Maryland
Department of
the Environment

Maryland's GHG Reduction Strategy
2030 GGRA Plan

ULI Baltimore – Regionalism Webinar
January 13, 2022

Climate Change in Maryland

Photo: https://pixabay.com/photos/thermometer-summer-heiss-heat-sun-4294021/

Addressing Climate Change and reducing greenhouse gas (GHG) emissions has become a major issue in Maryland for the past ten years

There are four key areas of focus:

1. The Greenhouse Gas Emissions Reduction Act (GGRA) of 2009 and 2016
   - Reducing leaking methane is a major part of the GGRA process
2. The Maryland Commission on Climate Change (MCCC)
3. Partnerships
   - Regional Collaborations
     - RGGI, ZEV MOU
     - United States Climate Alliance (USCA)
4. Pushing back on Federal backsliding
   - Many legal Challenges

The Greenhouse Gas Emission Reduction Acts (GGRA) of 2009 and 2016

- Climate change effort originated in 2007 by Executive Order
  - Resulted in a 2008 “Climate Action Plan”
- This led to the “Greenhouse Gas Emission Reduction Act” of 2009
  - 25% Greenhouse Gas (GHG) Emission reduction by 2020
- 2009 law reauthorized in 2016, adding new goals
  - 40% GHG reduction by 2030
- The Acts also require that the State’s GHG Reduction Plans support a healthy economy and create new jobs

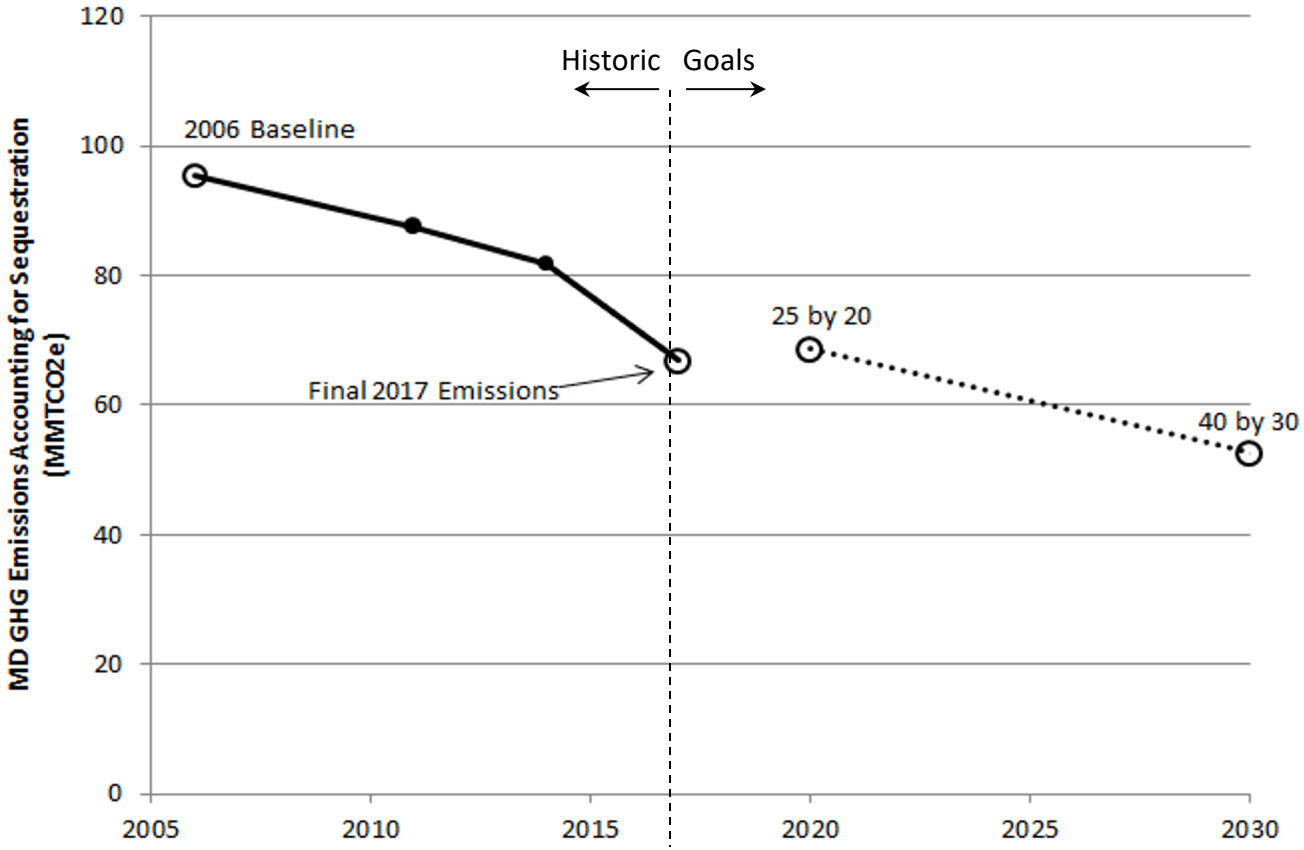
Maryland Commission on Climate Change (MCCC)

