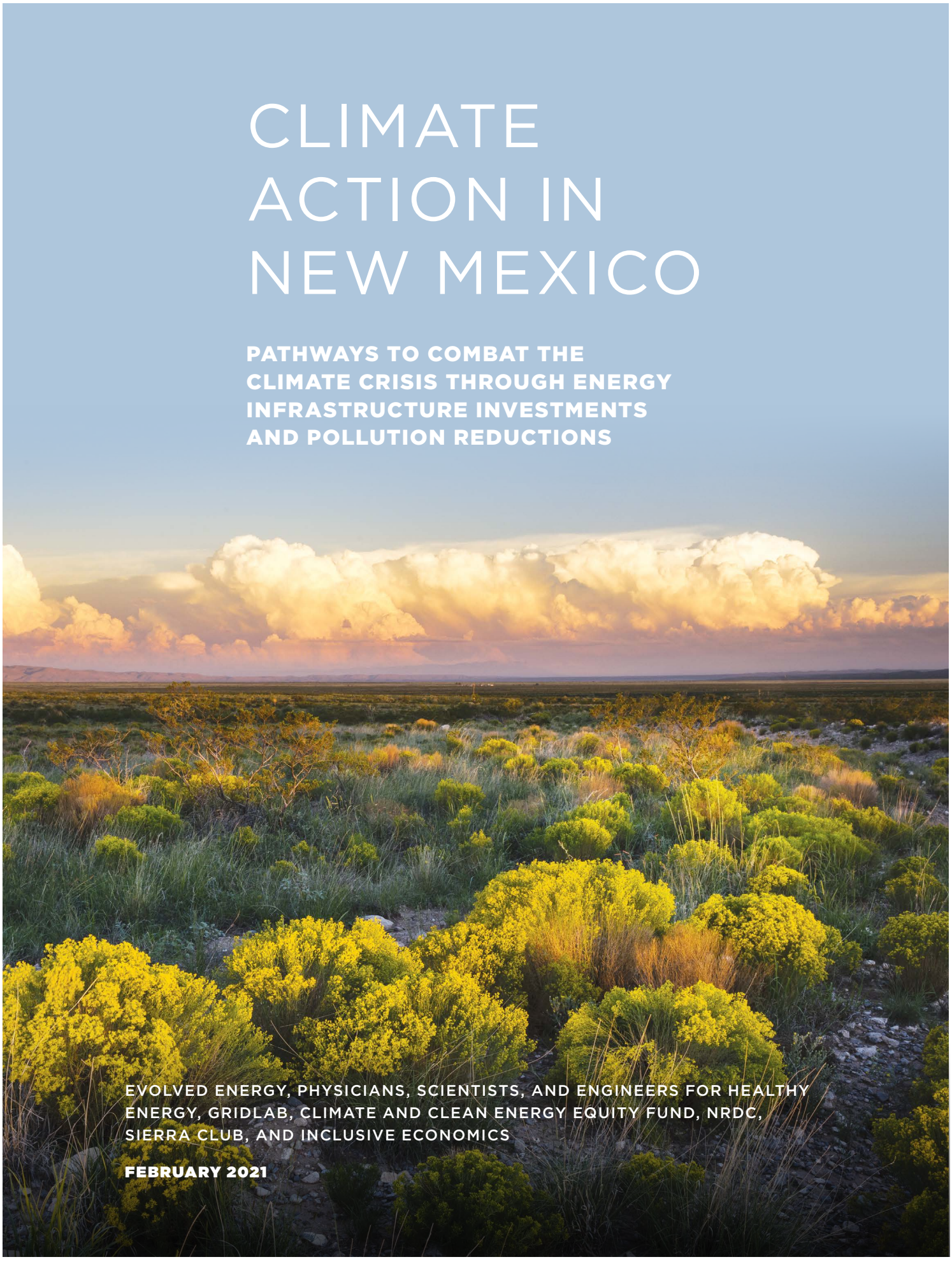
CLIMATE ACTION IN NEW MEXICO

PATHWAYS TO COMBAT THE CLIMATE CRISIS THROUGH ENERGY INFRASTRUCTURE INVESTMENTS AND POLLUTION REDUCTIONS



EVOLVED ENERGY, PHYSICIANS, SCIENTISTS, AND ENGINEERS FOR HEALTHY ENERGY, GRIDLAB, CLIMATE AND CLEAN ENERGY EQUITY FUND, NRDC, SIERRA CLUB, AND INCLUSIVE ECONOMICS

