



Union of  
Concerned  
Scientists

FACT SHEET

# A Bright Future for the Heartland

POWERING INDIANA'S ECONOMY WITH CLEAN ENERGY

As in most Midwest states, coal dominates Indiana's power supply, posing serious risks to public health and the environment and leaving families and businesses vulnerable to price hikes. And like the rest of the Midwest, Indiana has struggled to fully rebound from the recent deep recession.

Fortunately, practical and affordable ways are available to help revitalize the state's economy and ensure a clean, safe, and reliable power supply. Energy efficiency technologies and renewable resources such as wind, solar, and bio-power offer a responsible path away from the state's overreliance on polluting fossil fuels to generate electricity.

Indiana has already taken important steps to promote these solutions. However, the Hoosier State must go further to create a clean and sustainable energy economy and reduce the urgent threat of global warming. Doing so would deliver many important economic and environmental benefits, such as keeping Indiana competitive in the growing clean energy industry.

In 2009, the Midwestern Governors Association—a collaboration of 10 states (including Indiana) working on key public policy issues—released the *Midwestern Energy Security and Climate Stewardship Roadmap*. The Energy Roadmap's policy recommendations outline a path to a clean energy economy that entails maximizing local resources while reducing global warming pollution.

The Energy Roadmap recommends producing 30 percent of the Midwest's power supply from renewable resources by 2030, and investing in energy efficiency technologies to reduce power consumption at least 2 percent annually by 2015 and thereafter. The Union of Concerned Scientists performed an analysis that focused on these two recommendations, which we modeled as a renewable electricity standard (RES) and an energy efficiency resource standard (EERS).

The RES and EERS have proven to be effective and popular tools for advancing renewable energy and energy efficiency. As of April 2011, eight

Midwest states had adopted an RES (among 29 states nationwide, plus Washington, DC). Five of these states also have an EERS (among 26 states nationwide).

In 2009, Indiana adopted an EERS with a goal of reducing annual electricity

## The Benefits of a Clean Energy Economy for Indiana by 2030



### Job Creation:

Nearly 19,200 net new jobs from deploying renewable energy and energy efficiency technologies

### Economic Development:

Nearly \$11 billion in new capital investment, \$270 million in new income for farmers and rural landowners, and \$940 million in new local tax revenues

### Consumer Savings:

\$9 billion in lower electricity and natural gas bills by 2030 (\$371 for a typical family)

### Diversified Energy Mix:

10,530 megawatts of capacity for generating electricity from non-hydro renewable resources (up from about 1,410 megawatts in 2010)

### Climate Solutions:

Across the Midwest, reductions in global warming pollution from power plants equal to the annual emissions from 30 typical new coal plants

use 0.3 percent by 2010, 1.1 percent by 2014, and 2 percent by 2019 and each year thereafter. In April 2011, the Indiana legislature adopted a voluntary clean energy portfolio standard of 10 percent by 2025. Utilities can rely on both renewable and some non-renewable energy technologies to comply with that standard.

We used a modified version of the U.S. Department of Energy's (DOE's) National Energy Modeling System (NEMS) to examine the long-term impact on Indiana and the entire Midwest of achieving the Energy Roadmap targets. We modeled two



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policy scenarios, which we call our *core policy case* and *alternative technology pathway*. The two scenarios differ only in that the core policy case includes more pessimistic assumptions about the technology and costs of biopower than the DOE assumes in the NEMS model, to reflect the significant uncertainties and constraints facing biomass development today and into the future. We compared our two scenarios with an *existing policies case*, or base case, which assumes no new state or federal policies.<sup>1</sup>

Overall, our analysis shows that Indiana and the entire Midwest would reap significant economic, consumer, and environmental benefits from achieving the targets in the Energy Roadmap.<sup>2</sup>

## JOB CREATION AND OTHER ECONOMIC DEVELOPMENT BENEFITS

Under our core policy case, for example, we found that investments in clean energy needed to achieve the renewable energy and energy efficiency targets in the Energy Roadmap would create 19,200 new jobs in Indiana by 2030. These jobs would be on top of those created under Indiana's existing policies, and would span numerous sectors of the state's economy, including manufacturing,

construction, operations, maintenance, agriculture, forestry, finance, and retail. Those investments would also yield \$820 million in new annual income in Indiana by 2030, and \$480 million per year in new gross state product.

