



March 24, 2022,

Dear Members of the Energy and Utilities Finance & Policy Committee:

Center of the American Experiment appreciates the opportunity to provide support for several bills before the committee today, SF 225 (Kiffmeyer), SF 4082 (Mathews) and SF 4163 (Mathews).

American Experiment supports these bills because we believe new nuclear power must be part of Minnesota's energy future. Legalizing new nuclear plants is even more crucial because this energy source is superior to wind and solar in four main ways: national security, reliability, affordability, and environmental outcomes.

National Security

Nuclear power offers superior national security benefits because they are reliable assets that store 18 months of fuel on-site. This fuel can be mined in the United States or imported from friendly countries like Canada or Australia to offset the imports the U.S. currently gets from Russia.

In contrast, the vast majority of the world's solar panels are produced in China.¹ Many of the components are made by enslaved Muslim Uyghurs who work in factories powered by coal.² Additionally, many of the metals used in solar panels, wind turbines, and battery storage facilities are mined or refined in China, according to the International Energy Agency.³

Americans should not become as beholden to China for our energy as Western Europe has become beholden to Russia for theirs.⁴

¹ <https://www.reuters.com/article/china-solar-glass-idAFL1N2IJ0E2>

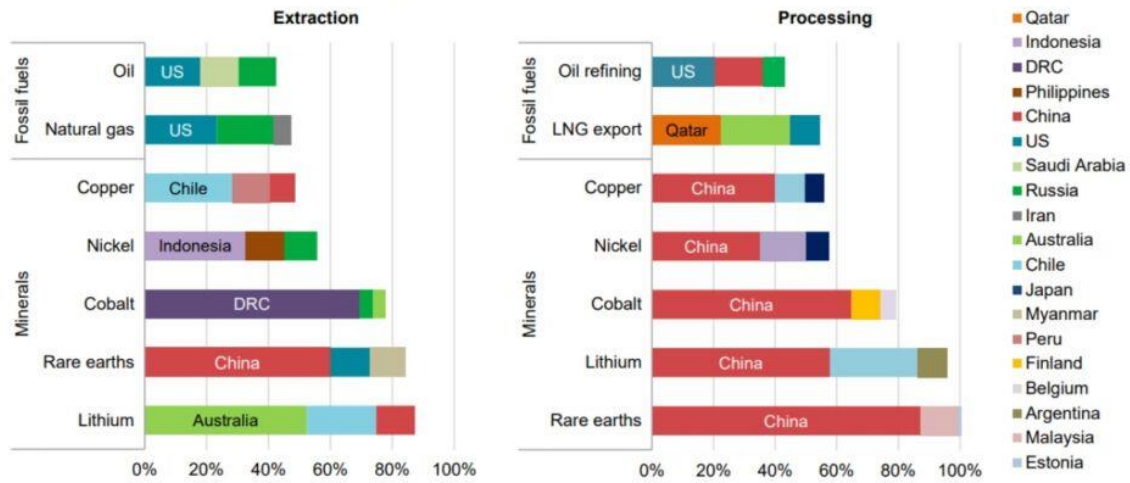
² <https://www.bbc.com/news/world-asia-china-57124636>

³ <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions>

⁴ <https://www.nytimes.com/2022/03/23/business/olaf-scholz-russia-energy.html>

Production of many energy transition minerals today is more geographically concentrated than that of oil or natural gas

Share of top three producing countries in production of selected minerals and fossil fuels, 2019



