Today's Presenters

Paul Orlando, Director of Division of Climate, Clean Energy & Radiation Protection

Bob Kettig, Assistant Director of Climate Change, Clean Energy & Sustainability

Helaine Barr, Supervisor in Bureau of Climate Change & Clean Energy

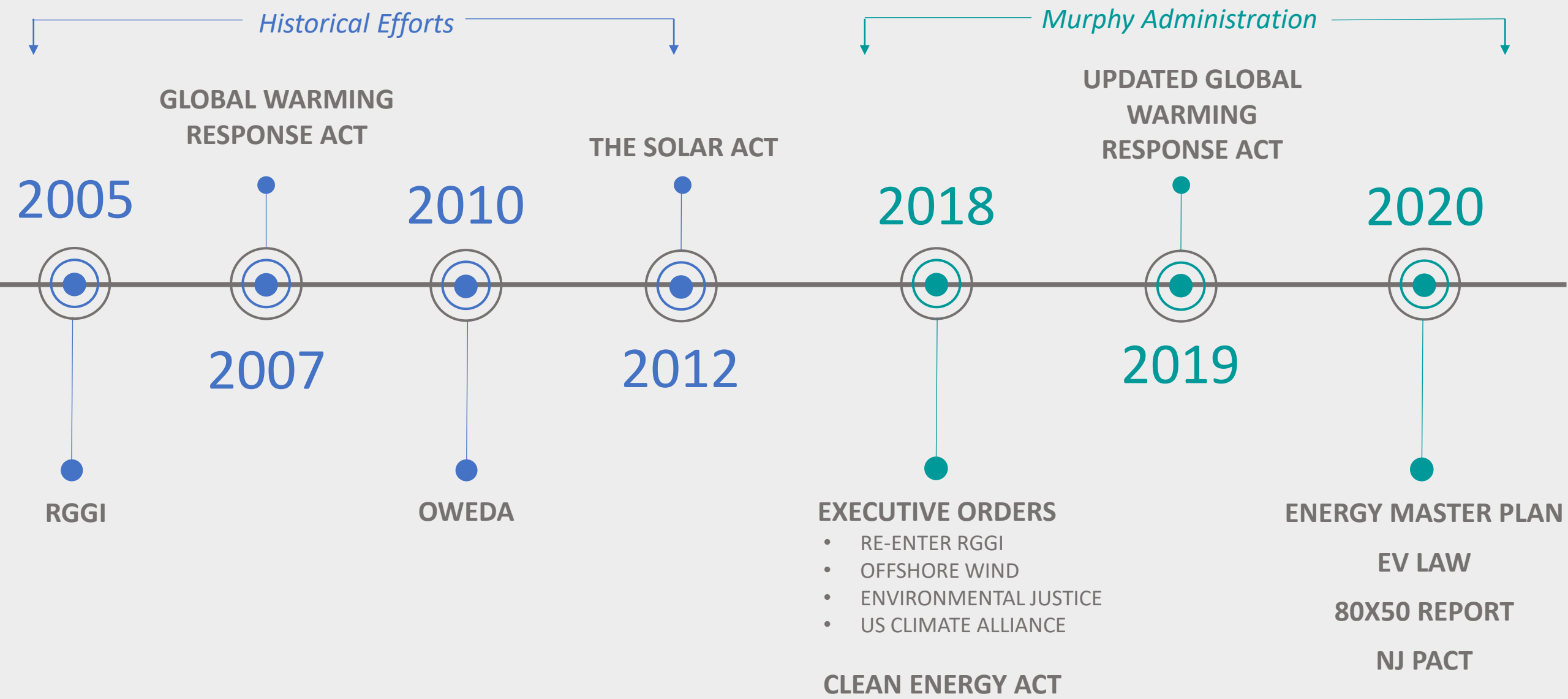
Webinar Housekeeping

1. This live event is being recorded.
2. All attendees are muted. If you have a question, please type it in the Q/A chat and our panelists will try to address as many as possible at the end of the presentations.
3. The full report can be found at https://www.nj.gov/dep/climatechange/mitigation.html

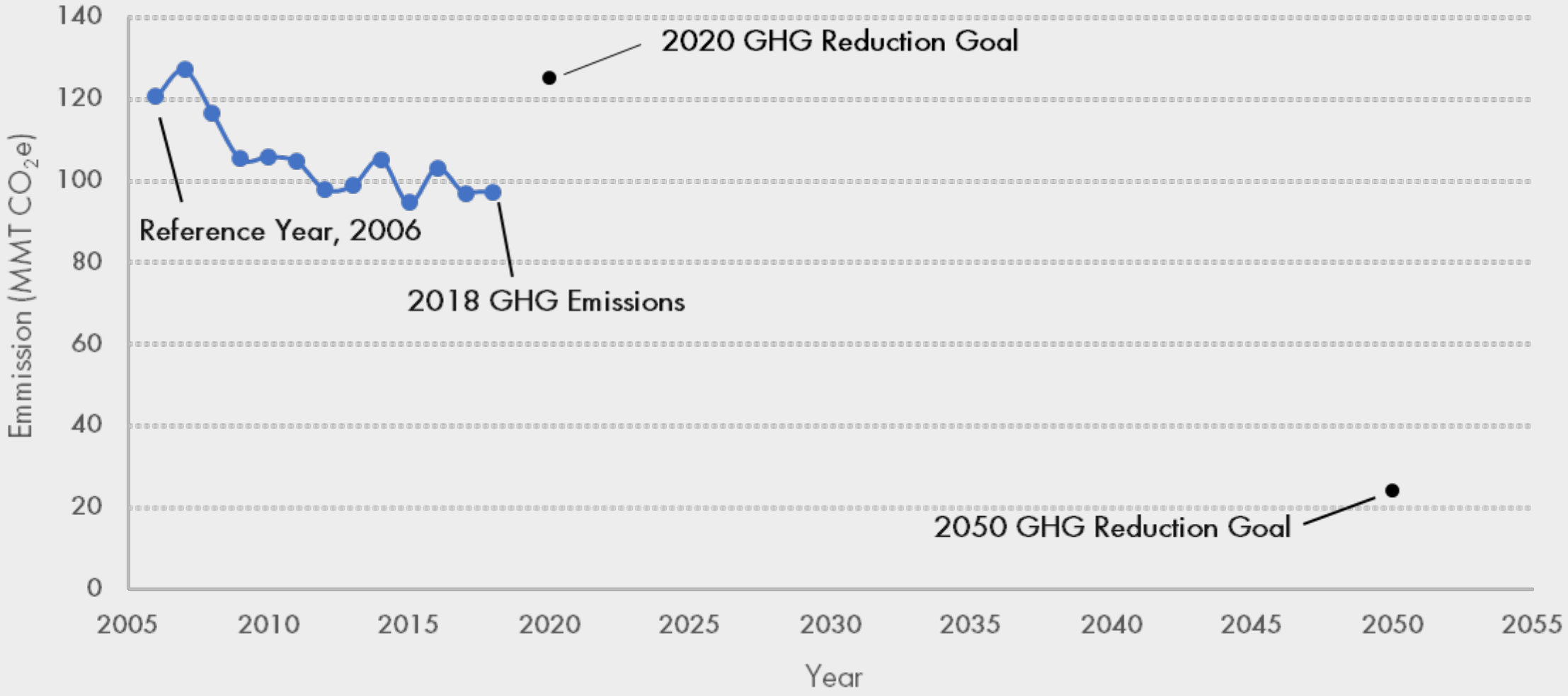



GLOBAL WARMING RESPONSE ACT 80X50 REPORT

Climate Initiatives



New Jersey's Greenhouse Gas Goals



Climate Mitigation Planning Process

Draft Energy Master Plan

June 2019

Integrated Energy Plan

Summer/Fall 2019

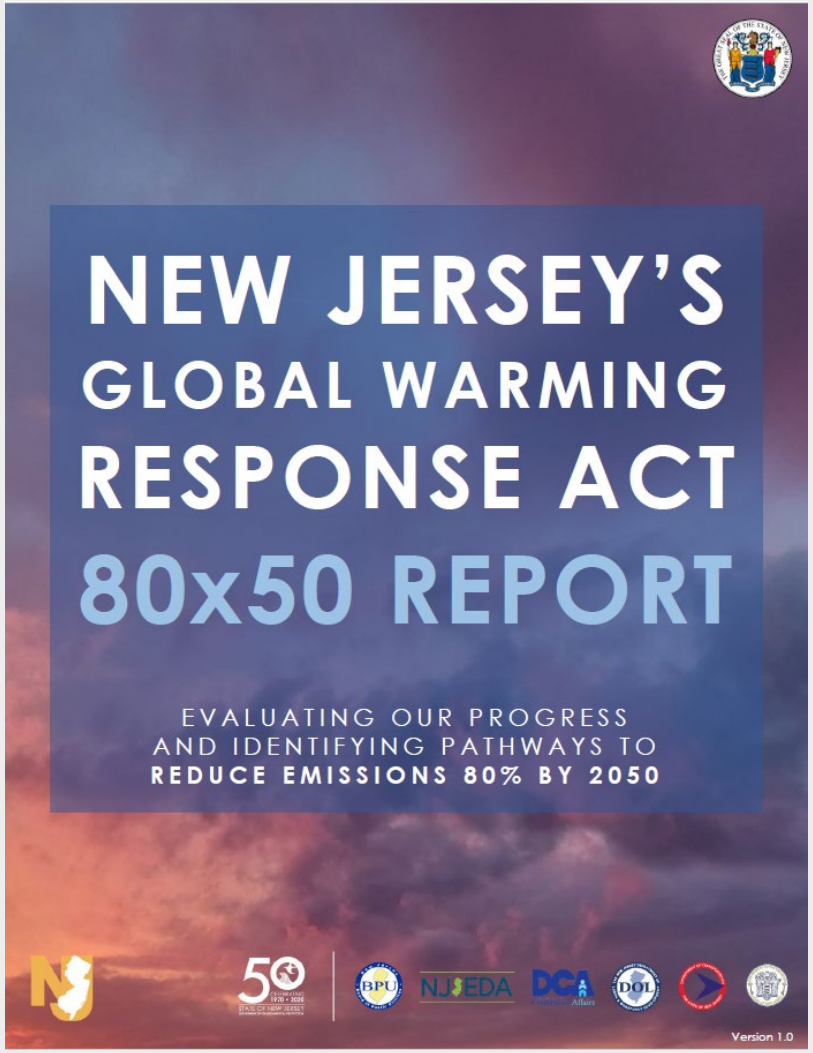
Energy Master Plan

January 2020

80x50 Recommendations Report

October 2020

Overview of Contents



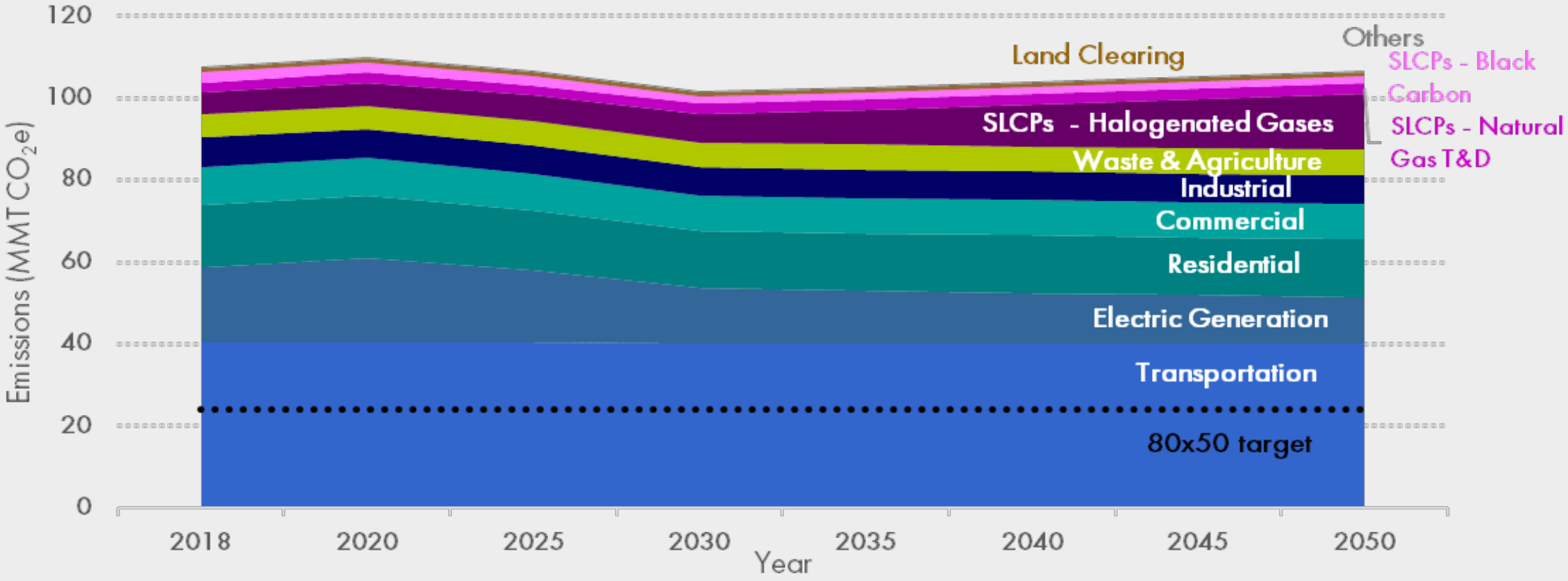
- Seven emission sectors are evaluated to determine how to achieve the 80x50 Goal.

- Each Sector Includes:
  - Business-as-Usual Projection.
  - Emissions Reduction Pathway Projections.
  - Specific legislative and administrative recommendations for achieving emissions reductions.

- Four electric demand scenarios are evaluated based on various levels of electrification throughout the state.

