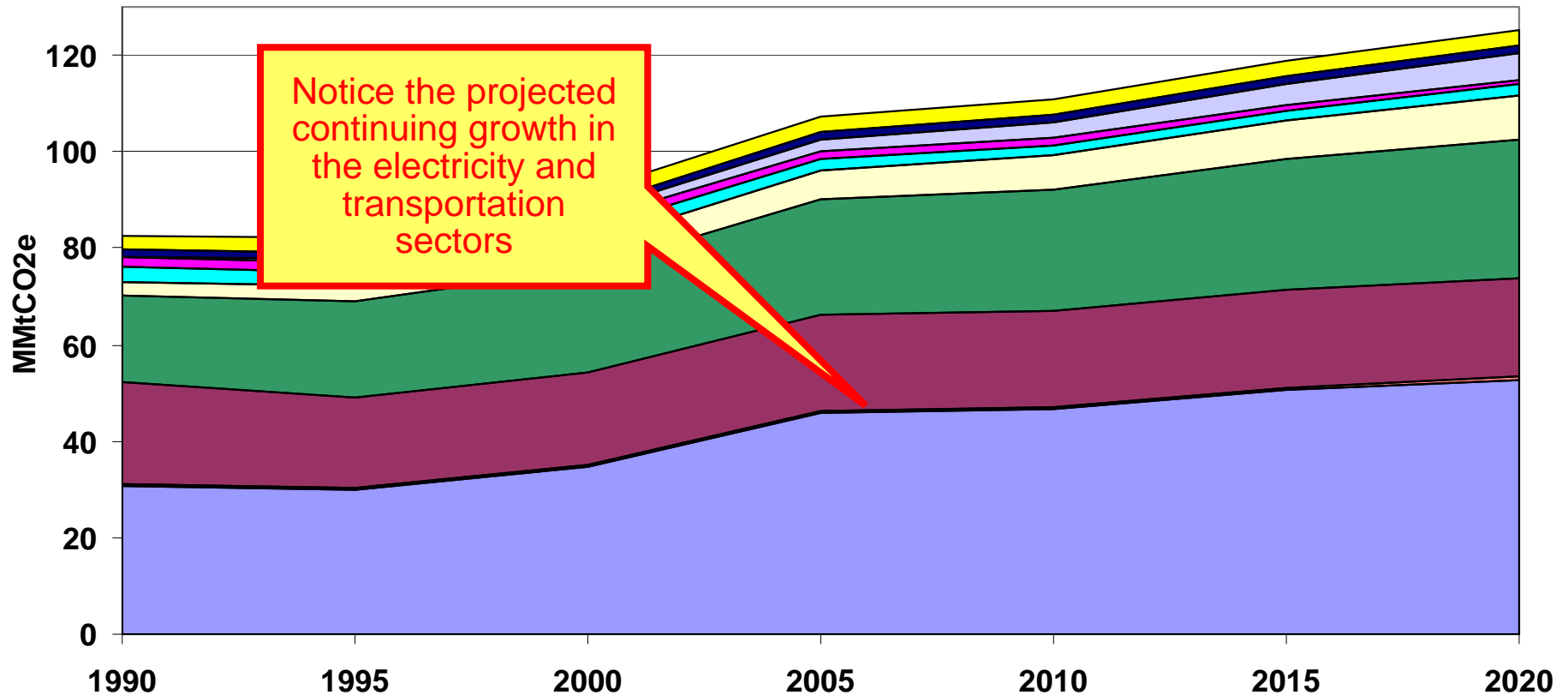


Projected Emissions - 1990-2020

IF NO NEW CONTROL PROGRAMS ARE IMPLEMENTED

DRAFT – PRELIMINARY DATA – FOR DISCUSSION ONLY

- | | | |
|---------------------------------|----------------------|-------------------------------|
| Electricity (Consumption Based) | Fossil Fuel Industry | RCI Fuel Use |
| Onroad Gasoline Use | Onroad Diesel Use | Jet Fuel/Other Transportation |
| Agriculture | ODS Substitutes | Other Ind. Process |
| Waste Management | | |



