



The Electric Grid in the Electrification Era

How will Washington's electric grid manage the transition to widespread electrification?

Supply & Demand

When we talk about the electric grid, it is helpful to consider it in two parts: supply and demand. The supply part includes the generators that create electricity like wind turbines, transmission lines that transport that electricity over long distances from the generators to neighborhood/regional substations, and the distribution lines that move electricity from substations to homes and businesses. The demand part includes all of the electric appliances and systems that consume electricity from refrigerators and lightbulbs to electric vehicles and industrial motors. For a functional grid, these two sides of the grid must be kept in balance; as demand increases, so too must supply.

With the outlook of increasing electricity demand—new loads from building and vehicle electrification—policymakers, regional planners and utilities must plan for a corresponding increase in supply. This will be a major undertaking in the coming decades because many new generation, transmission and distribution assets will need to be built or enhanced to meet growing loads on the demand side. At the same time, policymakers and utilities can work on lowering demand through increased energy efficiency and shifting demand to off-peak times through incentive programs. This combination of managing demand and increasing supply is how Washington will successfully electrify its economy. The [Northwest Power and Conservation Council](#) (NW Council), the agency responsible for developing the 20-year power plan for the four state Northwest region, agrees: “It is through the efficient management of [supply and demand] that the region will assure a reliable and economical power supply.”

In its [draft 2021 Northwest Power Plan](#) that examined the impact of clean energy laws and decarbonization goals, the NW Council stated, “While the region adapts to these policies, new economic signals, new resource development and dispatch, changing system operations, and uncertainty about the future, the Council is confident that the resource strategy in the Draft 2021 Power Plan will propel the region through the changes while maintaining an adequate, efficient, economical, and reliable power supply.”

Capacity

1. **Utilities already plan for maintaining resource adequacy:** When utilities talk about resource adequacy issues in the 2020s, it is important to keep in mind that those issues arise assuming *no new resource development* in future years. In fact, the transition to

electric buildings won't happen overnight. Over the next three decades, utilities will be taking a lead role and planning for a transition to all-electric homes and buildings. Load growth from electrification coupled with retirements of fossil-fuel generation plants require a robust utility planning process. Utilities regularly do this in order to meet growing loads from all kinds of sources, regardless of whether the new load is from new construction, transportation electrification, or transitioning existing buildings to electricity. We are much further along in the development of clean resources for electricity than in other sectors, such as industry and transportation, which is why electrification is the preferred and most economic pathway for meeting our GHG goals.

2. **Utilities ratepayers benefit from electrification:** As [E3 notes in their report for CARB](#), while the costs for maintaining the electric grid will rise in the coming decades regardless of the level of electrification adoption, "This study finds that the addition of new electric loads, in the form of electric vehicles and building electrification, helps mute these cost impacts on electric rates. Furthermore, these new electric loads offer the possibility to provide flexibility to the grid through demand management, which could help to reduce the cost of decarbonized electricity." [Already in Seattle, load growth is needed to stabilize rates](#).
3. **Heat pumps are incredibly efficient:** Both gas furnaces and baseboard electric heaters are at best about 95% efficient while a heat pump can be up to 300% efficient, which means that for every kW of electricity consumed a heat pump is producing around 3kW of thermal energy. The total impact to the electric grid is much lower with a heat pump than older forms of electric heat. This is why the anticipated load growth from building electrification can be offset substantially if energy efficient heat pumps replace baseboard electric heating as well as gas heating. In addition, as our appliances get smarter, they can be used as a demand management tool enabling utilities and their consumers to shift loads to off-peak times to optimize the use of the grid.

Reliability & Resiliency

1. **Electrification bolsters grid reliability investments:** Additional load on the electric grids generate more revenue for electric utilities which in turn can be accessed for investment in grid reliability. Moreover, by phasing out gas in homes and buildings, states can redirect financial resources toward maintaining and expanding the electricity grid—rather than pouring billions into maintaining polluting gas pipelines.
2. **Backup systems offer relief from outages:** Rooftop solar and battery systems can keep electric systems like heaters, cooktops and mobile phones humming when outages occur, allowing consumers to weather an outage with minimum inconvenience. Heat pump water heaters can use electricity from rooftop solar to heat water and store it for over 24 hours, so families will have hot water even if the grid is down or when the sun isn't shining.
3. **Gas systems are vulnerable to electric outages:** Most modern gas appliances require electricity to work—many gas water heaters need electricity to heat water, gas furnaces need electricity to power the blower fan and condensate pump. Moreover, the gas pipeline system is reliant on electricity to power compressors used to maintain

pressures in the pipeline—over an extended electricity outage, if pressure is not maintained, gas outages will occur. When electricity outages occur, during a disaster or in preparation for risky fire conditions, many families and businesses are not able to rely on gas.

4. **Electricity is safer in natural disasters:** All-electric buildings are more resilient following natural disasters as electricity can be restored far more quickly than repairs can be made to ruptured gas lines. Gas lines take 30 times longer to restore than the electric system after natural disasters. This is because once repairs are complete, gas workers must go house-to-house relighting pilot lights to ensure safe conditions before supplying gas to each customer.

ABOUT SHIFT ZERO

Shift Zero's mission is to catalyze a just transition to zero carbon buildings for all in Washington State. We do this by advocating for policies and programs that maximize energy efficiency and eliminate emissions from buildings. As an alliance, we convene our members' technical, policy, and advocacy expertise to identify solutions that can scale up to meet the urgency of the climate crisis. Collectively, we educate decisionmakers about how proven design approaches and building technologies can be leveraged to create affordable access to high-performance, resilient buildings.

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