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POLICY NOTE

The risk of Texas-style blackouts in Washington is real and growing

By Todd Myers, Director, Center for the Environment March 2021

Key Findings

1. The recent blackouts in Texas have increased awareness of the need for reliable sources of electricity.
2. The risk of a power shortage in Washington is already slightly above the acceptable standard of 5 percent for Loss of Load Probability (LOLP).
3. That risk increases dramatically in the upcoming years, reaching 26 percent in 2026.
4. A new assessment being completed by the NW Power and Conservation Council could find the risk is even higher than that.
5. Removing the four Lower Snake River dams would cause that already high risk to increase even more.
6. Reducing the LOLP to an acceptable level in our state will be challenging given the limits on building new dispatchable energy sources like hydro and natural gas.

Introduction

The recent electrical blackouts in Texas have sparked a great deal of discussion about how society can provide a predictable supply of electricity while reducing the environmental impact of producing energy. The costs of getting policies wrong, as has been demonstrated in Texas and California, can lead to expensive and deadly outcomes.

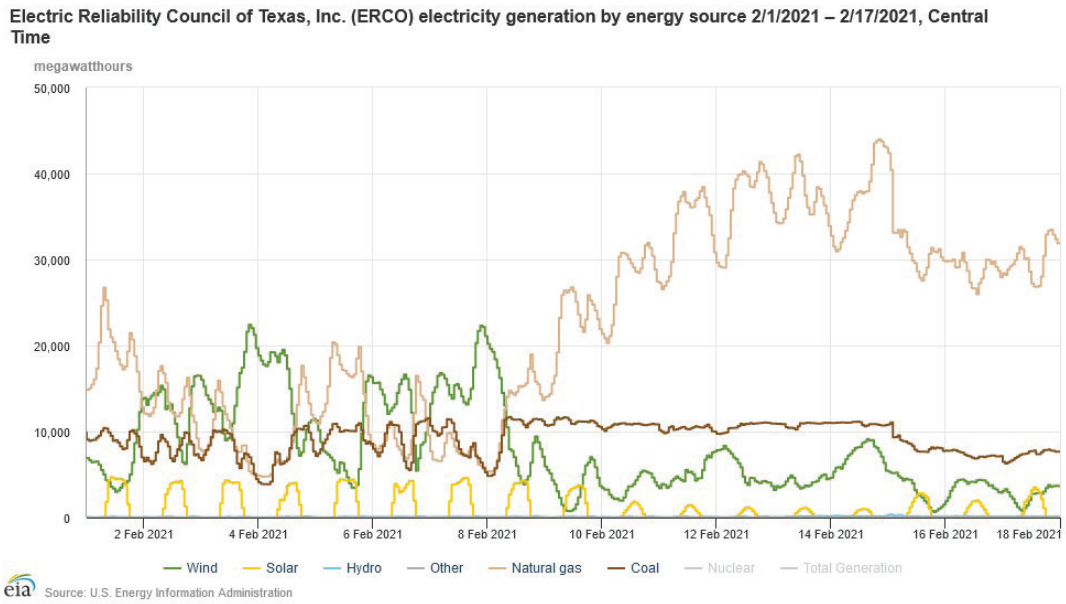
Although Washington State has a very different energy mix and utility system, the experience in Texas is a good reminder of how state leaders should assess the resiliency of our electricity generation and the grid's ability to withstand a serious winter storm.

What is the outlook for the stability of Washington's electrical supply? Currently, the risk of blackouts is slightly higher than is acceptable and the danger will get much worse in the near future. The high risk is a warning that the state's energy policy should not ignore reliability.

Power outages in Texas

Several factors contributed to the outages in Texas.

The basic cause of the outages was a storm that caused winter demand to hit an all-time high during the night of February 14, 2021. Soon after midnight on February 15th the electrical system could not meet demand and rolling blackouts were initiated by the grid manager, a Texas state agency known as ERCOT, causing the big drop in natural gas generation and a smaller drop in coal generation. Home heating has priority over electrical generation for supplies of natural gas, so a loss of fuel could have contributed to the reduction in natural gas generation. With high demand and struggling supply, the frequency of the alternating current dropped below 60 Hertz to a level that required some facilities be shut down to prevent equipment damage.



