

# PNUCC REPORT Council



## Northwest Power and Conservation Council

May 5 & 6, 2015

Last week, Council members entertained a full agenda of comments and observations from two of the region’s savviest energy professionals, Elliot Mainzer, BPA’s administrator, and our very own executive director, Dick Adams. In addition, the Council agreed to release the Final 2020/2021 Adequacy Analysis Report, and looked at the results of modeling two scenarios in the Seventh Northwest Power Plan.

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### The Agenda

#### PNUCC’s Adams sees power planning focused on capacity

Before delving into a summary of PNUCC’s latest *Northwest Regional Forecast*, Executive Director Dick Adams pulled out a yellowed copy of the *Regional Forecast* from March 1952.

“I’m sharing this because I like data,” Adams smiled. “Looking back in 1952, this post-war era report was sent to the Federal Power Commission. Sixty-five years ago loads were a quarter of what they are today (4,000 MWa compared to about 20,000 MWa today). Aluminum smelters were developed in the Northwest because of abundant and cheap hydropower. Loads were increasing rapidly and projections were based on 4.25 percent annual growth rate.”

Fast forward, the region is now looking at fairly flat load growth of just 0.6 to 0.8 percent per year, and those numbers are net of energy-efficiency savings, Adams said.

But he cautioned not to let the overall flat load growth tell the story for the whole region. “There are individual utilities and 25 different stories,” he said. “In a large utility, with energy-

efficiency programs and new standards, we might see flat growth. But we also have a small utility with a new data center facing 3.5 percent annual load growth in the next five years.”

Adams reminded the Council about the testimony it heard from smaller utilities in Eugene and Montana in the last two months. “One size doesn’t fit all, whether it’s a load forecast or resource development,” he said.

PNUCC produces its *Northwest Regional Forecast* each year, compiling data provided by utility integrated resource plans and it captures smaller utilities’ data from BPA.

Compared to PNUCC’s 1980 report, hydropower capability is now 1,500 MWa lower. The operating capabilities have changed, constraints have changed and, while the flows are the same, there are more conditions on how the hydro system can be operated. In compiling generating resource data, PNUCC only tracks plants committed to meeting Northwest loads.

Clean, renewable hydro remains the big dog, Adams said, as it has the largest responsibility for meeting winter peak capacity. We have some nuclear and coal, and natural gas has a growing slice. Wind has some impact, but very little winter capability, and we’re starting to see reportable information on solar generation.

*“...current information suggests that there’s a winter capacity need of growing importance.”*

*– Dick Adams  
PNUCC Ex. Director*

Over the years, the region has focused on energy planning, due to hydro, Adams explained, but current information suggests that there’s a winter capacity need of growing importance, especially with Boardman going offline at the end

of 2020. A gap between generation and need has moved the region from energy planning to capacity planning, Adams said. “We need more discussion on planning margins and how to pick one that fits the needs of the Northwest.”

### **Demand response raises questions**

Adams said that he found the Council’s dialogue around demand response valuable, but that the Power Committee meetings have left him with a lot of questions. Next week, PNUCC is consulting with utilities to hear how they value demand response, how they develop it, how they assessed its potential and the barriers they found.

“It feels like it’s a frontier that needs more attention,” Adams said. “But there are so many questions we need to address, including how often can these winter loads be interrupted? What are the conditions under which the utility can reserve that right? Is there a recovery period? We need to know more about the characteristics of this load. There may be all kinds of characteristics that are glossed over, and that’s the next step in understanding this demand side resource.”

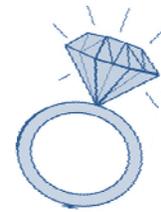
“Also, will it be used for the utility, for a balancing authority activity or to reduce your demand charge from your provider?” he asked.

Looking at energy efficiency, PNUCC’s forecast tallies up about 900 MWa in utility program savings looking out over five years. The potential savings from market transformation and other non-programmatic actions could add another 30 to 50 MWa per year to the stack.

“We know how our load forecasts have been changing over time, and then I looked at conservation forecasts and, if there’s a pattern there, I can’t see it,” Adams said. “These forecasts need to be reevaluated on a regular basis.”

### **Scenario work is the jewel of the Seventh Plan**

Adams concluded his presentation praising the Council for diving deep into scenarios for the Seventh Plan. “I still believe that the scenarios, the *what ifs* and policy propositions are of the highest value,” he said. “What would it take for the region to reduce carbon by 50 percent or to zero? What about if we retired all existing coal plants? With the data you have and brainpower that sits around this table, these are the most interesting parts of your Seventh Plan.”