Early Initiatives in MD

- RGGI
 - The Regional Greenhouse Gas Initiative
 - Part of the 2006 Healthy Air Act
- Clean Cars Act of 2007
- “EmPOWER Maryland” and other energy efficiency initiatives
- Renewable Portfolio Standard (RPS)



- In 2007, Maryland officially became the 10th member of RGGI
- RGGI is a regional cap and trade program focused on reducing carbon dioxide (CO₂) emissions from power plants
- Not your “typical” cap and trade program
 - CO₂ reductions achieved by reduced demand not “scrubbers” or other end-of-the-pipe pollution control technologies
 - RGGI reductions to be achieved by
 - Setting a cap for the region
 - Auctioning allowances
 - **Using auction proceeds to create incentives for energy efficiency and reduced demand**
- Will result in a small, but positive benefit to Maryland electricity consumers



Reductions From RGGI

- Step 1 – Change the growth trend
 - Emissions capped at current levels through 2015
- Step 2 – Begin to reduce emissions
 - CO2 emissions reduced by 10% by 2019
- Step 3 – Deeper reductions?
 - RGGI includes a mid-course review in 2012
 - Deeper reductions will be a major discussion item during that mid-course review
 - Federal cap-and-trade program for power plants is now being discussed by Congress



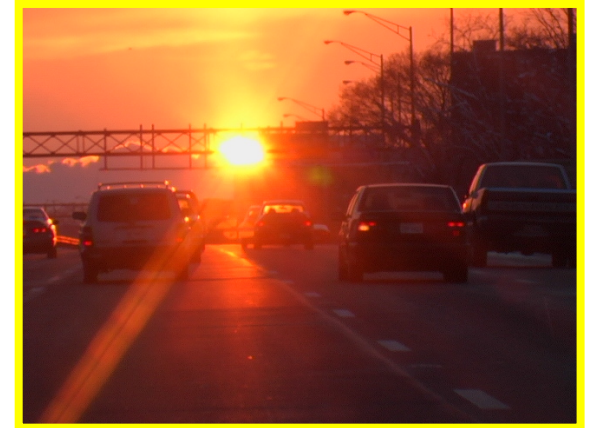
Clean Cars Act of 2007

- Also called CAL LEV II
 - California Low Emission Vehicle Program – Phase II
- One of Governor O'Malley's top environmental legislative initiatives in 2007
- Signed into law in April of 2007.
- Probably the most significant short-term GHG emission reduction effort for mobile sources that states can pursue
- Now part of a national approach for reducing GHGs from cars



Clean Cars Program

- The Maryland Clean Cars Program will reduce multiple pollutants that harm Maryland's environment
- The most dramatic new reduction is for greenhouse gases
 - Approximate 30% additional reduction by 2016
- The Program will also provide small but meaningful reductions of:
 - Nitrogen Oxides (NOx)
 - Volatile Organic Compounds (VOCs)
 - Air Toxics
 - These reductions will help MD meet federal ozone and fine particle standards
- Because of fuel savings, the Clean Cars Program will reduce the overall cost of new vehicles for MD consumers



EmPOWER Maryland

- Announced by Governor O'Malley in 2007
- Major energy efficiency initiative
- Goal is to reduce energy consumption by 15% by 2015
- One of the Country's most aggressive efforts
- Now built into State law
 - Empower Maryland (HB 374)
 - Strategic Energy Investment Fund-RGGI (SB 268)



