

# RA in the NW—Seems Like the Challenge Keeps Getting Bigger

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*In this first of a two-part guest column, Steve Wright, former BPA administrator (2000-2013) and Chelan County PUD GM (2013-2021), examines resource adequacy in the Northwest, through conversations with regional experts and reviewing several RA assessments. He notes regional progress in addressing RA, notably including development and near-implementation of the Western Resource Adequacy Program. But he sees an increasingly challenging landscape for regional RA, including forecasts for growing load-resource imbalances, difficulties in building new power supply and transmission in support of reliability, and the lack of a currently commercially viable "Holy Grail" clean, flexible, cost-effective resource.*

Preparing to speak at a recent conference provided me a chance to check in with some regional experts regarding electricity supply and demand electricity planning in the Northwest, including Arne Olson from Energy and Environmental Economics, Mary Wiencke from Public Generating Pool, Sarah Edmonds from Western Power Pool, Melanie Frye from Western Electricity Coordinating Council and Shauna McReynolds from Pacific Northwest Utilities Conference Committee.

I will try to capture what I learned. Any errors in interpretation are mine alone.

The bottom line: Resource adequacy in the Pacific Northwest looks even more challenging than it did three years ago when what has become the Western Resource Adequacy Program was initiated. It's a darn good thing WRAP continues to move forward because it will provide a perspective on the regional state of affairs for resource adequacy, something we have never had with granularity. Hopefully, it will be a catalyst for actions that increase supply and manage demand.

## **Western Energy Crisis Impact**

With apologies to those who have heard this from me before, the most scarring and impactful moment of my career was being on the front line during the 2000-2001 Western energy crisis. At its core was a supply-and-demand problem.

Most memorable from that time were the public meetings where people from all walks of life made essentially the same comment/question. "I was just living my life. I didn't do anything wrong. So why is my job/disposable income/services/environmental protection being eliminated when it was your job [looking at an electric executive or elected official] to be managing the electric system?" Our response as an industry was fairly unsatisfactory to the

public: We are doing everything we can now, but we have limited options in the midst of a crisis due to the timeline challenges of adding supply or reducing demand. We wished more had been done in advance, swearing we would learn and not let it happen again. Since then, I have tried to keep a focus on the risk of committing *deja vu*.

I would add that, from my perspective it is necessary to get the balance right between clean, affordable and reliable electricity, because systems out of balance will tend to move back toward balance. By that I mean pushing too far on any of the three legs of this stool causes a public reaction that counteracts progress made. For example, a very clean system that lacks affordability and reliability will cause a reaction that creates greater focus on reliability and affordability.

### **Assessments of Northwest Reliability**

My starting point for assessing the current state of Pacific Northwest reliability is an [E3 study](#) released in January 2019.

Conducted for a group of consumer- and investor-owned utilities, the study investigated the impacts of accomplishing a menu of aggressive carbon-reduction goals in the electric sector. It proved prescient in terms of identifying the risk of two types of outages—afternoon ramps on solar-dominant systems (like the August 2020 California outages) and extended-duration high- or low-temperature energy shortfall outages (like Texas in February 2021).

The study concluded that beyond aggressive renewables and conservation development, thousands of megawatts of new firm, flexible generation (i.e. natural gas-fired) and multiple transmission lines would be needed to maintain reliability under even modest carbon-reduction plans (by 2018 standards) and multiples more with 100 percent carbon-reduction goals. Importantly, the study concluded that substantial resource additions are needed in the 2020s as coal-fired resources are retired. The study built on PNUCC and Northwest Power and Conservation Council work that came to similar conclusions.

How have things changed in the last three-and-a-half years that would alter the study conclusions? While many ideas are being tested, no new miraculous clean, firm, flexible, cost-effective capacity has arrived to address the loss of dispatchable generation. Battery prices have declined (at least until recently), but the performance characteristics—particularly with respect to duration—have not demonstrably changed.

Also, state climate policies are more rigorous in the Northwest than the baseline the study anticipated, although well within the range of scenarios considered. The biggest change is likely the movement toward massive electrification and more load growth not in load forecasts back then.

The bottom line is the load/resource balance is likely more challenging than in 2018, while the improved options to address reliability challenges would not move the needle enough to substantially alter the conclusions.

NERC recently released its 2022 Summer Reliability Assessment, and—as has been widely reported—it's quite pessimistic.

All the Western U.S. has reliability risk defined as "high," while parts of the Midwest are even more at risk, defined as "elevated."

The reasons for the distinction between high and elevated levels of risk are difficult to discern. For example, California is shown as being at the same level as the rest of the West. That does not seem right, as California is sending very strong signals about being short this summer, more so than any other Western region. But the more important point is likely that the Western region is more fragile than at any time since the late 1990s.