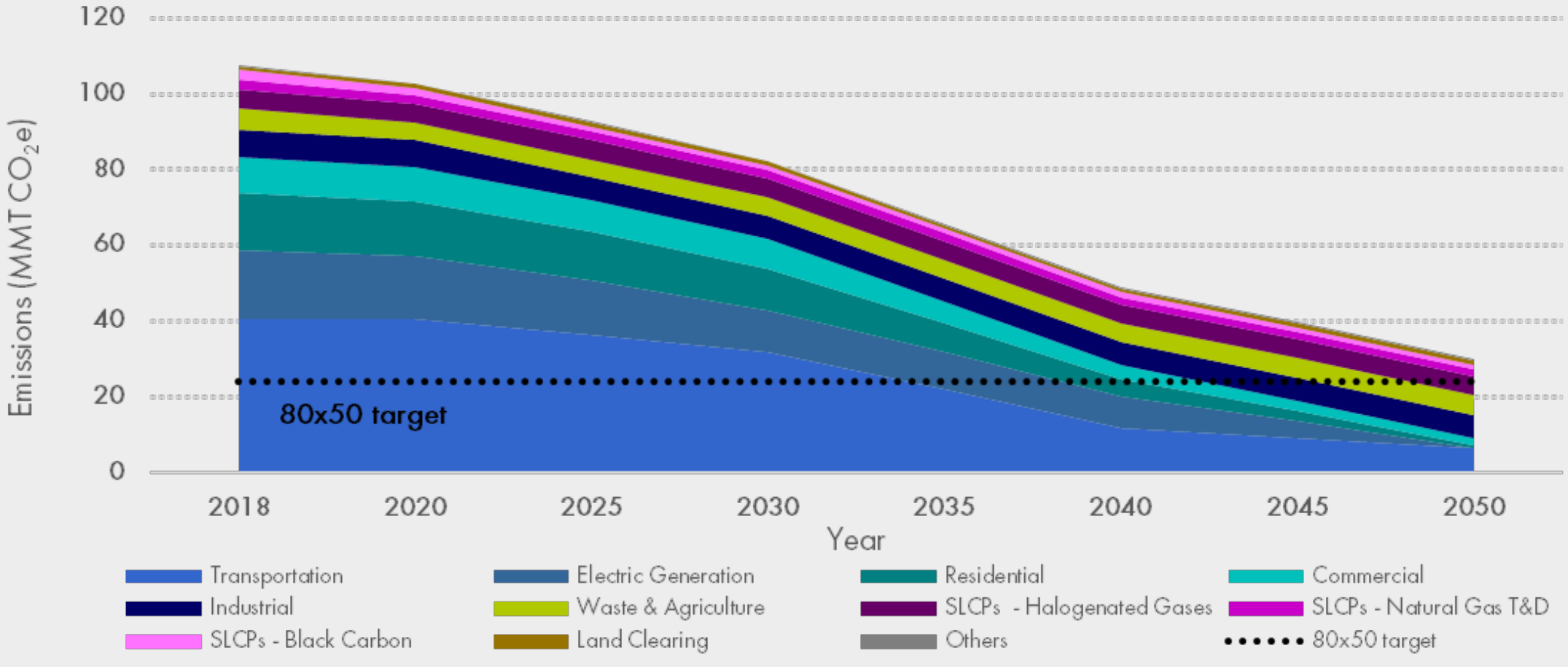
Business-as-Usual

- New Jersey is currently not on a trajectory to achieve its 80x50 GHG reduction goal.
- If the state stays on its current course, emissions would be higher than they are today, an estimate 106 MMT CO_2e.



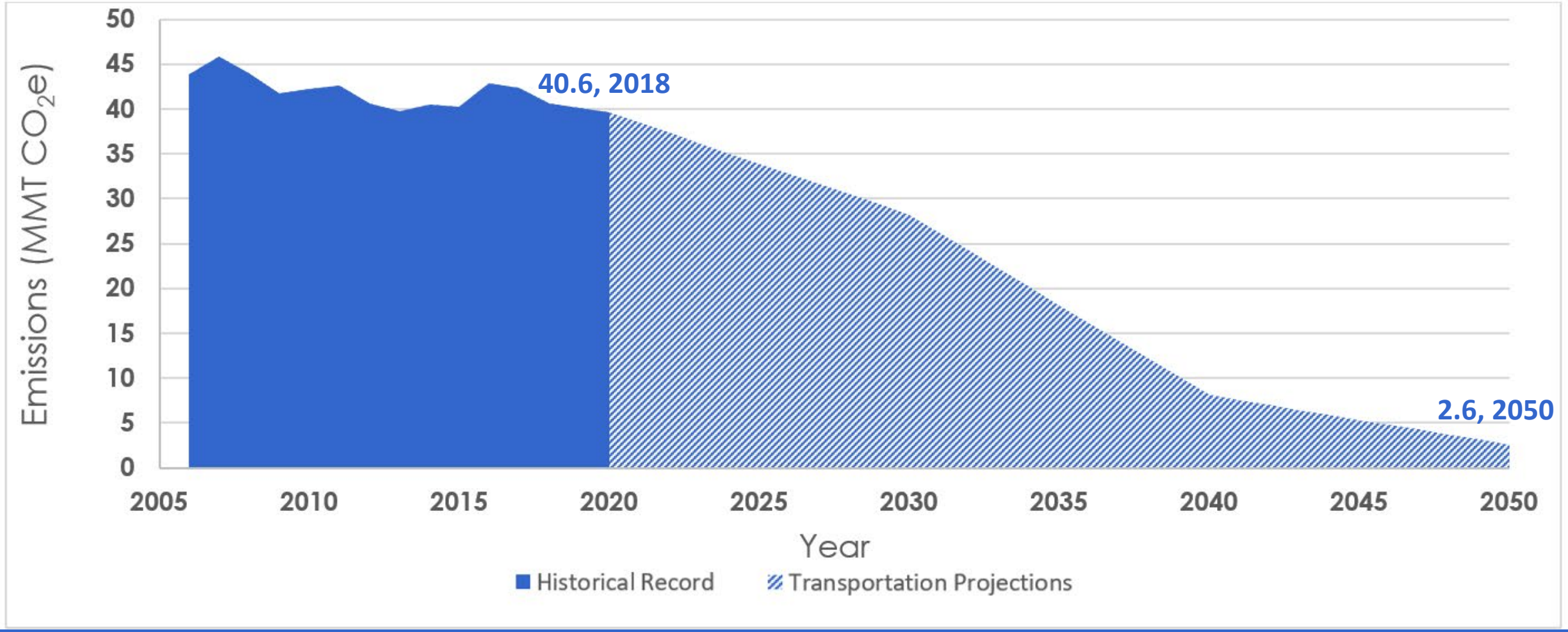
Pathway to 2050

- If New Jersey implements the pathways proposed in this report, GHG emissions can be reduced to 29.8 MMT CO_2e by 2050. After accounting for carbon sequestration, net emissions would be 19 MMT CO_2e, achieving the 80x50 goal.



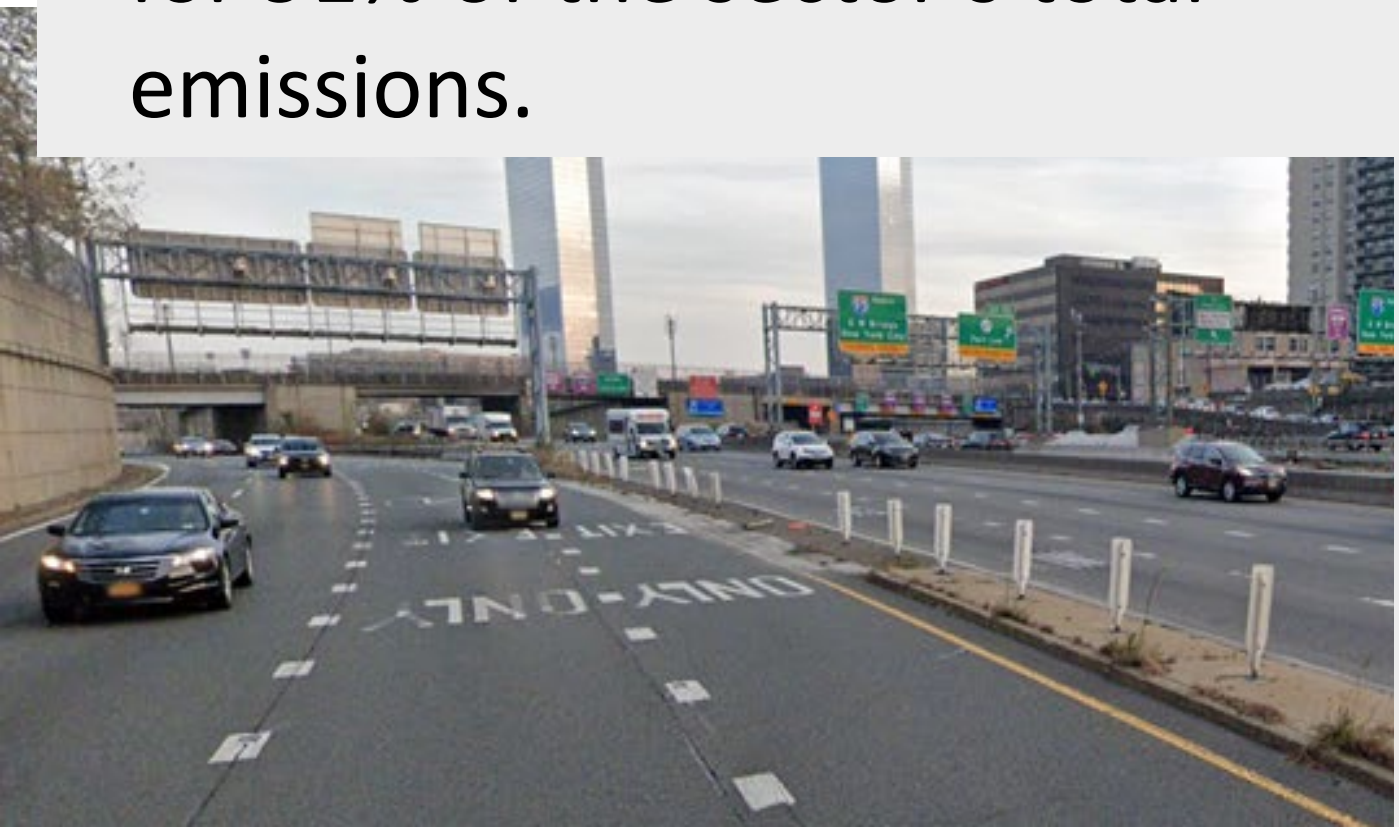
Transportation

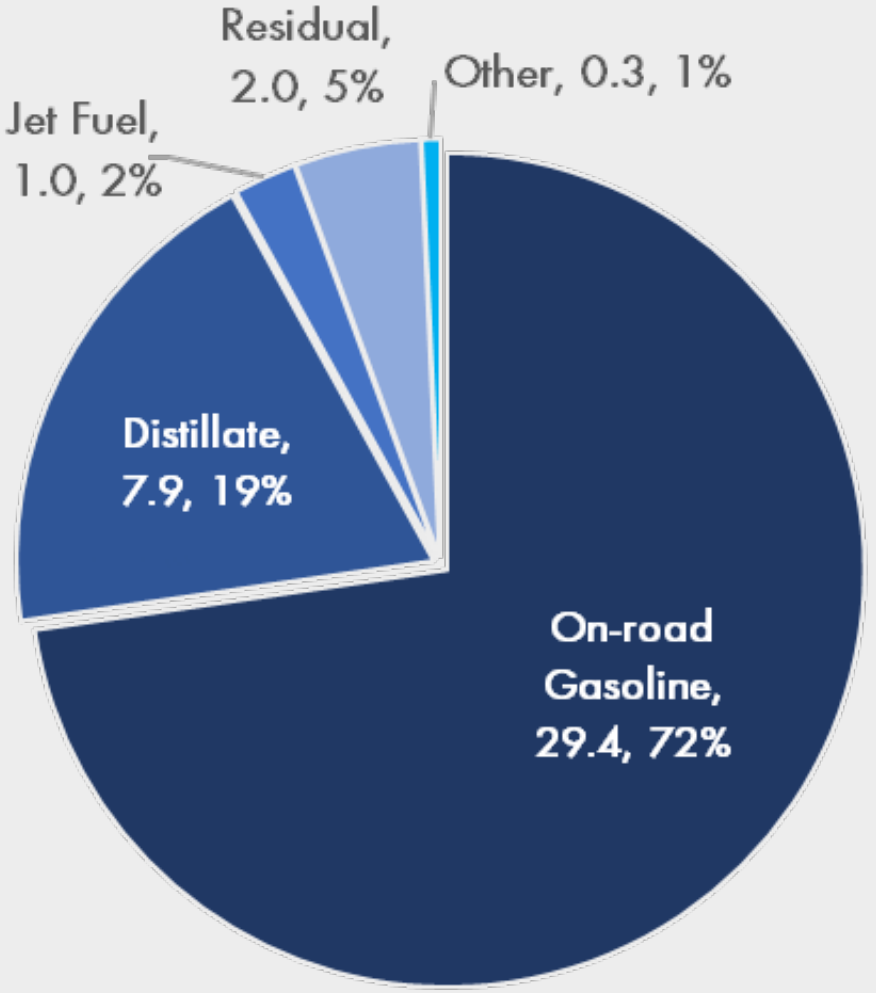
Transportation Emissions



Greatest source of emissions?

