Greenhouse Gas Reduction Act

40-By-30 Goal

Draft Plan Overview

June 20, 2019
The Greenhouse Gas Reduction Act

Requirement: Publish a plan to reduce GHGs by 25% by 2020, and 40% by 2030.
Increasing Urgency of Climate Change

Recent findings from the IPCC, the National Climate Assessment, and UMD point to increasing urgency to reduce emissions, even beyond GGRA Goals.
Maryland’s Strides in Climate

• On track to meeting our 25% by 2020 goal and in final stages of developing draft 40% by 2030 plan

• Leadership in RGGI: cutting emissions in half, generating $3 billion in proceeds, expanding membership and environmental strength

• Early and active member of US Climate Alliance, including initiative to ban super polluting HFC refrigerants

• Leadership in Transportation and Climate Initiative: Designing regional strategies to reduce carbon pollution
GGRA Plan Requirements

Must achieve the 40-by-30 Goal

ALSO

- “Be developed in recognition of” need for 80% to 95% reduction by 2050
- “Produce a net economic benefit to the State’s economy and a net increase in jobs in the State”
- Consider impacts to low-income, low-to-mid-income, minority, and rural communities; any other particular class of ratepayers; the agricultural sector; the manufacturing sector.
- Do not “decrease the likelihood of reliable and affordable electrical service and statewide fuel supplies”
We have found multiple pathways to meet and excel beyond the 40-by-30 goal and benefit the economy.
Good News - Emissions

The GGRA Draft Plan achieves the 2030 goal with cost-effective policies.
Good News - Economics

The GGRA Draft Plan achieves the 2030 goal with significant benefit to the state’s economy.

<table>
<thead>
<tr>
<th>MD impact relative to Reference Case</th>
<th>Through 2030</th>
<th>Through 2050</th>
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<tbody>
<tr>
<td>Average job impact*</td>
<td>+ 11,649</td>
<td>+ 6,703</td>
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<tr>
<td>GDP Impact**</td>
<td>+ $ 11.54 billion</td>
<td>+ $ 18.63 billion</td>
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<tr>
<td>Personal Income Impact**</td>
<td>+ $ 10.04 billion</td>
<td>+ $ 15.67 billion</td>
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<tr>
<td>Avoided Mortality**</td>
<td>+ $ 0.60 billion</td>
<td>+ $ 3.68 billion</td>
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<tr>
<td>Avoided Climate Damages**</td>
<td>+ $ 4.38 billion</td>
<td>+ $ 27.55 billion</td>
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* Average number of job-years created or sustained each year.
** 2018 Dollars, Cumulative, Net Present Value using 3% discount rate.
Policy Scenario Modeling

1. **Reference Case**: “Business-as-usual” scenario incorporating effects of major policies as they currently exist on the books.

2. **Policy Scenario 1**: Extension of current program framework (e.g. EmPOWER extension, 50% RPS).

3. **Policy Scenario 2**: New programs and changing program frameworks. Long-term measures to reach 2050 goal.

4. **Policy Scenario 3**: Climate Commission scenario: Carbon Price and complementary policies (including 50% RPS).

5. **Policy Scenario 4**: GGRA Draft Plan, drawing upon state agency determined cost-effective measures from prior scenarios, including the basics of a Clean and Renewable Energy Standard (CARES).
GGRA Draft Plan (Policy Scenario 4)

Major Programs:

**Electricity Supply**
- Clean and Renewable Energy Standard
- Continued RGGI Geographic Expansion

**Transportation**
- Numerous MDOT Investments
- Clean Cars / ZEV Mandate
- 50% ZEV Transit Buses
- Compact Development
- Transportation and Climate Initiative (TCI) could fund & enable other measures.

**Building Energy Use**
- Extended EmPOWER
- Heat Pump Incentives
- Compact Development

**Carbon Sequestration**
- Enhanced Forest Management
- Enhanced Healthy Soils Incentives

**Other**
- HFCs
Clean and Renewable Energy Standard (CARES)

• Incorporates low- and zero-carbon resources that are not renewable.

• Utilities turn in certificates from renewable sources (RECs) and “clean energy” sources (CECs).

• Broader competition lowers costs.
CARES Goals

• Get to 100% Clean Electricity by 2040.

• Build upon the RPS using homegrown clean energy.

• Use an all of the above strategy that significantly reduces carbon emissions by:
  – Increasing the strategic use of zero- and low-carbon clean and renewable energy sources;
  – Recognizing the clean and safe aspects of nuclear energy;
  – Supporting hydropower, coupled directly with maintaining environmental stewardship;
  – Advancing emerging technology for carbon capture and storage; and
  – Utilizing the role of energy-efficient combined heat and power.
CARES Benefits

• It is not possible to get to 100% clean electricity using current technology.
  – The CARES is flexible, so will deploy more renewables if that changes.
  – CARES takes advantage of CCS and modular nuclear, if those technologies mature.

• Allowing all low/zero-carbon resources to compete based on cost will get to 100% at lowest cost.

• Complements the RPS
CARES Benefits

- Additional clean and renewable energy is necessary to meet Maryland’s climate change goals.
- CARES relies on homegrown energy to move beyond the current RPS.
- 100% Clean Electricity by 2040 is among the most ambitious goals in the country.
State Agency Programs & Assumptions

**MEA**
CARES structure, CHP role & costs, rooftop solar assumptions

**MDOT**
Transportation infrastructure investment costs & benefits
EV deployment estimates

**MDP**
Compact development impacts in transportation & buildings

**DNR**
Forest management sequestration impacts

**MDA**
Healthy soils sequestration impacts

**DHCD**
EmPOWER low income & multifamily impacts
GGRA Draft Plan Emissions Results

PS4 Gap in 2020: -2.6 MMT (overachieved goal)
PS4 Gap in 2030: -5.1 MMT (overachieved goal)
PS4 Gap in 2050: 25 MMT
GGRA Draft Plan Employment Results

- Draft Plan drives substantial job gains.
- Almost all of MD’s fossil fuel comes from out of state.
- Investments that reduce fossil fuel consumption drive positive impacts for MD’s economy.

Large transportation projects drive substantial job gains in the near-term; investments in in-state clean energy and fuel-saving measures provide more modest underlying gains. (Transportation gains dependent on Federal funding)
Why Policy Scenario 4?

Policy Scenario 4 best balances economic and emissions benefits for 2030

- **MD Historical Inventory**: 25% below 2006 Emissions
- **Policy Scenario 1**: (continue current effort)
- **Policy Scenario 2**: (all available options)
- **Policy Scenario 3**: (MCCC/Carbon Fee)
- **Policy Scenario 4**: (GGRA Draft Plan)

Graph showing emissions reduction targets for different scenarios: 25%, 40%, 80% below 2006 Emissions.
Why Policy Scenario 4?

PS2 identified important long-term measures that should be re-evaluated as technologies mature, but are not cost-effective under current technology.

Some of the long-term technologies that were important to achieve the 2050 goal, but caused negative economic impacts under current technology were:
- Renewable Natural Gas
- Other advanced biofuels
- Electric heavy-duty trucks
- Electric non-road vehicles

These measures may be cost-effective over time. For now, the Draft Plan focuses on measures necessary for 2030.
Next Steps

• Detailed modeling presentation at next MWG
  – Program-by-program assumptions
  – Emissions & other outcomes by sector
  – Employment by sector, by income, by education level, and other equity considerations.

• Full plan draft going through interagency review before release for comment.