PNUCC's 2022 Northwest Regional Forecast, which relies on utility forecasts, underscores this point. It points to a load-resource balance increasingly out of equilibrium as time goes on. A continuing trend in the Pacific Northwest is less focus on and more attention to capacity deficits that are predicted to reach about 6,000 MW by 2032 in winter and summer, without the addition of firm resources.

The new BPA 2022 White Book projects regional energy surpluses through 2030, assuming 100 percent of uncommitted independent power producer resources stays in-region, but deficits if the IPP resources are exported. Capacity deficits begin in 2024 and stretch to 3,000 MW by 2030 if all IPP resources stay in-region, and roughly match the PNUCC forecast if IPP resources are exported.

Essentially, the PNUCC and BPA forecasts say the region is short without identifying specifically how the shortage will be alleviated. This is the traditional approach—leaving it to utilities to run their integrated resource plans to identify new resources and make commitments. The energy deficits may be manageable, given the broad support for large-scale additions of renewable resources, although hopefully this is being tested against 25-degree temperature excursion scenarios in either direction (e.g., a 2021 Texas-type weather anomaly, which has happened before in the Pacific Northwest). The magnitude of deficits and focus on capacity are relatively new, raising questions about where the supply additions or demand reductions will come from in an environment increasingly unfriendly toward traditional forms of flexible capacity. The deficits within the near-term planning horizon are particularly troubling given the challenges of building infrastructure.

Which brings us to WECC's most recent resource adequacy assessment. WECC displays a significant shortage over its five-to-10-year planning horizon and includes what should be chilling language: It concludes that even if all planned resources are built by 2025, ALL its subregions would fall below the 1-to-10-year planning standard. Entities need to take actions

beyond those currently planned for 2025, and given planning horizons for new resources, this will be extremely challenging. "If current long-term issues are not addressed immediately, they may become insurmountable when they become near-term issues," WECC states. It also points out the increasing incidence of widespread weather patterns reducing the likelihood of subregions being able to rely on imports. In other words, don't count on your neighbors to cover your planned shortages.

### Seeking the "Holy Grail" Resource

WECC in its clean-energy sensitivities study outlines the challenge by adding what we might call the "mystery resource" to get loads and resources into balance. In WECC parlance it's referred to as ECF, the Emerging Clean and Flexible Resource. ECF is the Holy Grail we all seek—a carbon-free resource that operates like a gas-fired combustion turbine. There are lots of ideas about where it might be hiding (long-duration batteries, hydrogen, flywheels, etc.). But nothing is close enough to commercial viability today to provide a specific name. Having just attended the American Public Power Association annual conference, the issue I heard most frequently discussed was how to maintain reliability until the "mystery resource" appears.

This is the great challenge. It has become politically unacceptable to propose new natural gas-fired plants. Hence we move forward toward aspirational goals that are increasingly near-term without a clear plan that assures reliability. I have learned from many years of experience, though, that conventional political wisdom can change on a dime based on circumstances. You buy the adult beverages and I'll tell the stories about how the politically impossible became possible overnight.

In fact, there is a very recent example. Take the extraordinary positions of California Gov. Gavin Newsom. First, he expressed interest in keeping the Diablo Canyon nuclear plant open past its planned 2025 shutdown, due to reliability concerns. But more shocking is the creation of a \$5.2 billion "strategic electricity reliability reserve" fund of which 80 percent of the dollars can be used for fossil fuel-fired generation, which has now been approved by the California Legislature. Apparently the 2020 outages have created electorate pressure that comes into sharp focus in an election year. This appears to acknowledge that the existing planning studies, and more importantly the political system's response to those planning studies, have not created adequate reliability, forcing the state to step in using public dollars for resources that previously have been deemed politically unacceptable.

Let's hope that focus on the need for cost-effective flexible generation can be created in the Northwest without suffering through outages first, and that the region avoids California's predicament.

### 'Mystery Loads'

But solving for mystery generation should not be our only concern. There is also a risk of "mystery loads." These are large loads owned by entities wanting to procure their own power supply, and hence do not fit neatly into traditional utility planning. Living in East Wenatchee, Wash., I know there is a 180 MW server farm under construction within 5 miles of my house that is not in regional load forecasts. Recent local newspaper reports indicate massive plans for additional expansion on the Chelan County side of the Columbia River. I hear talk of potentially a gigawatt of new service in the Umatilla, Ore., area and of a large cryptocurrency mine in Pend Oreille County, Wash. These are ones I know about, but certainly there are more spread across the Northwest and the rest of the West. Most, if not all, are not in current regional electricity plans.