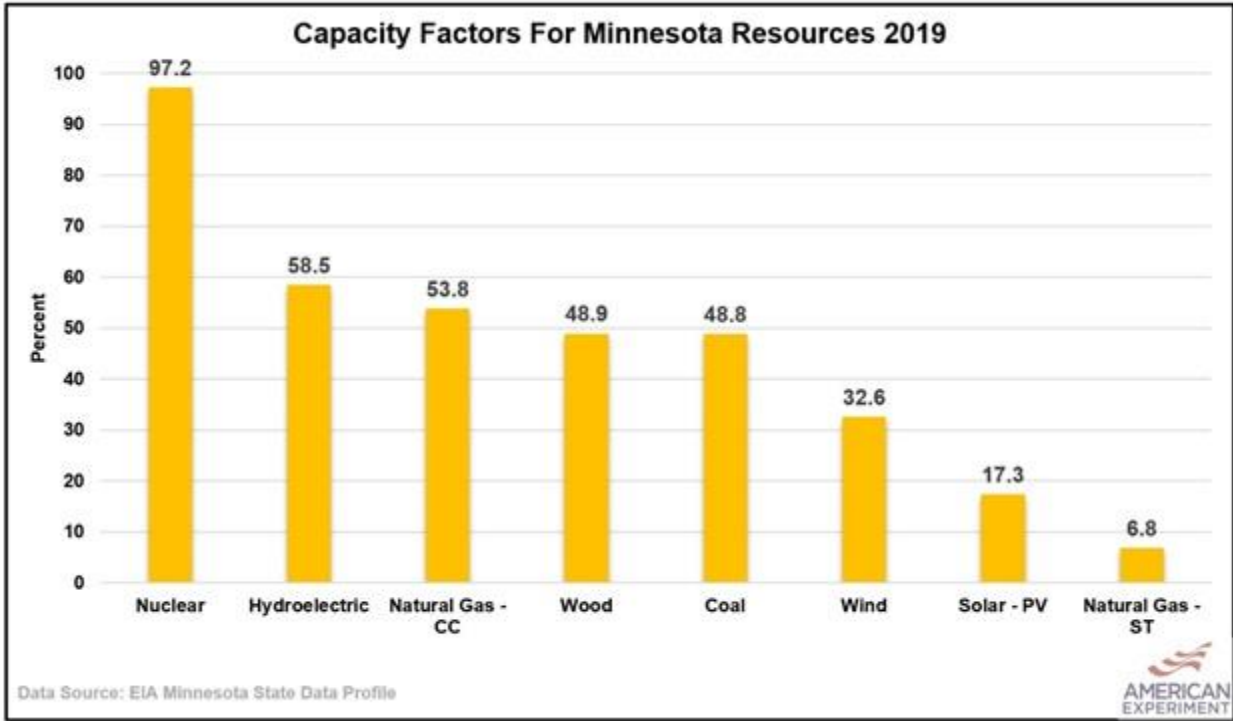
Notes: LNG = liquefied natural gas; US = United States. The values for copper processing are for refining operations.
Sources: IEA (2020a); USGS (2021), World Bureau of Metal Statistics (2020); Adamas Intelligence (2020).