Our analysis of changes in employ-

ment found that job gains from investments in renewable energy and energy efficiency would far outweigh any job losses from displaced fossil fuel generation. Electricity produced from renewable resources and gains in energy efficiency typically delivers more jobs than power produced from fossil fuel because a larger share of the money remains in the regional economy and in labor-intensive sectors such as manufacturing, installation, and maintenance. Many of the expenditures required to produce power from coal and natural gas flow to states outside the region, and support fuel extraction and transportation that is less labor-intensive.

Besides creating jobs, the stronger renewable electricity and energy efficiency standards in the Energy Roadmap would provide other important boosts to Indiana's economy by 2030. These economic benefits include:

- \$11 billion in new capital investment in renewable energy and energy efficiency
- \$270 million in new income for farmers and rural landowners who produce biomass energy or lease their land to wind developers
- \$940 million in new property tax revenues, which would help communities pay for schools and vital public services<sup>3</sup>

## A Plumber You Can Trust and the Solar Heating You Deserve

David Mann has been in the plumbing business for more than 25 years, and has always provided no-nonsense, affordable service. He recently expanded his business model to include solar water heating and solar electricity. Now not only does Mann offer quality service to his customers, but his business shows how Indiana's workforce is ready, willing, and able to expand consumers' access to alternative energy.

David Mann founded Mann Plumbing in 1992, and his commitment to the community and the environment led him to begin offering solar energy systems from his base in Bloomington in 2008. MPI Solar now consists of professional licensed journeymen, contractor plumbers, and apprentices, and the company is continuing to build its labor force (MPI 2011). In fact, when much of Indiana's construction business declined along with the national economy and other businesses were having trouble staying afloat, Mann Plumbing avoided layoffs—and even added a full-time sales position—because of its branching into solar energy (Mann 2011).

The company's impact on its community is evident in a recent project at the Wabash Valley Correctional Facility, where MPI Solar installed 15 solar hot-water panels. The facility expects the system to reduce energy use by 40 percent, and to provide savings of almost \$6,000 a year (*Mywabashvalley.com* 2011).

## CONSUMER SAVINGS

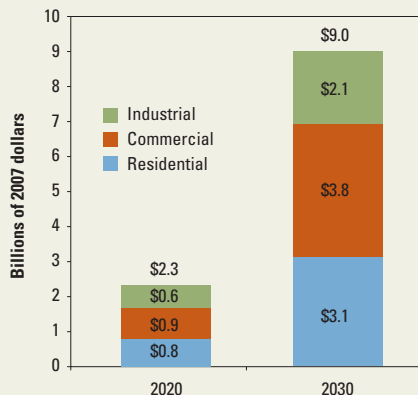
Indiana consumers stand to realize big savings on their energy bills if the state implements the renewable energy and

<sup>1</sup> Existing policies include state-level RESs and EERSs adopted as of March 2010, and the federal renewable energy tax credits and incentives in the American Recovery and Reinvestment Act of 2009. It does not include recent changes in power plant regulations that the U.S. Environmental Protection Agency is using to enforce the Clean Air Act.

<sup>2</sup> To read our full report, fact sheets on other Midwest states, and a technical appendix describing our modeling approach and assumptions, see [www.ucsusa.org/brightfuture](http://www.ucsusa.org/brightfuture).

<sup>3</sup> Results are in cumulative 2007 dollars and use a 7 percent real discount rate.

**Figure 1. Cumulative Savings on Indiana's Consumer Energy Bills under the Energy Roadmap**



energy efficiency targets in the Energy Roadmap. Investments in energy efficiency deliver much of these savings by reducing demand for electricity in homes, businesses, and industry.

Greater reliance on renewable energy and energy efficiency adds to the savings by fostering competition in the regional energy market. That leads to slightly lower and more stable prices for the coal and natural gas used to generate electricity and provide heat for buildings and industrial uses. Annual consumer electricity prices would be 4.4 percent lower, on average, from 2010 to 2030 under the Energy Roadmap targets, and consumer natural gas prices would be 0.8 percent lower.

