

THE IMPACT OF EXTREME COLD ON ENERGY SOURCES



**Without renewables,
Minnesota's economy
will be left behind.**

71% of Fortune 100 companies have renewable energy commitments. We can either serve that demand or be left behind. We have the resources to serve it.

216 of the largest companies in the world have pledged to go 100% renewable (most by 2030)

- In Iowa, wind energy has drawn investments from Google, Facebook, and Microsoft
- In Kansas, wind power was key to luring new Mars, Inc. factory

MN will be left behind if we continue to cling to outdated ideas.

Extreme weather impacts all energy sources

During Minnesota winters, the talking point often comes up that renewables can't handle the cold. The fact is, extreme weather events, like a polar vortex, impact all energy sources, not just renewables. **While 7,000 MW of wind energy faced outages on our grid during the 2019 polar vortex, 15,000 MW of coal and gas energy also shut down due to the cold.** Nuclear is not immune either, ice accumulation shut down the Salem Nuclear Power Plant in New Jersey in January 2019. **No power source is immune from the impacts of extreme weather** — this is an industry-wide problem that is being solved as the grid shifts nationally toward clean energy.

While in reality, the majority of outages during extreme weather events are a result of down power lines and pipes, not the source, when energy sources are impacted, our increasingly flexible grid allows operators to keep the lights on.

Transmission is the solution

Minnesota is part of a complex grid network, MISO, that extends across 15-states. This network allows grid operators to manage the strengths of different energy sources to achieve reliability. Of course the wind doesn't always blow and the sun doesn't always shine, this becomes a problem to solve when you have a grid that is 80% wind/solar. **MISO is currently about 8% wind/solar. By working together, we can power a grid with 10X as much renewables as we have now.**



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RENEWABLE ENERGY IS RELIABLE



Can Minnesota go fully renewable?

A 2018 McKnight Foundation study found that Minnesota could retire every coal plant in the state, never build another natural gas plant, and still meet Minnesota's energy demands through clean, renewable energy resources.

What happens if the sun isn't shining and the wind is not blowing in Minnesota?

Minnesota is part of a complex grid network —the Midcontinent Independent System Operator (or "MISO")— that extends across 15 states, from Canada down to Louisiana. Chances are, when the wind is not blowing here in Minnesota, the sun is shining in Arkansas. When the sun isn't shining in Iowa, the wind may be blowing in North Dakota. And thanks to our regional grid network, a state can import the electricity it needs from its neighbors who have excess generation.

Of course the wind doesn't always blow and the sun doesn't always shine. Fortunately, this becomes a problem to solve when you have a grid that is up to 80% renewable energy. At just 8% wind and solar, MISO has a long way to go before we need to worry about reliability. Denmark runs right now on almost 50% wind. And it's not just the Scandinavian countries — the UK is at about 40% renewable energy, most of that is wind, and, Costa Rica is already operating on almost 100% renewable energy.

Do renewables work in a polar vortex?

Extreme weather events, like a polar vortex, impact all energy sources, not just renewables. While 7,000 MW of wind energy faced outages on our grid during the 2019 polar vortex, 15,000 MW of coal and gas energy also shut down due to the cold. No power source is immune from the impacts of extreme weather —this an industry-wide problem that is being solved as the grid shifts nationally toward clean energy.

Isn't building a renewable grid too expensive?

Even putting the hidden costs of climate change aside, both solar and wind are cheaper than fossil fuel resources much of the time. The McKnight Foundation report found that transitioning to clean and renewable energy resources would reduce electric rates and save households \$1,200 per year in energy costs, while creating local jobs and promoting public health.

(2019 Lazard's LCOE for CC is \$44-68, solar PV \$32-42, wind \$28-54).

Who cares?

Your constituents, businesses, and most of all the planet. A March 2019 Gallup Poll found the majority of Americans support reducing fossil fuel use. Companies including Google, Ikea, Apple, Facebook, Microsoft, Coca-Cola, Nike have made 100% renewable commitments. And, the science is crystal clear reducing carbon emissions is critical to avoiding the worst impacts of the climate crisis.