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New Mexico is already experiencing the impacts of climate change through more frequent extreme heat days, worsening drought and diminished snowpack, and devastating wildfires. Meanwhile, New Mexicans are suffering from the devastating public health and economic consequences of the COVID-19 pandemic, compounded by long-standing economic and racial inequality. The state's energy workforce, a cornerstone of the state economy, has also taken a hit because of the volatility of the oil market.

We need immediate, decisive action from state, local, and federal policymakers to build a just and equitable clean energy economy, reduce harmful air pollution, and cut greenhouse gas emissions to avoid the worst impacts of climate change. New Mexico leaders have signaled their commitment to climate action through the clean electricity targets in the Energy Transition Act and Governor Grisham's Executive Order 2019-003 establishing a state-wide greenhouse gas emissions reduction target. Now, as the 2021 legislative session begins, is the time to take the next steps to build out clean energy resources and infrastructure, diversify the economy, create family-supporting jobs, and ensure near-term emissions and pollution reductions to achieve the state's goals.

1 For more details on Evolved's and PSE's methodologies, see *Committing to Climate Action: Equitable Pathways for Meeting Colorado's Climate Goals*. https://gridlab.org/wp-content/uploads/2020/10/GridLab_Colo-Clean-Energy-Economy.pdf

2 PSE's work on health, equity, and decarbonization in New Mexico is available here: https://www.psehealthyenergy.org/our-work/western-states-deep-decarbonization/new-mexico/

METHODOLOGY

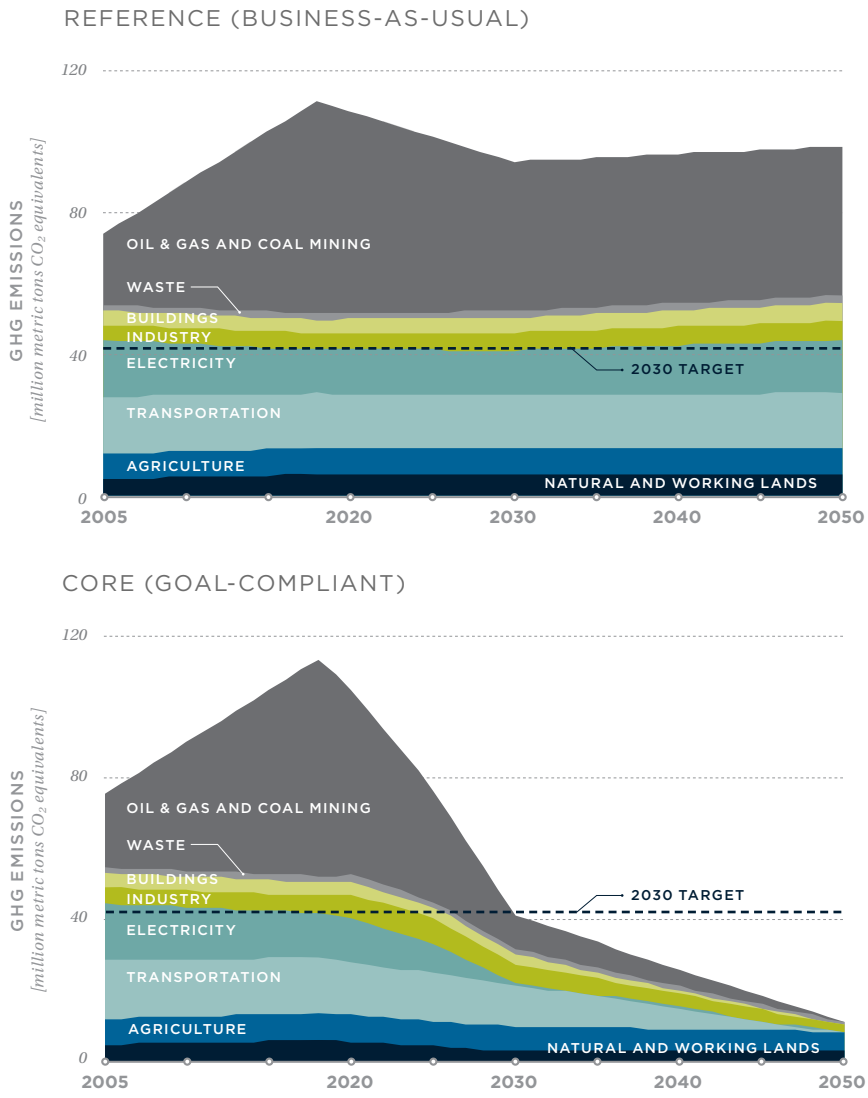
The Sierra Club, GridLab, the Climate and Clean Energy Equity Fund, and NRDC worked with Evolved Energy Research (Evolved) and Physicians, Scientists, and Engineers for Healthy Energy (PSE) to study pathways to achieve New Mexico's climate goals. Evolved modeled the energy system transformation required to cut greenhouse gas pollution, and PSE modeled the distributional effects of pollution and energy costs in the decarbonization pathways.[1] This brief summarizes major results from Evolved's modeling and includes a short summary of a few key initial takeaways from PSE's analysis.[2] The transformation required to effectively decarbonize the state's economy will shift and create job opportunities across the state. Forthcoming analysis from Inclusive Economics will explore the economic and employment impacts associated with this transition and make recommendations for high-road, inclusive workforce development and a just transition.