The savings from reduced energy consumption and lower prices for electricity and fossil fuels would more than offset the costs of investing in renewables and energy efficiency. Cumulative savings on electricity and natural gas bills for Indiana consumers would total \$2.3 billion by 2020, and grow to \$9 billion by 2030, with all sectors of the economy sharing in the savings (Figure 1). The typical Indiana family would begin to see small savings in annual gas and electricity costs in 2011, with savings reaching \$135 by 2020, and \$371 by 2030. From 2010 to 2030, a typical household would

save an average of \$153 on electricity and natural gas bills each year.

### DIVERSIFYING THE ELECTRICITY MIX

In 2009, about 1 percent of the electricity generated in Indiana came from renewable resources. The rest of the state's power came primarily from coal, along with nuclear energy and other fossil fuels—with most of the fuel imported from out of state.

Yet the state is rich in untapped renewable energy resources. Indiana has the technical potential to generate nearly five times its 2009 electricity demand from renewables—led primarily by wind and bioenergy—although economic and physical barriers will curb some of that potential.

Under the regional renewable energy targets in the Energy Roadmap, Indiana would diversify its coal-dependent mix of power, making its supply more reliable and secure. Indiana would increase its home-grown generating capacity based on non-hydro renewable resources from some 1,410 megawatts (MW) today to 10,530 MW in 2030, primarily by adding wind power and biopower. That development represents a 146 percent increase over the renewable energy generation that would occur under existing policies (Figure 2).

Indiana also has a wealth of untapped potential for replacing coal-fired power and diversifying its electricity mix by relying more strongly on energy efficiency technologies. Investing in

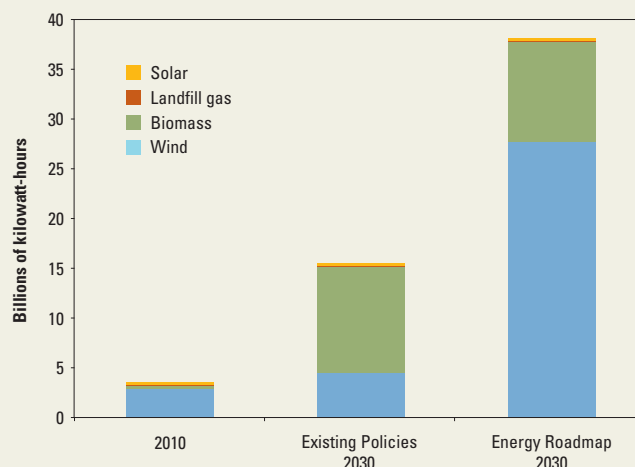
energy efficiency is one of the quickest and most cost-effective ways to transition to a clean energy economy.

By 2030, the energy efficiency targets in the Energy Roadmap would reduce electricity use by an additional 34.9 billion kilowatt-hours annually in Indiana—equivalent to replacing the power output from more than eight new coal plants of a typical size (600 MW). Greater reliance on renewable energy and energy efficiency would reduce the need to generate power from coal by 9 percent in 2030 compared with existing policies.

### ALTERNATIVE TECHNOLOGY PATHWAY

Given its abundant and diverse renewable resources, the Midwest could develop various mixes to meet the Energy Roadmap's targets. In our model, small changes in assumptions about the cost, performance, and siting or supply constraints of each technology affect the mix. In our alternative technology pathway, we assume that some of the significant development constraints facing biomass can be overcome, leading to lower cost and better performance of the technology.

**Figure 2. Use of Renewable Resources to Generate Electricity in Indiana, 2030: Existing Policies vs. Energy Roadmap**



Under this alternative technology pathway, Indiana would generate 21 percent more electricity from renewables in 2030 than under the core policy case. This finding primarily reflects the state's strong potential for co-firing biomass at existing coal plants. Under the alternative technology pathway, more than three times as much electricity would come from such co-firing by 2030. The amount of electricity generated from wind and other renewable energy resources would be similar under both scenarios.

