

# MINNESOTA'S CLEAN ENERGY

## Our Clean Energy Economy

With an abundance of wind, solar and bioenergy—Minnesota is poised to grow our own clean energy economy, fulfill our own energy needs, and reduce our emissions. In fact, we already are well on our way. Minnesota is the fourth best state for favorable policies and the ninth best state in clean technology leadership, based on a review of technologies, state policies and access to capital. Four clean energy industries in Minnesota already have a strong base from which to grow local businesses. Representing huge potential earnings for clean energy workers, these industries are expected to add more jobs in Minnesota in the coming decades.

### WIND

Minnesota generated nearly 16% of its electrical power from wind in 2013, ranking fifth nationwide. And, in 2013, landowners received more than \$10 million in annual land-lease payments.

**In 2011, large-scale wind power from the upper Midwest was available for just over 3 cents per kWh (\$30/MWh), compared to new natural gas plants at 6-8 cents per kWh (\$61-87/MWh).**

### SOLAR

Minnesota has as much sun to power solar panels—for seven hours a day—as Houston, Texas. This abundance—along with increasing demand for solar, decreasing solar prices and the state's aggressive renewable energy policies—could mean a boon for Minnesota companies in the solar market. Solar demand in the United States increased more than 33% in 2013, and solar energy consumption is projected to increase by roughly 19% in 2014. Driving demand for solar in Minnesota is the state's solar energy standard, which requires investor-owned utilities to meet 1.5% of their electricity needs from solar by 2020.

**Solar module prices plummeted 40% from 2008 to 2012.**

### BIOENERGY & BIOCHEMICALS

We can replace petroleum with fuels and chemicals derived from plants. For more than a century, Minnesota has used its rich endowment of timber and farmland to become a pioneer in bioenergy. Today, the Department of Natural Resources and the Statewide Wood Energy Team are accelerating the substitution of high-cost fossil fuels, such as propane and fuel oil, with sustainably managed wood from Minnesota's forests.

**The Minnesota Department of Natural Resources estimates that we could offset about 3% of our fossil needs with woody biomass.**

### ENERGY EFFICIENCY

The cheapest, cleanest energy is energy we don't have to produce, making energy efficiency an energy resource, just like wind or solar. Minnesota's Conservation Improvement Program requires an annual energy savings goal of 1.5% of retail sales for electric and natural gas utilities. The policy has saved electricity and gas customers millions of dollars over the last few decades and created thousands of stable jobs that cannot be outsourced, such as weatherizing (insulating) homes, installing new windows, and upgrading heating, venting and air conditioning systems and lighting. Today, Minnesota's energy efficiency firms employ about 9,000 people.

#### EFFICIENCY IS CHEAP

The cost to *SAVE* a kilowatt-hour of electricity is about

**1.5 CENTS**

The cost to *BUY* a kilowatt-hour of electricity is about

**8 CENTS**

**20%**

#### DID YOU KNOW?

Renewables account for almost 20% of Minnesota's electricity generation annually, and our residential electricity rates are still consistently below the national average.

## By the Numbers

### CLEAN ENERGY JOBS



15,300+ Minnesotans Work in Clean Energy

More than 15,300 Minnesotans work in clean energy. In 2013, these workers added more than \$1 billion in direct wages to the Minnesota economy.



75%+ Growth in Clean Energy Jobs

Minnesota's clean energy jobs grew more than 75% between 2000 and 2014. By comparison, the total Minnesota economy grew 11% during the same period.

### BIOFUELS EXPORTS



79% of Ethanol Is Exported

Minnesota is such a large ethanol producer that we export 79% of what we make.

## Success Stories



### WIND

**Xcel Energy** has said that wind is now less expensive than a 20-year natural gas contract. The company is the nation's number one purchaser of wind power and operates two wind farms in Minnesota. The American Wind Energy Association named Xcel Energy its "2013 Energy Utility of the Year" for its commitment to wind power.



In 2012 alone, wind energy provided up to 2,000 direct and indirect jobs in Minnesota.



### SOLAR

St. Paul-based **SimpleRay** predicts that by the end of the decade Minnesota's solar requirement could boost in-state solar panel sales by a factor of 40. Increasing solar demand, lower prices and aggressive renewable energy policies are driving market growth in Minnesota.



Minnesota solar businesses plan to hire 250 more workers through 2015.



### EFFICIENCY

Minneapolis-based startup **SmartThings** developed a cloud-based infrastructure that allows users to control thermostats, lights and other household electronics from their smartphones. The company received \$12.5 million in venture capital investment in 2013.



SmartThings technology makes it easy for consumers to save money and energy.



Downed trees and waste wood were taken from Frontenac State Park to generate energy.



### BIOENERGY & BIOCHEMICALS

Climate adaptation, mitigation and economic opportunities can be linked to each other. In 2013, overgrown trees and invasive buckthorn were removed from Frontenac State Park to support landscape biodiversity. The waste wood was then brought to **District Energy in Downtown St. Paul** and directly used to generate enough energy to heat 90 homes for one year, displacing fossil fuel sources.

**Segetis**, a biochemical company in Golden Valley, uses plant-based chemicals to displace petroleum products that would otherwise be used in household products. The company's solvents can be found in Method laundry detergent and Seventh Generation cleaning products.

### DID YOU KNOW?

From 2004 to 2013, Minnesota clean energy firms received **\$422 million in venture funding**—more than Wisconsin, Iowa and North Dakota combined. Minnesota solar, wind and bioenergy firms also received **\$10.87 billion in energy project financing**.