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Reliability

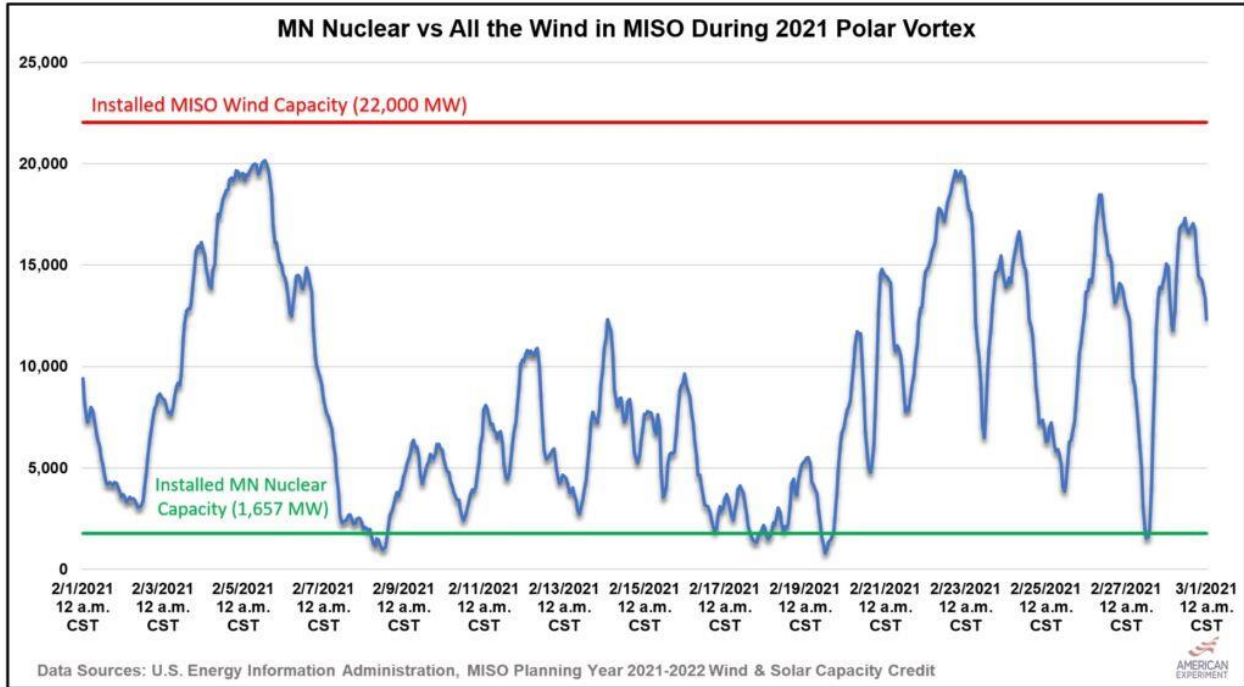
Nuclear plants offer superior reliability to wind and solar. In 2019, Minnesota nuclear plants generated 97.2 percent of their potential output, whereas wind turbines averaged just 32.6 percent, and solar panels averaged only 17.3 percent.⁵

