

NRDC's Second Annual Energy Report

Positive Energy Trends Bode Well for U.S. Security and the Economy



Acknowledgments

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POSITIVE ENERGY TRENDS BODE WELL FOR U.S. SECURITY AND THE ECONOMY

The United States is reducing oil dependence, slowing the growth of electricity needs, and making energy services more affordable to all Americans. Oil and energy consumption remain well below levels seen a decade ago, renewable energy is surging, and growth in U.S. electricity sales continues to decline. NRDC's 2014 review of the most recent data shows the economic and environmental performance of America's energy systems has never been better. The single most important contributor to these positive trends is energy efficiency, the nation's largest and most inexpensive resource to meet our energy needs. Efficiency has allowed America to get more work out of less oil, natural gas, and electricity while pushing our economy forward and cutting residential, business, and industrial customers' bills.

And while the United States appears to be on track to meet the Obama administration's target of a 17 percent reduction in carbon pollution by 2020 (relative to 2005), more can and must be done. Based on its own extensive assessment of recent improvements in emissions performance, the U.S. Environmental Protection Agency (EPA) this year proposed pollution control standards to reduce emissions from existing power plants even further—calling for a 26 percent reduction by 2020 and a 30 percent reduction by 2030. However, based on the latest numbers summarized here, even larger reductions are feasible and cost-effective.

CLEAN ENERGY HIGHLIGHTS

Forty years of sustained improvements in optimizing energy use have made energy efficiency not just America's largest single energy resource (for example, reduced energy use means utilities need not purchase additional fuel sources to generate electricity), but a "supply" whose cumulative contributions to meeting growth in the nation's needs for energy services now exceed those of all competitors, from oil and coal to natural gas and nuclear power.¹ And we're not nearly done.

In June 2013, President Obama set a goal of reducing carbon emissions by 3 billion metric tons by 2030 through efficiency standards for appliances and federal buildings. Over just the past year, the Department of Energy (DOE)

has finalized energy efficiency standards for five product classes (metal halide lamp fixtures, external power supplies, commercial refrigeration equipment, electric motors, and walk-in coolers and freezers) that will cumulatively reduce electricity use by 442 billion kilowatt-hours and carbon emissions by 236 million metric tons by 2030. These standards will also save American consumers and businesses \$38 billion on their utility bills.²

Combined with energy efficiency standards set earlier in his administration, the president is now two-thirds of the way to his 3-billion-ton emissions reduction goal. As of September 2014, the Obama administration's energy efficiency standards will save 4,193 billion kilowatt-hours of electricity and 2 billion metric tons of carbon emissions by 2030, while reducing energy bills by more than \$400 billion.³

But the best is yet to come. The EPA has proposed standards for existing power plants that will reduce carbon emissions by more than 5 billion additional tons by 2030, equivalent to almost three years of annual U.S. power plant emissions at current rates.⁴ Put differently, by 2030, the standards will reduce emissions from America's power plants by 30 percent compared to 2005 levels. And because states would be credited for energy efficiency improvements in all sectors of the economy, the EPA expects that electricity bills will drop by an average of about 8 percent as a result.⁵ The EPA's findings are one more reminder that progress toward a clean energy economy goes hand in hand with overall economic health, and America's success in linking them will help inspire worldwide progress toward stabilizing atmospheric concentrations of greenhouse gases.

ELECTRICITY: Americans spend almost \$400 billion annually just on electricity to power their homes, offices, and factories.⁷ National electricity use more than doubled from 1973 to 2000, while the population increased by only about a third (see Figure 2). Thanks in large part to America's increased energy efficiency, however, the national growth rate for electricity consumption has since dropped below that of the population for an extended period—for the first time in modern history (see Figure 2). From 2000 to 2013, electricity consumption rose by less than 7 percent, with an average annual growth rate of about 0.5 percent, even as the population grew by about twice that rate. As a result of this continuing slowdown, which has persisted through both economic recessions and recoveries, there is additional interest in a “utility business model of the future” that ends utilities' longstanding stake in robust growth in electricity sales to ensure their financial security. In February 2014, NRDC and the Edison Electric Institute (which represents America's largest electric utilities) jointly proposed solutions at a meeting of the nation's electricity regulators [See Unfinished Business section on Page 6].⁸

