ACCELERATING DEEP DECARBONIZATION IN THE U.S. TRANSPORTATION SECTOR

EXECUTIVE SUMMARY

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The Challenge

Transportation is the largest greenhouse gas (GHG)-emitting sector in the US, accounting for 28 percent of total greenhouse gas emissions and 37 percent of energy related CO_2 emissions.[1] The sector is also a major contributor to conventional air pollution, which is concentrated in low-income communities and communities of color, often as a result of historical inequities and policy decisions. The technology to dramatically reduce emissions is available in the form of electric vehicles (EVs). But while electric vehicle sales have increased, growth in deployment is being held back by the higher initial purchase price of EVs, lack of consumer awareness, and supply side issues of inadequate numbers of EV models. Likewise, electrification of trucks has also lagged. Efforts to achieve zero carbon in the transportation sector will also have to address airplane travel, which accounts for roughly 10 percent of the transportation GHG emissions in the U.S. Significant replacement of liquid petroleum-derived jet fuel and shipping fuels will depend on achieving large volumes of sustainable biofuels, or transitioning to low energy density fuels like hydrogen.

The Solution

Electrify Surface Transportation

The most compelling strategy for deep GHG emissions reductions in this sector is accelerating the electrification of cars, trucks, buses, and other vehicles. This can be done through the implementation of GHG performance standards and sales requirements, expansion of incentives, and investments in charging and fueling infrastructure. The ultimate goal is switching all light duty vehicles and most trucks from fossil fuel combustion (i.e., gasoline and diesel) to electric propulsion (i.e., battery, plug-in hybrid, and hydrogen fuel cell electric vehicles). Over the longer term (to 2040), the net costs of transitioning to electric road vehicles is less than 1 percent of staying on our current path given what consumers and businesses would otherwise be paying for gasoline and diesel vehicles and fuels. Net cost increases will be slightly higher over the next 5-10 years, but in about 10 years or so, assuming rapid scale-up, the overall costs will be substantially lower. Indeed, the savings to consumers would steadily increase (on a total cost of ownership basis), because of lower energy and maintenance costs, more than offsetting the initially higher (but declining) purchase cost of the vehicles.

Low-income communities and communities of color, which now often suffer from higher levels

of pollution, would see important improvements in local air quality as a result of the transition to zero emission cars, trucks, and buses. Because buyers of new vehicles, including EVs, tend to be more affluent, an important component of this strategy will be policies that support EV purchases, including used EVs, by low-income communities and communities of color.

Reduction in Vehicle Use

A second compelling strategy is reducing automobile use. Not only would this reduce carbon emissions and air pollution but it would bring about large economic, health, land use, and social equity co-benefits when alternative transportation is provided and enhanced, thus increasing access to health, education, jobs, and other services for the mobility disadvantaged. While most of the needed policies affecting mode choices are the prerogative of state, regional, and local governments, the federal government does retain a very important role: through legislation and funding, it can empower and support state and local efforts to reduce single-occupant vehicle use and increase the use of less carbon-intense mobility.

Intercity Travel

While decarbonization of daily travel within communities and metropolitan areas is critically important, approximately 30 percent of passenger miles travelled are estimated to be between cities. The use of petroleum fuels for trip lengths less than 400 miles should be minimized if not completely eliminated, for example, by switching to other modes such as rail and electric vehicles, and perhaps over time to electric planes. For air trips over 400 miles, low-carbon biofuels and perhaps renewable hydrogen should replace petroleum fuels.

The transportation decarbonization pathway must also include low-carbon mobility opportunities for rural communities, including car-dependent low-income populations and an aging population. In addition to personal vehicle transportation, rural microtransit services, inter-city public transit route expansion, and increased availability of rural broadband internet and cellular data to promote telecommuting and telemedicine can provide additional benefits to rural populations and reduce the need to travel longer distances to obtain services.

Policy Recommendations

Here are the top priority policies to reduce emissions from the transport sector:

- Rapidly increase the sales of ZEVs by implementing the following:
    - National ZEV sales requirements for cars
    - National ZEV sales and fleet purchase requirements for trucks
    - Incentives for ZEV vehicle purchases and ZEV infrastructure
- Tighten fuel economy/GHG standards for all new cars and trucks
- Adopt national low-carbon fuel standard covering all fuels for road vehicles and airplanes
- Reduce dependence on automobile travel while increasing access for walking, bicycling, new micro mobility modes, telecommunications, transit, pooled ride-hailing services, and other low carbon choices, especially for disadvantaged travelers by:

    - Shifting federal transportation or stimulus funding from new highway capacity and lane expansions to bicycle, and pedestrian infrastructure and new micro- mobility modes; transit in dense areas; and public-private partnerships between transit operators and ride-hailing providers.
    - Supporting local and state actions to increase low-carbon travel and investments, reduce single-occupant vehicle use, and transit-oriented development.
    - Adopt vehicle use fees and pricing policies to provide incentives and fund low-carbon alternatives.

- Support low-carbon biofuels for aviation, ships, and long haul trucks
- Support local policies that increase the use of automation for electric, pooled vehicles to reduce vehicle use, provide low-cost accessibility to mobility disadvantaged travelers, reduce the cost of travel to individuals and society, and sharply reduce the amount of land devoted to transportation.

Outcomes

Decarbonization of transportation will not only reduce GHG emissions, but also curb urban air pollution that disproportionately impacts low-income communities and people and communities of color. An equitable transportation decarbonization pathway will also address the needs of individuals in communities underserved by the transportation system as well as those overburdened by transportation pollution. Over the long term, decarbonization of this sector will bring about significant economic savings, improved health, and more livable communities.

References

1. "Sources Of Greenhouse Gas Emissions | US EPA". 2020. US EPA. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.; "Frequently Asked Questions (Faqs) - U.S. Energy Information Administration (EIA)". 2020. Eia.Gov. https://www.eia.gov/tools/faqs/faq.php?id=75&t=11.