

America Working Together: Building a Clean, Low Carbon Electric System

Benefits for Consumers, Climate, and Public Health



The electric power industry in the U.S. is already in a period of transition to low- and zero-carbon resources, helping our nation meet our power needs while reducing the burdens of pollution on our climate and public health. Market competition among generating technologies, widespread deployment of energy efficiency programs, and investment in transformative modern generating technologies including wind and solar power are forging a modern, safe and cost-effective electricity system while reducing pollution. Effective policies can support the growth of low-carbon technologies, while ensuring reliable power supplies and keeping electricity affordable.

Planned Capacity Additions, 2013-2017



Source: U.S. EIA

Study Finds Wind and Solar Projects Reduce Electricity Prices

“The study findings indicate that the PJM system [the country’s largest power market], with adequate transmission expansion and additional regulating reserves, will not have any significant issues operating with up to 30% of its energy provided by wind and solar generation...Every scenario examined resulted in lower PJM fuel and variable Operations and Maintenance (O&M) costs as well as lower average [wholesale electric prices].”

GE Energy Consulting,
PJM Renewable Integration Study

A TRANSITION IN PROGRESS

America is building a modern, cleaner power system.

- Conventional coal-fired generation is facing stiff competition from low- and zero-carbon resources. Due to market forces, coal-fired power plants only ran 60% of the time in 2013 - down from 73% in 2008. Electricity generated from coal fell by 20% over that same time period. Meanwhile, savings from utility energy efficiency programs increased by 116%, power from renewables (not counting hydro) doubled, and gas-fired output was up 26%.
- New coal-fired power plants are one of the costliest generation options even without considering the significant pollution they generate. New coal-fired plants built in the next five years would cost about 19% more than onshore wind, 44% more than combined cycle natural gas, and significantly more than energy efficiency.
- These realities have affected future investment decisions. 84% of planned power plant additions from 2013-2017 are expected to come from natural gas and renewables. Utility spending on energy efficiency is projected to triple by 2025, from about \$6 billion in 2010, reducing the demand for costly new fossil fuel power plants.

Integration of renewables and deployment of energy efficiency technologies reduces carbon pollution affordably, replacing coal.

- The costs of renewables have declined significantly over the last decade, and forecasts suggest this trend will continue. According to the Department of Energy, the price of onshore wind power has fallen by 43% since 2008, and the total price of solar PV systems has fallen by 35-40% over the same period.
- Energy efficiency also helps protect customers from fossil fuel price volatility and enhance reliability, while reducing the need for new energy capacity, benefiting all customers. Between 2008 and 2011, the nine states in the Regional Greenhouse Gas Initiative derived about \$1.6 billion in net economic benefits from the program, largely by investing in efficiency programs.
- Studies by regional system operators, state governments, and other experts also show that renewable energy can help reduce wholesale electricity prices. For example:
 - A study of the Massachusetts renewable portfolio standard (RPS) found that it generated \$200 million in net consumer benefits in 2012, almost three times the costs of the program.



Study Finds Clean Energy Policies Reduce Electricity Rates

Over the 20-year period since the start of clean energy policies in North Carolina, rates are expected to be lower than they would have been had the state continued to only use existing, fossil fuel generation sources.

RTI International

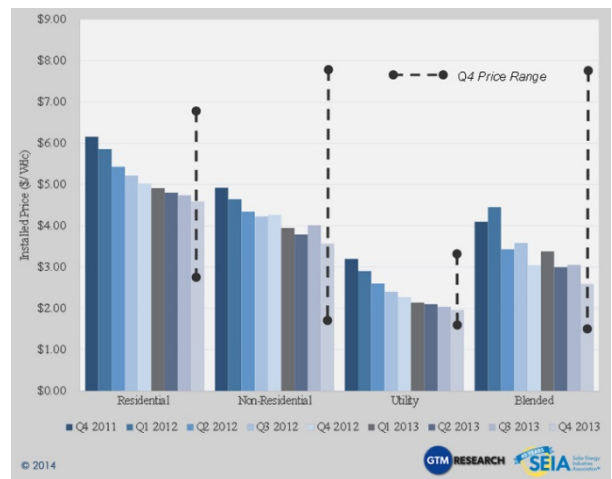
Solar and Other Renewable Energy Costs Continue to Decline

The average installed price of solar PV has been steadily declining.

Year-over-year, the national average PV installed system price declined by 15% to \$2.59/W in 2013 (Q4).

The average price of a solar panel has declined by 60 percent since the beginning of 2011.

Source: Solar Energy Industries Association



- A major Northwestern utility found that its compliance with Oregon’s renewables policies reduced rates for consumers by 0.6% in 2011.
- The 11 states with the highest share of generation from wind power have seen reductions in electricity prices over the last five years, in contrast to other states which have seen increases in electricity prices.

A HISTORY OF CLEAN AIR PROGRESS

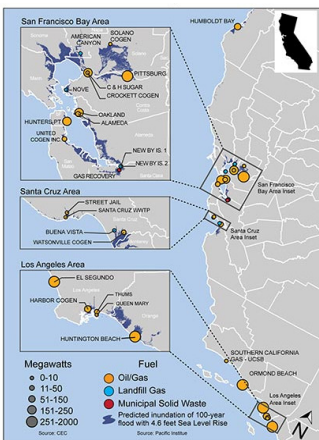
The Clean Air Act has produced dramatic improvements in air quality while our nation’s economy has grown and expanded.

- Power plants in the U.S. have reduced emissions of nitrogen oxides (NOx) and sulfur dioxide (SO₂) by greater than 75% since 1990 when Congress passed major amendments to the Clean Air Act. At the time, many argued that this would be impossible and the costs too high, because they underestimated the potential for technological innovation and cost minimization.
- EPA’s own estimates significantly overestimated the costs of control.

In the absence of meaningful action to address the clear and present danger of climate change, the costs of conventional energy production could increase and the reliability of energy infrastructure could be at risk.

- Drought and rising sea levels are threatening the reliability of fossil and nuclear power plants, while reducing the availability of hydroelectric facilities.
- Both coal and nuclear power plants require enormous amounts of water to operate. Drought conditions have already forced some power plants in the Southeast and Midwest to shut down or reduce power production because of reduced cooling water availability. A significant number of large, central station power plants would be impacted by rising sea levels.
- Severe weather events, like Hurricane Sandy, are testing the resiliency of aging power infrastructure. Transmission lines can be damaged in storms, resulting in blackouts, and extreme heat and cold put increased stress on the grid.

California Power Plants Potentially at Risk from Sea Level Rise



Source: National Climate Assessment

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