The tough part, Adams observed, is translating it all into policy answers, not just distributions and net present value. “You’re poised to do that kind of work and I think it needs to get done,” he said.

Council Member Tom Karier took the opportunity to thank Adams for all his work with his impending retirement from PNUCC: “I want to thank Dick Adams for his contribution to this industry and to the Council over the years,” Karier said. “Dick has been the executive director of PNUCC since I’ve been on the Council, and he has been doing this since before I arrived. He’s been a wonderful resource. He’s the director of this small, highly influential group, and his retirement will be a loss to the intellectual capital of the region. Thank you for helping us over the years.”

### **Mainzer takes a systemic look at BPA’s priorities and challenges**

When Mainzer first appeared before the Council in March 2014, the 13-year BPA veteran had just been placed in charge, and was facing the enormous challenge of restoring the standing of an



organization undergoing a very public human resources and administrative crisis.

Last March when I was here, I probably still had that deer in the headlights look,” BPA Administrator Elliot Mainzer told the Council. “It’s amazing what 14 months will do.”

“We have our Human Resources restored, have a full set of executives, a general counsel and we feel very positive about where things are,” he said. “I believe this is a historical period for the industry. It’s game on.”

Speaking without prepared remarks, Mainzer pointed to what he termed “transformational” events in the industry. He believes that some fairly significant changes will come out of the

carbon conversation, which “has huge implications for the industry.” Some of the key topics Mainzer dove into include:

**Infrastructure investment** – “We’re making an enormous investment in transmission infrastructure,” he said. We’re in a period of significant investment in the high-voltage grid. We’re making a multi-\$100 million investment strengthening the DC Intertie in California and we’re investing in reliability and flexibility. We’re accommodating a huge amount of renewables on the grid. Last year we invested \$500 million and we’re investing the same this year.”

*“We’re sitting on assets of unimaginable value. We have a shared stewardship responsibility to continue to invest in them.”*

– Elliot Mainzer  
BPA Administrator

On the power side, BPA is spending at least \$200–250 million a year in sustained investments in the hydro system. The largest amount is at Grand Coulee. With an average age of 55 years, “we’re the classic story of aging infrastructure,” he said. “But we’re sitting on assets of unimaginable value. We have a shared stewardship responsibility to continue to invest in them.”

**Market design** – He said that the market design changes occurring in California — the creation of the new energy imbalance market with PacifiCorp, California Independent System Operator, and the other utilities — should not be underestimated in terms of its impact on the West.

“I’ve been engaged with entities in California, trying to figure out how to accommodate that change while managing impacts on transmission system,” Mainzer said. “It raises some big questions about where the Northwest is heading.”

He said BPA put out a Request for Proposals to see if they could get a market operator to operate a Northwest Security Constrained Economic Dispatch. One bidder was higher than we anticipated. And an offer from California ISO was just not appealing to BPA’s core constituents. “So we’re stuck in the middle right now, looking at how to advance the conversation,” he said.

“I feel it’s important to keep the Security Constrained Economic Dispatch option on the table and finish the due diligence,” he asserted. “There’s been tremendous design and regulatory work and that went into that, including the development of a request for declaratory order from FERC on the big regulatory questions and issues around resource sufficiency and adequacy. As BPA’s administrator, he wants to give Northwest utilities the best chance of controlling their own destiny, and build off our legacy of operational coordination of the Power Pool since 1942.”

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– Elliot Mainzer  
BPA Administrator

**BPA's long-term sustainability** – “Big decisions were made in the 1960s around the Columbia River Treaty and the Interties, which have been the backbone of our operating environment. Some decisions we make today will have lasting impacts, so we need to take the long view. Everything we do — from energy efficiency, fish and wildlife mitigation, low-income assistance and technology innovations — are enabled by one thing: our ability to be cost competitive today. It falls apart if we're not running a viable organization. So I'm concerned about long-term cost structure of BPA.”

**Rates** – “We've had four rate increases in the last eight years, and now we're going into a nearly 7 percent increase on the power side and 5.5 to 6 percent increase on the transmission side for the 2016-17 rate period. There's an understanding of why we're seeing that: There's increased O&M on the hydro system, more investment in fish and wildlife, and in the residential exchange.”

**Forecasting** – We've put a lot of effort into refreshing our long-term rate forecasting capability, and we're putting a tremendous amount of work into capital portfolio management. We need to be efficient in how we manage that capital and allocating it between all asset categories: power transmission, fish and wildlife, energy efficiency, IT and facilities. We want to make sure that our investment planning with the Bureau of Reclamation and Army Corp of Engineers is done as efficiently as possible. We have created a new position of hydro investment coordinator, and will develop a 20-year asset investment strategy for the Federal Columbia River Power System.