- Original Climate Change Commission established through executive order in 2007 - Developed a 2008 Climate Action Plan that led to the 2009 GGRA
- MCCC codified into law in 2015
- Established a balanced, bipartisan Commission
  - Representatives from the General Assembly, state and local government, the private sector, environmental advocacy groups, labor, the general public & more

- Basic charge of the MCCC:
  - Provide recommendations on how to reduce GHG emissions and adapt to the impacts of climate change

The Greenhouse Gas Reduction Act

Maryland Law ("GGRA"): Reduce GHGs 25% by 2020 and 40% by 2030



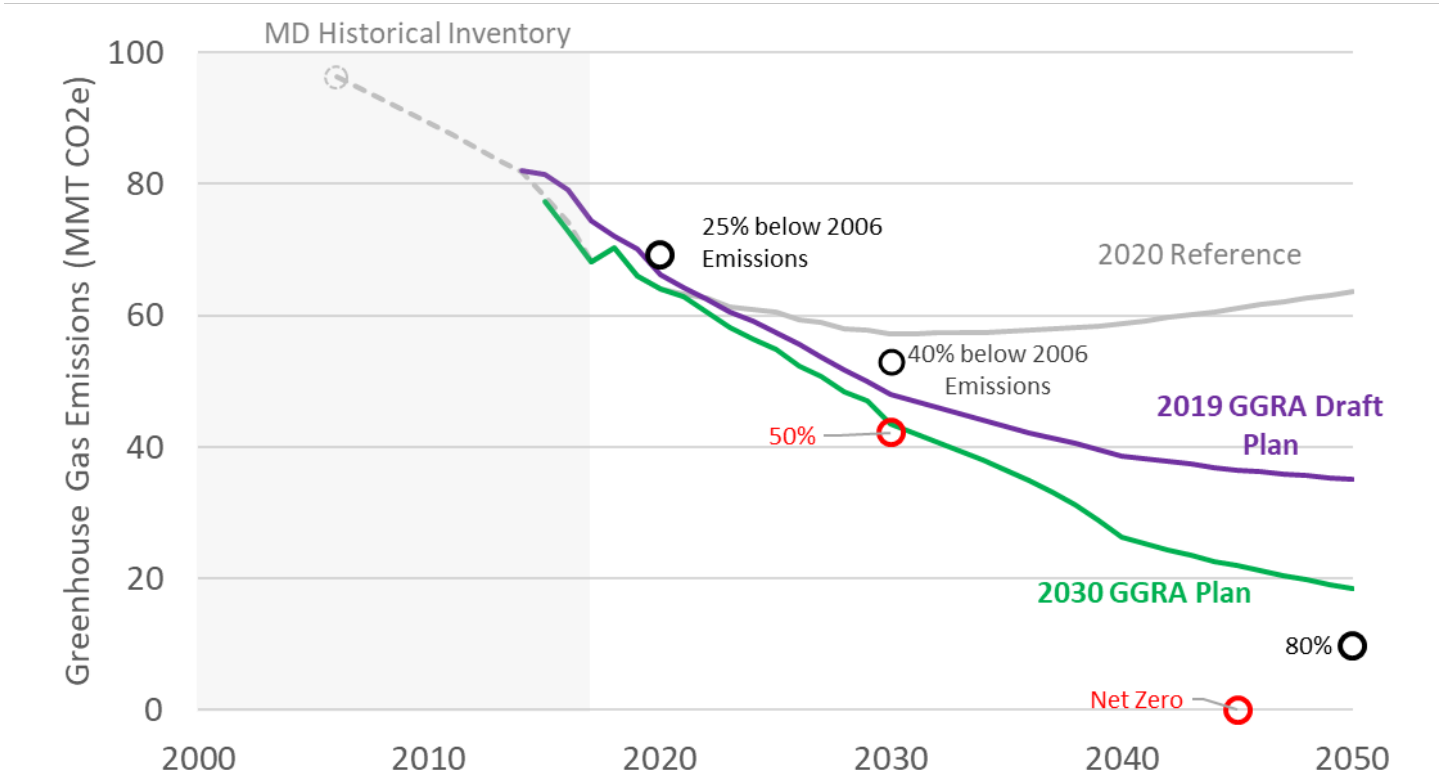
Maryland greenhouse gas emissions, accounting for sequestration. Please note favorable weather drove additional reductions in 2017.

MD GHG Emissions Breakdown (2017)

The 2030 GGRA Plan

The GGRA requires MDE to develop a plan to reduce GHGs 40%. That plan draws upon existing programs across all levels of government, and new state programs.

The 2030 Plan reduces substantially more than the 40-by-30 requirement, and achieves 50-by-30 with federal action



Major Mitigation Programs (Updated in)

Electricity Supply
Renewable Portfolio Standard (current)
Clean and Renewable Energy Standard (updated)
Regional Greenhouse Gas Initiative (RGGI) Long term 100% Clean Electricity
Expanded Net Metering (REDS Rpt)
SMART-POWER Offshore Wind Partnership

Transportation
Medium & Heavy Duty ZEV MOU
Greater telework post-COVID
State Fleet Innovation Plan
Public Transit & other infrastructure
Electric Vehicles: Clean Cars & ZEV Mandate
50% ZEV Transit Buses by 2030
Smart Growth & Compact Development
Transportation and Climate Initiative (TCI)