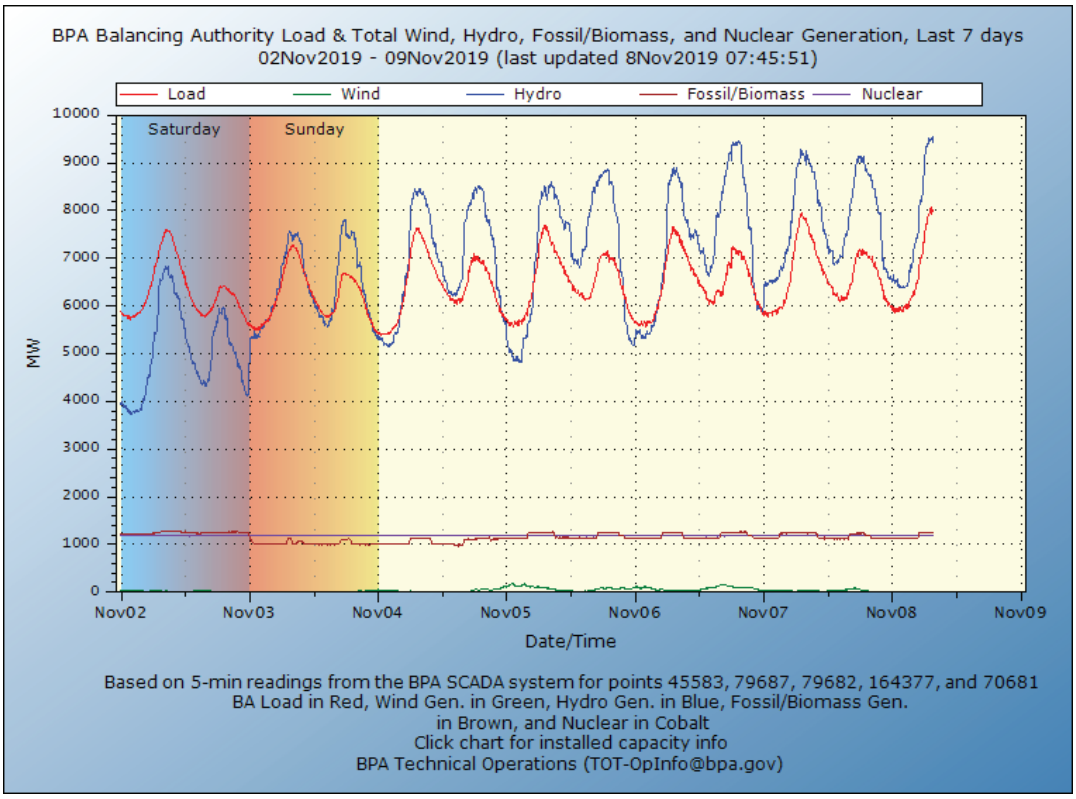
Additionally, once the winter weather moved in, the amount of wind energy available declined significantly. In the week before the storm, variable wind generation ranged from 3,000 megawatt hours (MWh) to 21,000 MWh. When the storm moved in, that range narrowed to a maximum of 9,000 MWh to below 1,000 MWh. Some have noted that ERCOT only planned for about 6,000 MWh of wind, so the reduction was not unexpected. That is true, but that left nuclear, coal, and (mostly) natural gas – i.e. dispatchable electricity (because it can be dispatched when needed) – to meet the extremely high demand for power.

Rising risk of blackouts in Washington State

Could a similar situation, with dispatchable energy unable to keep up with demand, happen in Washington State? The chances of that scenario are, unfortunately, increasing.

To estimate the chance that outages or electricity shortfalls could occur, the Northwest Power and Conservation Council (NWPCC) calculates the annual Loss Of Load Probability (LOLP), which is the "the likelihood (probability) that system demand will exceed the generating capacity during a given period."

It is important to keep in mind that a loss of load could simply mean that grid managers ask major industrial users of electricity to shut down or reduce demand. It does not necessarily mean what we saw in Texas. Additionally, reducing the risk that electricity supply falls short can mean adding generating resources that may be idle much of the time. Generation that is only used when demand is very high means the cost of the electricity will be very high. So, while we could, theoretically, push the LOLP to near zero, doing so would be very expensive.



According to the last "Power Supply Adequacy Assessment," in 2019, the LOLP is currently about 7.5 percent, which is above the acceptable level of 5 percent. Unfortunately, that number will increase significantly over the next few years. The current projection predicts LOLP will increase to 12.8 percent in 2024, jumping up to 26 percent in 2026.

There are several causes for this increase, including a projected increase in demand coupled with the closing of several coal-fired generators.