Commission on Climate Change

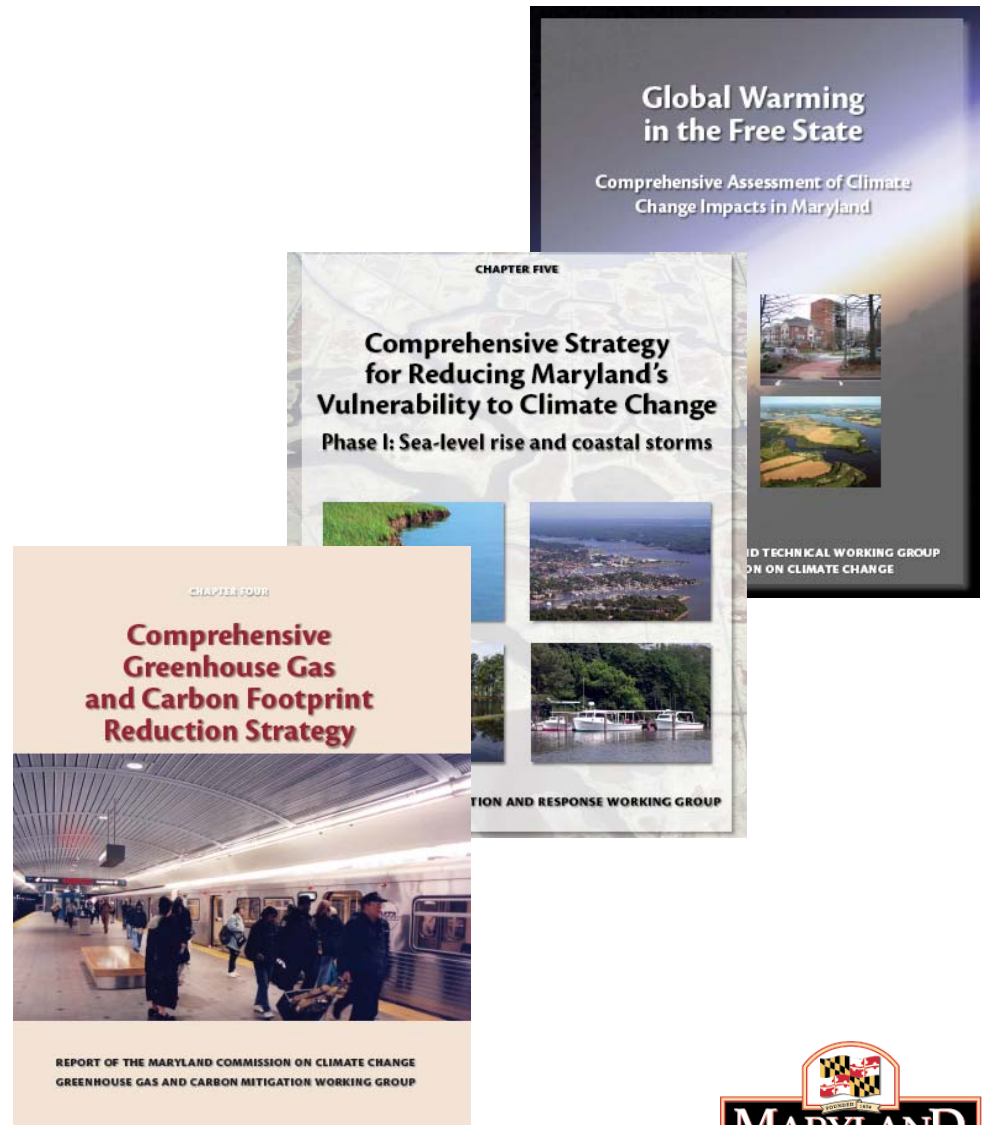
- Established in 2007 by Executive Order
- Charged with addressing Maryland's climate challenge on all fronts
- Three specific areas of concern:
 - Mitigation (MDE)
 - Adaptation (DNR)
 - Science and effects in Maryland (U of M)
- Climate Action Plan by 2008