Building Energy Use
EmPOWER Maryland
Compact Development
State Building Efficiency EO
New Building Codes
Beneficial Electrification

Short-lived Climate Pollutants
HFC regulation (Final Rule)
Methane regulation (Final Rule)
Sustainable Materials Mgmt

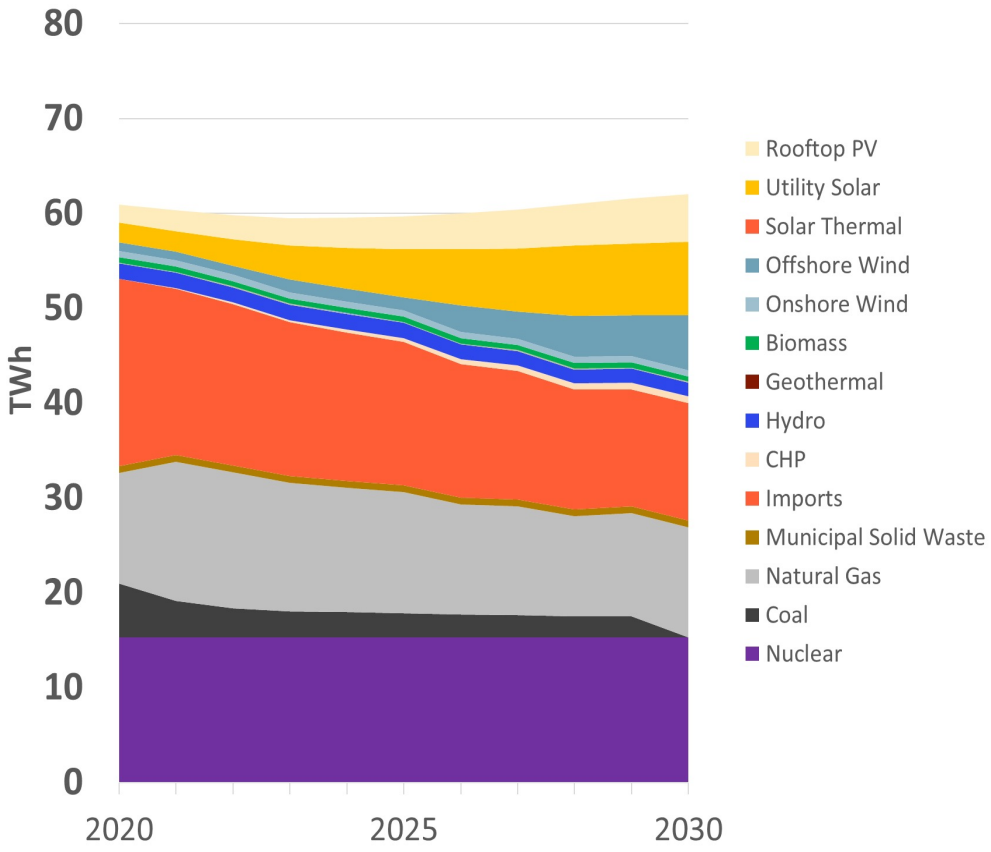
Carbon Sequestration
Forest Management Programs
Healthy Soils Program

Electricity Supply Programs

Electricity strategy: 100% Clean Electricity by 2040 by building more clean energy and capping emissions from fossil energy.

- CARES
  - Bill prepared for 2021 session
  - Builds upon existing RPS; 100% Clean Electricity by 2040
  - Our numbers drawn from analysis by Resources for the Future (RFF), which estimates substantial MD solar builds.

- RGGI
  - Carbon cap on power plants and state investment in clean energy (11 states participate now; 12 soon with PA)
  - Plan proposes long-term cap decline consistent with 100% Clean goal



Maryland electricity generation and imports in GGRA Plan through 2030. CARES and RGGI reduce fossil generation and increase clean & renewable generation. **Analysis assumes no new nuclear or carbon capture before 2030**

Buildings Programs

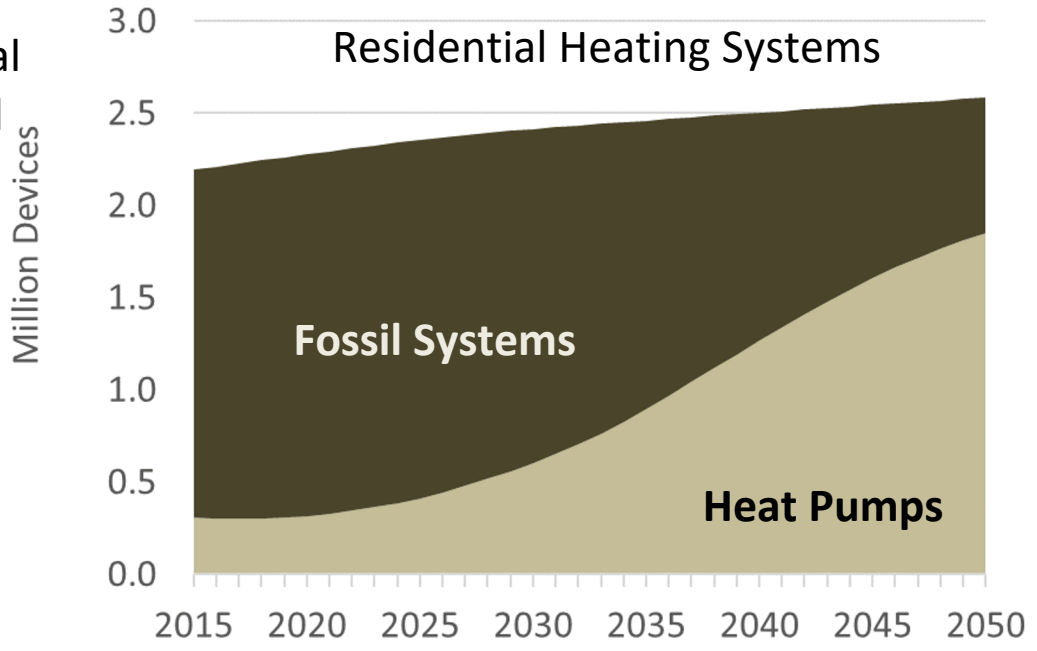
Buildings strategy: use efficiency to counteract growth & convert heating systems to run on increasingly clean electricity.