The most likely power outages happen in the winter, when energy needs in Washington state are greatest and available wind power can be very low. For example, between October 31st and November 8, 2019, the amount of wind available on the BPA system across the Northwest fell to virtually zero for more than a week.

Currently, wind power does not amount to a large enough percentage of our energy supply – only 6.3 percent of electricity generated in Washington – to cause power outages by itself. As the NWPCC assessment notes, "While low wind and solar generation and thermal forces outages can add to shortfalls, they rarely, if ever, are the sole cause. In other words, having an extremely high number of thermal outages can easily be overcome if river flow volumes are near average or above." In a normal year, Washington's stored, dispatchable hydro power is significant enough to meet demand. In unusual winter circumstances, however, the unpredictability of wind power can make a bad situation worse.

As bad as those numbers for our state are, the updated projection being released later this year could make them worse. A new model is adding complexity, which allows a more granular and realistic understanding of energy flows in the Northwest. That additional complexity is likely to reveal that the chance of grid disruptions is higher than believed. There are a number of reasons for this.

Previous projections treated all available resources similarly, assuming they were interchangeable. The new model includes the limitations of long-distance transmission lines, which means that the power supply created in Montana and Wyoming is not automatically available in Seattle. The result is that we could see an LOLP over 20 percent in 2025.

The importance of reliable hydro power

Additionally, all of these projections assume the four Lower Snake River (LSR) dams continue to supply dependable energy. The Snake River dams have a combined peak capacity of about 3,000 MW. Estimates of the existing shortfall of generation for 2025 range from about 1,000 MW to 3,000 MW in the NWPCC research. Another study, completed for several utilities in Washington State, found the shortfall could be as high as 7,000 MW in 2025. Destroying the dams and deliberately shutting down 3,000 MW of peak power generation would make a bad situation much worse.

The NW Energy Coalition, a group pushing for destruction of the Snake River dams, claims the energy can be replaced with variable wind and solar power. The NWPCC assessment shows there are problems with that plan. First, destroying the dams would replace a predictable source of energy with unreliable intermittent sources. Second, NW Energy Coalition calls for putting the wind generation in Montana and the solar generation in southern Idaho. The updated NWPCC model shows that long-distance power transmission is a problem, so even on a winter day when the wind is blowing in Montana and the sun is shining in Idaho, it may be challenging to deliver the electrons to households in Western Washington.

It is also unclear how we are going to make up the currently projected deficit in dispatchable generation. Two years ago, the Washington Legislature passed the Clean Energy Transformation Act (CETA), which requires generation to be CO2-neutral in 2030. It is extremely unlikely that the Northwest will see new hydro generation in the next decade, so new generation will either come from unpredictable renewables or thermal sources like natural gas. With CETA looming, utilities are unlikely to add new natural gas generation to meet the deficit because that electricity will face legal restrictions in Washington State.

Conclusion

Filling the dispatchable energy generation deficit with intermittent sources like wind and solar means overbuilding in the hopes that enough generation could be supplied even if there is very little wind available. This would put us in a similar situation as Texas. Wind's defenders note that ERCOT did not plan on much wind, so blaming wind isn't fair. This is true, but when determining resource adequacy ERCOT knew wind was unpredictable, so it was a small part of its worst-case planning. If we choose to fill the growing generation deficit with wind and solar, it makes us more reliant on sources of energy that may not be available when needed. Texas's production fell short without having to take that risk on wind.

The story isn't all bad. Keeping the current Snake River dams in place and increased generation and improvements to the grid will fill some of the gap in future generation. The trend, however, is not positive and the risk of blackouts in

Washington State is increasing. Texas provides a good example of the high cost of state officials failing to acknowledge the risk and to prepare for the future power needs of our communities.

Todd Myers is the Director of the Center for the Environment at Washington Policy Center. He is one of the nation's leading experts on free-market environmental policy. Todd is the author of the landmark 2011 book *Eco-Fads: How the Rise of Trendy Environmentalism Is Harming the Environment* and was a Wall Street Journal Expert Panelist for energy and the environment. Todd's research on the failure of "green" school mandates has stirred a reassessment of those requirements in school districts across the country. He currently sits on the Puget Sound Salmon Recovery Council and served on the executive team at the Washington State Department of Natural Resources. Todd also served as Director of Public Relations for the Seattle SuperSonics and Director of Public Affairs for the Seattle Mariners, and he holds a Master's degree from the University of Washington. He and his wife live in the foothills of the Cascade Mountains with two dogs and 200,000 honeybees.

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