

Strategies for Using Renewable Resources to Reduce Greenhouse Gas Emissions from Electric Vehicles in the Northeast

Summary

This report released by the Northeast States for Coordinated Air Use Management (NESCAUM) examines how renewable resources can reduce the greenhouse gas emissions associated with electric vehicle recharging. The use of electric vehicles (EVs) is an important part of the overall strategy to reduce ozone levels in New England, New Jersey and New York. This report examines the implications of EV recharging in the Northeast for greenhouse gas emissions and examines the potential to use renewable resources in the utility grid to reduce these impacts.

The transportation sector currently accounts for 30 percent of anthropogenic carbon dioxide emissions in the United States. Under the current Northeast electricity grid, emissions associated with electric vehicle recharging are 10 percent lower than those from a standard internal combustion engine with 30 mile per gallon fuel efficiency. More significant reductions in greenhouse gas emissions from the transportation sector can be obtained from the expanded use of electric vehicles charged by renewable resources in the Northeast utility grid. Electric vehicles charged with non-combustion renewable resources offer the greatest greenhouse gas benefits among all transportation fuels.

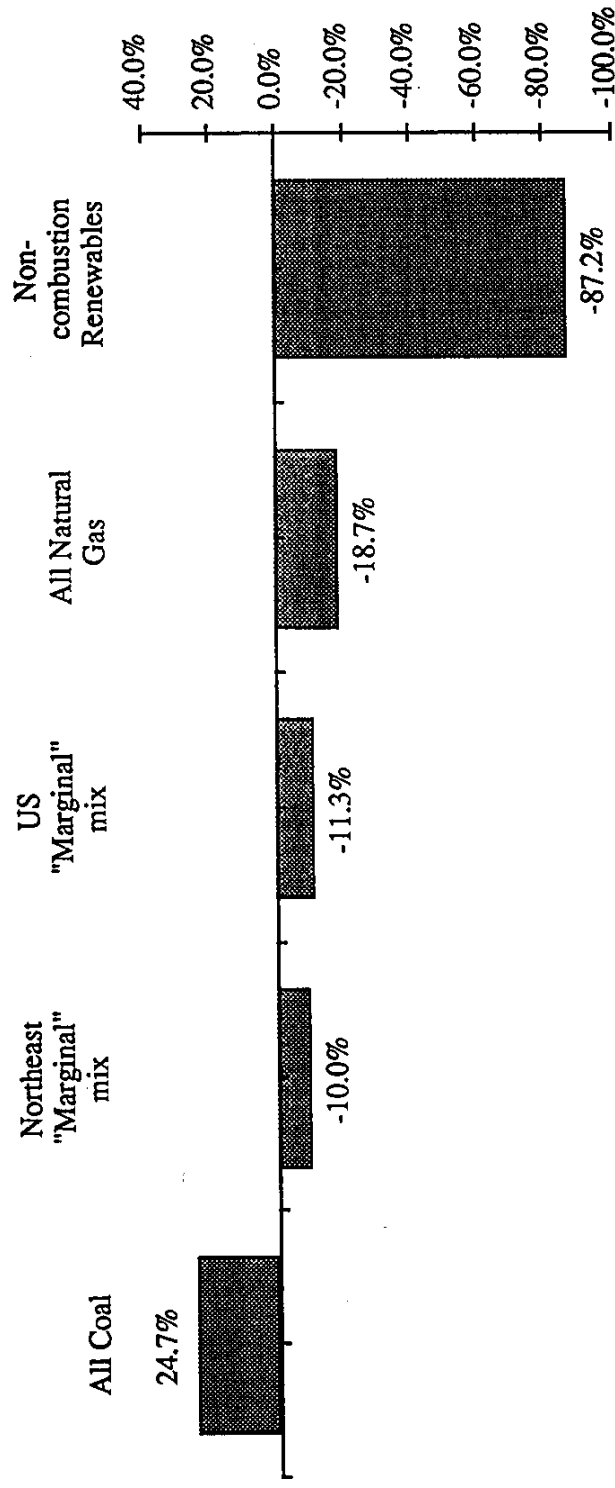
The report finds that the capacity potential of renewable resources in this region is well suited to meeting the charging requirements for electric vehicles. The near-term viability of both EVs in niche markets and increasing renewable energy constitute two important strategies for environmental enhancement in the Northeast. This report suggests that cost-effective renewable supply options can be developed in the Northeast in the near-term, with additional opportunities for the mid- and long-term. The results of a "green" Request for Proposals released recently by New England Electric System (NEES) confirm this conclusion. NEES has procured 36 MW of new capacity entirely from renewable resources, including wind energy, landfill derived methane waste-to-energy and heat waste at costs competitive with utility prices. Mid- and long-term renewable supply options include an expanded role for each of these technologies, as well as the increased use of small-scale hydropower, biomass, and photovoltaics.