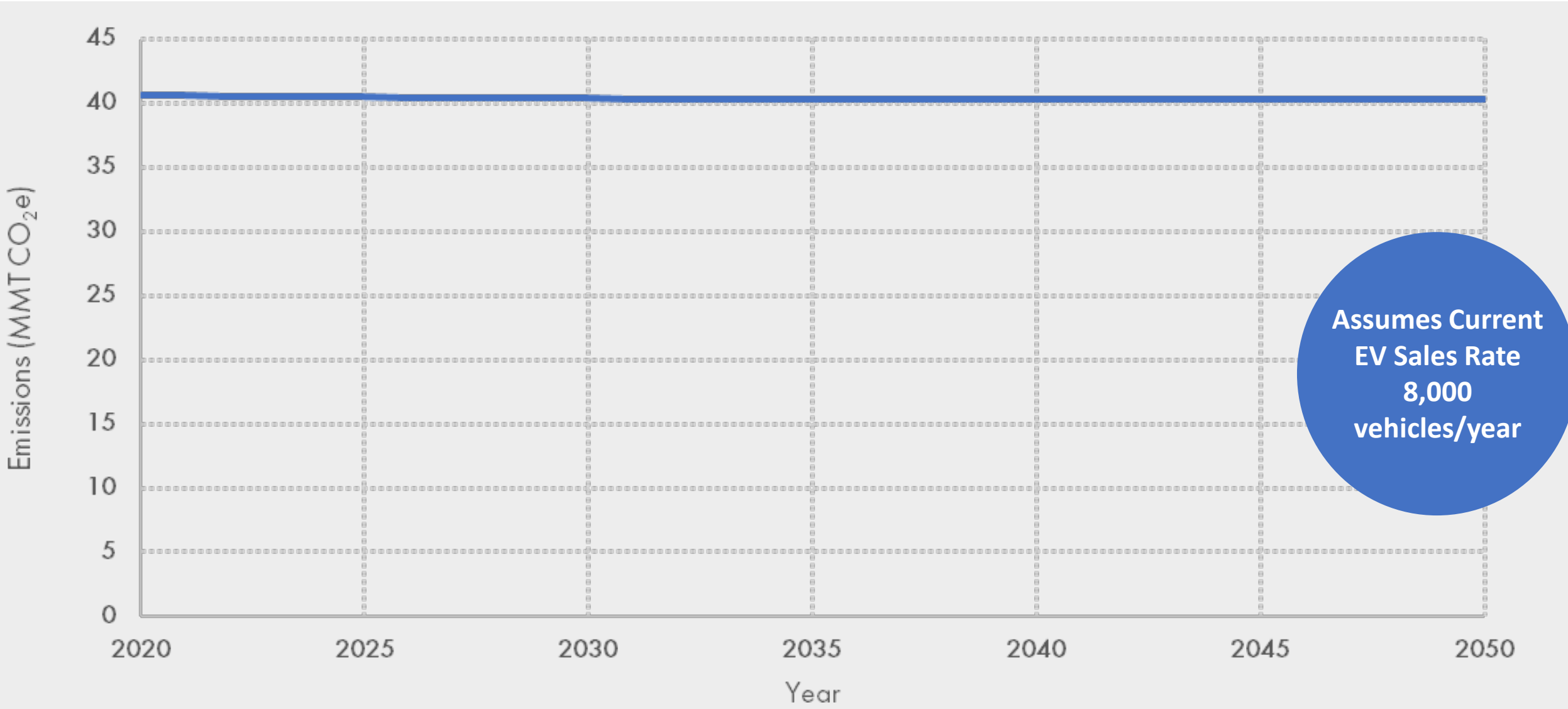
- On-road gasoline and distillate (on-road diesel) are responsible for 91% of the sector's total emissions.





NJ Transportation Emissions by Fuel Type
(MMT CO_2e and Percent)

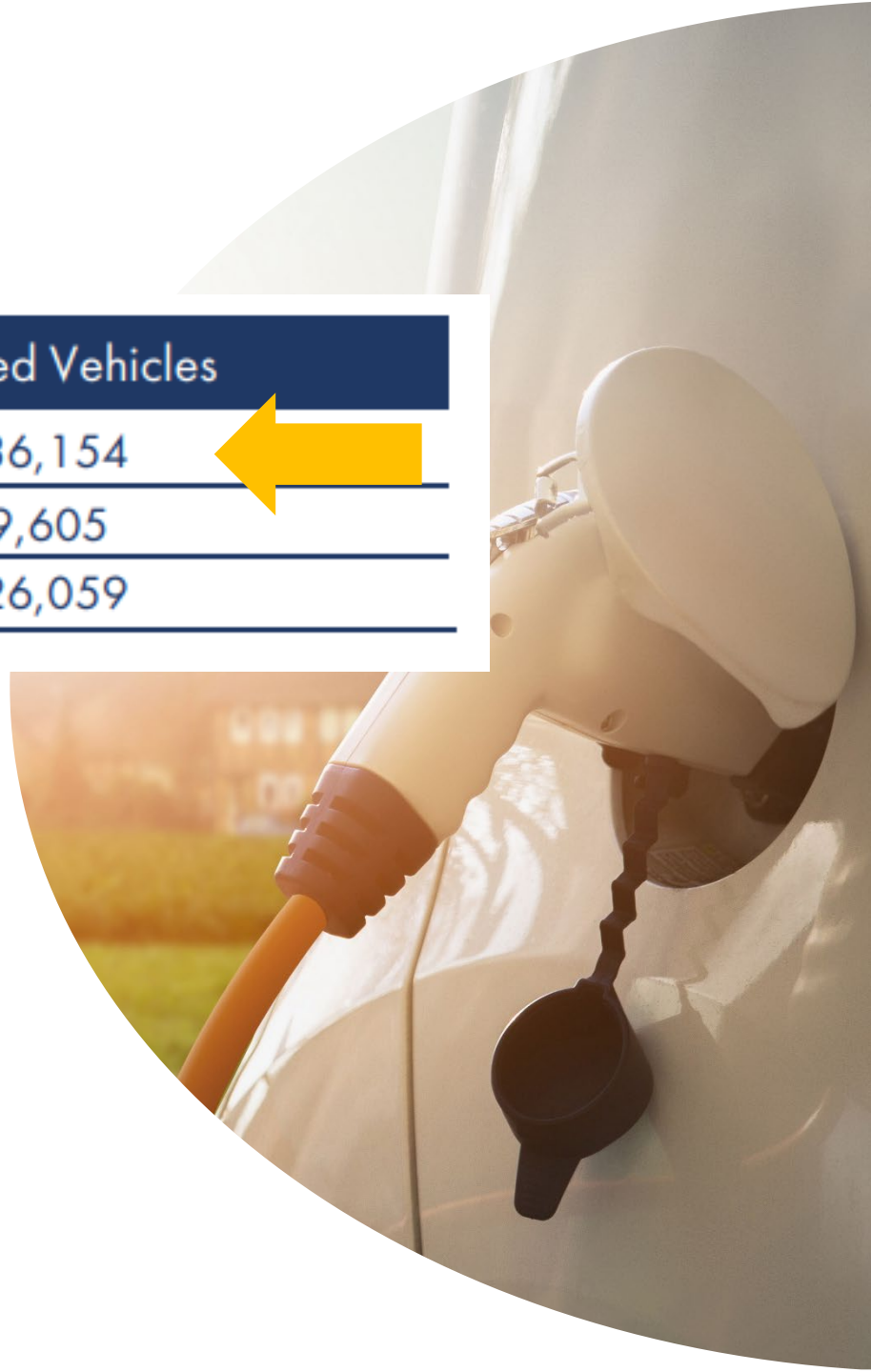
Business-as-Usual Projection



Emission Reduction Pathways

Pathway 1:
Electrify Light-Duty Vehicles

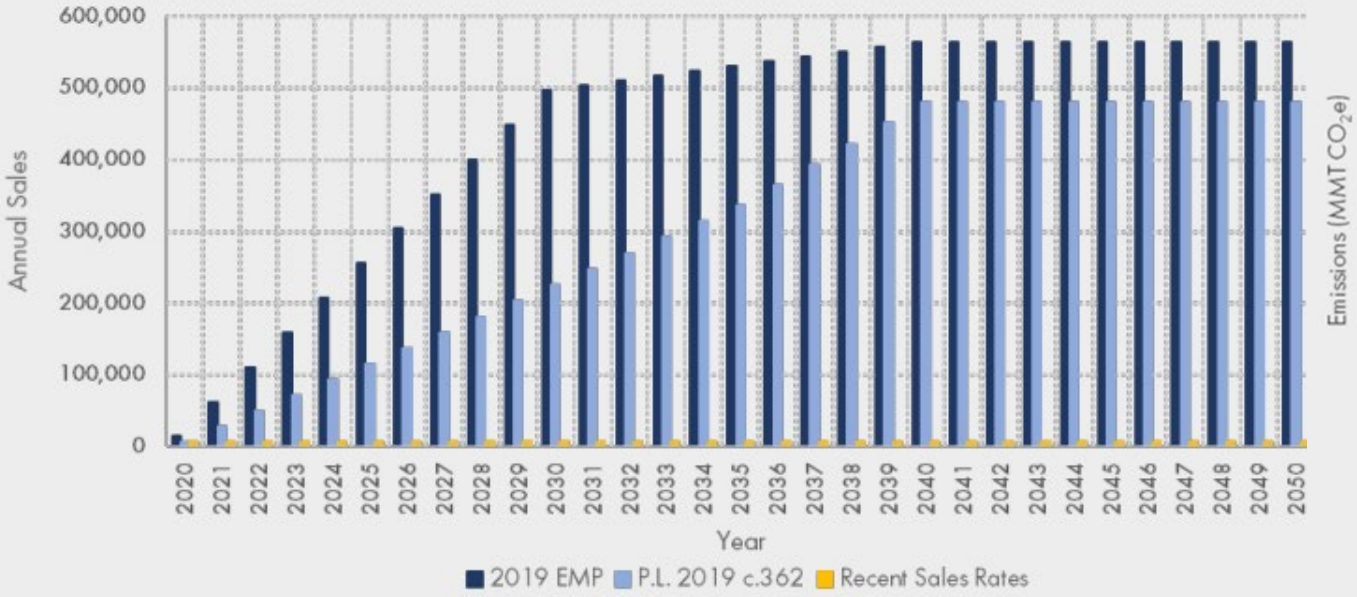
Vehicle Category	Registered Vehicles
Light-Duty Cars and Trucks	6,336,154
Medium-Duty Trucks, Heavy Duty-Trucks, and Buses	389,605
Total	6,726,059



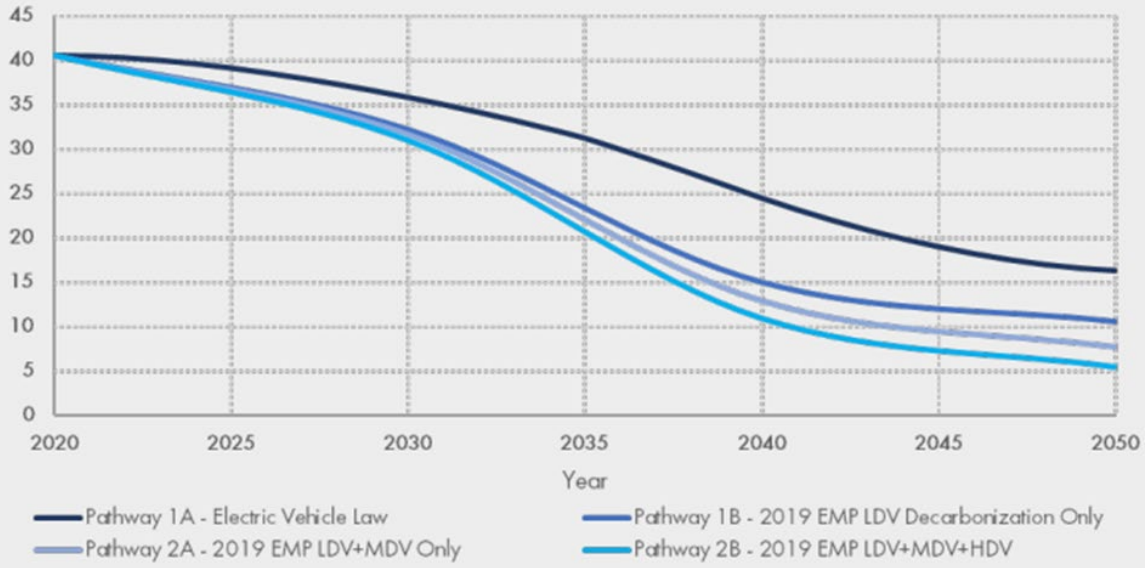
- 88% of new vehicle sales must be electric by 2030
- 100% of new passenger car sales must be electric by 2035

EV Law vs. Where We Need To Be

Comparison of Required Annual Sales of Light-duty Electric Vehicles to Meet the Goals of the EV Law and the 2019 EMP.



Transportation Sector Emissions under the NJ Electric Vehicle Law and the 2019 EMP Least Cost Scenario.



