CLIMATE ACTION IN NEW MEXICO

PATHWAYS TO DECARBONIZING TRANSPORTATION

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INTRODUCTION

To stave off the worst effects of the climate crisis, New Mexico must transition its vehicle fleet off of fossil fuels and towards those that use electricity and clean fuels. Accomplishing this relies on the widespread adoption of electric vehicles, for both passenger cars and trucks, over the next two decades. For trucking and aviation applications that remain too costly or technically infeasible to electrify, biofuels, hydrogen, and synthetic fuels play a role. Smart investments in public transit, pedestrian, and biking infrastructure are also a valuable tool for reducing additional load on the electricity system and improving equitable access to mobility options. These strategies carry the co-benefits of reducing local air pollution (and its associated health consequences), driving down electricity rates, and cutting household fuel costs. Policies must ensure that these benefits are distributed equitably, acknowledging that the burdens of fossil fuel-powered transportation have disproportionately fallen on New Mexico’s low-income families, tribal communities, and communities of color.

METHODOLOGY

This brief is based on modeling of New Mexico’s energy system conducted by Evolved Energy Research using the EnergyPATHWAYS tool and the Regional Investment and Operations (RIO) platform. These models use input assumptions about policy decisions, fuel price forecasts, technology costs, and technology performance to output a least-cost representation of the energy system under a set of carbon-emissions constraints. This analysis compares four scenarios: a Reference case, which is not required to meet carbon emission reductions beyond business as usual, and three Decarbonization pathways which achieve the state’s goal of net-zero greenhouse gas (GHG) emissions by 2050 and 50 percent emissions reductions by 2030 relative to 2005.

3 The Governor had previously signed an Executive Order in 2019 that set a target of 45 percent emissions reductions by 2030 relative to 2005, though this was modeled at 50 percent. The state’s net-zero goal was announced by Governor Lujan Grisham in 2021 and is expected to be codified in the January 2022 legislative session.
POLICY RECOMMENDATIONS

1. **Adopt a zero- and low-emission vehicle (LEV/ZEV) standard with strong post-2026 targets. Adopt clean truck rules for medium- and heavy-duty trucking. Complement standards with EV charging infrastructure investments.**

   New Mexico should join other Advanced Clean Car states to require increasing zero-emission vehicle (ZEV) sales to 100 percent by 2035. Based on the modeling, New Mexico should aim to cumulatively sell at least a little under 190,000 electric passenger cars over the next eight years leading up to by 2030. Performance standards that set emissions limits on passenger cars accelerate the growth of the ZEV market by incentivizing manufacturers to sell electric models in New Mexico. By joining the 17 other states that have already adopted or are considering ZEV and LEV standards, New Mexico can drive down transportation emissions while increasing residents’ access to the most affordable, efficient, and innovative electric models on the market.

   To reduce the climate and health impacts of trucking emissions, New Mexico should also adopt the Advanced Clean Truck (ACT) and Heavy-Duty Omnibus rules as allowed under the Clean Air Act. The ACT rules would require truck makers to increase sales of zero-emissions trucks (instead of those that run on diesel and gasoline) to 30-50 percent of sales by 2030 and 40-75 percent of sales by 2035. The Omnibus rule would set new criteria pollutant standards for conventional trucks. Together, these rules would result in significant public health benefits by replacing the oldest, most-polluting vehicles on the road today. These benefits should accrue fastest for communities along highway corridors and in areas with high ozone pollution, such as Albuquerque and the southwest corner of the state. Policies can maximize these benefits by prohibiting diesel idling, directing electrification investments to regions with high pollution burdens, and incentivizing shifting freight shipping to rail where feasible.

   Charging infrastructure policies and incentives should be pursued simultaneously to complement these rules. These should be supported by expanded utility charging investments and the utilization of federal funds, including the 38 million dollars authorized for New Mexico by the Infrastructure Investment and Jobs Act of 2021.

2. **Design public charging infrastructure and EV purchase support programs for low-income households.**

   The distribution of EV registrations indicates that EV adoption happens faster across high-income communities than low- and moderate-income communities. To access the cost savings of an EV, a household must be able to first make the upfront investment of purchasing one. They also need

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consistent and convenient access to vehicle charging. Policies that provide upfront financial support for low income households purchasing an EV and that increase charger availability in multi-family and rental units, including those in rural areas, can help better distribute the benefits of EVs to more New Mexico families. Where these chargers are sited should be rooted in community outreach. Similarly, programs and incentives should be created to empower small businesses to convert their cars and trucks to electric models. 

3. Invest federal and state funds in strategies to reduce vehicle miles traveled (VMT), including expanding electrified transit, low-no fare public transit, freight shipping by rail, and pedestrian and biking infrastructure.