Our analysis includes a Reference (or business-as-usual) scenario, which does not include any limits on greenhouse gas pollution, and a Core Decarbonization scenario, in which New Mexico must achieve a 45 percent reduction in economy-wide greenhouse gas emissions from 2005 levels by 2030 and net-zero greenhouse gas emissions from the energy system by 2050. The modeled 2030 requirement assumes emissions reductions from natural and working lands, waste processing, and agriculture, which are not well represented in Evolved's models. The modeled 2050 requirement does not include these sectors, though the state will also need to achieve significant emissions reductions from these sources as part of comprehensive climate policy.

We also analyzed three decarbonization sensitivities, one of which is included in this brief. The Energy Efficiency sensitivity, discussed here, includes 1) lower building energy demand from more ambitious energy efficiency measures, 2) reductions in vehicle use from smart planning and public transit policies, and 3) increased flexibility of electricity load from buildings and vehicles. We also analyzed a sensitivity in which coal-fired power plants stay online longer than in the Core scenario and another in which the state must achieve net-zero greenhouse gas emissions by 2050 across the economy, not just for the energy system. Forthcoming publications will discuss the results of those two sensitivities.

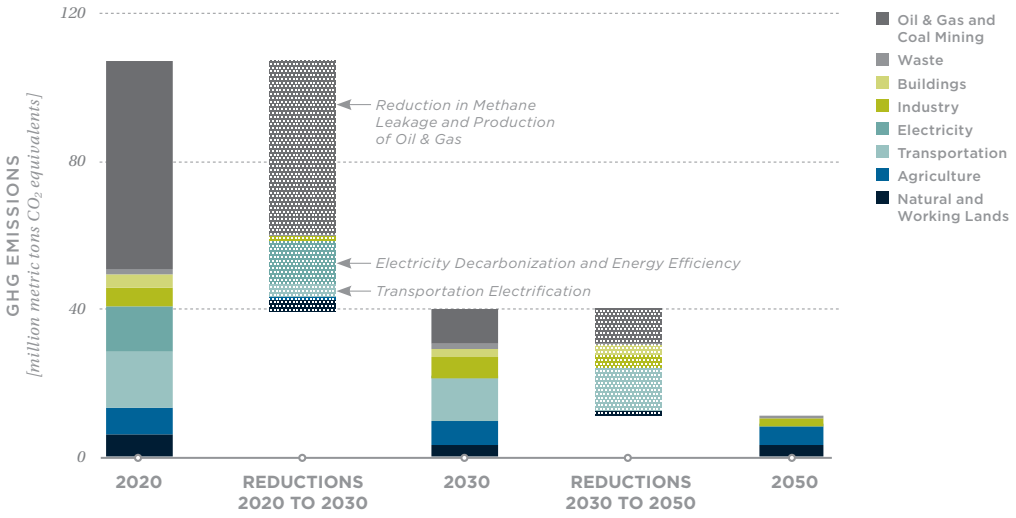
Our analysis shows that New Mexico can meet science-based climate pollution limits with significant growth in job-creating clean energy and energy efficiency industries, while reducing harmful air pollutant emissions and with little to no change in household energy costs from business as usual. Doing so requires a steep reduction in emissions over the next decade, as shown in Figures 1 and 2, driven by three core strategies: cleaning up and setting strict pollution limits on oil & gas, deploying renewable energy and energy efficiency, and electrifying buildings and transportation.

