

Charting a New Path for North Dakota's Electricity Generation and



North Dakota's energy future is at a crossroads

One path leads to increased dependency on fossil fuels—threatening our economy and fueling global warming. The other leads to a new, smarter energy future for North Dakota. Investing in clean energy alternatives—like solar and wind power—can create and protect jobs in North Dakota, save families and businesses money, and make America more energy independent. Clean energy is also the most effective solution to the threat of global warming. We can start making progress right away using proven technology, and then draw on American innovation to take us the rest of the way with new technologies.

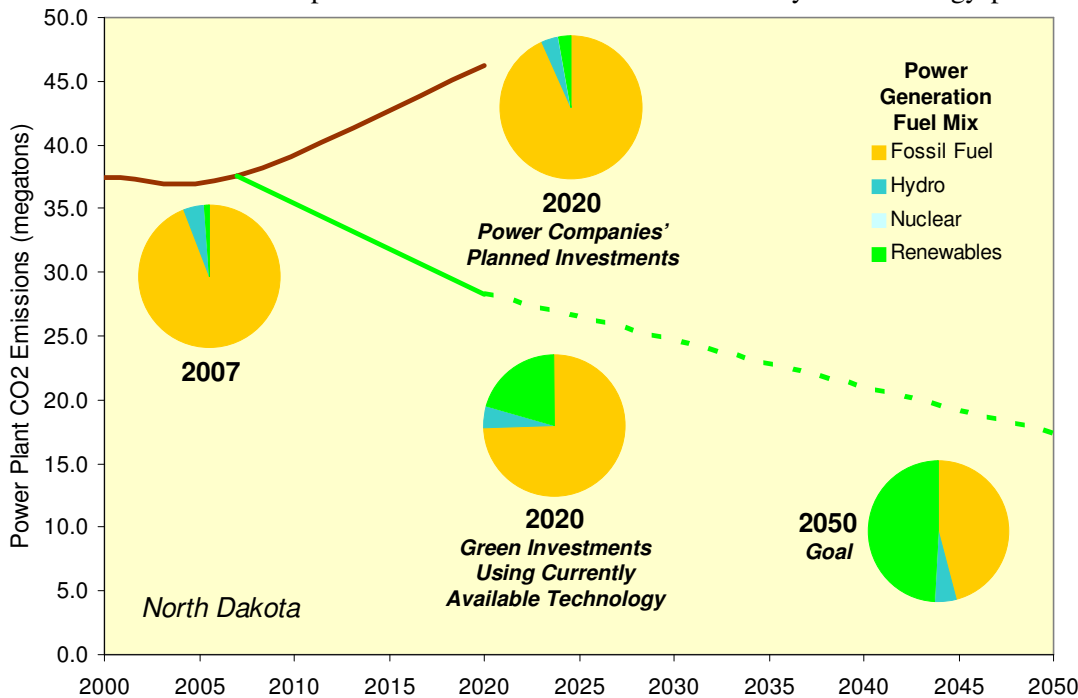
How does North Dakota generate electricity today?

In 2007, electric power generated in North Dakota primarily came from coal (93.8 percent), and hydro (4.8 percent). Most utilities intend to continue relying heavily on fossil fuels in the coming decade. North Dakota power companies plan to increase the energy generation from coal by 24.6 percent. Only about 1.1 percent of electricity generated in North Dakota is expected to come from renewable sources like wind, solar, geothermal, and biomass under current plans.

North Dakota has a choice to invest in a cleaner energy future

North Dakota can achieve a new energy future by making better investments as utilities replace increasingly aged infrastructure and expand capacity. An important first step is for North Dakota to generate at least 20 percent of electricity from renewable sources by 2020, a goal readily achievable with today's technology. Continuing to convert 15 percent of the state's energy portfolio to renewable energy sources each decade could yield an energy profile of at least 65 percent renewables by 2050.

North Dakota can also benefit from improved energy efficiency. Technologies are available that could reduce demand nationally by 20 to 30 percent over the next decade. Innovations in energy efficiency should allow us to keep demand constant after 2020, even as the population grows.