Efficiency:

- EmPOWER beyond 2023
- Achieve State Building Efficiency Goal
- Achieve Compact Development Goal

Electrification:

- Deploy more efficient electric heat pumps to transition building energy source from fossil fuel to clean electricity.
- MWG to produce buildings plan this year.
- In the meantime, the GGRA Plan incorporates Federal estimates of beneficial electrification in residential and commercial buildings (NREL Electrification Futures Study).



Residential space heating systems, fossil vs. heat pump (air source and ground source), through 2050. Commercial adoption of heat pumps assumed to be much slower.

Transportation Programs

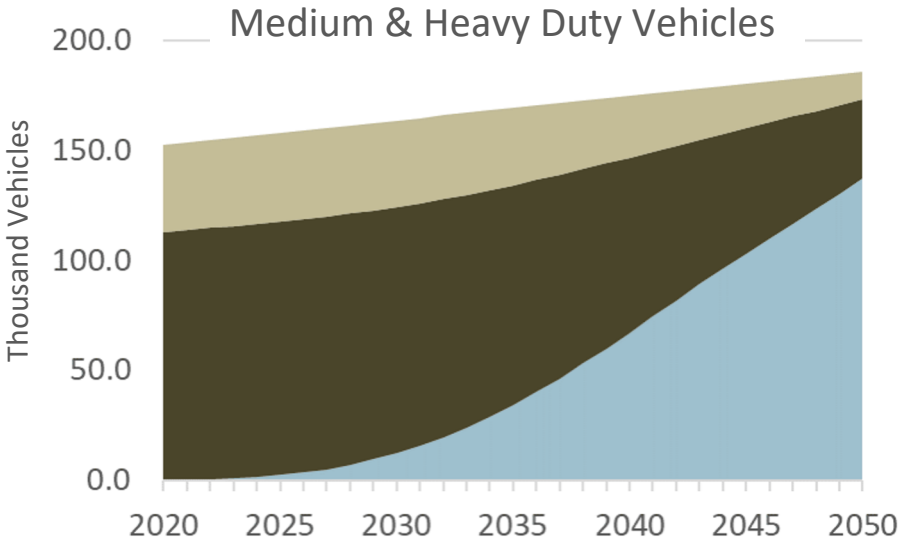
Transportation strategy:

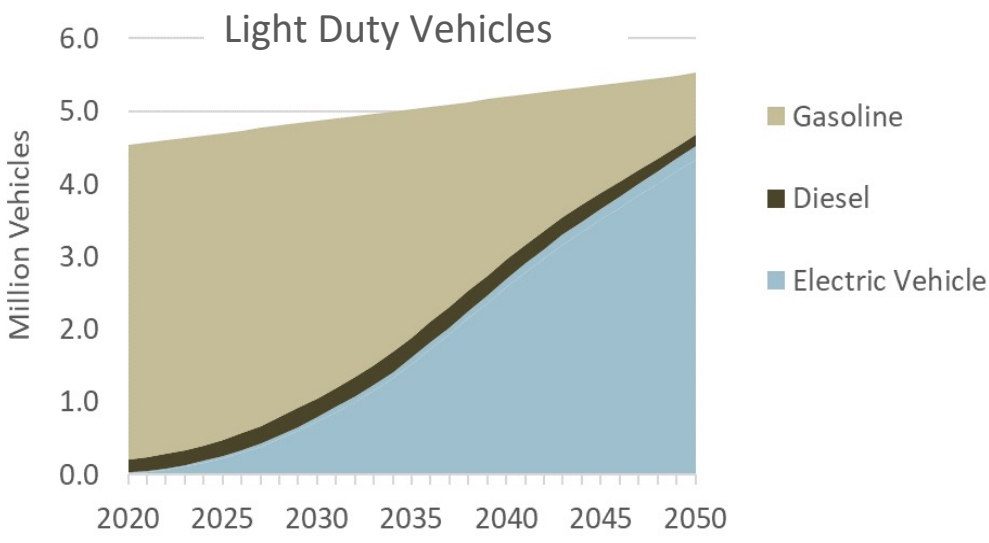
Reduce vehicle miles traveled and

- Transit Investments
- Intercity Transportation
- Active Transportation (e.g., bike lanes)
- Compact Development