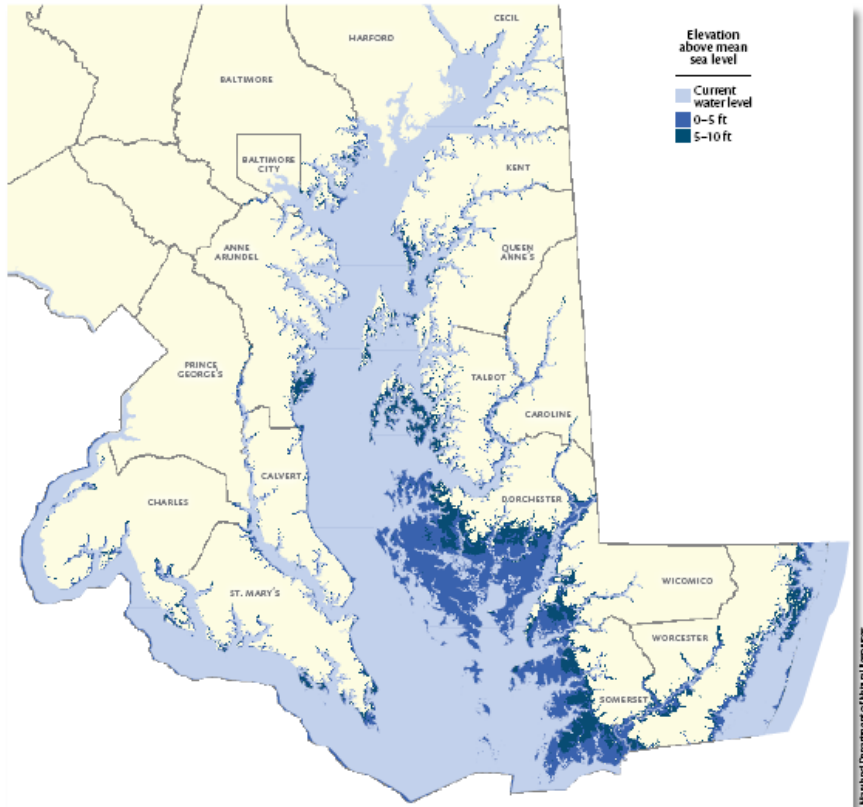
The Climate Action Plan

- Finalized in August, 2008
- Includes reports from the three Working Groups
 - 42 strategies on mitigation
 - 19 strategies on Adaption
 - Cutting edge report on the effects of global warming on Maryland
- Other sections on:
 - The cost of inaction
 - Maryland's effort into a future Federal program

<http://www.mde.state.md.us/Air/climatechange/index.asp>



Science Working Group



Maryland Specific Assessment

- Science Working Group Chaired by Don Boesch, University of Maryland
 - Annual average temperature predicted to increase 3 degrees by 2050
 - Coastal areas experiencing sea-level rise
 - Approximately 1 foot during 20th century
 - Mitigation and Adaptation Strategies are needed
 - Early actions are cost effective

Adaptation Working Group

Chaired by John Griffin, Maryland
Department of Natural Resources

Rise in Sea Level

- Coastal Resources
- Impacts on people and nature

Loss of Aquatic Resources

- Chesapeake Bay Ecosystems
- Living Resources

Potential for Extreme Weather

- Storm surges and floods
- Hurricane Isabel



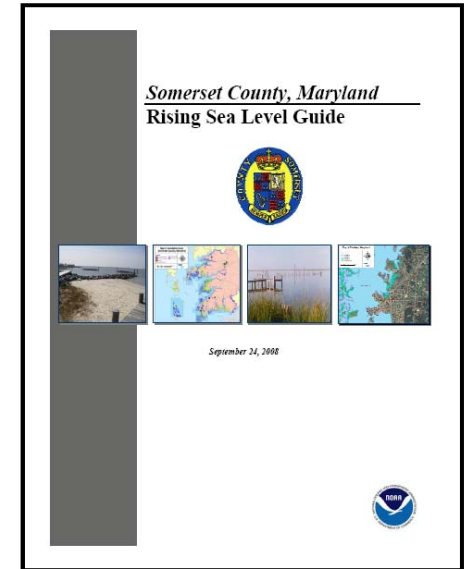
Recommendations on Adaptation

19 recommendations

- Existing-Built Environment
- Future Growth & Development
- Human Health, Public Safety & Welfare
- Natural Resources & Resource-based Industries

Examples of recommendations:

- Building code and floodplain management revisions
- Integrated planning for sea level rise
 - transportation/infrastructure siting & design
 - growth and development planning
- Climate change insurance advisory committee
- Forest and wetland protection
- Sustainable shorelines and buffer management
- Local government guidance



Adaptation Planning – Phase II

Phase I - Adapting to sea level rise

Phase II - DNR is working with stakeholders to develop further sector-based strategies for:

- ☐ Human health
- ☐ Water resources
- ☐ Forest management
- ☐ Restoration of the Chesapeake and Atlantic Coastal Bays.