Though New Mexico is home to large rural areas, most of the population lives in cities and towns. Expanding equitable transit options — and their attractiveness relative to single-occupancy vehicles — increases mobility-limited households’ access to affordable transportation while reducing tailpipe air pollution. This is especially true for low-income households, which typically have lower rates of car ownership and longer commute distances. State planning capacity should support municipal governments in land-use and zoning decisions that increase density and reduce vehicle reliance in favor of walking-, biking-, and transit-friendly communities.

In addition to the state’s record budget surplus in 2021, New Mexico is slated to receive over 3 billion dollars for transportation from the Infrastructure Investment and Jobs Act of 2021. Those funds should prioritize improving and fixing transit, bike and pedestrian infrastructure before building any new roads. For example, this funding can support the electrification of city and school buses to increase the availability of low-carbon transit options. These investments should be coupled with the creation of commuter incentive programs to ensure these options are affordable for low-income residents. Transit investments should be built upon community participation and, where possible, expanded to reach rural populations in addition to the urban communities that they traditionally serve.

4. If adopted, a low carbon fuel standard should ensure all utility revenue is required to benefit customers and electrification.

The state is set to consider a low carbon fuel standard in the upcoming legislative session. If adopted, such a standard can facilitate investments in charging infrastructure and provide incentives for EV purchases, if all funds from utility credit sales are required to benefit customers and electrification.

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ANALYSIS

Transportation emissions must reach a turning point in the next decade. In the Reference scenario, transportation-related emissions are expected to stay roughly flat in the near-term before rising again after 2040, as fuel efficiency gains are offset by increased demand for heavy-duty and long-haul trucking. In the Core decarbonization scenario, these emissions must instead decrease at least 20 percent by 2030 in order to stay on track to net-zero emissions by 2050 (Figure 1).

The key to decarbonizing the transportation sector is electrification: replacing internal combustion engines (ICE) powered by gasoline and diesel with batteries charged with clean electricity. This means that the market for electric vehicles, especially light-duty vehicles, must grow exponentially. Under the Reference scenario, ZEV sales do not reach sufficient market penetration; even by 2050, the proportion of light-duty vehicle sales that are for zero-emissions vehicles tops out at 20 percent, and heavy duty vehicles do not transition (Figure 2). In the Core scenario, this transition happens rapidly: light-duty ZEV sales reach 22 percent by 2025, 56 percent by 2030, and 100 percent as early as 2044. This transformation happens a few years later for medium- and heavy-duty vehicles, which reach 21-22 percent ZEV sales by 2030, and 100 percent of sales as early as 2046.

Increasing consumer demand for ZEV will depend in part on increasing electric model availability, purchasing incentives, and expanding public charging infrastructure. A report from Physicians, Scientists, and Engineers for Healthy

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Energy finds that charging stations in New Mexico are primarily concentrated in urban areas and along highway corridors (Figure 3). To achieve full electrification of the vehicle fleet, investments in charging infrastructure will need to target rural areas and tribal lands, where public transit access is limited and fuel cost burdens are often highest. Similarly, programs should empower low-income households to switch to electric models through financing assistance mechanisms, such as point-of-sale rebates.

**FIGURE 2.** Percent of vehicle sales that are for zero-emissions vehicles under Reference and Core scenarios.
FIGURE 3. Public electric vehicle charging stations and demographic index in New Mexico, Albuquerque, and Santa Fe. Each dot represents an electric vehicle charging station, while the bubble size reflects the number of charging outlets per station. Charging stations are largely located in urban areas and along interstate highways, but are limited in many rural areas and on public lands.\textsuperscript{10}

Under the Core decarbonization scenario, the modelling projects that nearly all sales for ‘zero emissions’ light-duty vehicles are for battery electric vehicles (BEV) (Figure 4) over the next three decades\textsuperscript{11}. Electric and hydrogen fuel cell (HFC) options for heavy-duty trucks are constrained in the near-term, but adoption accelerates after the 2030s, when technologies are projected to be more widely available. By 2050, the Core case shows a modest role for HFCs, which represent 22 percent of medium- and heavy-duty vehicle sales but remain outnumbered 3-to-1 by battery sales (Figure 4). Given that heavy duty trucking represents a significant source of both GHG and NO\textsubscript{x} emissions, accelerating zero-emissions options for heavy duty trucking should be a priority for minimizing air pollution impacts on New Mexicans’ health, in addition to decarbonization efforts.


\textsuperscript{11} I.e., 99 percent of all light duty vehicle sales.
Additional clean fuels will be needed for the hardest-to-abate transportation applications. In the Core case, electricity from renewable energy meets half of the overall energy demand of the transportation sector by 2050, up from 3 percent in 2030 (Figure 4). However, for some medium- and heavy-duty trucking applications, electrification may remain technologically and economically challenging. The model predicts that, for these applications, fossil fuels can be replaced by the measured use of zero-to-low carbon and carbon-neutral fuels, such as biofuels and synthetic fuels. Synthetic fuels, labeled as “power-to-liquids” in Figure 5, are produced from green hydrogen, captured CO₂, and clean electricity. These fuels must be accompanied with the right measures to manage their risks, including continued on-road air pollution and upstream emissions leakage.