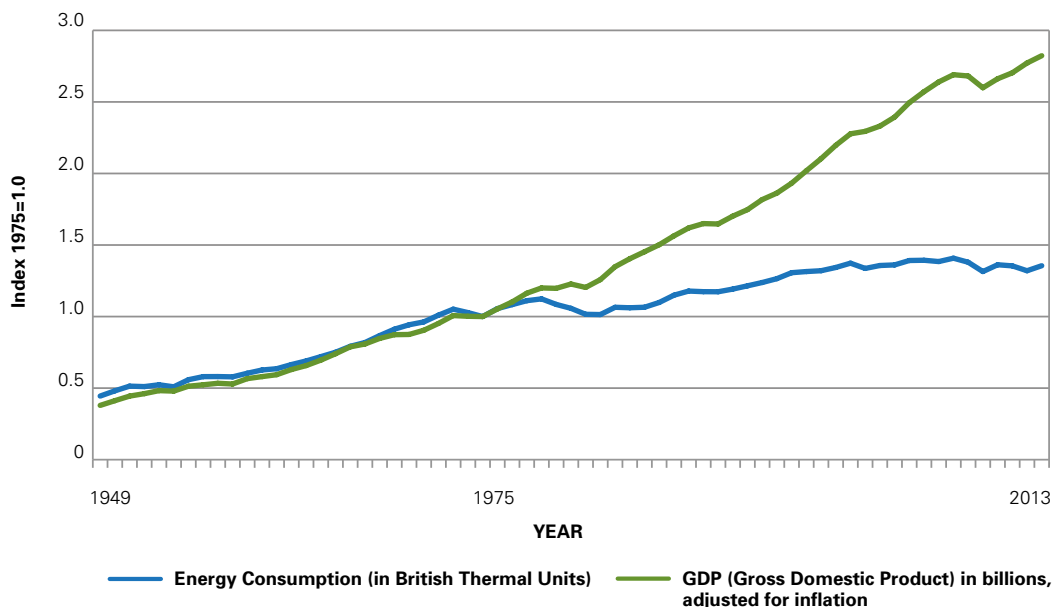
OIL: Although the amount of oil used in the United States rose slightly in 2013 (about 1.5 percent), the total is still down almost 12 percent from its 2005 peak. Surprisingly, oil use in 2012 had been lower than in 1973 (when the nation's economy was only about one-third of its current size). As a result of these lower usage numbers, the United States is able to reduce its dependence on oil imports from unstable and unfriendly sources—along with a vulnerability to possible price spikes if conditions suddenly worsen. Thanks to new

AMERICA'S ENERGY USE

UP CLOSE

The total amount of energy used in the United States peaked in 2007, and has trended downward ever since. While there was a 2.8 percent uptick in energy use in 2013, the total was still below the level recorded a full decade earlier. Thanks to continuing energy efficiency progress, any lockstep linkage between economic growth and total energy use ended almost four decades ago (See Figure 1.)⁶ The remainder of this report examines the most important elements of this trend and explores the implications for the U.S. economy, the nation's security, and the environment.

