

Appendix 1

Anticipated Greenhouse Gas Emission Reductions Expected by 2020 from the Core Recommendations

As discussed in Chapter 2 of the State's final Global Warming Response Act Recommendation Report (hereafter referred to as the main report) three core recommendations, if fully successful and fully implemented on schedule, would enable the State to meet the statutory 2020 limit.

1. Much of the greenhouse gas (GHG) emission reduction necessary to meet the statewide 2020 GHG limit is expected to be accomplished through the implementation of New Jersey's Energy Master Plan (EMP). The chief goals of the EMP are to reduce projected energy use by 20 percent by 2020 and meet 22.5 percent of the State's electric needs with renewable energy sources by 2020. Based on the data and analysis in the EMP, this can be achieved with a combination of energy efficiency, conservation, and renewable energy resources.
2. New Jersey has implemented a cap-and-trade program developed through the Northeastern and Mid-Atlantic States' Regional Greenhouse Gas Initiative (RGGI) that imposes a cap on carbon dioxide (CO₂) emissions by electricity producers in the region. Specifically, RGGI caps regional power plant emissions at approximately current levels from 2009 through 2014 and then reduces those emissions 10 percent by 2018.
3. The State has adopted a Low Emission Vehicle (LEV) Program modeled after the California program. This program requires automakers to reduce fleetwide GHG emissions from the vehicles they sell in New Jersey 30 percent by 2016.

These 3 measures are listed and briefly described, and their approximate expected emission reductions are quantified, in Table A1.1. Note that these estimates are preliminary, and are subject to revision based on additional input. The total reduction, if all reductions shown in the table are fully successful and fully implemented on schedule, is approximately 38 million metric tons (MMT) of carbon dioxide equivalent (CO₂eq) below the estimated business-as-usual emission of 154 MMT CO₂eq. This reduction would result in statewide emissions of 116 MMT CO₂eq by 2020, which would allow the State to meet its Statewide 2020 limit of 123 MMT CO₂eq, (the estimated 1990 emission levels).

Additional reductions could be achieved by extending energy efficiency measures and implementing the other measures outlined in Chapter 3 of the main report. Long-term emission reductions sufficient to meet the 2050 limit, which is 80 percent below the 2006 GHG emissions level, will require more far-reaching measures.¹

¹ The estimated reductions in this Appendix are based on the State's first GHG inventory, which analyzed 2004 emissions. The state has completed the GHG inventory estimates for 2005, 2006 and 2007. Data show that differences between the 2004 and 2007 totals are not significant enough to warrant recalculation of the reduction estimates in this Appendix. The inventory reports are available at <http://www.nj.gov/globalwarming/>.

**Table A1.1: Anticipated 2020 GHG Reductions per Action, (MMT CO₂eq)
Preliminary estimates – subject to revision based on additional input**

Action	Discussion	Approximate GHG Reduction (MMT CO ₂ eq)
RGGI	RGGI caps carbon dioxide emissions from electricity producers in the region. Reductions attributable to RGGI are difficult to quantify at a statewide level because the RGGI limits are regional. For the purpose of estimating anticipated reductions by 2020, the emissions from NJ facilities covered by RGGI are considered to be equal to NJ's share of the total emission reductions attributable to RGGI.	8.5 ²
EMP	The EMP relies on many approaches to reduce energy use and to expand the State's renewable generation capacity. Measures include a Renewable Portfolio Standard (already in place), additional use of biofuels, and a variety of efficiency measures for existing and new buildings. Renewable energy sources are expected to generate over 18,000 gigawatt hours (GWh) of NJ's electricity by 2020, including over 2000 GWh from solar, over 6,700 GWh from biomass, and over 9,500 GWh from wind. This electricity is projected to come from growth in all renewable sectors, including development of offshore wind to a total of 3,000 megawatts capacity. It is assumed for this analysis that GHG emissions from wind and solar are essentially zero, and that emissions from biomass sources are equal to those from the combustion of biodiesel. A number of efforts are expected to result in increased energy efficiency. One effort is the expansion of capacity of on-site generation, which is expected to be based largely on combined heat and power units. On-site generation is expected to produce over 12,000 GWh per year of electricity by 2020. In addition to supplying electricity, combined heat and power units translate waste heat to useable thermal energy, which can displace fossil fuels. The EMP projects that, because of expanded renewable capacity and energy efficiency measures, the State will be a net exporter of electricity by 2020. Exported electricity has been factored into the total emissions quantity as a negative number, and would theoretically be balanced by additional emissions representing imported electricity into another state's inventory. The interrelationship of RGGI limits and projected exported electricity cannot be estimated with precision without knowing the state to which that electricity is exported, which is uncertain at this time.	19.4

² This reduction could be further increased if the following are taken into account: (a) reductions due to additional terrestrial sequestration (estimated at about 270,000 metric tons CO₂ annually) resulting from investment of RGGI auction proceeds on strategic management of state lands for forest and tidal marsh stewardship and restoration; (b) GHG reductions from energy efficiency, renewable energy and combined heat and power projects in the commercial, institutional, and industrial sectors, also funded by RGGI through the Economic Development Authority; and (c) GHG emissions reduction, avoided emissions, and carbon sequestration from local government grant projects likewise supported by RGGI proceeds (through the NJDEP) as directed by the Global Warming Solutions Fund law (N.J.S.A. 26:2C-50 *et seq.*).

LEV	The State implemented the New Jersey Low Emission Vehicle Program in 2009. This program, modeled after the California Low Emission Vehicle Program, requires automakers to reduce fleet-wide greenhouse gas emissions from the vehicles they sell in NJ 30 percent by 2016. Assuming that 1) VMT growth in the State will be in the range of 1 percent per year until 2020, and 2) NJ residents continue to acquire new vehicles at the current pace, overall GHGs emissions from the motor vehicle fleet are expected to be reduced by approximately 22 percent below what they otherwise would be by 2020.	10 ³
	Approximate total reduction if all reductions occur as listed above	37.9

³ As discussed in more detail in Chapter 2 of the main report, a federal motor vehicle control program was jointly proposed by the USEPA and the U.S. Department of Transportation on September 28, 2009. This federal rulemaking, if adopted, will be different than the State's Low Emission Vehicle Program. The State is in the process of evaluating the impact of the federal program on the State's assumptions regarding greenhouse gas reductions from new motor vehicle initiatives.