Pathway 2: Decarbonize Medium-and Heavy-Duty Vehicles

Vehicle Category	Registered Vehicles
Light-Duty Cars and Trucks	6,336,154
Medium-Duty Trucks, Heavy Duty-Trucks, and Buses	389,605
Total	6,726,059

- 75% of medium-duty trucks and 50% of heavy-duty trucks must be decarbonized by 2050

Pathway 3: Increase NJ TRANSIT Ridership and Expansion of Transit Villages

- NJ TRANSIT delivers over three billion passenger miles of mobility annually vs. 68 billion traveled by passenger vehicles

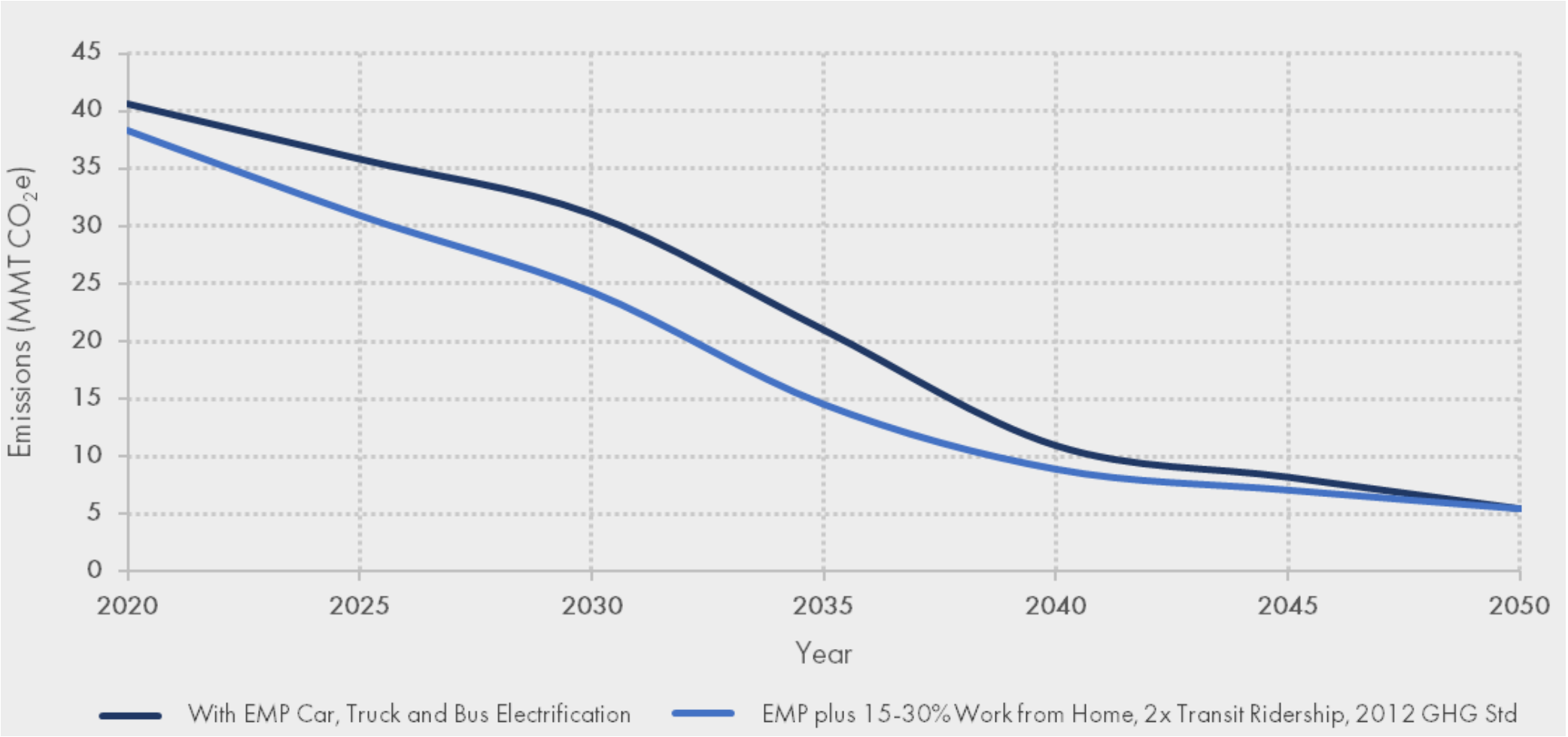
Pathway 4:
Work-From-Home Policies, Ridesharing, Home Delivery and other Strategies

- Transportation strategies that collectively reduce vehicle miles traveled (VMT).
- VMT = measures the amount of travel for all vehicles in a geographic region over a given period of time, typically a one-year period. It is calculated as the sum of the number of miles traveled by each vehicle.

Emissions Reduction Pathway 5:
Support regional and national efforts to reduce GHG emissions of light-duty fossil-fuel powered new vehicles

Emission Reductions – Combined Pathway Analysis

Transportation Sector Emissions under 2019 EMP Alone versus with additional measures



Recent State Actions

- NJ PACT
  - Advanced Clean Truck Rule
  - Omnibus Rule

- RGGI Investments in Clean Transportation
  - EDA's NJ ZIP Program ($15 million)

  https://www.njeda.com/njzip/

  - DEP/BPU $32 million in clean transportation investments

  https://nj.gov/dep/vw/

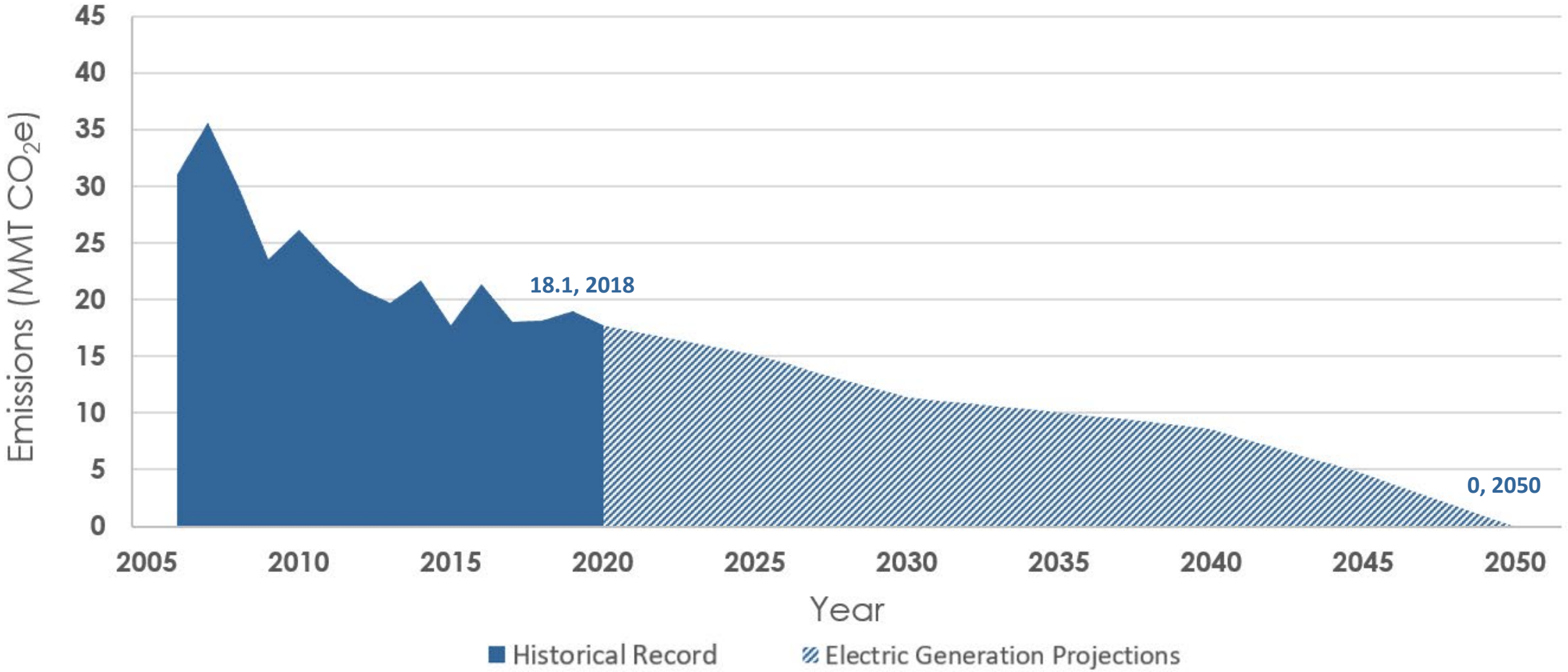
- BPU EV Rebate Program – Phase II, Summer 2021

- NESCAUM - Medium- and Heavy-Duty Zero-Emission Vehicles: Action Plan

  https://www.nescaum.org

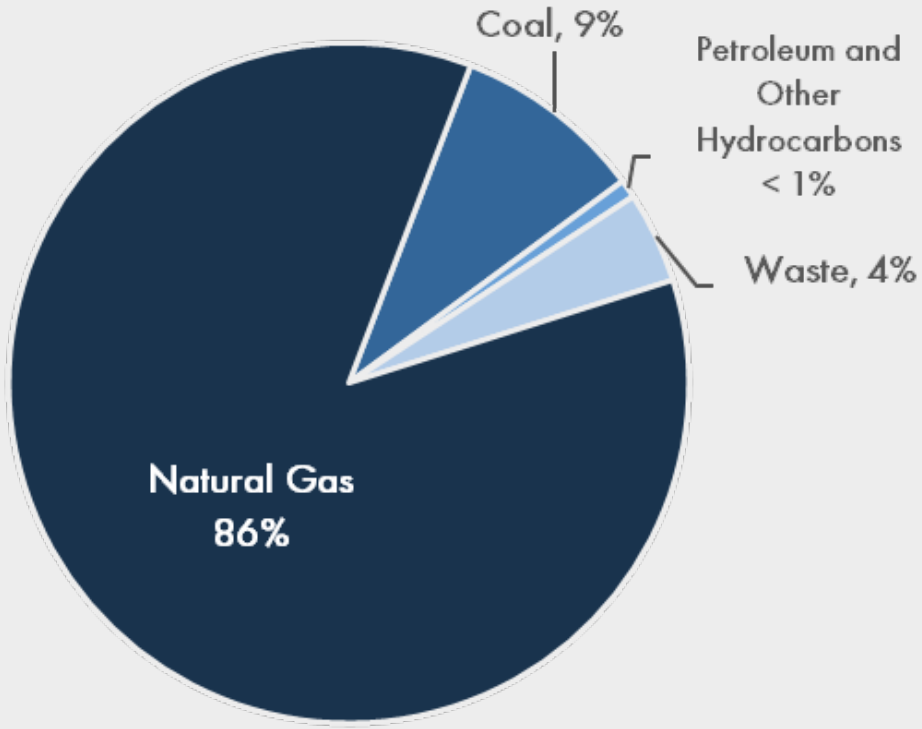
Electric Generation

Electric Generation Emissions



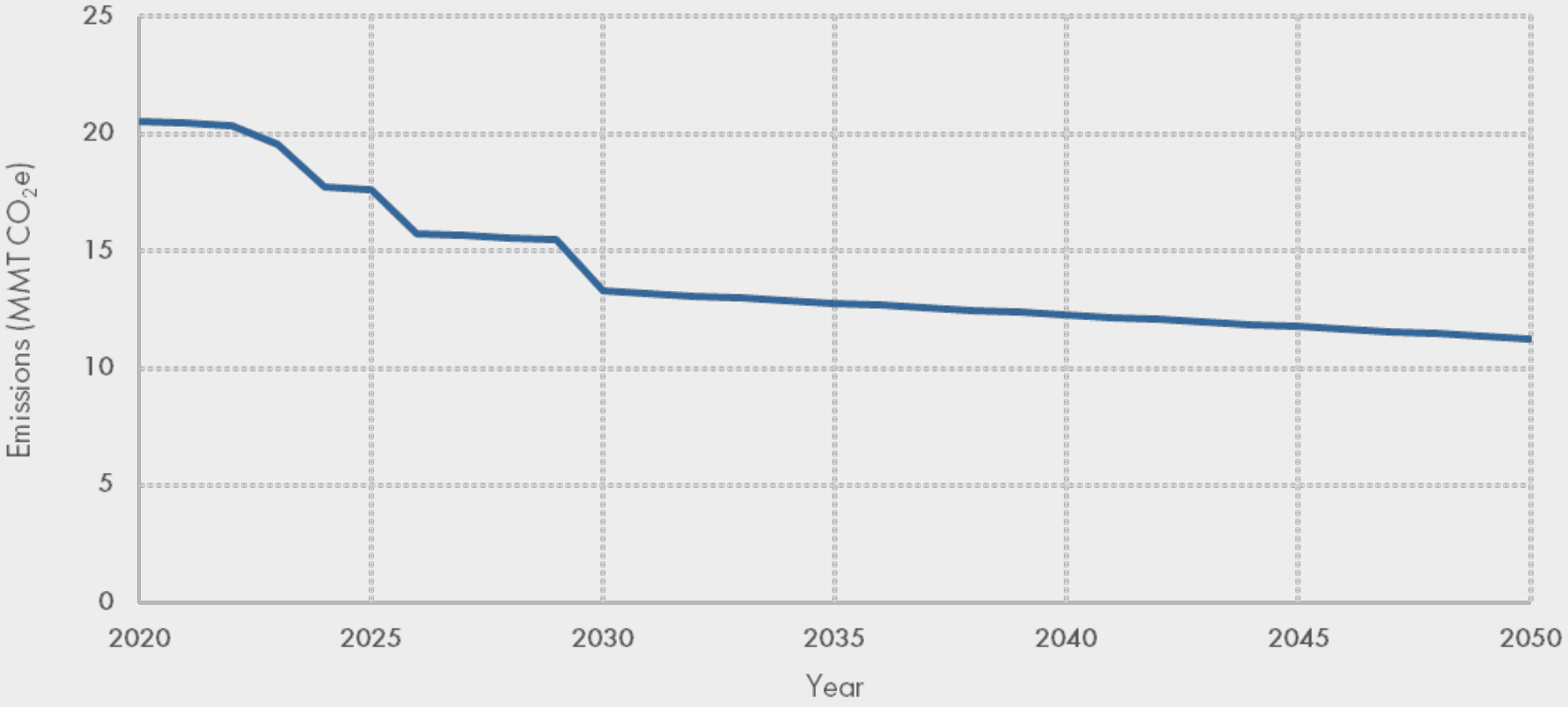
Greatest source of emissions?

- Combustion of natural gas accounts for 86% of emissions from in-state electric generation.



