



FAQ

NRDC “80 BY 50” CLEAN ENERGY FRONTIER REPORT FAQs

WHAT DOES THE NRDC CLEAN ENERGY FRONTIER REPORT SHOW?

New, comprehensive modeling by NRDC and Energy + Environmental Economics (E3) outlines a low-cost pathway to a safer climate future that relies on today’s proven clean energy solutions. Our report shows the U.S. can reduce greenhouse gas emissions 80 percent by 2050 from 1990 levels, an important contribution to curbing the dangers of climate change. The big news here is not just that we can do it. It’s *how*—with a bold and rapid expansion of energy efficiency, renewable energy, and the electrification of vehicles and buildings with clean electricity, all supported by a modernized grid. We don’t need to wait for new breakthroughs, and we don’t need to rely on more risky or costly strategies like nuclear power or biomass. What we do need is to keep pushing forward—hard—on existing clean energy solutions.

On the renewable energy front alone, our plan shows we can get 70 percent of U.S. electricity from wind and solar power, and 80 percent of our power from all renewables (including wind, solar, hydropower and geothermal). On the vehicles front, we can see fuel economy of the on-road fleet rise to the equivalent of 100 miles per gallon due to a combination of improved gasoline vehicles and greater numbers of electric vehicles. On the energy efficiency front for buildings and appliances, we can see gains that would cut U.S. energy demand by 50 percent. Our plan, finally, reduces greenhouse gas emissions.

And we can get there at a much lower cost than any comparable study predicts. For just 1 percent above business-as-usual U.S. energy costs, NRDC’s approach delivers climate benefits 7 times greater – in avoided extreme weather, heat waves, and climate-induced illnesses. If we include resulting additional health advantages from reducing smog and other pollutants, the net benefits would be even greater.

IS THIS PIE-IN-THE-SKY THINKING?

No. NRDC used not only E3’s deep energy expertise, but many different, external, peer-reviewed reports and analysis to determine what is feasible. While our pathway will require political willpower and reflects an ambitious transition, all of NRDC’s assumptions and results are based on technologies and approaches that have been identified as achievable in external, existing literature. Many of these technologies are already deployed commercially today—LED lighting, efficient buildings and appliances, heat-pump water heaters, electric cars, wind and solar generation, etc.

In addition, NRDC’s modeling assumed no early retirement of appliances, vehicles, power plants, buildings, or industrial facilities. By 2050, the U.S. energy picture does look quite different from present day, but the transition is gradual. However, if we continue to delay making the necessary investments and steps to start more aggressively reducing our climate-warming greenhouse gas (GHG) emissions and continue to make significant investments in carbon-intensive infrastructure, the odds that we will have to prematurely retire assets grows and the costs of an energy transition will increase.

HOW DOES NRDC'S REPORT DIFFER FROM OTHER REPORTS ANALYZING WAYS TO TRANSITION FROM FOSSIL FUEL TO CLEAN ENERGY?

NRDC's report further supports findings from other reports that a goal of reducing GHG pollution 80 percent by 2050 (80 x 50) is attainable for the U.S. with already available tools. NRDC's analysis, however, provides a new perspective on deep decarbonization strategies by using more aggressive—but achievable—assumptions on the potential to substantially increase energy efficiency. Additionally, the United States can meet a substantial portion of our energy needs and necessary emissions reductions through renewable electricity and clean electrification, all at lower cost than previously assumed possible. And we can do it with today's technology.

Compared to other more clean-energy dominated approaches, NRDC's modeling also included a more robust technical analysis that identified and “built” the necessary transmission, distribution, and storage needs to ensure that power supply and demand were balanced and the grid remained reliable out through 2050. The grid enhancement and expansion costs are included in NRDC's modeling.

ARE THE LEVELS OF ENERGY EFFICIENCY GAINS IN NRDC'S SCENARIO ACHIEVABLE?

In the NRDC scenario, total energy demand is cut in half from 2050 reference levels. Energy efficiency directly reduces total energy demand by 40 percent economy-wide compared to 2050 reference levels. This translates to a roughly 1.5 percent average annual reduction over the 2015-2050 period compared to the reference case of business-as-usual. In addition, we gain an additional 10 percent in efficiency by using near carbon-zero electricity to the greatest extent possible to electrify buildings and industry. Electric equipment, such as electric cars and heat pumps, is inherently more energy efficient than the equipment it replaces.

NRDC's modeling assumptions are based on external, peer-reviewed studies on America's feasible energy efficiency potential. All these technologies are available now and many are already deployed commercially today – LED lighting, efficient buildings, efficient appliances—although their utilization will need to ramp up many fold to meet the levels in NRDC's scenario.

HOW DOES NRDC'S ANALYSIS ACHIEVE THE GASOLINE-POWERED VEHICLE FUEL EFFICIENCY GAINS?

In the core scenario, NRDC assumes that new conventional passenger vehicles—those that are powered by internal combustion engines, including hybrids—continue to improve, achieving 95 miles per gallon (mpg) by 2050. The whole fleet of existing and new internal combustion cars achieves 80 mpg. This assumption is based on a report from the National Academies that found feasible technology pathways for new passenger vehicles to achieve 75 mpg by 2030 and 100 mpg by 2050 (not including electric vehicles). We also assume a full implementation of technologies based on the U.S. Department of Energy's (DOE) SuperTruck program, which would double average new vehicle fuel efficiency from 6 mpg to 12 mpg for trucks and heavy-duty vehicles, and cut fuel consumption from new vehicles in half.