⁵ https://www.eia.gov/electricity/state/Minnesota/state_tables.php

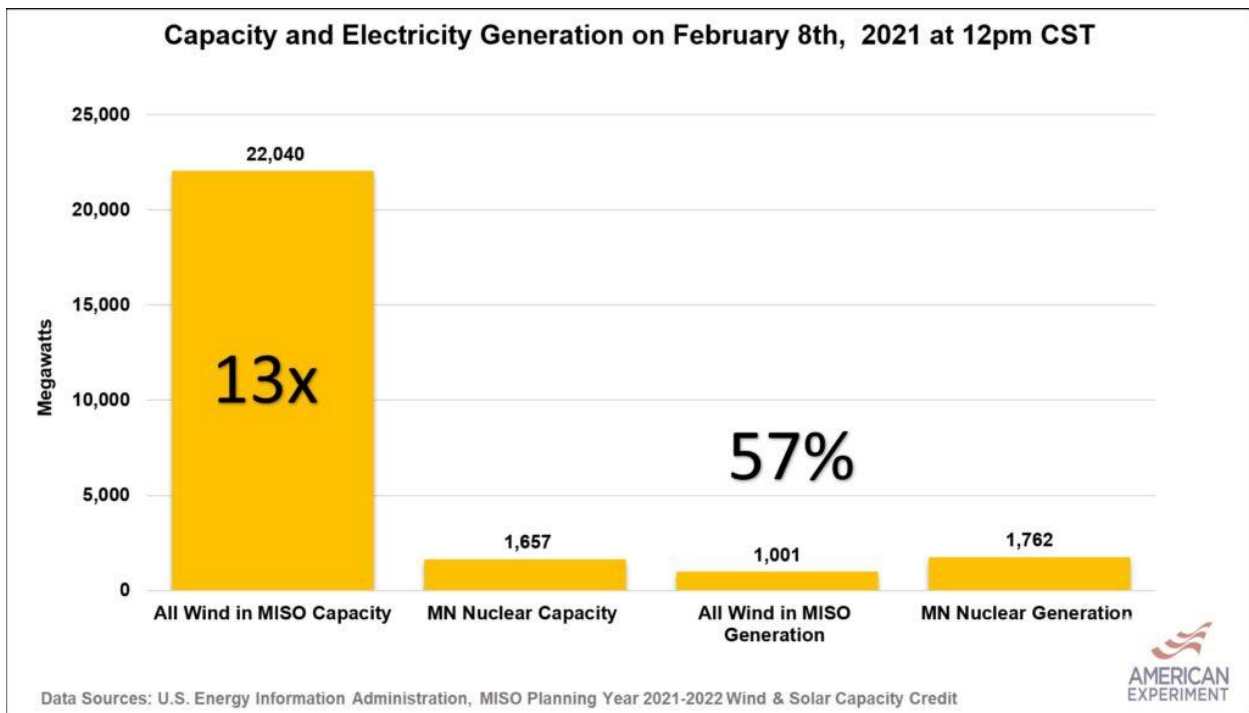


What's more important than average electricity generation is the fact that nuclear shows up to work when it is needed most, but the wind does not.

Data from the U.S. Energy Information Administration show that Minnesota's small fleet (1,657 megawatts) of nuclear power plants produced more electricity than the entire wind fleet (22,000 megawatts) in the 15-state regional grid, the Midcontinent Independent Systems Operator (MISO) for several hours during February of 2021.

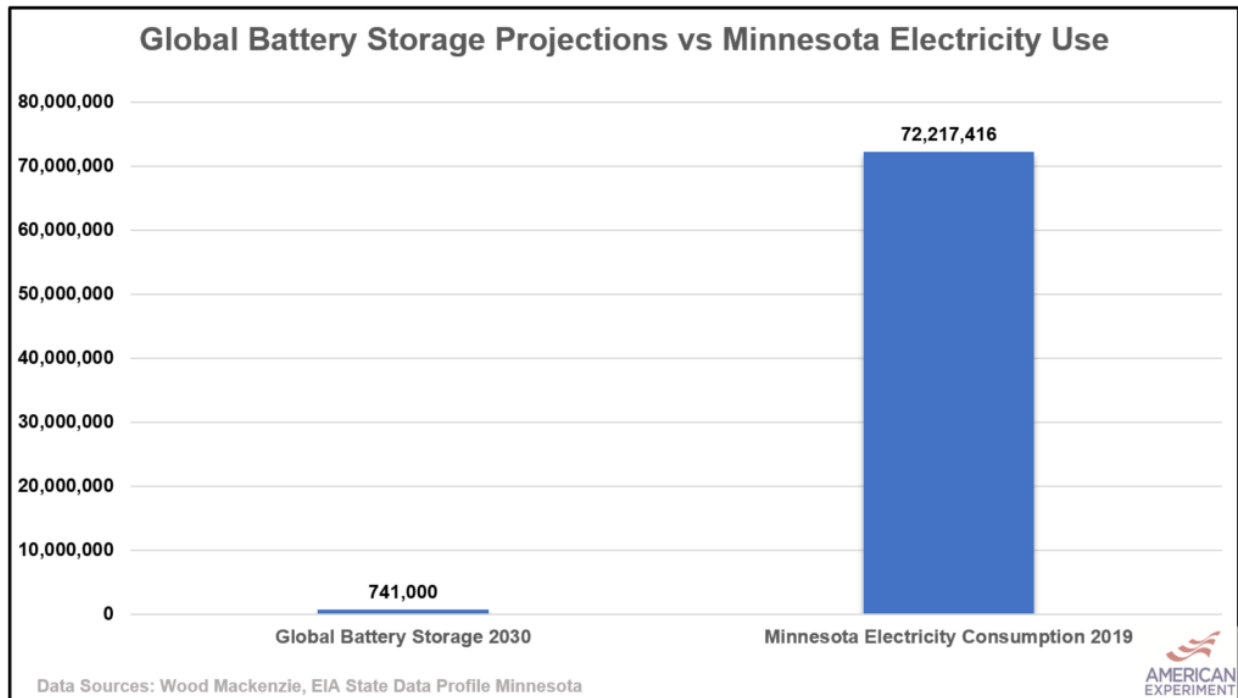


Put another way, for some hours in February; wind produced only 57 percent of the output of Minnesota’s nuclear fleet even though there is 13 times more wind capacity on the regional grid than Minnesota’s nuclear fleet.