2018 Emissions from In-State Electric Generation (18.1 MMT CO_2e) by Percentage

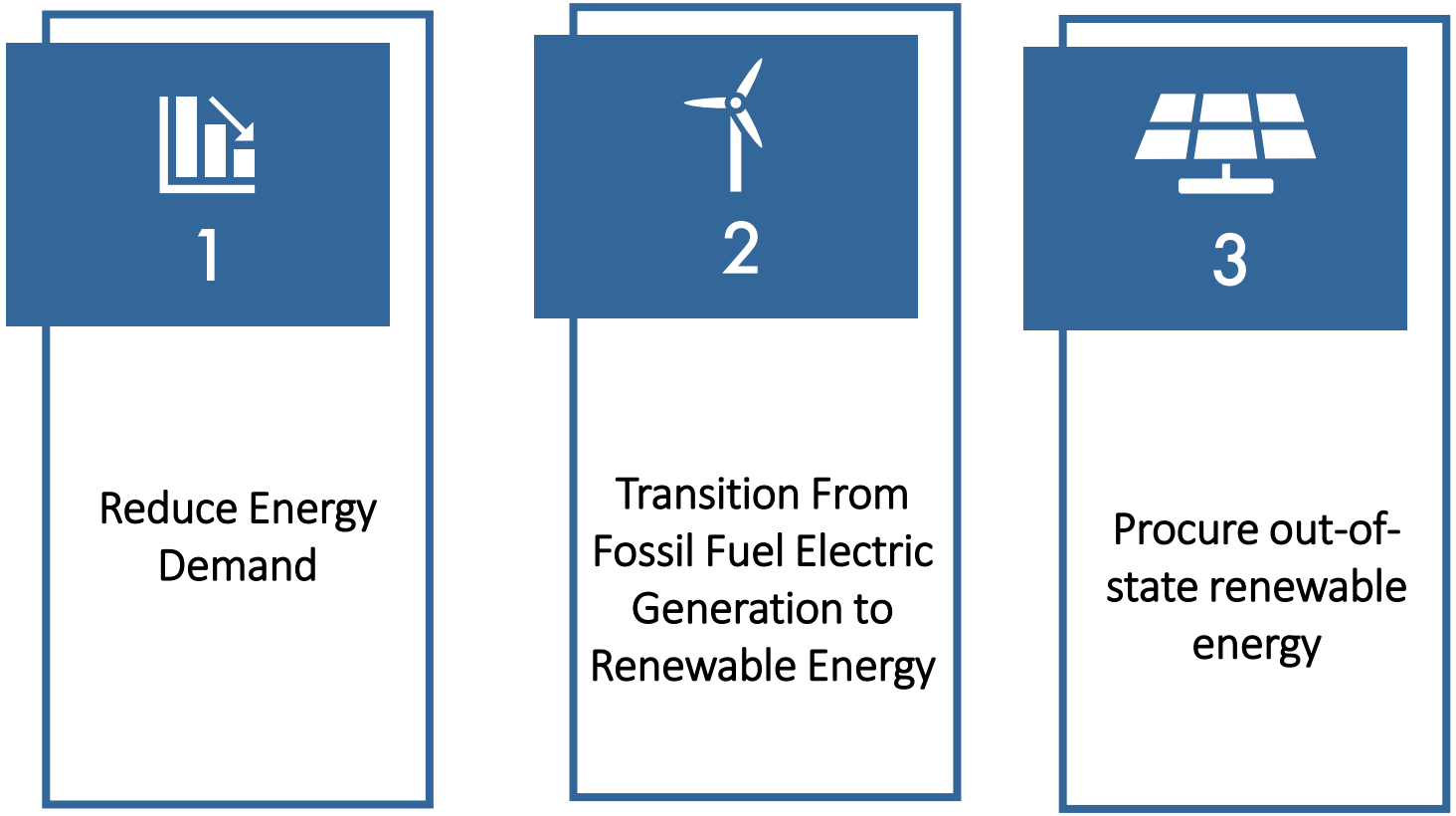
Business-as-Usual Projection



Electric sector emissions under Reference Case A (BAU)

- **Assumes Current EV Sales Rate 8,000 vehicles/year**
- **Annual energy efficiency improvements of 2% from 2023 to 2030**
- **Solar PV growth of 152 MW/Year**
- **Offshore wind of 3,500 MW by 2030**

Emission Reduction Pathways



Pathway 1: Reduce Energy Demand

- Insulation, weatherproofing, LED lightbulbs
- Clean Energy Act requires energy efficiency, with retail sales decreasing by 2% annually.

Pathway 2:
Transition from fossil fuel electric generation to renewable energy

- Strong and enduring growth in Solar PV
- Steady rise in offshore wind
- Continued reliance on nuclear
- Reliance on fossil gas decreases over time

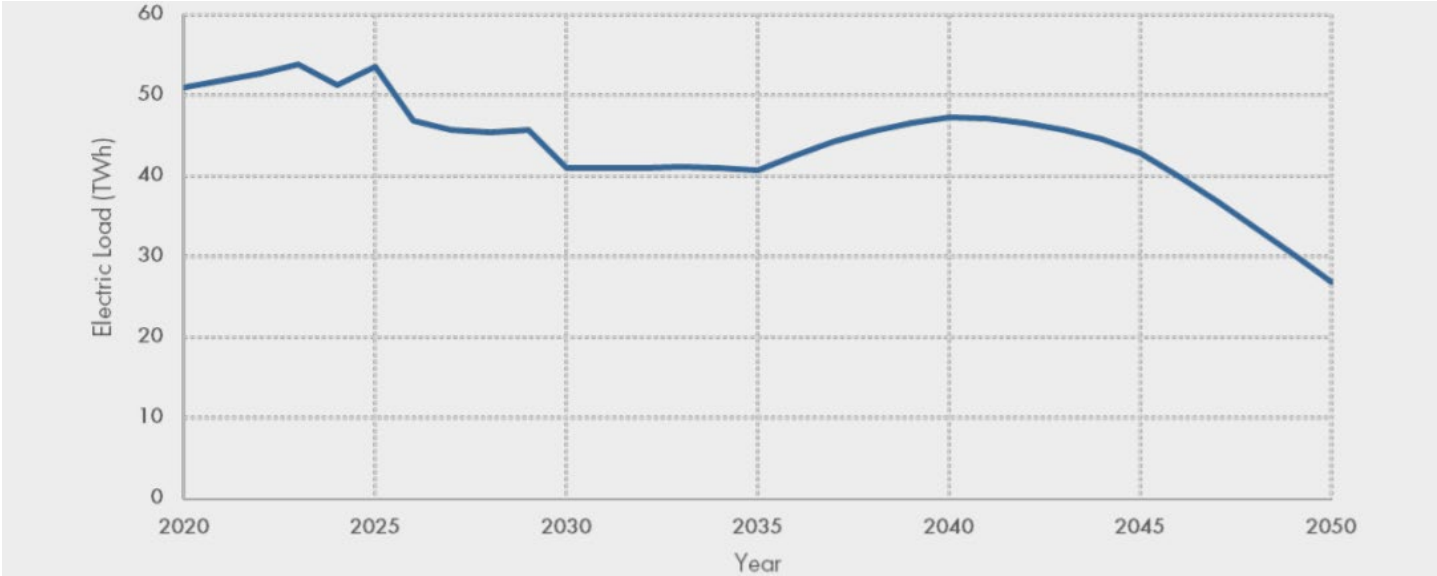
In-State Installed Capacity Goals by Year (GW)

Resource Type	2020	2025	2030	2035	2040	2045	2050
NJ Solar	3.5	5.2	12.2	17.2	22.2	27.2	32.2
Offshore Wind	0	1.1	3.5	7.5	8.8	10.1	10.7
Nuclear	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Fossil Gas	11.7	10.1	10.7	10.8	12.4	13.7	0
Biogas, Biofuels and Hydrogen	0	0	0	0	0	0.3	17.6
Storage	0.6	1.6	2.5	2.5	2.5	5.2	8.7
Other[1]	0.97	0.25	0.26	0.22	0.19	0.16	0.15
Total	**20.3**	**21.8**	**32.7**	**41.7**	**49.6**	**60.2**	**72.9**

Pathway 3:
Procure out-of-state renewable energy

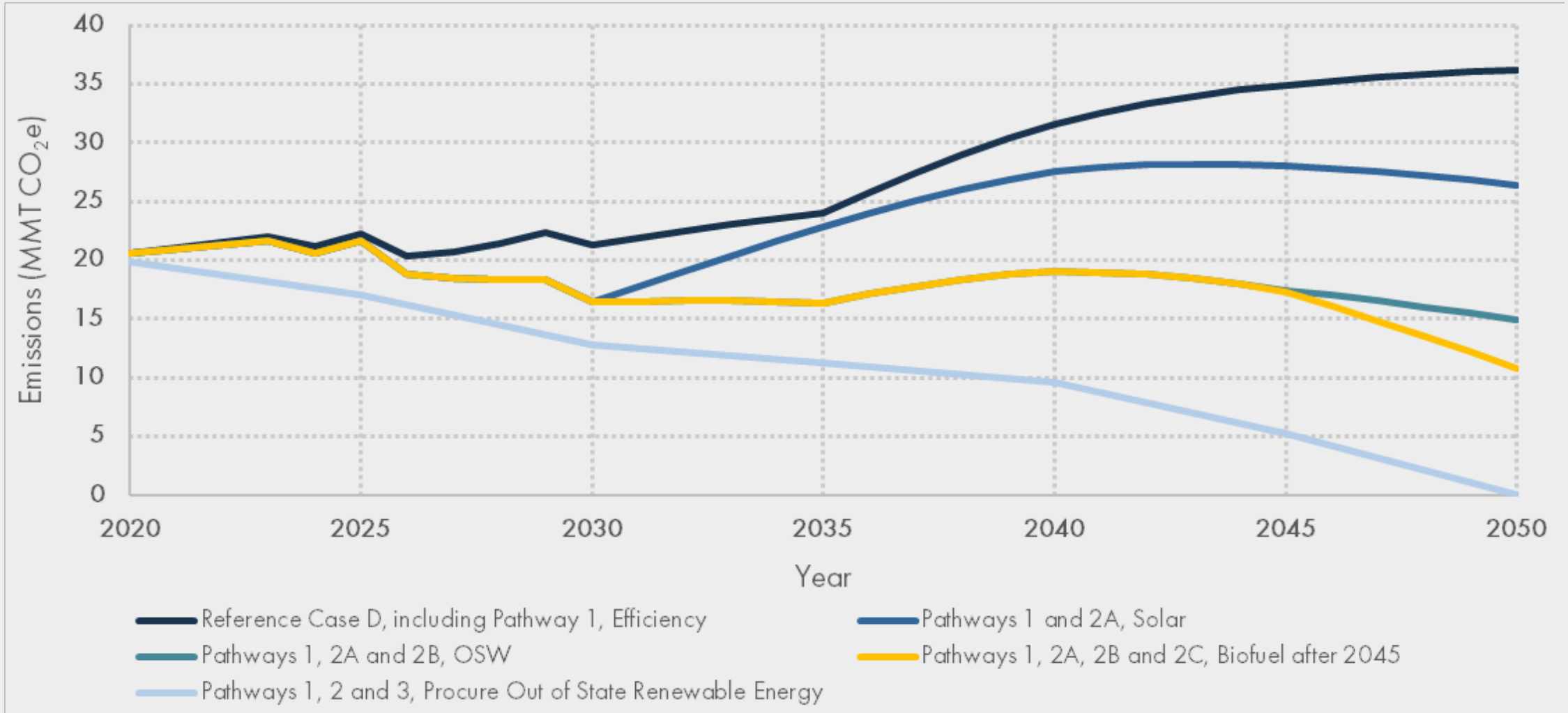
- Due to the electrification of other sectors (transportation & buildings) there will be a power deficit that must be met through out-of-state renewable resources

Load not met with in-state zero emitting sources (renewables or nuclear power)



Combined Emission Reductions Analysis

Estimated emissions due to renewable energy and energy efficiency in the Electric Generation Sector