Mitigation Working Group

- Mitigation Working Group chaired by Tad Aburn, MDE
- The Recommended Plan
 - 42 measures to reduce GHG emissions
 - \$2 Billion net economic benefit by 2020
 - New green jobs
 - 40 to 55 percent reduction in GHG emissions by 2020



42 Recommended Measures

Energy
Supply
Strategies

Residential,
Commercial,
And
Industrial
Strategies

Transportation
and
Land Use
Strategies

Agricultural,
Forestry and
Waste
Strategies

Cross
Cutting
Strategies

For Each Measure:

- GHG Emission reductions
- Costs
- Benefits
- Linkage to existing efforts
- Other benefits from the measure

Types of Measures

- **EXISTING**
 - Healthy Air Act, RGGI, the Clean Cars Program, EmPOWER MD, RPS, Greenhouse Gas Emissions Reduction Act of 2009, LEEDs standards in public buildings, 2008 energy legislation
- **UNDERWAY**
 - Telework programs, transit incentives, Smart Growth, urban trees, 'Buy Local'
- **VOLUNTARY**
 - Public education and outreach, 'Government Lead by Example'
- **LEGISLATIVE**
 - Generation performance standards
 - Improved building & trade codes



Examples by Sector

Residential, Commercial & Industrial (RCI)

Demand-Side Management Energy Efficiency (RCI-2)

Improved Building and Trade Codes (RCI-1)

Energy Supply (ES)

GHG Cap & Trade (ES-3)

Renewable Portfolio Standard (ES-7)

Transportation and Land Use (TLU)

Transit (TLU-1)

Transportation Technologies (TLU-10)



Agricultural, Forestry and Waste (AFW)

Nutrient Trading with Carbon Benefits (AFW-8)

Waste Management & Advanced Recycling (AFW-9)

Cross-Cutting (CC)

State GHG Reduction Goals & Targets (CC-3)

Public Education & Outreach (CC-5)

Recent Legislative Actions

- 2006 The Healthy Air Act (RGGI)
- 2007 Clean Cars Program
- 2008 Legislation
 - Empower Maryland (HB 374)
 - Enhanced Renewable Portfolio Standards (SB 209/HB 375)
 - Strategic Energy Investment Fund- RGGI (SB 268)
 - Low Cost Energy Efficiency Loans (SB 885/ HB 1301)
 - High Performance Buildings (SB 208)
 - Solar Easements (HB 117)
 - Solar/ Geothermal Grants (HB 377)
 - Maryland Clean Energy Center (HB 1337)
 - Bio-heating Oil Credit (SB 565)
 - Transit Oriented Development (SB 204)
 - Project Open Space (SB 259)
 - No Net Loss Forestry (SB 431)
- 2009 GHG Reduction Act



Impact to Maryland Jobs



Green Jobs

Potential for 144,000 to 326,000 jobs from clean tech industries

Up to \$5.7 Billion in wages and salaries

\$973 Million boost in State and local tax revenues

Maryland well-positioned to attract clean tech businesses but lagging behind other states

States investing now are reaping benefits of \$50B annual worldwide clean tech industry

Source: DBED and MEA funded study: "Economic Development Potential of Clean Energy Technology in Maryland", International Center for Sustainable Development, Inc., Dec. 2006