Wind and solar advocates often argue that battery storage will provide the needed solution for the unreliable nature of wind and solar. However, an analysis from Wood Mackenzie finds that there will be just 741,000 megawatts of battery storage capacity *globally* by 2030, which is about one percent of Minnesota’s annual consumption.⁶

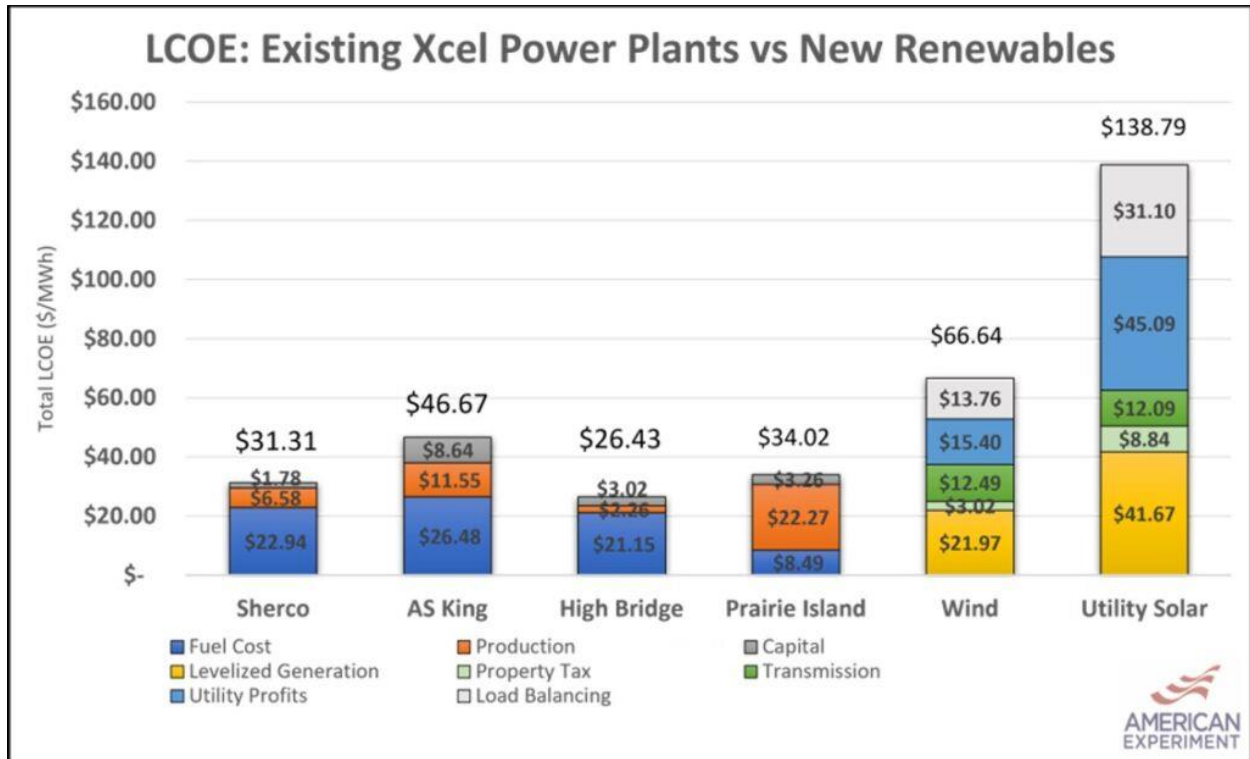
In other words, there won’t be enough battery storage globally in 2030 to power Minnesota for four straight days.



Affordability

Data from the Federal Energy Regulatory Commission show Minnesota’s nuclear plants are some of the lowest-cost power producers in the state. These plants are far more affordable than new wind and solar when the full costs of these sources are accounted for (see the graph below).