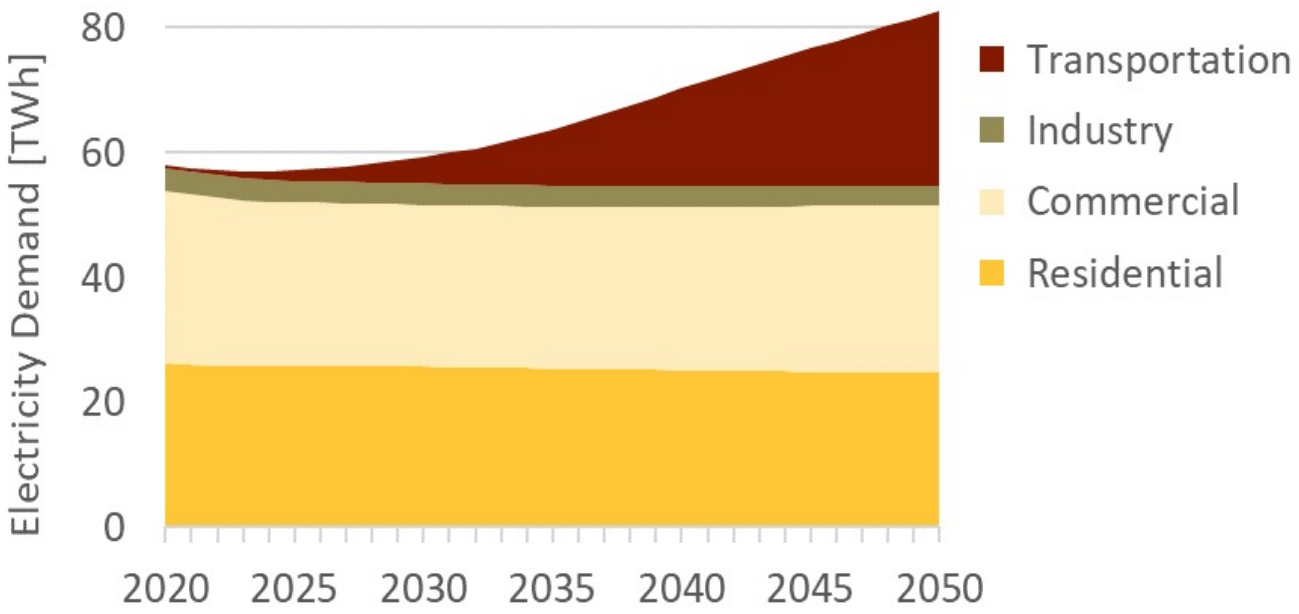
deploy electric vehicles that run on increasingly clean electricity

- Clean Cars Program & ZEV mandate
- State LDV Fleet Innovation Plan
- 50% ZEV Transit Buses by 2030
- Medium & Heavy Duty ZEV MOU
- Transportation and Climate Initiative (potential)