**Energy Efficiency** – Mainzer said that going into this 2016-17 rate period, BPA moved its energy-efficiency program from capital to expense. “I was presented with the opportunity to take \$1.3 billion off the books and \$500 million in interest expense, without imperiling our ability to meet energy efficiency targets, so it was an opportunity I had to take,” he said. “I acknowledge it happened quickly and in a perfect world it should have had more dialogue.”

Council Member Henry Lorenzen commented, “A concern I have is that BPA and its customers view conservation as a cost and expenditure. I don't see a great emphasis on promoting and marketing the benefits of it, and the impact it has on rates.”

“I have sympathy for utilities dealing with the operational and cost-realities of their communities,” Mainzer replied. “I'm not as interested in cutting costs, but how do you unleash the value in the most efficient ways possible? The driver is trying to mend the cognitive dissonance we have in the Council and utilities facing a different reality. We need to bridge that gap.”

Council Member Bill Booth asked Mainzer to identify some cost-side opportunities.

“The first is BPA's asset investment program,” Mainzer noted. “We spend \$750 million a year on hydro and transmission assets. We need to make sure that our core, sustained expansion investments are being made as efficiently as possible. We need to increase the availability of the turbines, which gets to the revenue side. It's about being good stewards of our revenue dollars.”

## Adequacy Analysis reveals a shortfall in 2021

John Fazio, Council's staff senior power systems analyst, brought to the Council the adequacy assessments for 2020 and 2021. Back in 2011, the Council adopted a methodology to assess the adequacy of the Northwest's power supply. The assessment provides an early warning if resource development fails to keep pace with demand growth. The Council assesses resource adequacy every year, examining the ability of the power supply to meet regional demand five years out.

The Council's maximum threshold for loss-of-load probability (LOLP) is set at 5 percent. This means that the power system has a 5 percent chance of having a shortfall sometime during the year being examined.

For 2019, the assessment came in at 6 percent, which is a little inadequate. The current adequacy assessment for 2020 shows an LOLP of five percent, just at the Council's adequacy threshold. It turns out that the load forecast has come down quite a bit — 310 MW lower than what was used for the 2019 assessment.

The biggest change on the resource side is that Big Hanaford is no longer in use, which is 250 MW not in the assessment. There also were adjustments for hydro constraints in light of the Biological Opinion. When everything is put together, the LOLP is 4.8 percent, rounded off to 5 percent. So looking forward five years, the region is adequate, but just barely.

By 2021, however, after the planned retirements of the Boardman and Centralia-1 coal plants (1,330 MW nameplate), the LOLP rises to a little over 8 percent, and would lead to an inadequate supply without intermediate actions. Some combination of new generation and load reduction programs will be used to bridge the gap assuming 1,600 MWa of energy efficiency savings are acquired as expected.

## Least-risk and least-cost strategies examined for Seventh Plan

The Resource Portfolio Model estimates a regional cost and risk associated with pursuing different resource development strategies being for the Seventh Plan. Staff members Tom Eckman, power division director, and Ben Kujala, system analysis manager, focused on the model results for two of the 14 scenarios.

**Current Policy scenario** (1b) assumes that all existing emissions requirements and current assumptions about the variability of future gas prices, population growth, employment growth, load forecasts, hydro conditions, carbon policies stay in place for the next 20 years.

**Carbon Risk scenario** (2c) same as the Current Policy scenario except it includes a range of carbon costs on a random basis between \$0 and \$100 a ton.



A comparison of the two scenarios revealed:

- More **conservation** purchased in the carbon risk scenario when comparing least cost strategies, with 50-70 MWa more in the first five years growing to about 500 MWa over the 20 year study. The results also showed differences in the ramping of energy efficiency.
- **Thermal resources** are acquired and used differently. In the carbon risk scenario, more efficient combined cycle combustion turbines are selected rather than peaking units. And existing units with associated carbon emissions have a much lower dispatch over the planning period.
- Under both scenarios, average **carbon emissions** are significantly below the EPA 111(d) proposed limits. The Current Policy scenario estimate is about 15 percent below, while the Carbon Risk scenario's average carbon emissions are approximately 40 percent lower than the proposed limits. However, 10% of the time emissions exceed EPA's proposed limits in both scenarios.

“What is driving these results is the announced retirements of existing plants, more than anything else,” Eckman said. “We already have policies in place to reduce emissions.”

Eckman said that staff is still refining inputs, such as which combustion turbine technology or peaking system to use, and the pace of demand response. He said staff has several more on the docket: the next set of scenarios will model a faster and a slower pace of conservation.