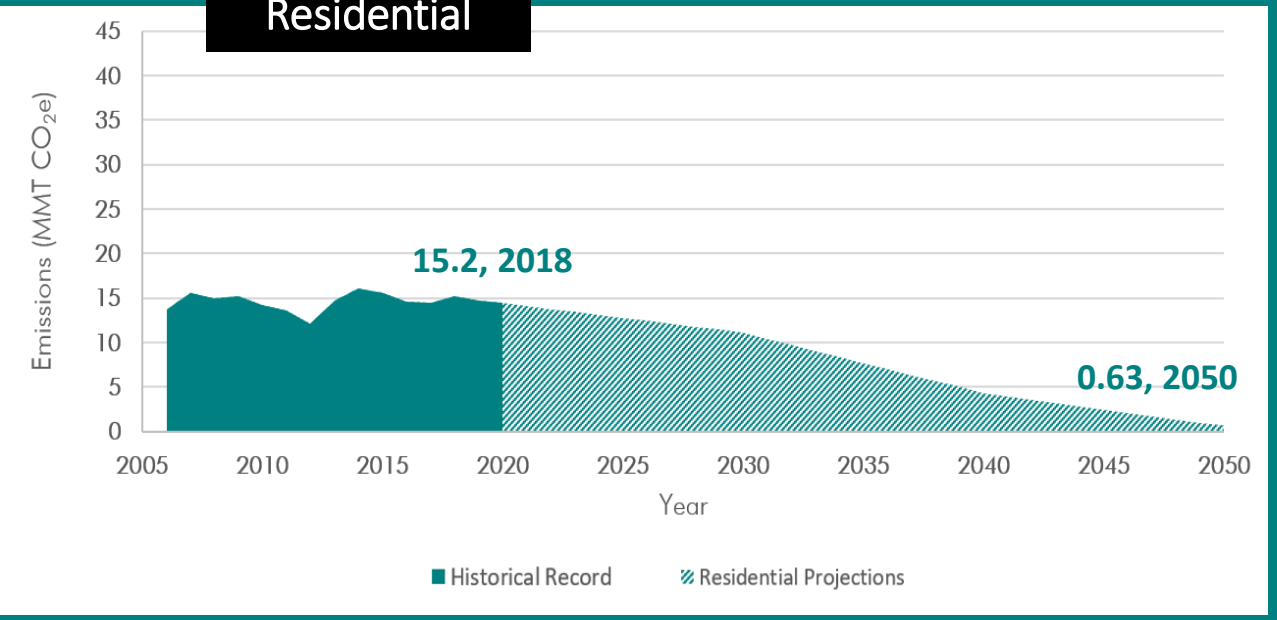
Recent State Actions

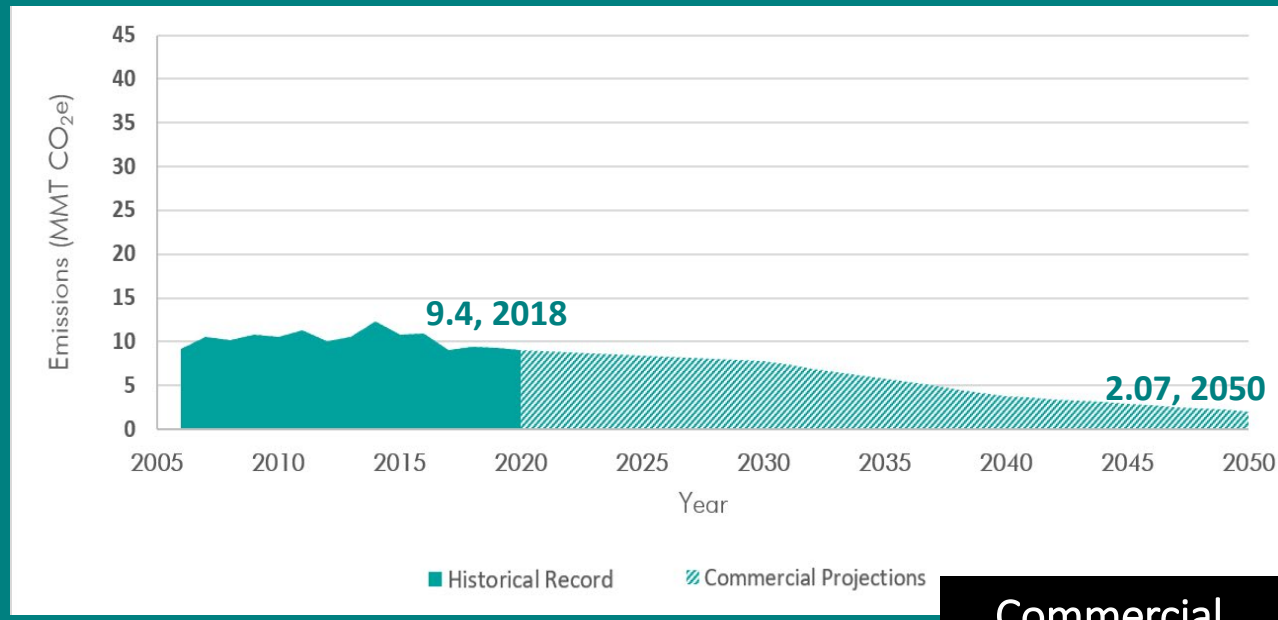
- Solar
  - 75 MW of community solar awarded in 2020
  - Anticipated 150 MW solicitation fall 2021
  - New Solar Successor program expected by end of 2021
- Wind
  - Awarded 1100 MW in June 2020
  - up to an additional 2400 MW of offshore wind to be awarded summer 2021
- NJ PACT Rules
  - Emission standards for EGUs

Residential & Commercial

Residential & Commercial Emissions

Residential

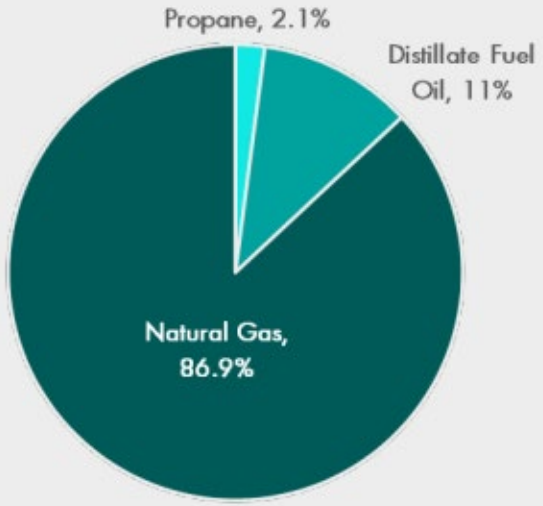




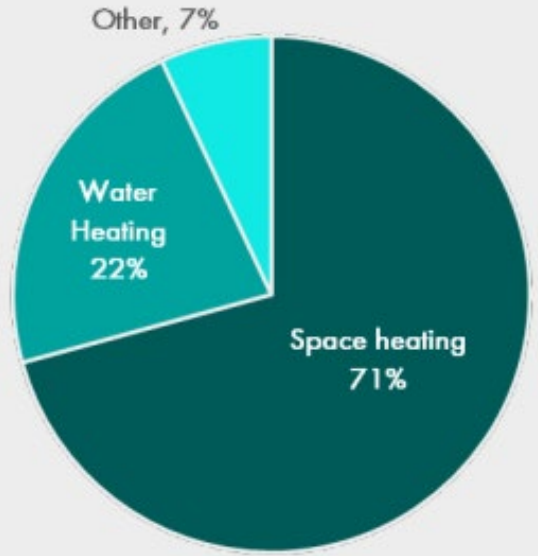
Commercial

Greatest source of emissions?

- Combustion of natural gas for space heating accounts for the majority of emissions from the residential and commercial sectors.

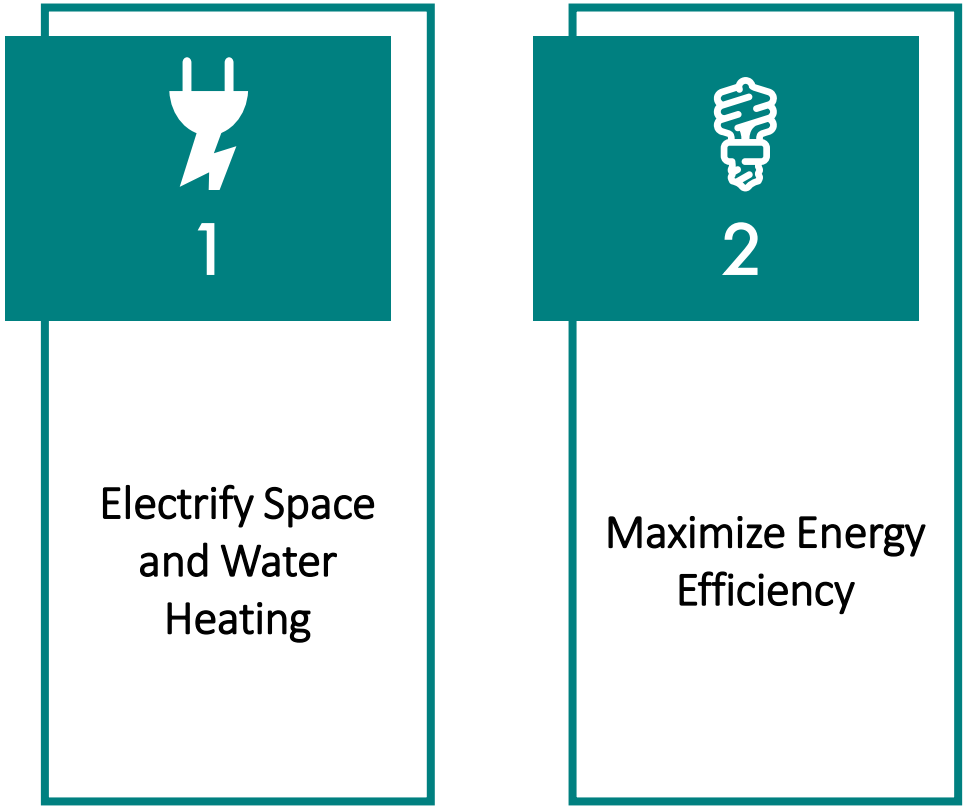


2018 Emissions from Residential Sector (15.2 MMT CO_2e) by Percentage



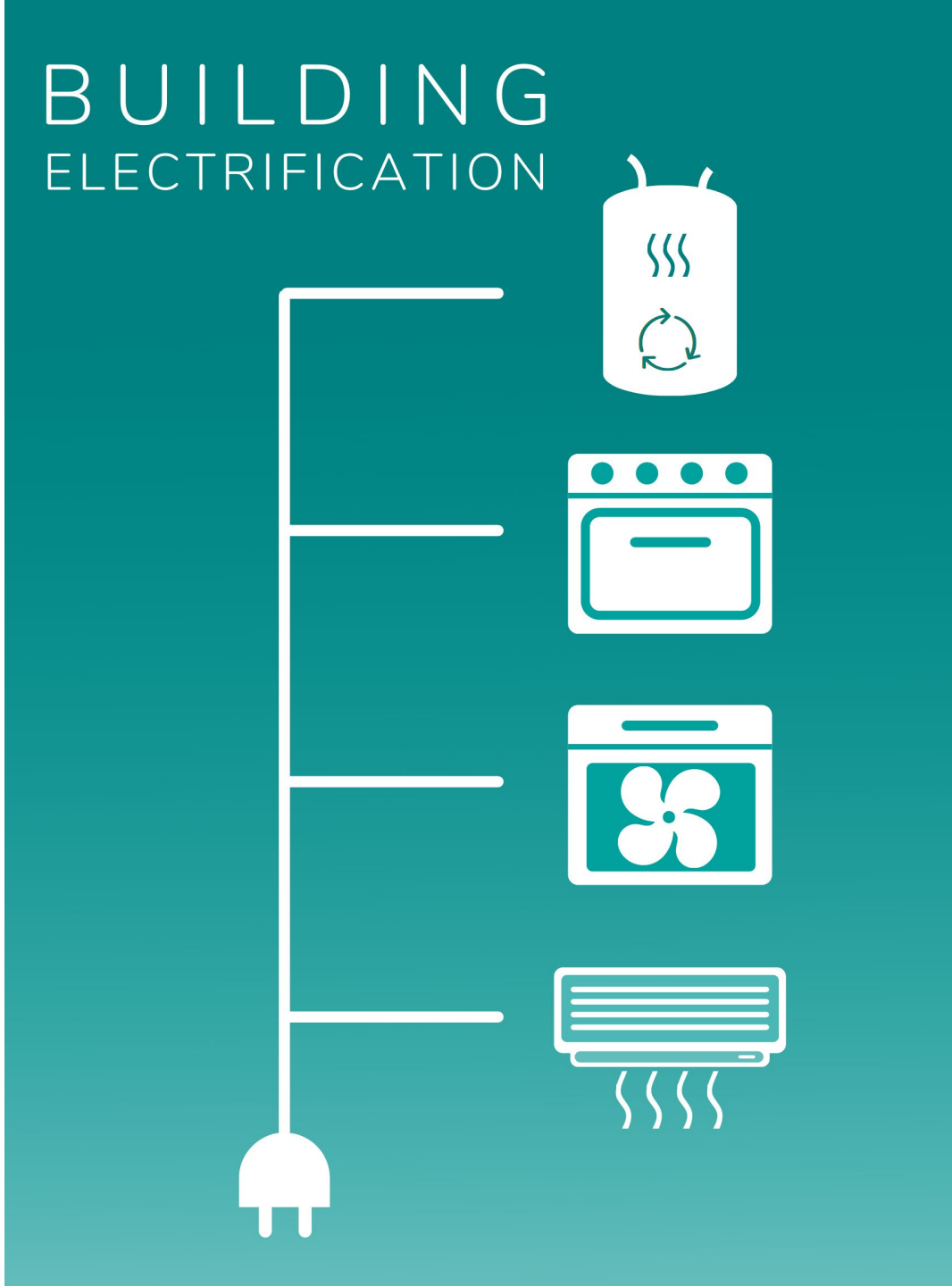
Natural Gas End Use in Residential Buildings

Emission Reduction Pathways

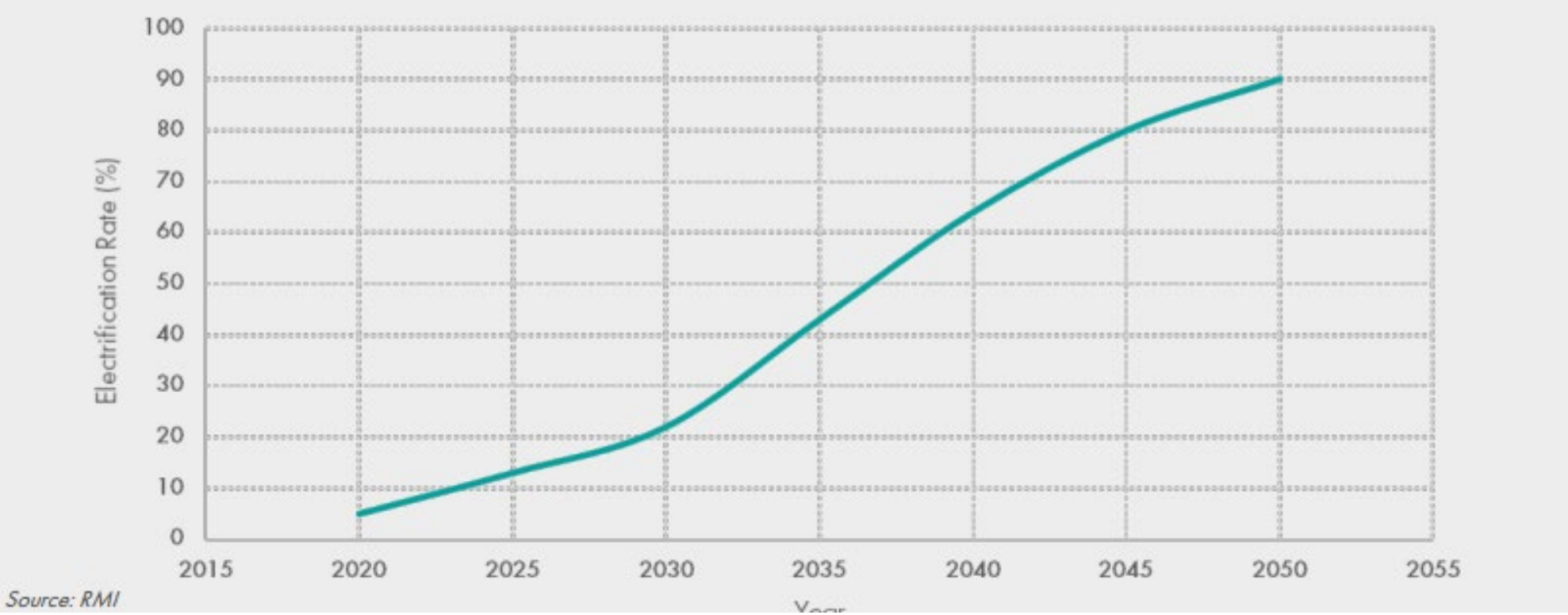


Pathway 1: Electrify space heating and water heating

- Eliminate on-site fossil fuel combustion
- Adoption of heat pumps, electric appliances