FIGURE 1. *Greenhouse Gas Emissions in the Reference and Core Scenarios*



One of the biggest takeaways from our analysis is the urgency of cutting pollution from the oil & gas industry in New Mexico. Today's runaway greenhouse gas emissions from fossil fuel extraction, processing, and transportation exceed the state's economy-wide 2030 emissions budget by 25 percent.[3] The explosive growth in emissions from New Mexico's oil and gas sector is unsustainable, and the state must sharply cut pollution from the sector. Achieving the required cuts will require a major effort to reduce leakage from oil & gas infrastructure , which makes up the vast majority of methane emissions in the state. Reducing methane leakage is a jobs-intensive process and will grow the workforce in New Mexico. Beyond leakage rates, the state must ensure significant cuts to all emissions from oil and gas in the next decade—while creating new family-sustaining opportunities for workers and diversifying the economy.

FIGURE 2. *Sectoral Emissions Reductions to Meet New Mexico's Climate Goals*



3 Historical and present greenhouse gas emissions data are taken from "New Mexico Greenhouse Gas Emissions Inventory and Forecast," published on October 27, 2020 by the Center for the New Energy Economy at Colorado State University.

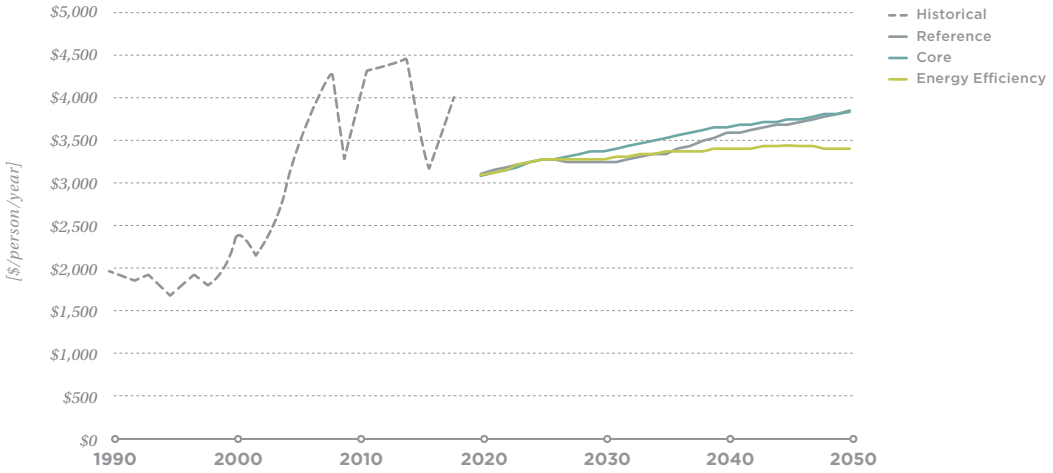
ENERGY COSTS

New Mexico can achieve science-based climate pollution limits with household energy costs that are almost identical—within a few percent—to business as usual for the coming decades. By 2050, we found no difference in per-capita cost between the decarbonization case and business as usual. In fact, we found that New Mexicans could spend 12 percent less on energy costs if the state takes bold action on building retrofits and energy efficiency measures. New Mexico's energy costs have fluctuated over the last few decades, in part as a result of volatility in oil and gas prices. Replacing fossil fuel use with low-cost renewable resources can bring much-needed stability to household energy bills.