The rate at which EVs are to be introduced into the region with the adoption of the California LEV program constitutes a reasonable rate for increasing the contribution of renewable resources to the region's electricity supply. Many renewable resource technologies are competitive with current conventional electric generating technologies. It is reasonable to expect that their use can expand over the next twenty to thirty years concurrent with the expansion of EVs in the region.

A variety of policy and technological initiatives must be implemented to ensure that this goal is met. The report discusses some of the most promising strategies for advancing the expanded development of regional renewable resources. These pertain to several aspects of implementation, including policy, technical and educational initiatives.

The benefits of using renewable resources to charge electric vehicles include environmental benefits, the value of a more diverse energy base for the northeast region which fully takes advantage of domestic resources, and reduced dependence on imported oil. These benefits can be translated into economic values through increases in the marketability of renewable supply technologies and improvements in the economic competitiveness of the region.

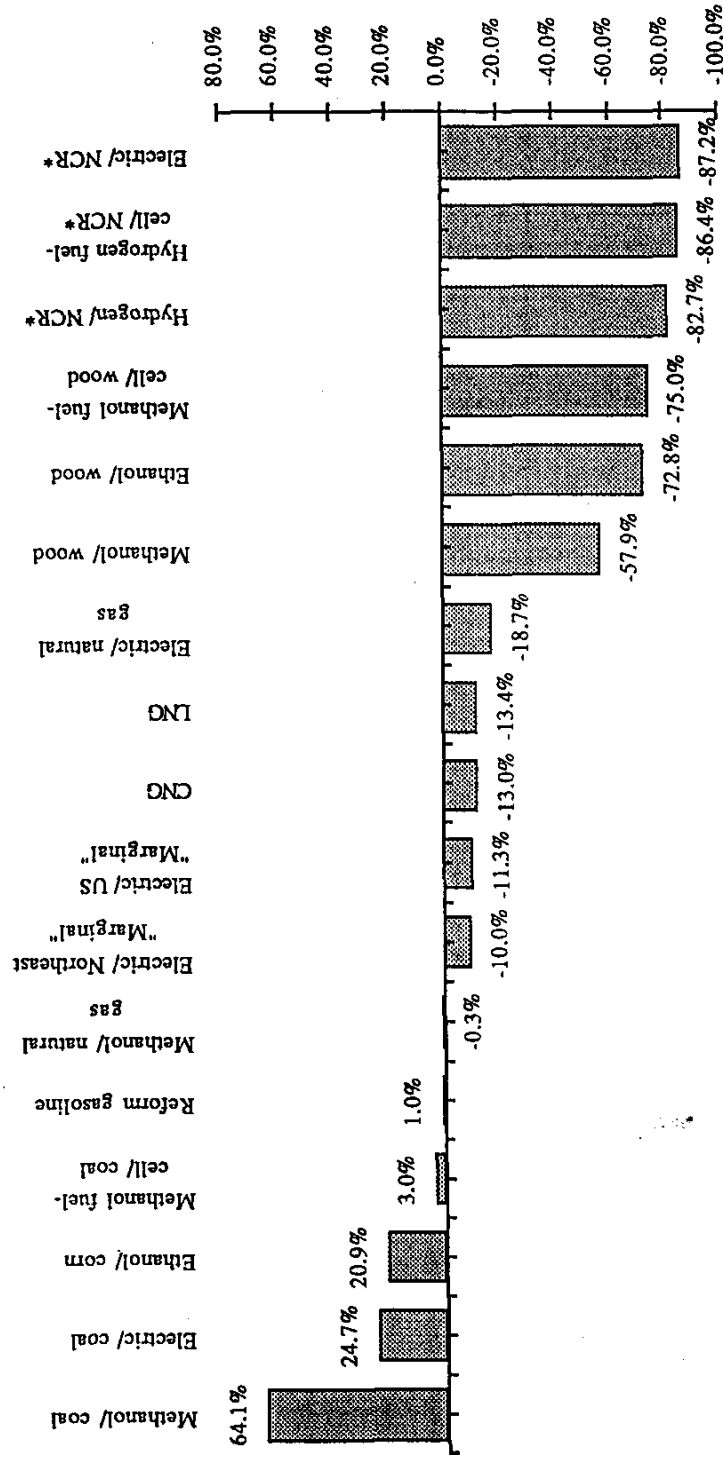
Chart ES.1--Greenhouse Gas Impact of Electric Vehicles with Different Generating Mixes



Grams/mile % difference relative to 30 mpg standard gasoline car

Source: Argonne National Laboratories

Chart ES.2--Greenhouse Gas Impact of Alternative Fuels



Grams/mile % difference relative to standard 30-mpg gasoline car

See explanatory notes in text for discussion of criteria used to evaluate emissions

*Non-combustion renewable technologies

Source: Argonne National Laboratories