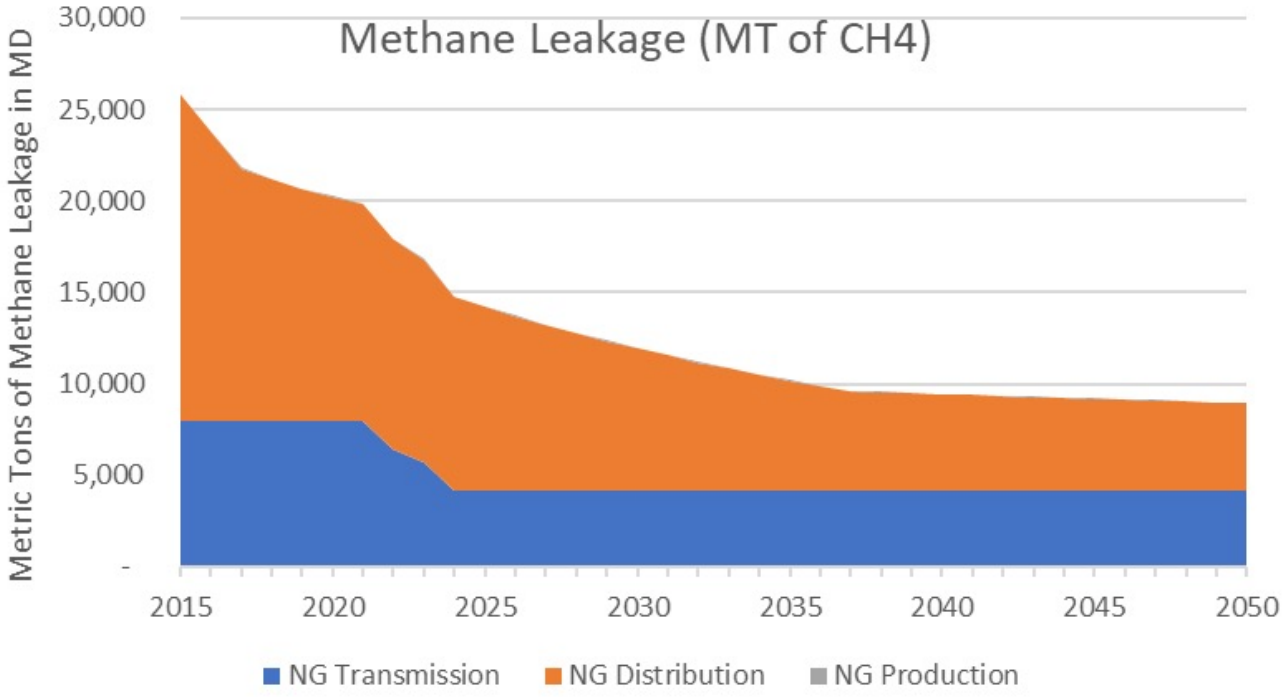


Effects of Electrification



- Overall annual electricity demand in buildings is flat or declining as efficiency counteracts electrification, but changes in timing of demand are important and must be managed.
- Long-term increase in overall electricity demand driven by EVs, but is not material until 2030s.

Methane Leakage from Gas System

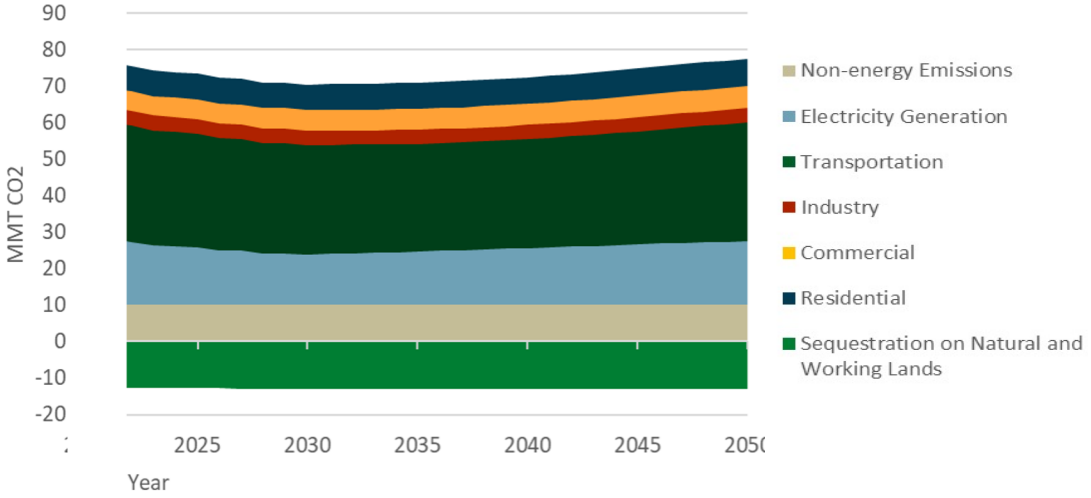


- Reductions in Transmission System from MDE regulations published in 2020
- Reductions in Distribution System from utility pipe replacements (STRIDE program + future measures)

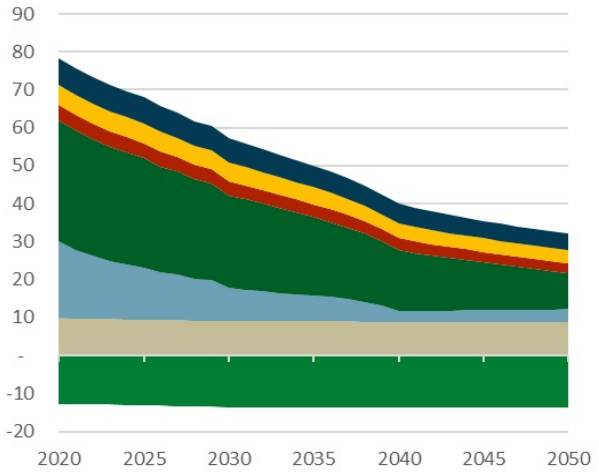
Sequestration Programs

Forest management, tree planting, and the Healthy Soils programs (DNR & MDA) accelerate carbon sequestration in forests and agricultural soils, adding benefit on top of emission reduction programs.

Reference Case (no additional action)