About the chart: 2000, 2007 and 2020 Power Companies' Planned Investments from CARMA 1.0 (www.CARMA.org). The 2020 Green Investments projection assumes that, using currently available technology, North Dakota makes (1) improvements in efficiency to reduce overall demand by 25 percent and (2) shifts away from fossil fuels so that 20 percent of power generation is from renewable energy sources. The 2050 Goal assumes (1) hydro and nuclear are unchanged, (2) continued efficiency improvements keep total demand flat, and (3) renewable energy replaces at least 65 percent of power generation formerly done through fossil fuel burning. Note that the projection of future CO₂ emissions from fossil fuels assumes no investment in carbon capture and storage.

Making a Difference in North Dakota

North Dakota has the best wind resources in the country, earning it the top rank for potential wind energy. If the available wind power in the state were harnessed, North Dakota would be able to produce over 10,000 times as much electricity as it consumes. However, the state is currently ranked only 14th for wind energy produced. Wind farms in the state currently produce 344 megawatts, with 327 MW under construction. To realize North Dakota's wind potential, the state needs to update its electricity transmission system. As is, the transmission system is not robust enough to handle the added load of large wind farms. Without further investment in the transmission system, North Dakota will only be able to reach a fraction of its wind potential.

Sources:

http://www.nationalwind.us/north_dakota_wind_facts

<http://www.awea.org/projects/projects.aspx?s=North+Dakota>



Making a dent in global warming pollution

Simply by shifting to renewable energy sources and improving energy efficiency over the next decade or so, North Dakota can reduce its future carbon dioxide (CO₂) emissions from electricity generation by 39 percent compared to the business-as-usual path that utilities are following now.

Given that 65 percent of North Dakota's CO₂ emissions come from electricity generation, diversifying and updating our power sources is critical for cutting the state's total global warming pollution.

Increasing North Dakota's energy and economic security

Investing in renewable energy sources will reduce North Dakota's dependence on fossil fuels and at the same time create new green collar jobs. A new energy future in North Dakota could include:

Expanded solar power. North Dakota has enough solar resources to produce 4,500 to 5,000 Whr per square meter using photovoltaic systems and 4,000 to 5,000 Whr per square meter using concentrating solar power systems. This means that devoting just 1 square mile in North

Dakota to solar power can provide enough electricity for about 1,200 households each year.

Expanded wind power. North Dakota is currently ranked 14th for wind power, with 345 MW of existing electricity generation capacity and 327 MW under construction. The American Wind Energy Association ranks North Dakota 1st in terms of its future wind potential, with 138,400 MW of potential capacity.

Biomass power. North Dakota has 21.0 million dry tons of biomass available each year that could be used to generate about 4,200 MW of electricity.

New Jobs. A nationwide investment in green infrastructure of \$100 billion over the next two years could yield 331 jobs in solar power and 270 jobs in wind power for North Dakota. That's 488 more jobs than an equivalent investment in conventional power would create.

How does North Dakota use electricity?

North Dakota's energy is used to power:

- homes (34 percent),
- businesses (37 percent), and
- industry (29 percent).

Per capita residential electricity use is 6,044 kilowatt hours per year, 34 percent greater than the national average.

References and Additional Reading:

American Council for an Energy-Efficiency Economy, www.aceee.org.

American Wind Energy Association, www.awea.org.

Bioenergy Feedstock Information Network, bioenergy.ornl.gov

CARMA (Carbon Monitoring for Action), www.CARMA.org.

Database of State Incentives for Renewables and Efficiency, www.dsireusa.org.

Department of Energy, Energy Efficiency and Renewable Energy, apps1.eere.energy.gov/states/alternatives/electricity.cfm.

Energy Information Administration, State Energy Data System, www.eia.doe.gov/emeu/states/_seds_updates.html.

Environmental Protection Agency, Energy CO₂ emissions by state, www.epa.gov/climatechange/emissions/state_energyco2inv.html.

Geothermal Energy Association, www.geo-energy.org.

McKinsey Global Institute, 2007: *Wasted Energy: How the U.S. Can Reach its Energy Productivity Potential*.

Political Economy Research Institute, www.peri.umass.edu.

Renewable Energy Policy Project, www.repp.org.

For more information, visit www.nwf.org/globalwarming.