Figure 1: Economic and Energy Growth Trends Diverge



Source: U.S. Energy Information Administration

fuel economy and clean car standards, the EPA projects that U.S. oil consumption will decrease by 2.1 million barrels per day by 2025. That's more than the United States purchases now from any OPEC nation.⁹ As an indication of existing progress, the University of Michigan reports the average new vehicle driver in the United States has cut carbon pollution by more than 20 percent, compared with his or her counterpart in 2007, thanks to both better fuel economy and less driving.¹⁰

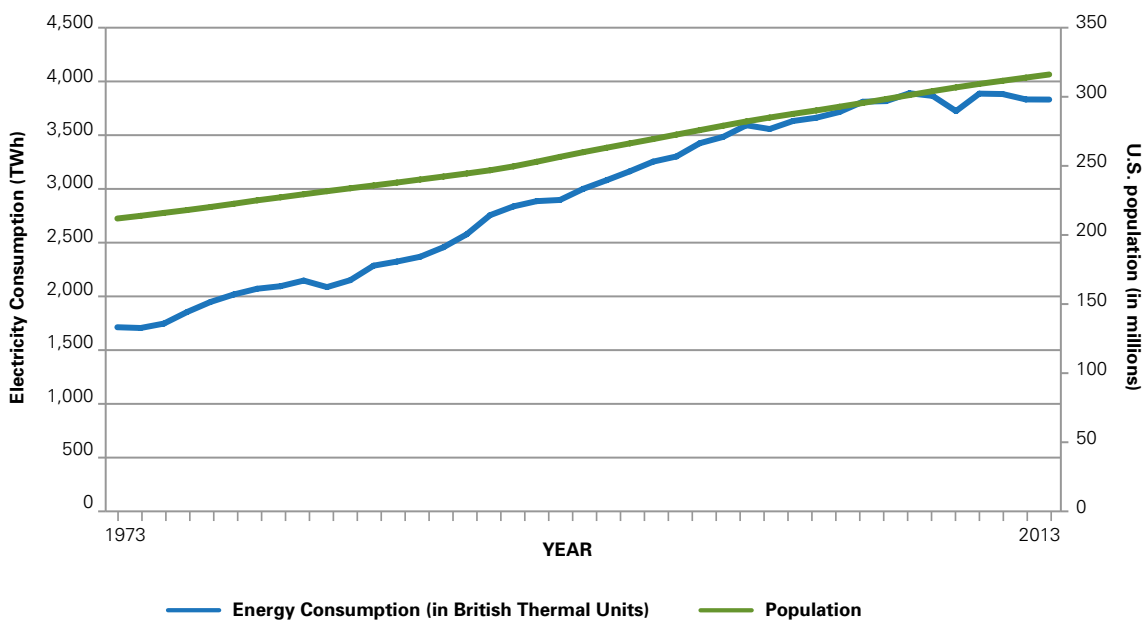
COAL: In 2013, U.S. coal use had dropped from 1990 levels and was down more than one-fifth from the peak year of 2005. This trend primarily reflects the movement of utilities away from aging coal-burning power plants, which have become increasingly uneconomic and are responsible for air pollution that causes more premature deaths than any other form of energy use.¹¹ American utilities continue to raise their investments in energy efficiency and renewable energy, such as wind and solar.

NATURAL GAS: Although natural gas raised its market share to a 40-year high in 2012, exceeding 30 percent of electricity generation, this figure dropped back to 27.5 percent in 2013. In general, natural gas has displaced coal for electricity production in recent years, but the trend has not been steady or uniform. In fact, coal recovered some market share in 2013 after natural gas prices rose, as shown in Figure 3.

NUCLEAR: Nuclear generation in 2013 remained below 19 percent of total electricity generation for the second consecutive year, after decades of rising sales driven mostly by increased productivity at existing plants. Although total nuclear power production in 2013 increased slightly from the year before, it is still below the average for 2006–2011. The retirement of aging and uneconomic plants, such as Southern California Edison's two San Onofre units and Duke's Crystal River reactor in Florida, are significant factors in the trend.