Average Electrification Rate in Residential and Commercial Buildings

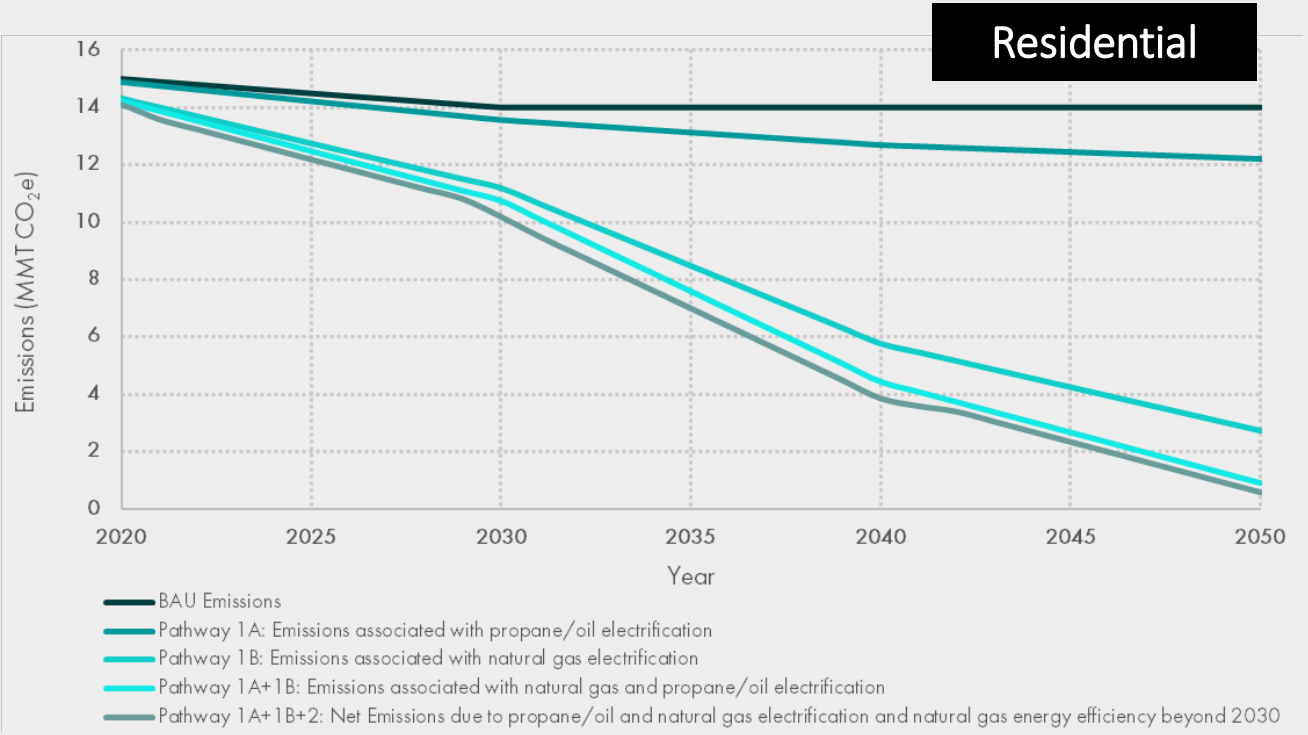


Pathway 2:
Maximize Energy Efficiency

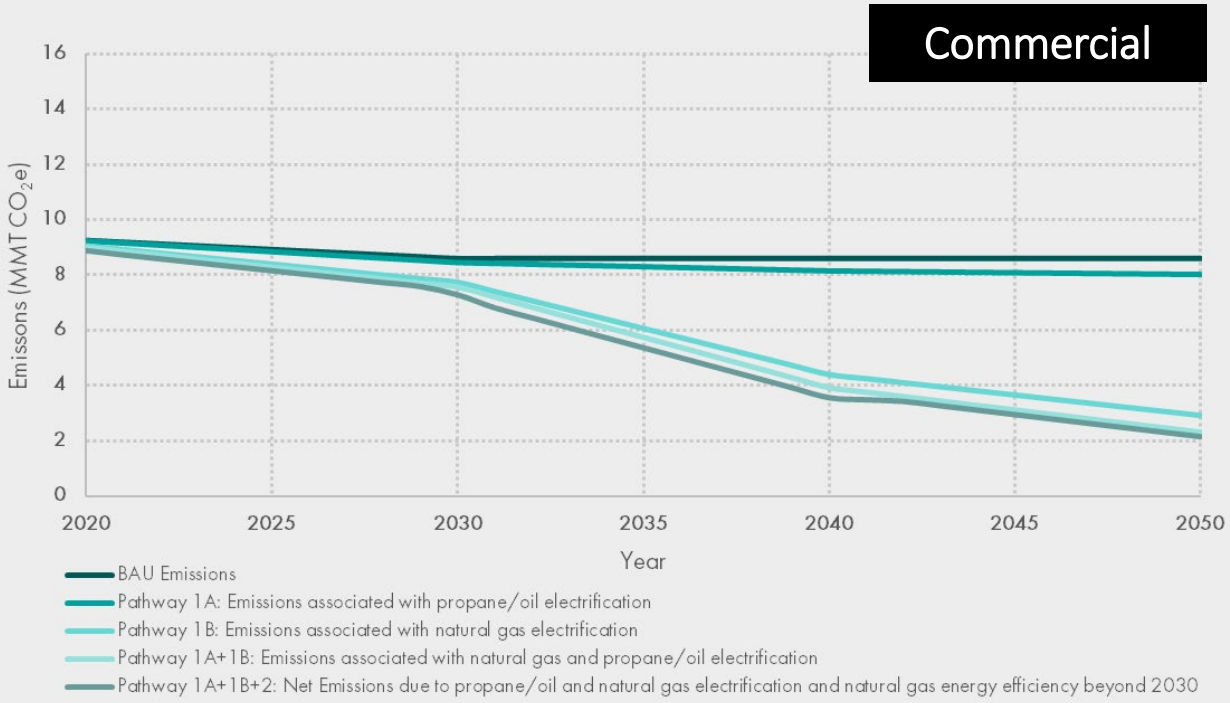
- Conducting energy audits
- Benchmarking
- Retrofitting existing buildings
- Strengthening Building and Energy Codes

Emission Reductions Analysis

Estimated emissions due to electrification and natural gas energy efficiency in the Residential Sector



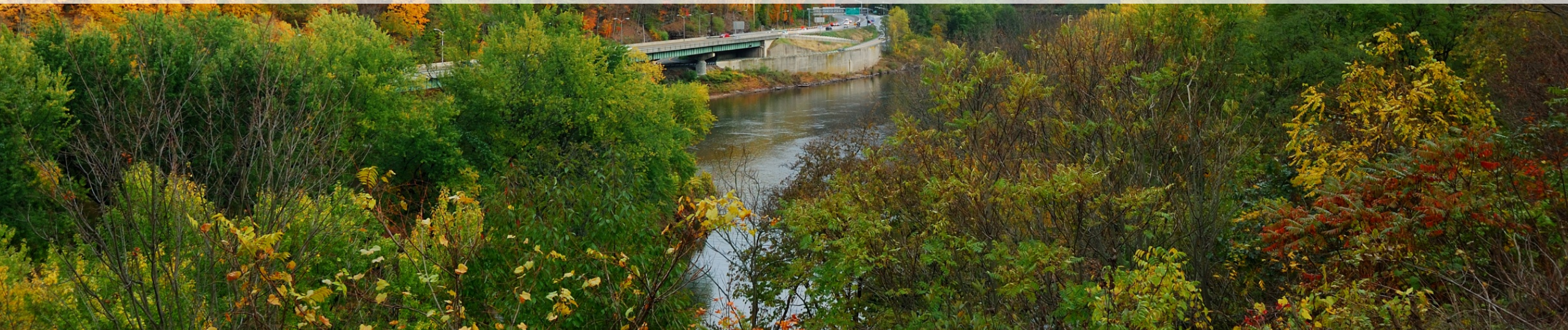
Estimated emissions due to electrification and natural gas energy efficiency in the Commercial Sector



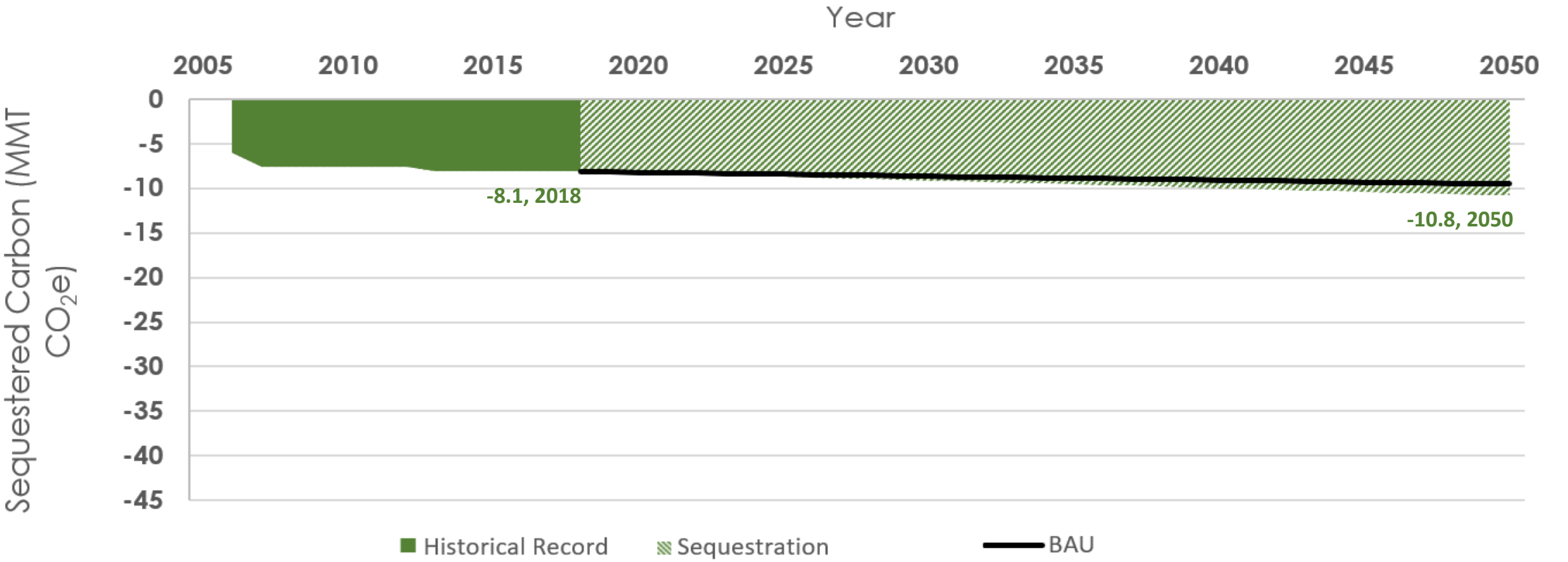
Recent State Actions

- Utility energy-efficiency plans – launch July 2021
- Zero Energy Building Code Collaboration
- State Agency Energy Audits

Carbon Sequestration

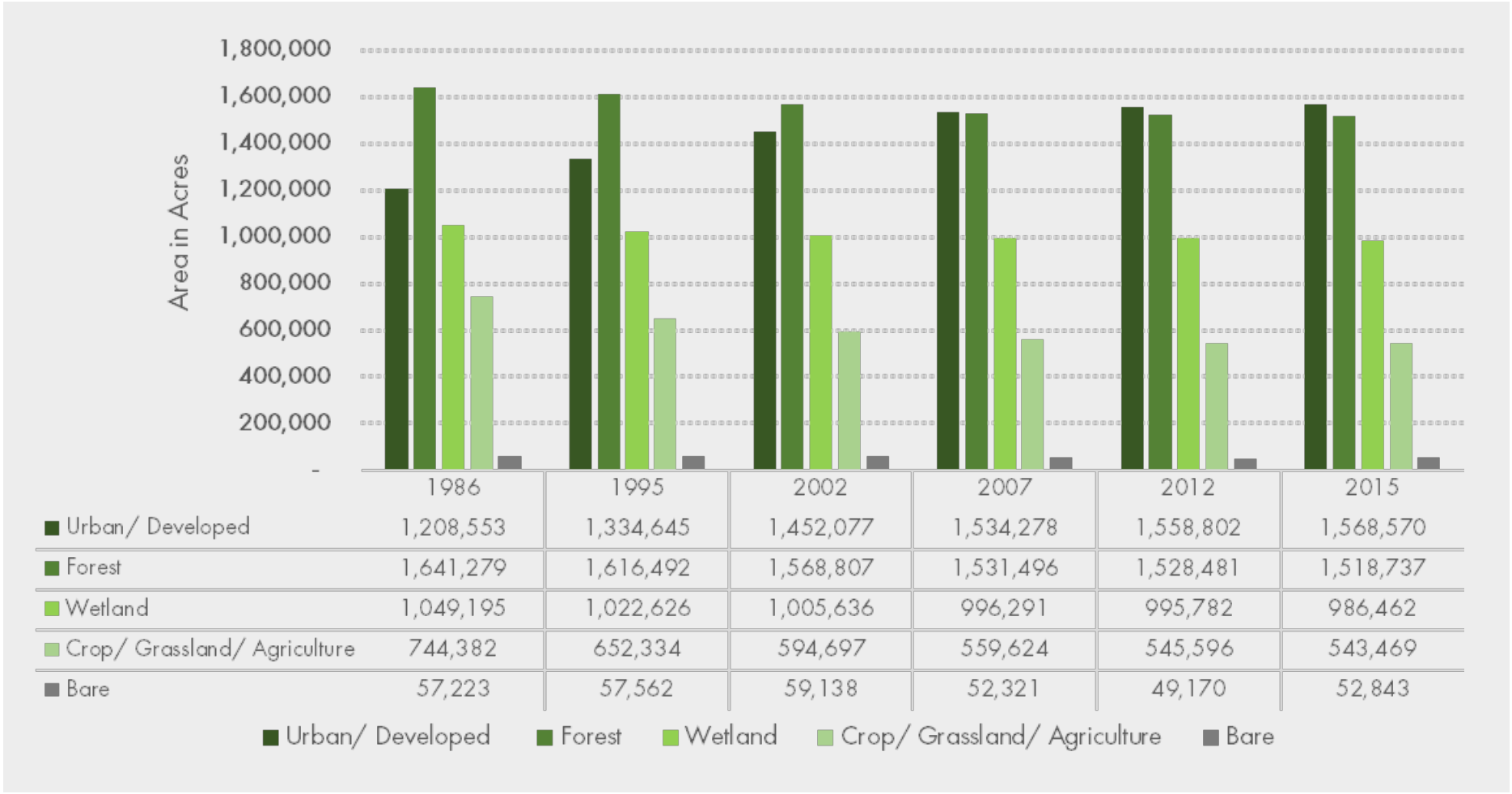


Sequestration



Where We Stand

New Jersey Land Use Trends 1986-2015



	1986	1995	2002	2007	2012	2015
Urban/ Developed	1,208,553	1,334,645	1,452,077	1,534,278	1,558,802	1,568,570
Forest	1,641,279	1,616,492	1,568,807	1,531,496	1,528,481	1,518,737
Wetland	1,049,195	1,022,626	1,005,636	996,291	995,782	986,462
Crop/ Grassland/ Agriculture	744,382	652,334	594,697	559,624	545,596	543,469
Bare	57,223	57,562	59,138	52,321	49,170	52,843

Carbon Gain Pathways

Reforestation

Avoided Conversion of Natural Lands

Salt Marsh and Sea Grass Restoration and Enhancement

Conservation Management of Agricultural Lands

Proactive Forest Management

Pathway 1: Reforestation

- Reforestation represents the biggest opportunity for carbon gain in the state.
- Variety of land types were considered for reforestation

Pathway 2: Avoided Conversion of Natural Lands

.2
MMT CO_2e

- Evaluates carbon storage that would be retained by eliminating forest loss to other land uses and grassland lost due to conversion to croplands.