⁶ <https://www.greentechmedia.com/articles/read/woodmac-global-storage-to-reach-741-gigawatt-hours-by-2030>

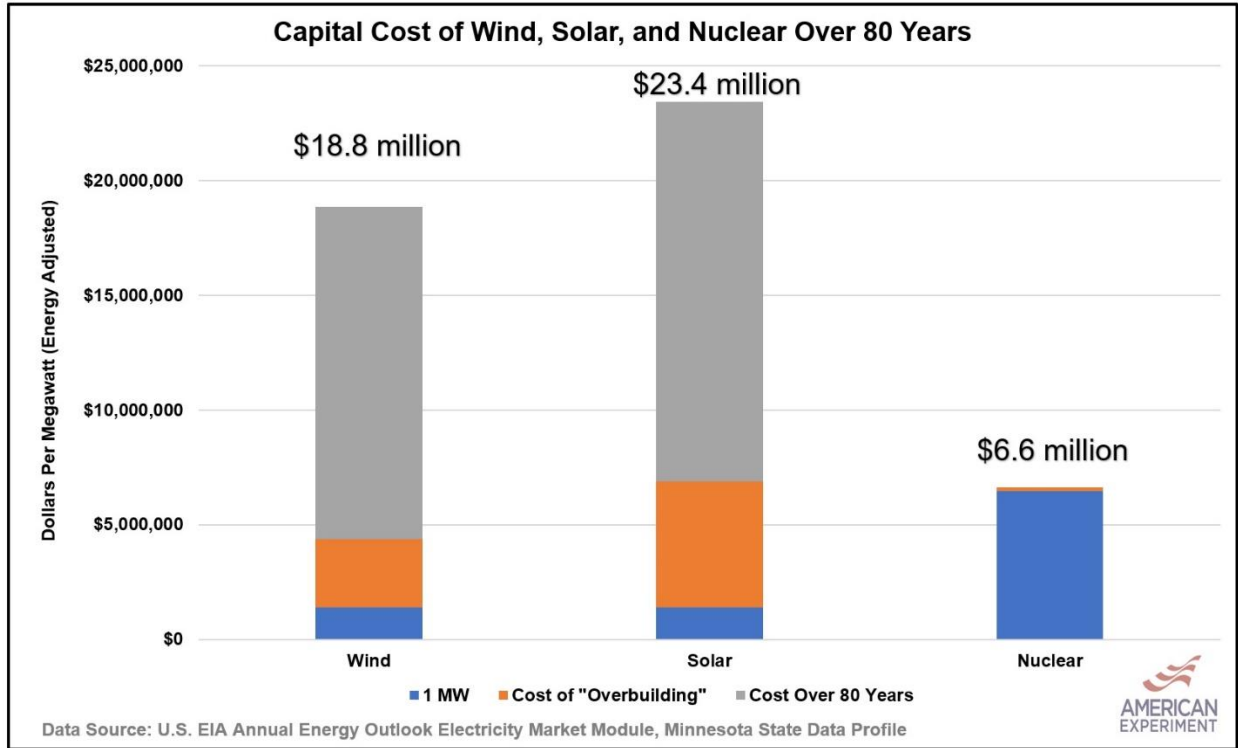


Nuclear is also a much better value than wind and solar. Wind turbines and solar panels only produce one-third and one-fifth of the electricity generated by nuclear on a per-megawatt of installed capacity basis. This means we would need to build three times as many wind turbines and five times as many solar panels to get the same amount of energy as a nuclear plant.

Furthermore, nuclear plants last for up to 80 years, whereas wind turbines last for 20 years and solar panels for 25 years.^{7,8} This means wind and solar would need to be rebuilt multiple times over an 80-year timeframe, causing them to be much more expensive than a new nuclear plant.