Existing Manufacturing Jobs

Climate Action Plan: no new impact

Reductions from manufacturers (through cap-and-trade program) may come later

- Federal Program
- RGGI expansion

Recommended Goals

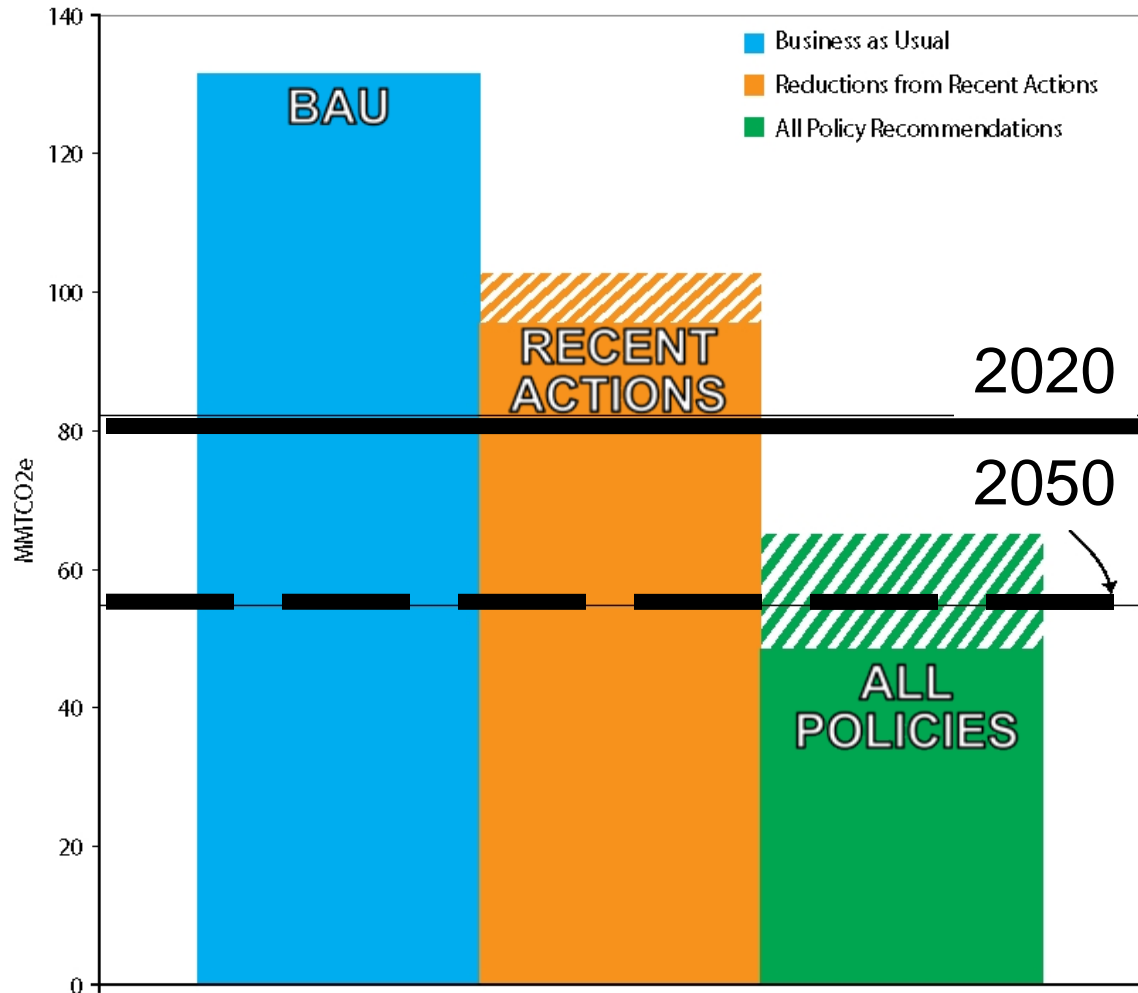
- The Goals
 - All from a 2006 base year
 - 10% reduction by 2012
 - 15% reduction by 2015
 - 25-50% reduction by 2020
 - Approximate 90% reduction by 2050
- Science-based
 - Include mid-course reviews
- Consider jobs and the economy
- Consistent with goals in other leadership states



2020 Estimated Reductions

- The Commission's 2020 goal is to achieve a 25% to 50% reduction
- Early actions, already taken in Maryland, will achieve about 60% to 70% of the reductions needed to meet the 25% reduction goal.
- The 42 strategies are projected to achieve an approximate 40% to 55% reduction by 2020.