Many New Mexicans already pay an inordinate share of their income on energy expenses. The prevalence of high energy burden, coupled with pandemic-induced unemployment and an egregious lack of electricity access in some parts of the state, makes clear that the the status quo does not meet the needs of many families. Addressing this crisis, while also tackling climate change, requires universal access to energy utilities, shutoff protections, low-income electricity rates, and energy efficiency and economic development investments.

In particular, many people living in rural New Mexico, especially in the Navajo Nation, do not have access to electricity in their homes. Among the 55,000 homes in the Navajo Nation, 15,000 do not have electricity, making up 75 percent of all unelectrified households across the United States. Addressing this crisis requires electricity infrastructure investments to ensure universal access to electricity.

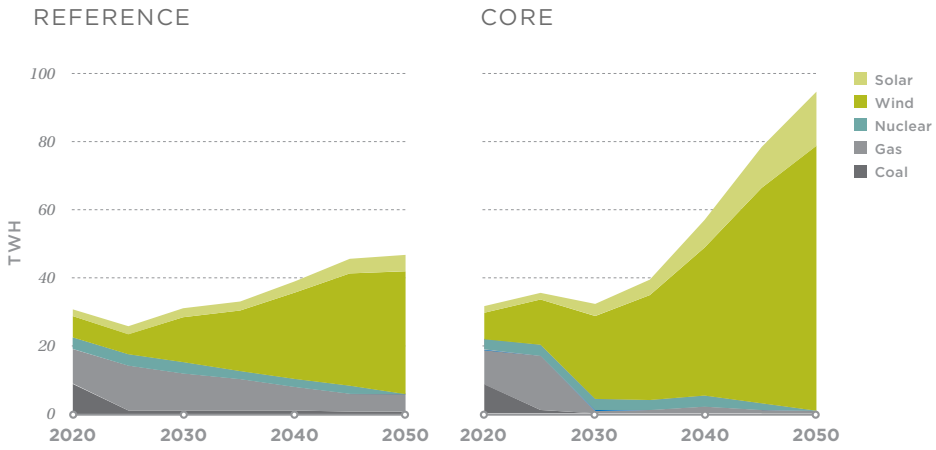
FIGURE 3. *Per-Capita Energy System Costs*



BUILDING OUT A CLEAN ELECTRICITY GRID

New Mexico has abundant, high-quality wind and solar resources. Tapping into these resources is an enormous opportunity to cut emissions while creating economic development and providing clean low-cost power to households in the state and across the west. Since 2003, New Mexico has built 2.7 GW of wind and solar capacity in the state. Over the next decade, the state must add another 5.2 GW of renewable capacity to meet a 45 percent reduction in economy-wide emissions. And our analysis shows a tenfold increase in renewable energy capacity by 2050 to achieve net-zero emissions. The transformation and investment are already underway, following the passage of the Energy Transition Act in 2019. The economics of clean energy compared to fossil fuels will further accelerate this transition in the coming years. Meanwhile, the size of the grid must grow, generating and transmitting three times as much electricity in 2050 as today. An analysis from the New Mexico Renewable Energy Transmission Authority shows a similar opportunity for investment in the state.