To be considered truly “zero-carbon”, hydrogen for fuel cells and synthetic fuel production must be generated from fully renewable-powered electrolyzers. Hydrogen produced from fossil gas with carbon capture and sequestration carries the risk that lifecycle methane emissions will undermine any GHG reduction benefits. Notably, a “zero-carbon” product is not “zero-emissions”, and any hydrogen transport or combustion must be accompanied by infrastructure to mitigate hydrogen leakage and NOₓ emissions. Similarly, for biofuels to be considered truly “carbon-neutral”, they must be sourced from certified sustainable biomass feedstocks. Even with these production constraints, the combustion of any fuel must be accompanied by efforts to eliminate harmful air pollution impacts on overburdened communities, particularly along highway corridors and heavy-duty trucking routes. Further research and development will be essential to understanding and mitigating the risks of these new technologies, while scaling them to meet increasing demands for low-carbon fuels.
Accelerate power sector decarbonization to ensure that increased load is met by clean electricity. Because electric vehicles are more energy efficient than internal combustion engine vehicles, the overall energy footprint of the clean vehicle fleet in 2050 is two-thirds of that of the gasoline-powered fleet of the Reference case (Figure 5). This is true even as vehicle miles traveled (VMT) are projected to increase. However, as more electric vehicle chargers, batteries, and equipment in other sectors are added to the grid, the load on the electricity system will more than double by 2050. This underscores the importance of transitioning the power sector to clean energy to ensure that additional load from the transportation sector is met with carbon-free electricity.  

Reduce peak demands on the system through load flexibility and transit investments. Investments in demand reduction can alleviate the level of clean energy infrastructure buildout needed to meet additional load from transportation. Expanding public transit, pedestrian, and biking infrastructure reduces VMT by providing mobility alternatives, especially in urban areas. Load shifting — during which vehicles charge during off-peak hours or

12 For details about decarbonizing New Mexico’s power sector, see the Electricity sector brief.
during periods of excess renewable generation — also reduces electricity load during periods of peak demand. Policies such as strategic utility rate design can incentivize load shifting and improve overall grid operations. Demand for synthetic fuel production can also be managed by diverting freight trucking to rail where feasible.

**Reduce VMT through rail, transit, bike and pedestrian investments.** By maximizing these demand reduction strategies, the Low Demand scenario shows that the energy footprint of transportation can fall another 20 percent relative to the Core scenario, representing 55 percent less energy use compared to the Reference case by 2050 (Figure 5). The Low Demand scenario also shows the highest reductions in per capita transportation costs for New Mexicans (Figure 6).

**FIGURE 6.** Personal travel-related transportation costs per driver per year. Though costs decline on average, there may be significant variance between the cost burdens — or fractions of income spent on transportation — experienced by individuals of different income levels. This highlights the importance of policies that ensure equitable access to zero emissions transportation.
## Reference
No emissions reductions required; **does not meet net-zero goals.** Business as usual assumptions based on existing policy and market conditions.

**For transportation:** Minimal electrification. Vehicle use grows by 38 percent and aviation increases by 89 percent by 2050 from today’s levels.

### Core
**Principal decarbonization scenario** upon which other scenarios are built. Meets 2030 and 2050 goals through ambitious but practical demand- and supply-side transformations to achieve the most cost-effective energy supply portfolio. Relies on rapid electricity decarbonization before 2030 and electrification of end-use applications and a limited deployment of low-carbon fuels by 2050.

**For transportation:** Vehicle electrification accelerates at the optimal pace to meet 2050 net-zero target, based on Evolved’s analysis. Vehicle miles travelled increase by 38 percent and aviation miles increase by 89 percent by 2050 from today’s levels due to growth not offset by efficiency.

### Low Demand
Built upon the Core scenario, but designed to assess the benefits of **reducing demand through increased energy efficiency measures** (including existing home retrofits, public transit infrastructure buildout, and reduced heavy-duty vehicle and aviation use).

**For transportation:** Transportation energy demand is lower than in the Core case. Light-duty vehicle miles travelled decline by 10 percent, heavy-duty VMT increases by 10 percent, and aviation miles increase by 50 percent by 2050, compared to today’s levels.

### Fossil Free
Built upon the Core scenario, but **designed to achieve zero fossil fuel production and use** across the United States by 2050. Given that this is a more limiting constraint than the state’s net-zero target, this scenario is not an “apples-to-apples” comparison with the other scenarios but rather one to provide insight into the state relying solely on wind, solar, hydropower, and geothermal as resources to decarbonize the power sector.

**For transportation:** Same as Core.