Projected Emissions by 2020



GHG Reduction Act of 2009

- 25% GHG Emission Reduction (from 2006 levels) by 2020
 - State Plan by 2012
 - Must have a positive impact on Maryland's economy and jobs
 - 2 Reports to Legislature in 2015
 - Requires 2016 Legislative Action
 - Manufacturing Provisions
- 90% by 2050 as a planning concept
 - Not mandated in law
- Climate Action Plan serves as a roadmap



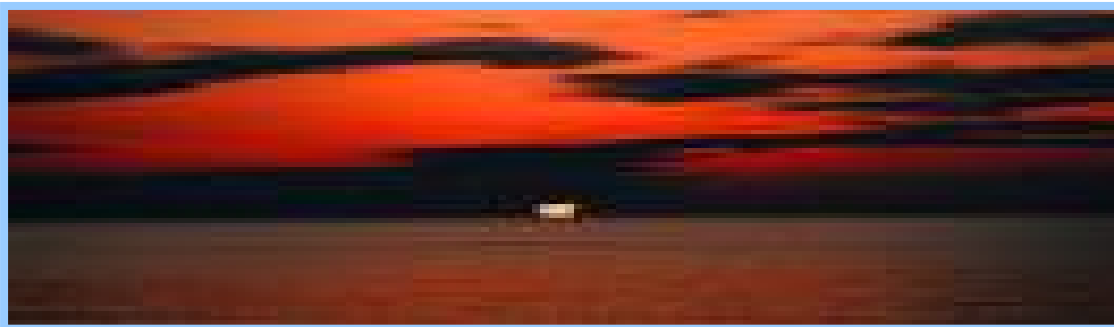
The 2012 GHG Reduction Plan

SCHEDULE

- 2011: Draft Plan to reduce GHG emissions 25% by 2020 from a 2006 base year
- 2011: Public Workshops
- 2011: Submitted to General Assembly in October
- 2012: Plan Finalized
- 2015: Report to General Assembly on Status of Plan

REQUIREMENTS

- Reduce GHG emissions
- Protect existing jobs
- Include provisions to stimulate creation of new jobs
- Net positive effect on Maryland's economy





2 Reports to Legislature in 2015

MDE STATUS REPORT

- Are reductions on schedule?
- Are jobs being created and protected?
- Is Plan having a positive impact on Maryland's economy?
- What Are requirements of Federal Program, if any?
- What does current climate science say?
- Should Maryland keep, change or eliminate the 25% Reduction by 2020 Requirement?

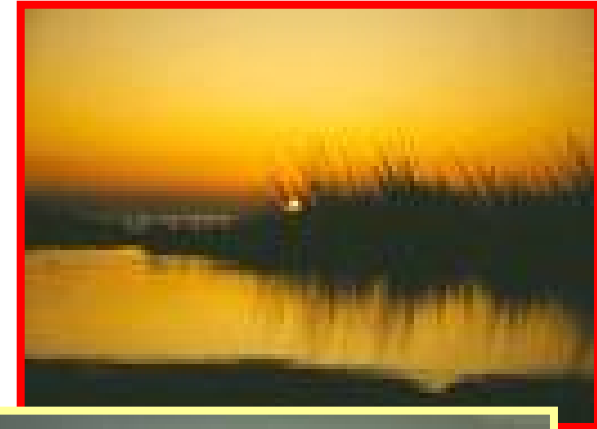
MANUFACTURING REPORT

- Independent study on this sector



Take Away Messages

- Reducing GHG emissions in a way that supports economic development and job creation is very feasible
- Maryland has already begun to reduce emissions through programs like RGGI, Clean Cars and EmPOWER Maryland.
- Reductions in the 25% to 50% range by 2020 are achievable
- Economic benefits from the Climate Action Plan could be considerable
- Creating new green jobs and protecting existing jobs can - and should - be part of the process
- Leadership, from states like Maryland, is very significant in the debate over a Federal program



Questions?