FIGURE 4. *New Mexico's Electricity Generation Mix in Reference and Core Scenarios*

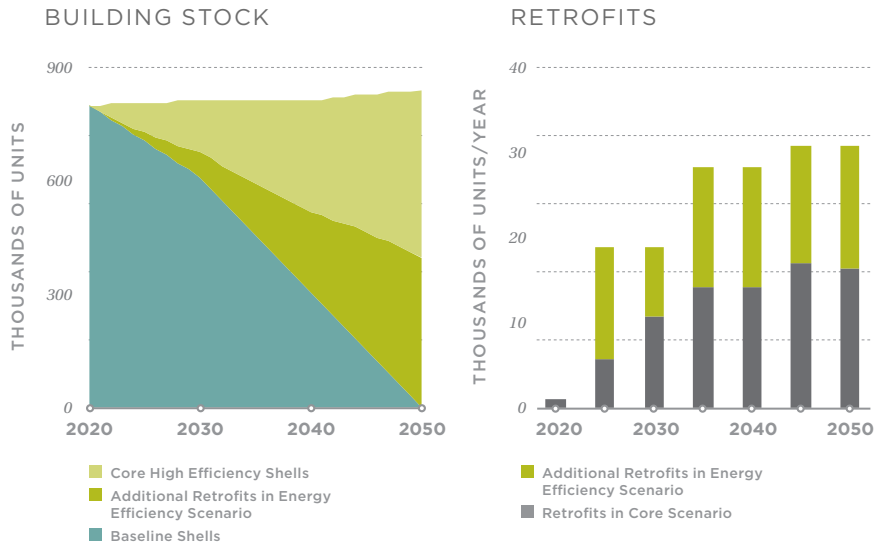


UPGRADING NEW MEXICO'S BUILDING STOCK

New Mexico will also need to invest in the building stock to meet its climate goals. In the lowest-cost scenario that we modeled, the state ramps up a residential building retrofit program to upgrade 20,000 homes per year in the 2020s and 30,000 per year in the 2030s. By comparison, the Weatherization Assistance Program, one of the most significant federal retrofit programs, funds only 35,000 retrofits per year *across the entire country*. Energy efficiency is a proven job creator—before the pandemic, the efficiency industry employed more than 6,000 people in New Mexico—and New Mexico can create good

quality jobs by investing in efficiency. Revitalizing New Mexico's building stock will also cut energy bills, reduce pollution, and make homes more comfortable and safer. Targeted investments in retrofits for energy-burdened households are important.

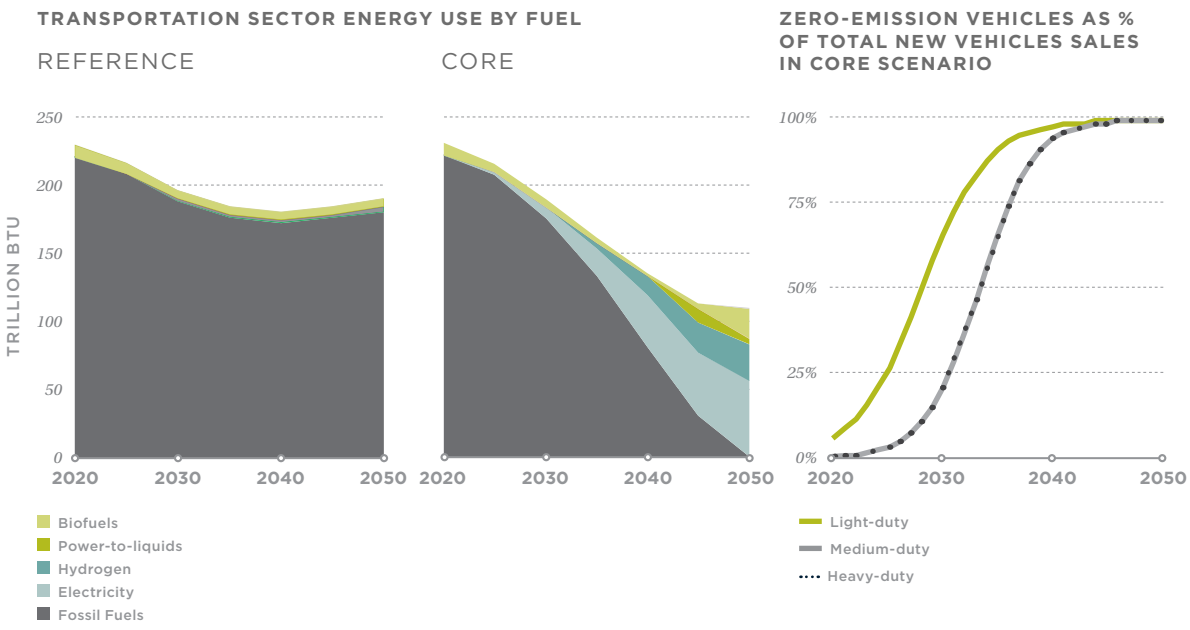
FIGURE 5. *New Mexico's Residential Building Retrofits in Core and Energy Efficiency Scenarios*