RENEWABLE ENERGY: Wind power continues to dominate the nation's renewable energy growth, with a 30-fold increase since 2000. In 2013, for the first time, wind provided more than 4 percent of all U.S. electricity. Meanwhile, the absolute increase in wind generation from 2000 to 2013 was almost five times greater than the increase in nuclear generation over the same period. In addition, solar power continues to surge, although it still represents less than 0.5 percent of total U.S. electricity. Perhaps most impressive, however, was the DOE's announcement earlier this year that the combined contribution of all non-hydro renewable energy resources—including wind, solar, and geothermal—was well on its way to exceeding the generation from hydropower. Historically, hydropower was a much more dominant source of renewable generation, accounting for three times as much generation in the United States as non-hydro renewable energy sources just a decade ago. But as of June 2014, non-hydro renewables had surpassed the total generation of hydro resources over a full year.¹²

Figure 2: Trends in U.S. Electricity Use and Population

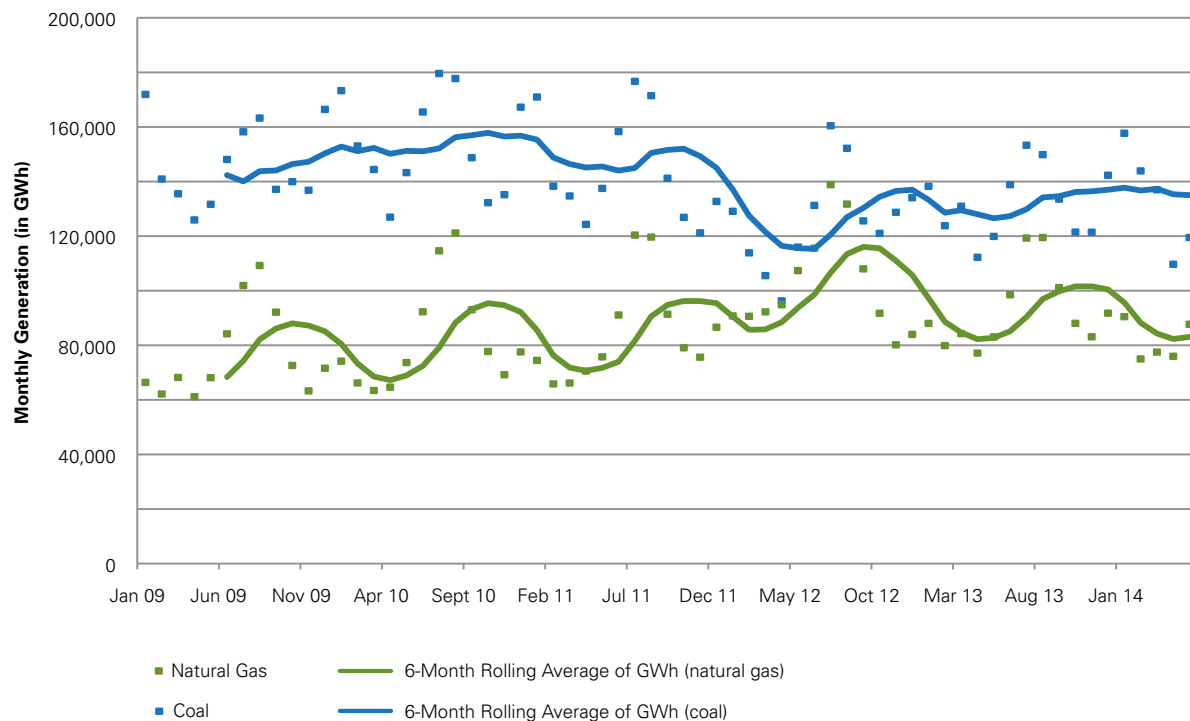


ENERGY EFFICIENCY: Providing the same, or a higher, level of services with less energy remains America's largest and most productive energy resource. The amount of energy required to produce an inflation-adjusted dollar of economic output dropped by almost 60 percent between 1970 and 2013. Energy efficiency standards and financial incentives, underwritten mostly by the utility industry, have dramatically reduced both energy intensities and costs. But opportunities abound to increase energy savings in our homes and businesses. Smarter use of energy is far less costly than adding other energy resources like fossil fuels and it is already saving the nation hundreds of billions of dollars annually, preventing millions of tons of carbon emissions, helping U.S. workers and companies compete worldwide, and increasing our energy security.¹³ In addition, NRDC's Dr. David Goldstein concluded in his book *Invisible Energy*: "Energy efficiency can become the cornerstone of a global effort to stabilize the earth's climate."¹⁴ He is referring to an 80 percent or greater reduction in the amount of carbon pollution from fossil fuels before 2050. This would reduce energy bills thanks to the relatively low cost of energy efficiency compared to the resources that it displaces.