Representatives of these server farms are very prickly about not wanting their growth plans publicly discussed until absolutely necessary. From a regional planning standpoint, that means the process of knowledge of the load to operations can be a year or less. These are gigantic loads that rival the size of an aluminum plant. I am unaware of server farms willing to operate at other than high capacity factors. So the question becomes: How many megawatts of these "mystery loads" are out there? At least some, maybe all, plan to take service from the market along with developing unique additional clean generation. Given the regional and Westwide load forecasts, that would suggest these loads are at high risk of curtailment or leaning on the system. Of particular concern will be their impact on projected capacity deficits. Are the owners of these loads willing to modulate production to reflect hourly surpluses and deficits in wholesale power markets? We may not know until the moment of tight supply conditions.

## **Renewables, Transmission Challenges**

And then there is the question of renewable resources that are known. Most of these are on the east side of the Cascade Range. As Randy Hardy, energy consultant and former BPA administrator, has repeatedly pointed out, some new transmission will need to be built to connect east-side resources to west-side loads. When one flies from Wenatchee to Seattle across many miles of wilderness in the North Cascades, that appears a very daunting environmental task. The lack of even an announced plan undergoing initial review for cross-Cascade transmission suggests a long timeline to more capability for megawatts flowing east to west.

And the east-siders, at least the ones in my general neighborhood, seem to be getting more concerned about renewable resource development impact on views, rural lifestyles and even endangered species protection for assets designed to benefit west-siders. The more thousands of acres proposed for development, the more likely these concerns will increase.

So, while the need for new renewable generation and transmission is increasing, the environment affecting construction timelines appears to be pushing in the opposite direction.

The bottom line is that, as a region we have known for at least three years that we have a serious resource adequacy problem. In the last few years we have encouraged substantial electrification, committed to retiring more dispatchable generation while exploring even more, are subterraneously adding large new loads without associated plans for reliable generation, and are increasingly counting on aspirational "mystery resources." There is no clear plan for cost-effective, adequate additions on a realistic timeline. It feels like letting the kids play day after day while they assure us they will get their homework done on time.

### **Political Focus Needed on Building Supply**

We need the kind of strong political focus on building supply to meet demand that is being put into issues like removing the lower Snake River dams. We need reliable, cost-effective, clean, flexible capacity that does not exist today. This is made clear in the recent E3 study of lower Snake River dam removal (see story this issue), which in order to avoid extremely costly overbuild of renewable resources to meet infrequent but important capacity needs relies on hydrogen generation technology that is currently unproven and not commercially available. We need success in building new renewables and transmission as precursors to further exacerbating the planned load/resource balance. Anyone doubting the political wisdom of this approach to assure supply and demand are in balance can look back 20 years, or south in the past month or so.

### **The Importance of Implementing WRAP**

All of this brings home the importance of implementing WRAP. The Western Power Pool has done an outstanding job of getting WRAP nearly to the point of implementation. It was heartening at the recent Northwest Public Power Association annual meeting to hear John Haarlow from Snohomish County PUD announce that a panel comprised of Debra Smith from Seattle City Light, Elliot Mainzer from the California ISO and Mark Holman from Powerex was in violent agreement that the highest priority is completing and implementing WRAP.

The national and regional evidence points toward this being the right conclusion. The Pacific Northwest is getting this more right than any other region of the country by making resource adequacy the highest priority while also advancing short-term market development.

My only caveat is that the current WRAP addresses only one of the two primary risks to reliability—the need for firm, flexible capacity to address the evening-ramp risk as the sun goes down. But we know that the system is also constrained by energy production during multiday temperature excursions (high or low). The decision to prioritize and get a limited resource-adequacy standard in place was a good one. But as soon as reasonably possible, attention should turn to establishing an energy standard as well. In fact, from a consumer

perspective, the energy shortage that occurs over multiple days under extreme circumstances is the most troublesome. The WPP has committed to continuously improving WRAP, providing the avenue for enhancements.

Resource-adequacy standards alone, however, do not increase supply or reduce demand. They send a signal to the markets (capital and political) as to the level of need, the potential for price volatility and the risk of reliability constraints. The goal of resource adequacy is to send a planning signal that will cause actions to increase supply or reduce demand. In California, the planning function has become more relevant only after widespread outages occurred. Let's hope the Northwest will learn from our neighbors. We need to create a political environment that both implements resource adequacy standards and takes action on the signals before the outages begin.

The Pacific Northwest electric community should be proud of the progress made to address resource adequacy. But success—whether in sports, business or elsewhere—can be a source of pride while also leading to striving for continuous improvement.

When one looks at the landscape of readily available information on resource adequacy, loud alarm bells should be ringing. Much needs to be done.

**Next week:** Part two of this column looks at how the Northwest Power and Conservation Council's 2021 regional plan fits into this picture.