Pathway 3: Salt Marsh and Sea Grass Restoration and Enhancement

- Salt Marshes and seagrass play a key role in storing carbon.
- New Jersey has an estimate 191,178 acres of blue carbon resources.
- Rising sea-levels will threaten these carbon sinks.
- More analysis is needed to quantify carbon gain from this pathway.

Pathway 4: Conservation Management of Agricultural Lands

- New Jersey has an estimate 411,000 acres of harvested cropland.
- This pathway evaluates carbon gain potential from the use of cover cropping and cropland nutrient management.

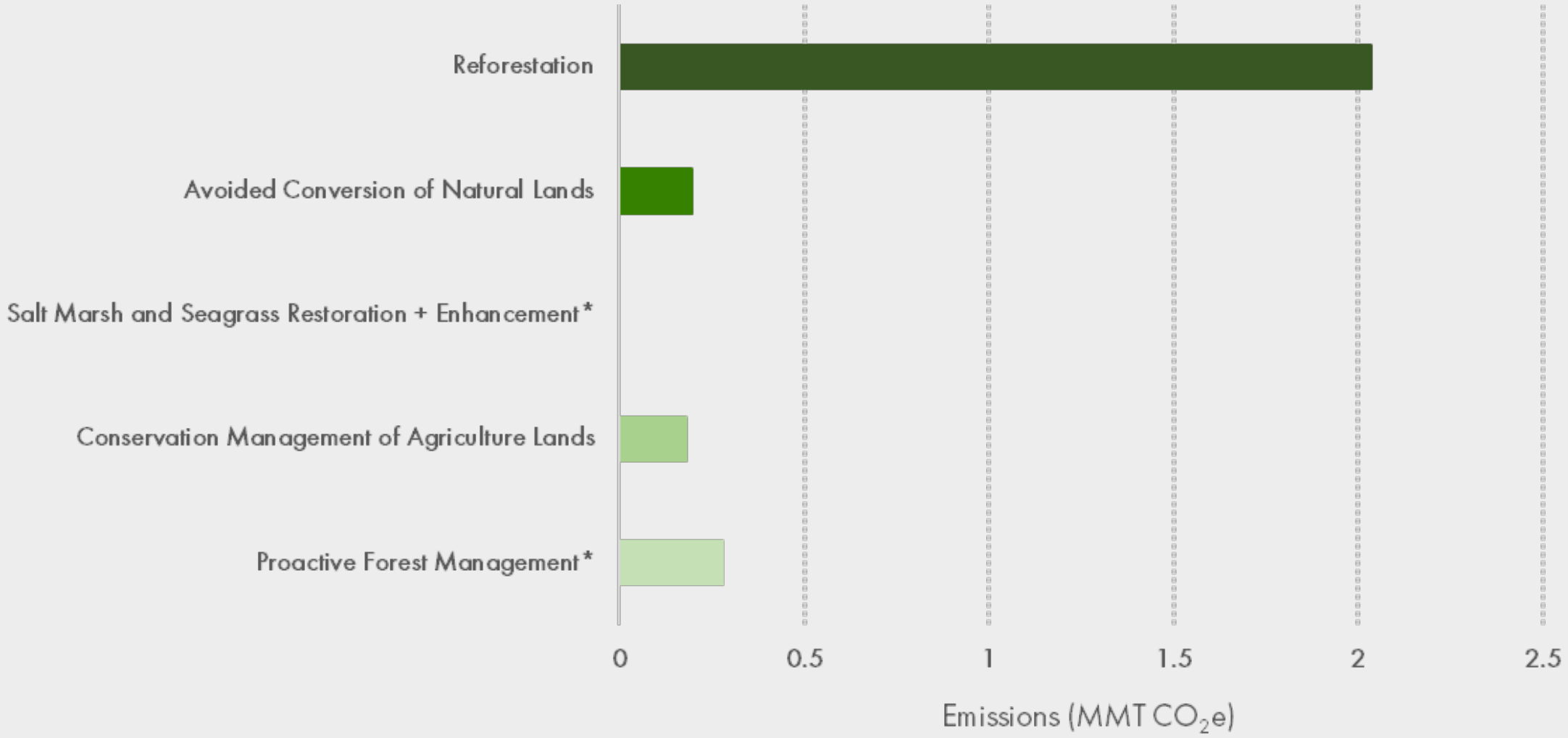
.2
MMT CO_2e

Pathway 5: Proactive Forest Management

- Only estimates carbon gain associated with planting trees in forest areas that are understocked.
- New Jersey's forest are at risk of becoming net emitters due to excessive density.
- More analysis is needed to quantify benefits from carbon defense activities.

.3
MMT CO_2e

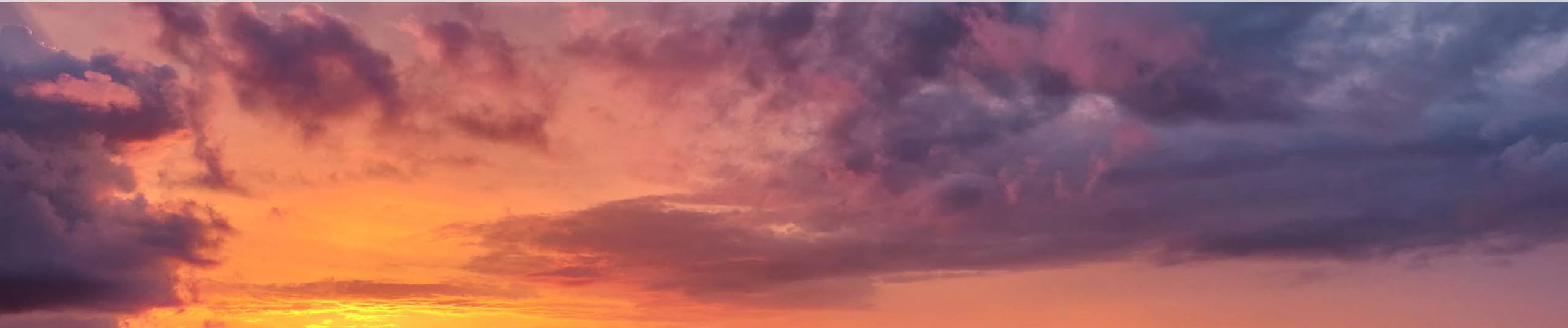
Carbon Gain Estimates



Recent State Actions

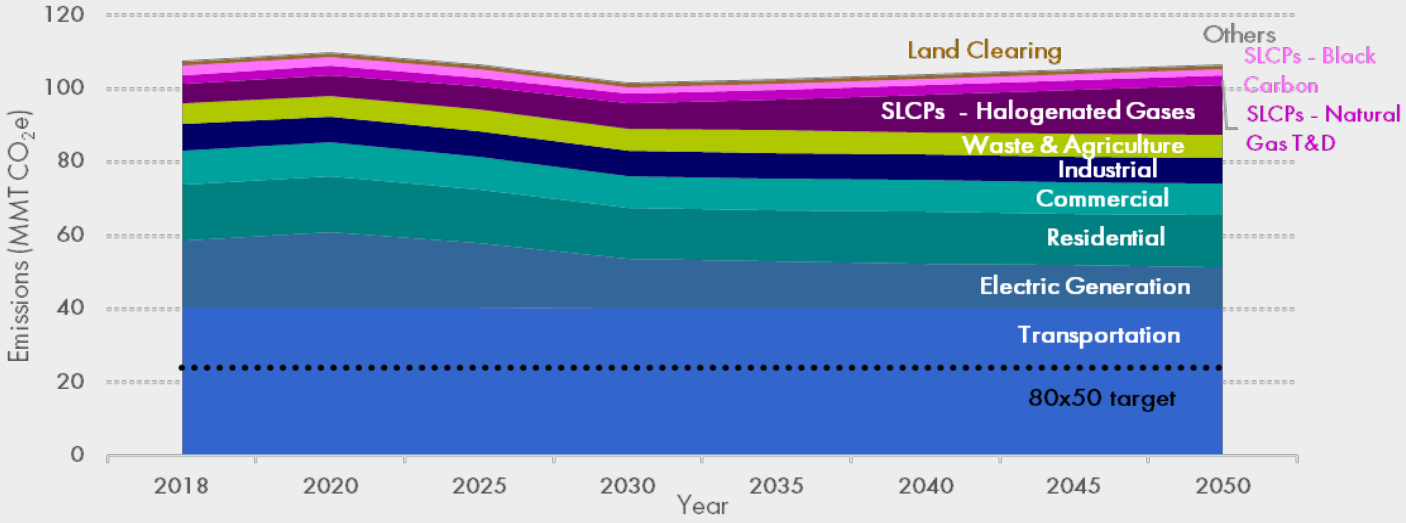
- Natural Working Land Strategy – focused on carbon sequestration and other environmental services

Conclusion

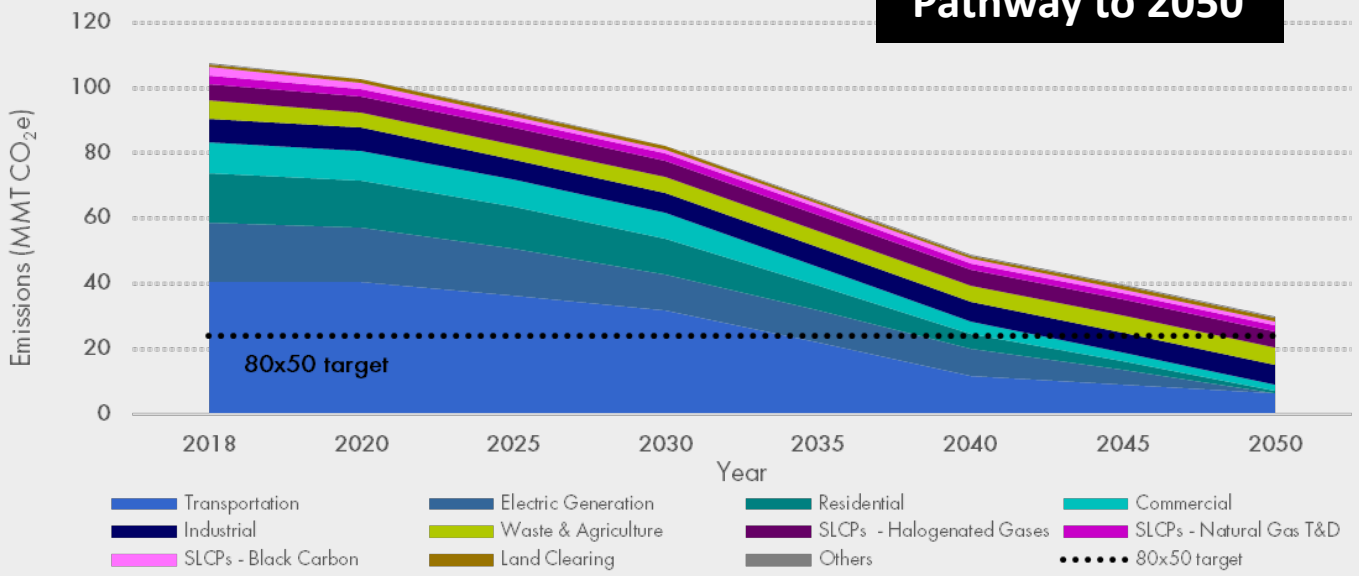


How it's going & where we need to be

Business-as-Usual



Pathway to 2050



How can you help?

- Make your next car purchase an EV
- Purchase electric appliances when its time to upgrade
  - Heat pumps (low GWP)
  - Electric Stoves
  - Electric/Solar Thermal Water Heaters
  - Electric Lawn Equipment
- Reduce your energy demand at home
  - Do a home energy audit
  - Insulate, insulate, insulate
  - Programmable Thermostat
  - Strategize remodeling to improve efficiency
- Consider rooftop Solar PV + battery storage technologies

Thank You

www.nj.gov/dep/climatechange/mitigation.html

Questions

Paul Orlando, Director of Division of Climate, Clean Energy & Radiation Protection

Bob Kettig, Assistant Director of Climate Change, Clean Energy & Sustainability

Helaine Barr, Supervisor in Bureau of Climate Change & Clean Energy