UNFINISHED BUSINESS: NEW ROLES AND RULES FOR AMERICA'S UTILITIES

Prospects for America's vital electricity sector and all who depend on it are bright, if utility regulators remove unintended obstacles to sustained progress. Traditional regulatory practices unintentionally leave utilities in the position of commodity businesses, which depend on growth in their energy sales to meet their needs for cost recovery and capital investment. In a joint statement released in February 2014, NRDC and Edison Electric Institute (EEI) responded to growing concerns about whether utilities can adapt to the changing needs of modern electricity systems while providing customers with affordable and reliable energy services, maintaining financial integrity, and delivering continuous improvement in environmental performance. To meet these goals, utility regulatory and business model changes are needed.¹⁵

Figure 3: Electricity Generation—The Uncertain Course of Gas v. Coal Competition



Source: U.S. Department of Energy, Energy Information Administration

The solutions begin with “revenue decoupling,” which makes utilities indifferent to retail energy sales volumes without abandoning the tradition of calculating utility bills based on energy consumed by customers, and preserving incentives for those customers to use energy efficiently. Decoupling relies on small annual rate adjustments, which can go either up or down, to prevent changes in customers’ total consumption from affecting utilities’ ability to recover their authorized costs of service. More than half the states (most recently Maine) have now adopted this approach for at least one electric or natural gas utility. A comprehensive June 2013 order by the Washington Utilities and Transportation Commission is a recent primer on how to do it effectively.¹⁶ The EEI/NRDC statement addresses additional aspects of utility business model reform and rate design that are critical to a clean energy transition, including ways to increase solar power and ensure equitable allocation of grid enhancement costs that are essential to a clean energy future.

CONCLUSION

The United States is now considering how best to reduce the power plant carbon pollution harming its citizens and representing 40 percent of the nation’s carbon pollution. This report is a testament to how much success America has already recorded in reducing these emissions while improving its economic and environmental health. To continue this progress, we most move forward with curbing power plant emissions; change utility business and regulatory models; and continue to tighten efficiency standards for our buildings, appliances, and vehicles. If we do so, there is every indication that these positive energy trends will continue and accelerate, which bodes well for the nation’s energy security and health.

Endnotes

- 1 See, e.g., Bipartisan Policy Center, *America’s Energy Resurgence* (February 2013), p. viii: “Over the last four decades, energy savings achieved through improvements in energy productivity have exceeded the contribution from all new supply resources in meeting America’s growing energy needs.”
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- 5 The draft rule and EPA estimates are available at <http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule>
- 6 Unless otherwise indicated, all data on U.S. energy production and use are taken from U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* (August 2014).
- 7 U.S. Energy Information Administration, *Electric Power Monthly* (April 2014). http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_02.
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- 9 EPA, “Regulatory Impact Analysis: Final Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards,” EpA-420-R-12-016, August 2012, table 7.4-7 (available at www.epa.gov/otaq/climate/regs-light-duty.htm); Energy Information Administration, www.eia.gov/dnav/pet/pet_move_impqus_a2_nus_ep00_im0_mbbldpd_a.htm.
- 10 See www.umich.edu/~umtriswt/EDI_sales-weighted-mpg.html.
- 11 See, e.g., Paul R. Epstein et al., “Full Cost Accounting for the Life Cycle of Coal,” *Annals of the New York Academy of Science* (2011), http://www.chgharvard.org/sites/default/files/epstein_full%20cost%20of%20coal.pdf.
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- 15 EEI/NRDC Joint Statement, http://docs.nrdc.org/energy/files/ene_14021101a.pdf.
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