TRANSFORMING THE TRANSPORTATION SECTOR WITH CLEAN VEHICLES

New Mexico must also transition from a transportation sector almost entirely reliant on fossil fuels to one powered mainly by clean electricity and hydrogen. Increased adoption of electric vehicles is a core part of the solution set. In the Core decarbonization scenario, almost 70 percent of new light-duty vehicles are electric by 2030 and zero-emission options make up greater than 90 percent of all vehicle types (including medium- and heavy-duty trucks) by the late 2030s. Our analysis finds that hydrogen fuel cell vehicles can help decarbonize trucking and biofuels can help meet fuel needs in hard-to-decarbonize transportation sector applications. Smart planning and public transit policies are also important to reduce additional load from transportation electrification, cut vehicle pollution even further, and improve mobility.

FIGURE 6. *New Mexico's Transportation Fuel Use and Zero-Emission Vehicle Sales*



ADDRESSING POLLUTION BURDEN

New Mexico's oil and gas infrastructure, vehicles, buildings, and power plants emit harmful air pollution throughout the state. Oil and gas wells and processing facilities release volatile organic compounds and other air pollutants alongside methane and carbon dioxide. Vehicles release particulate matter and nitrogen oxides, which both contribute to poor air quality. These pollutants contribute to the formation of ground-level ozone, which is harmful to public health. As a result of major trucking routes that pass through the state, transportation-related pollution from heavy-duty vehicles makes up a disproportionately large share of total air pollution in New Mexico. Fuel use in buildings for cooking and heating also releases harmful air pollution, including nitrogen oxides and particulate matter. Wood burning is particularly bad for air quality and is most common in rural and tribal communities.

The steps that New Mexico must take to meet its climate goals will also reduce emissions of harmful air pollutants, improving air quality and providing public health benefits. For example, in our lowest cost decarbonization scenarios, the state almost eliminates nitrogen oxide and sulfur dioxide pollution from the power sector by 2030.

However, decisions about which technologies and strategies to prioritize, as well as where investments are targeted, will affect who benefits from pollution reductions and how significant the reductions are. For example, because of technology trends, heavy-duty trucks will likely be slower to decarbonize than

cars and light-trucks. But targeted investments in truck electrification—and other policies such as interstate truck emission reduction agreements—could have disproportionate benefits for air pollution reductions, compared to light-duty vehicle electrification. Similarly, the state may not need to reduce wood use in buildings to meet its greenhouse gas emission reduction goals, but making it easy and affordable for every household to switch from wood use to electricity for heat could significantly reduce building-related air pollution.

The state's approach to cutting emissions from oil and gas infrastructure will also affect public health outcomes. Policymakers should use methane controls as an opportunity to simultaneously monitor and reduce non-methane volatile organic compounds and other air pollutants. To take the climate crisis seriously, the state must ensure the elimination of oil & gas sector emissions, beginning rapidly in the next decade and completing by 2050. Dedicated funding will also be needed to monitor and inspect orphaned and abandoned wells, remediate brownfields, and otherwise ensure that retired infrastructure does not continue to pollute nearby communities.

Forthcoming analysis from PSE will further explore these questions and detail specific trends in pollution reductions under different scenarios and sensitivities.