While the alternative technology pathway alters the mix of renewable resources used to generate electricity, Indiana would still achieve the Energy Roadmap targets while reaping consumer savings and other economic benefits (Table 1). Job creation is somewhat lower than under the core policy case, because the state meets a larger share of the renewable energy target by co-firing biomass at existing coal plants—a less labor-intensive approach than building new renewable energy facilities. However, greater reliance on biopower under the alternative technology pathway puts more money in the pockets of rural landowners from the harvest and sale of biomass products.

## RESPONSIBLE ACTION ON CLIMATE CHANGE

If heat-trapping emissions are left unchecked, global warming—which already threatens our health and environment—will worsen. Indiana will see significant consequences in the next few decades, and they will become more severe as the century progresses (Hayhoe et al. 2009).

Fortunately, renewable energy and energy efficiency are smart and affordable global warming solutions that cut CO<sub>2</sub> emissions by reducing fossil fuel use. Under the core policy case, the Energy Roadmap targets would lower CO<sub>2</sub> emissions from Midwest power plants by 130 million metric tons annually by 2030 (16.7 percent below base-case levels)—equivalent to the annual emissions from 30 typical new coal plants.

## THE BOTTOM LINE

As Indiana and other Midwest states search for ways to help revitalize their economies, investing in clean energy is a smart and responsible course. Adopting the Energy Roadmap's goals for renewable energy and energy efficiency would spur innovation, create thousands of jobs in big cities and small towns across Indiana, provide much-needed savings on energy bills for families and businesses, and diversify the state's power supply, making it more reliable and secure.

Indiana has already taken important steps toward a clean energy future. However, the Hoosier State should go further by making its existing clean energy goal binding, and by increasing it from 10 percent by 2025 to 30 percent by 2030. Indiana also needs to strengthen its EERS to match the target in the Energy Roadmap of 2 percent annual cuts in electricity use by 2015 and thereafter.

**Table 1. Indiana's Economic Benefits from Meeting the Energy Roadmap Targets: Core Policy Case vs. Alternative Technology Pathway**

	Core Policy Case	Alternative Technology Pathway
<b>Savings on Electricity and Natural Gas Bills (cumulative)</b>		
2010–2020	\$2.3 billion	\$2.6 billion
2010–2030	\$9.0 billion	\$8.9 billion
Typical annual household savings, 2030	\$371	\$346
<b>Net Job and Economic Benefits (in 2030)</b>		
Net job creation	19,200	17,800
Income	\$820 million	\$650 million
Gains in gross state product	\$480 million	\$390 million
<b>Other Net Economic Benefits (cumulative 2010–2030)</b>		
New capital investment in renewable energy	\$7.5 billion	\$0.9 billion
New capital investments in energy efficiency	\$3.5 billion	\$3.5 billion
Biomass payment	\$160 million	\$980 million
Wind land-lease payments	\$110 million	\$10 million
Property tax revenues	\$940 million	\$140 million

State and federal tax credits and other financial incentives, more funding for research and development, stronger energy codes for buildings, and better processes for planning, siting, and approving electricity transmission lines are also needed. By doing its part to promote renewable energy and energy efficiency in the Midwest, Indiana will reap significant economic and environmental benefits today while creating a clean and sustainable energy economy for future generations.

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The full text of this report is available on the UCS website at [www.ucsusa.org/brightfuture](http://www.ucsusa.org/brightfuture).



**Union of Concerned Scientists**

Citizens and Scientists for Environmental Solutions

**National Headquarters**  
Two Brattle Square  
Cambridge, MA 02138-3780  
Phone: (617) 547-5552  
Fax: (617) 864-9405

**Washington, DC, Office**  
1825 K St. NW, Ste. 800  
Washington, DC 20006-1232  
Phone: (202) 223-6133  
Fax: (202) 223-6162

**West Coast Office**  
2397 Shattuck Ave., Ste. 203  
Berkeley, CA 94704-1567  
Phone: (510) 843-1872  
Fax: (510) 843-3785

**Midwest Office**  
One N. LaSalle St., Ste. 1904  
Chicago, IL 60602-4064  
Phone: (312) 578-1750  
Fax: (312) 578-1751