⁷ <https://www.power-eng.com/nuclear/nrc-approves-80-year-lifespans-for-surry-nuclear-units-1-and-2/>

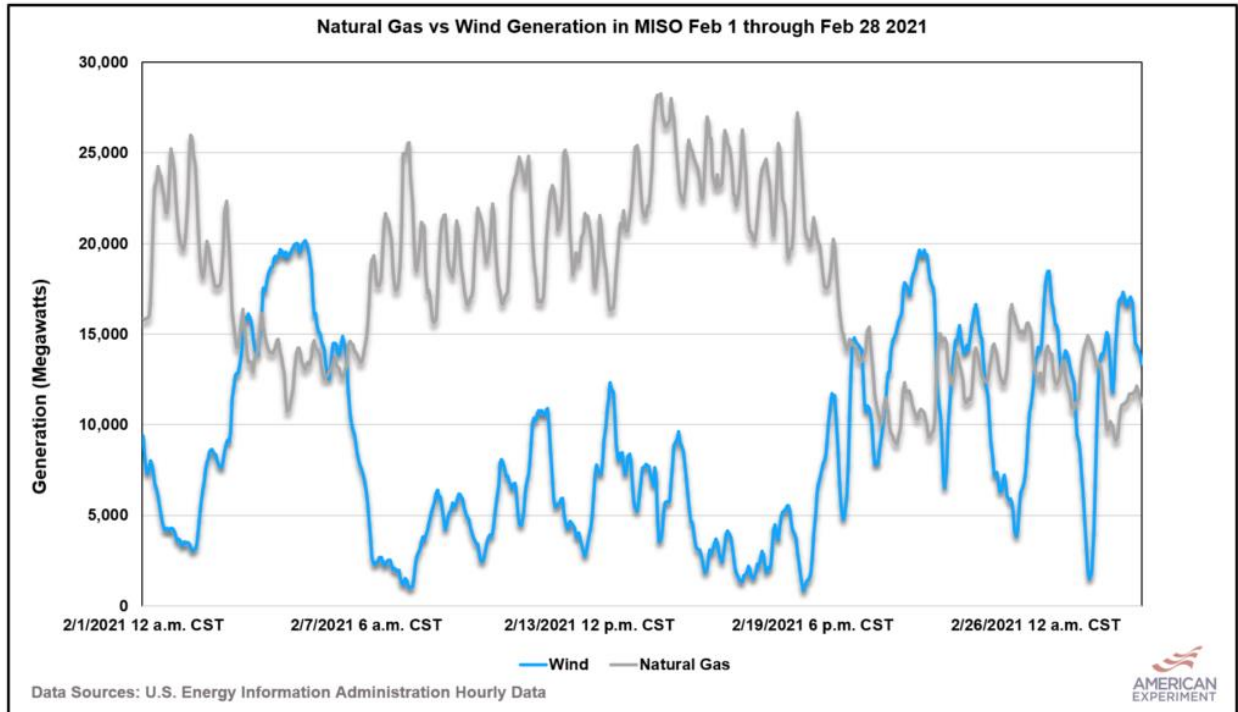
⁸ <https://www.nrel.gov/analysis/tech-footprint.html>



Sunlight and breezes may be “free,” but it is expensive to generate electricity with wind turbines and solar panels. In terms of cost, nuclear is clearly a superior alternative.

Environmental outcomes

Nuclear also produces superior environmental outcomes. The graph below shows wind generation versus natural gas generation during February of 2021. As you can see, natural gas generation increases as wind generation falls.



Burning natural gas for electricity generation when the wind isn't blowing emits carbon dioxide. This means that the grid, as a whole, is emitting more carbon dioxide using a combination of wind and natural gas than it would if we had a nuclear-powered grid, which, as we saw above, produced steady, reliable power during this month.

If the grid had 22,000 MW of nuclear, instead of wind, it would have greatly reduced the need for natural gas, and emissions.

Conclusion

Nuclear should have unanimous support from members of all political parties because it is a common-sense way to provide the secure, reliable, and affordable energy conservatives prize while also delivering superior reductions in greenhouse gas emissions prized by liberals.

This is why American Experiment believes each of these bills should be adopted with unanimous support.