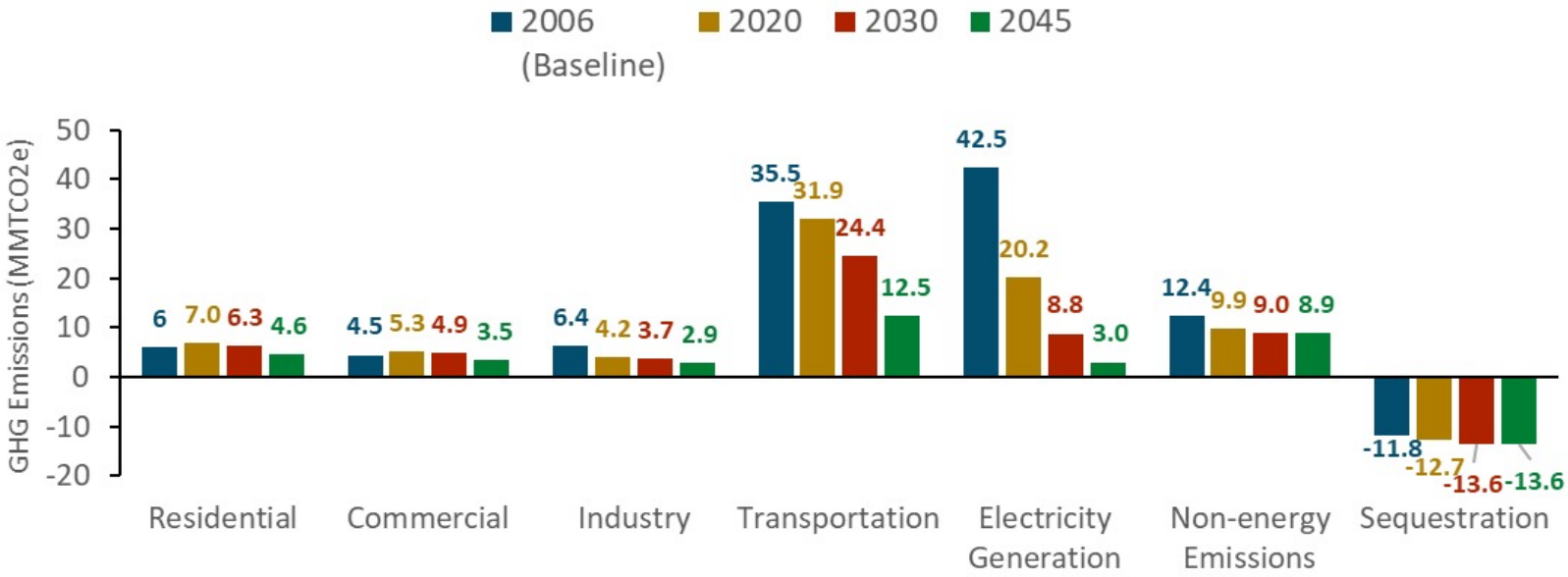


Latest Scenario



*Non Energy includes Agriculture, Waste Management, Industrial Process and Fossil Fuel Industry.

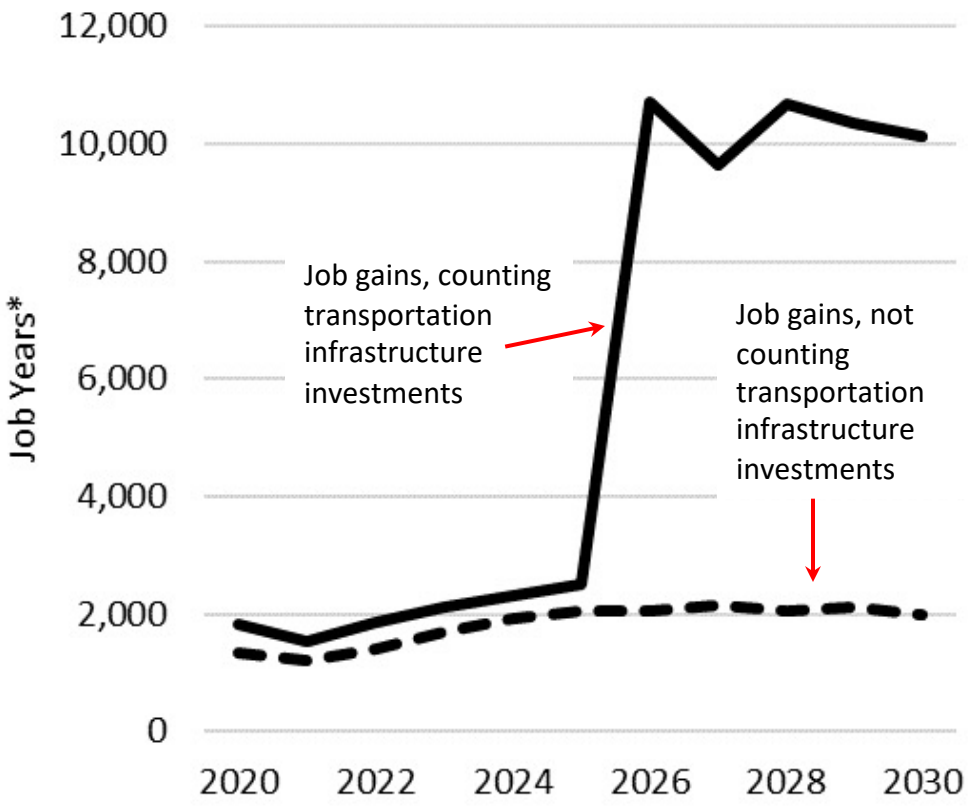
Beyond 2030: 2045 and 2050



- Additional actions needed beyond 2030 to achieve net-zero GHGs by 2045, including Federal action
- By 2045, additional ~22MMT in reductions needed for net-zero.
- Future measures to deploy: deeper electrification; renewable fuels and carbon capture for remaining combustion sources and process emissions; more sequestration; emerging technology for zero-carbon buildings and vehicles, and direct air capture.