THE REPORT SHOWS THE U.S. CAN REACH 80 PERCENT RENEWABLE ELECTRICITY BY 2050. WHAT ABOUT 100 PERCENT?

NRDC's goal was to find out what levels of clean energy were necessary for the U.S. to achieve an 80 percent greenhouse gas emissions reduction by 2050 with current technology. We were not asking the question of whether 100 percent renewable energy (economy-wide) is feasible.

Our modeling shows that we can increase the amount of electricity generated from renewable sources to 80 percent, coming from wind, solar, geothermal, and hydro by 2050. Our country may be able to achieve even greater development of renewable energy, as innovation grows, and NRDC will continue to push for that. Already, renewable prices are falling far more sharply than anticipated, more storage technologies are coming online, and innovation may unlock doors that will deploy even more renewable energy.

WHAT DOES THE REPORT SAY ABOUT NATURAL GAS USE?

NRDC is pushing to move the U.S. off fossil fuels and to scale up clean energy. As the report explains, natural gas fracking is causing a host of public health and environmental impacts. NRDC's report shows that the U.S. can cut fossil fuel usage by at least 70 percent by 2050—and that includes a two-thirds reduction in conventional natural gas usage. The steep declines in fossil fuel usage in our main scenario are enabled by significant increases in energy efficiency and renewable energy, and the report calls for rigorous scrutiny of any additional fossil fuel infrastructure.

UNDER NRDC'S MODELING, NUCLEAR POWER DROPS FROM 20 PERCENT OF THE U.S. ELECTRICITY GENERATION TO 3 PERCENT. PLEASE EXPLAIN WHY.

Due to the high cost of nuclear power plant construction and the current wave of retirements ahead of the expiration of their Nuclear Regulatory Commission licenses, NRDC's model assumes that, aside from a small number of reactors already under construction, no new nuclear facilities would be built.

NRDC also used the assumption that very few existing plants would operate beyond 60 years. That is a reasonable assumption given the current economic challenges facing aging reactors and because, to date, no plant has received a license to extend to 80 years, although the U.S. Nuclear Regulatory Commission is now considering it.

NRDC is not opposed in principle to nuclear power, and acknowledges its beneficial low-carbon attributes in a warming world but we take seriously the significant safety, global security, environmental, and economic risks that use of this technology imposes on society. These outstanding problems for nuclear energy include: environmental harms from uranium mining; safety and security of nuclear plant operations; nuclear weapons proliferation impacts; and spent nuclear fuel disposal. In addition, nuclear power is increasingly uneconomic compared to alternative forms of zero- and low-carbon electricity generation.

WHY DO WE NEED TO UPGRADE THE ELECTRICITY GRID?

NRDC's analysis demonstrates that the projected level of renewable energy resources can be reliably integrated into the U.S. electricity grid, but it must be modernized and expanded. Much of the grid was built more than 40 years ago and is vulnerable to extreme weather events. Achieving a clean electric grid will require transmission and distribution infrastructure investments, expanded grid oversight regions, reforms to energy market rules and operations, improved operational practices, advanced forecasting, and demand-side upgrades. NRDC's key clean energy drivers, supported by a modernized grid, would reduce carbon emissions to 1 billion metric tons compared to the approximately 5.8 billion metric tons anticipated if no action is taken.

WHAT DOES THE REPORT MEAN FOR FOSSIL FUEL WORKERS AND COMMUNITIES?

NRDC's report discusses many possible policies and programs that cities, states, and the federal government can implement to ensure that the transition to low-carbon fuels does not leave behind those workers and communities that currently rely on fossil fuels for employment and economic wellbeing. NRDC supports working to mitigate the impacts to these communities and workers to ensure that they can take full advantage of the employment and economic opportunities of clean energy and help lead U.S. technology and energy innovation. Any successful emission reduction strategy must include policies and programs that proactively work to address employment, tax revenue, and local economic losses from a transition away from climate-warming, carbon-intensive fuels.

This includes, but is not limited to: greater funding for low-income energy efficiency and weatherization programs; worker retraining programs and unemployment benefits; state and federal efforts that direct potential carbon revenue to supplement and replace lost local tax revenue from any reductions in fossil plant, coal mine, and oil and gas activities; funding to support economic development and revitalization efforts in affected communities; tax incentives to encourage companies to locate new facilities and plants in certain areas; and policies that expand access to clean energy resources to ensure that all communities and customers have access to these resources.

HOW WAS NRDC'S RESEARCH CONDUCTED?

NRDC's analysis used E3's PATHWAYS model, which shares a common architecture with the U.S. Energy Information Administration's (EIA) National Energy Modeling System (NEMS) that is used to generate annual projections of energy production, demand, imports, and prices. The PATHWAYS model incorporates a more detailed representation of America's energy resource portfolio, the electricity sector, and grid operations and expansion. The data, costs, and other pertinent assumptions used in NRDC's modeling are largely from the EIA's Annual Energy Outlook (AEO) 2013 in order to facilitate an apples-to-apples comparison with other published deep decarbonization reports using the same underlying data and information. However, since 2013, there have been rapid and continuing cost declines for wind and solar energy, and natural gas prices have fallen, which means cost projections in NRDC's report (for all scenarios) may be higher than the most recent data indicates. However, relative comparisons between scenarios are still meaningful and valuable.