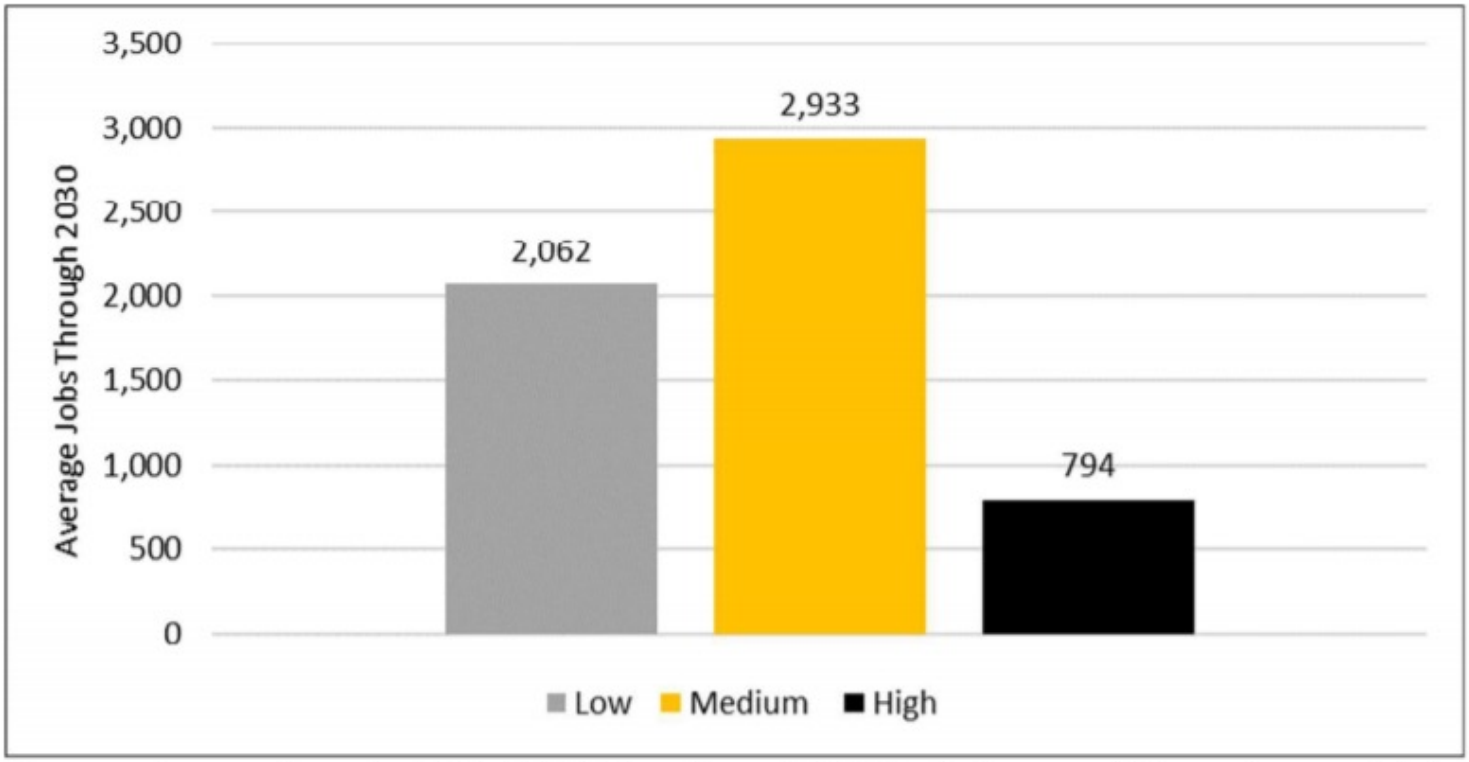
Employment Results

- GGRA requires positive economic impacts.
- The GGRA measures drive substantial job gains.
- Almost all of MD's fossil fuel comes from out of state.
- Investments that reduce fossil fuel consumption have 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)

Employment Results



Jobs created or sustained by income category (lower, middle, and upper third of income distribution).

- Job gains are concentrated in middle-income categories.
- Towson analysis also explores distribution across geography, education/training requirements, and race/ethnicity.

Economic, Health, and Climate Benefits

The agency scenario achieves the 2030 goal with significant benefit to the state's economy.

MD impact relative to Reference Case	Through 2030	Through 2050
Average job impact*	+ 6,186	+ 6,823
GDP Impact**	+ $ 5.3 billion	+ $ 14.7 billion
Personal Income Impact**	+ $ 4.5 billion	+ $ 16.1 billion
Public Health Benefit (Avoided Mortality)**	+ $ 0.9 to $ 2.1 billion	+ $ 7.5 to $ 17 billion
Climate Change Benefit**	+ $ 3.12 billion	+ $ 27.9 billion

* Average number of job-years created or sustained each year.

** 2018 Dollars, Cumulative, Net Present Value using 3% discount rate.

Climate benefit evaluated using Federal Social Cost of Carbon (2015 Update)

Next Steps

1. Sensitivity analysis exploring upcoming Federal action coming shortly as we hear more detail about the Biden administration's plan.

2. Some underlying planning processes continuing
   - Building Energy Decarbonization Plan
   - Medium/Heavy Duty ZEV Action Plan (Agencies, ZEEVIC, & Multistate ZEV Task Force)

3. Mid-course progress report due in 2022.

4. MDE will be paying close attention to what happens in Annapolis this session.

Contact

Chris Beck

Deputy Manager, Climate Change Program

Maryland Department of the Environment

christopher.beck@maryland.gov

Follow us

@ClimateChangeMaryland