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July 30, 2013

## MEMORANDUM

**TO:** Power Committee

**FROM:** Charlie Black

**SUBJECT:** Historical Context of Power Plan Provisions of the Northwest Power Act

During development of the Sixth Northwest Power Plan Mid-Term Assessment, several regional interests provided comments requesting the Council to address significant changes that have occurred since the Northwest Power Act was adopted in 1980, and to consider how these changes can be reflected in development of the Seventh Northwest Power Plan.

This topic is being addressed in a series of three briefings for the Power Committee:

1. What requirements does the Northwest Power Act impose regarding the process and content of the Council's Northwest Power Plans?
2. What was the overall context for power planning in 1980 and how did it shape development of the Act and the Council's First Northwest Power Plan?
3. What is the overall context for power planning in 2013 and how should it shape development of the Council's Seventh Northwest Power Plan?

At the Power Committee meeting in July, John Shurts provided a briefing on the first item listed above. At the Power Committee meeting in Bend on August 6, John Shurts and Tom Eckman will brief the Power Committee on the second item, namely a description of the historical context that influenced the provisions that were included in the Act.

# **Historical context for the power plan provisions of the Northwest Power Act of 1980**

August 2013

## **Second in a series of briefings/discussions, in three parts**

- Power plan provisions of the Northwest Power Act
- **Context at the time of the passage of the Act**
- Present-day context and implications

## **Road map of today's discussion: Historical context for the power plan provisions of the Northwest Power Act of 1980**

1. Based in the post-war structure of the electrical power industry in the Pacific Northwest.
2. High demand growth for electricity in 1950s/60s, with expectations that it will continue and new resources will be needed.
3. Bonneville and the Hydro-Thermal Power Program is the 1960s solution
4. Hydro-Thermal Power Program eventually collapses in a cloud of massive financial losses, huge rate hikes, bond defaults, environmental short-comings, and other legal and policy problems.
5. Paving the road to the Northwest Power Act.
6. Considerations out of the context that directly inform the power plan provisions of the Northwest Power Act.

### **1. Based in the post-war structure of the electrical power industry in the Pacific Northwest.**

- Vertically-integrated regulated utilities and regulated wholesale sales as in the rest of the country. But the region is unusual in having more publicly-owned utilities, and more small publicly-owned utilities than elsewhere.
- Especially unlike most other places in the country, dominant at the center is not just a Columbia River hydropower system, but a *federal* Columbia River hydropower system and federally owned transmission system. With a federal power marketing agency controlling a huge amount of the generating assets of the region, relatively low-cost, sold at wholesale at cost, an agency also controlling a major portion of the transmission system.
- 1950-70s is the real period of the development and culmination of the Columbia hydrosystem, run-of-the-river and storage (both US and Canadian through the Treaty).

Mostly federally owned, but mixed in non-federal in both Columbia and Snake. Pacific Northwest Coordination Agreement (PNCA) to optimize.

- Across the landscape, publicly-owned and investor-owned utilities that are partial or full requirements customers of Bonneville and/or have low-cost hydro of their own. Law expresses a preference for publicly owned utilities in access to Bonneville power, but the agency tries to serve everyone it can in the region, seeing itself as a central engine of regional economic development. *See* Bonneville Project Act of 1937 (“in order to encourage the widest possible use of all electrical energy that can be generated...”) And after Federal Columbia River Transmission System Act of 1974, Bonneville is also self-financing.
- Bonneville customers also include direct service industries (especially aluminum companies) that are a significant source of load at Bonneville and that can function as reserves, but also a source of high volatility in load.

## **2. High demand growth for electricity in 1950s/60s, with expectations that it will continue and new resources will be needed.**

- Growth in demand for electricity in post-war period is high, as economy develops on the back of low-cost hydropower and post-war prosperity. (slide)
- Expectation is that this will continue, demand growth that is relatively inelastic or insensitive to price. (slide)
- And so, also an expectation that a significant amount of new generating resources will be needed to meet this demand growth. While in this period there are still plans to develop additional hydro-generation capacity, the sense is also that major hydropower development is largely tapped out, and so the new resources will mostly be big thermal plants (coal and nuclear).
- Long planning and development lead-time for a new plant, plus significant costs compared to hydro investments.
- Lots of uncertainty as to who will bear risk and cost of new resources vs. who gets to benefit from the existing low-cost hydrosystem.

## **3. Bonneville and the Hydro-Thermal Power Program is the 1960s solution.**

- Bonneville and the region’s utilities agree in late 1960s that Bonneville and utilities will act together to address this problem -- not utility by utility as a utility projects a need for power -- with Bonneville conceived of as the central pivot in helping the region’s utilities

develop new power plants, mostly coal and nuclear. And at first Bonneville will even act as the financier for some plants through a “net billing” mechanism.

- The point of the Hydro-Thermal Power Program is as it sounds -- Bonneville will agree to acquire the output of the new higher-cost thermal plants developed by the utilities and meld with the output of the lesser-cost hydropower system.
- Higher costs and risks of new thermal plants would thus be melded with certainty and low-cost of existing hydro, in essence socializing the cost and risk (and easing the costs and difficulties of financing, even if not “net billed”). Note that while the Hydro-Thermal Power Program is a regional approach developed and pushed by Bonneville and the utilities, and not a policy or program developed or explicitly authorized by Congress or the Administration, the HTPP certainly has support from DC (Congress and Nixon Administration), at least at first.
- The Hydro-Thermal Power Program vision at its greatest extent included plans to develop by 1990 more than 20,000 megawatts of thermal power -- a number of coal plants and up to 20 nuclear plants -- and more than 20,000 megawatts of new hydropower capacity.
- Out of the first or “net billing” phase of the Hydro-Thermal Power Program the region gets the Centralia coal plant, the Trojan nuclear plant (now gone from the map), and a start on three nuclear plants by the Washington Public Power Supply System (WPPSS), only one of which (WPPSS 2) will ever be completed and come on line. This Phase I of the Hydro-Thermal program is also when the region sees the beginning of the coal plant developments at Boardman, Colstrip, and Jim Bridger. These are not “net billed,” but development of these plants is seen part of the regional HTPP, spurred by plans to integrate at least some of the output into the Hydro-Thermal concept.
- Cost overruns and an IRS ruling in 1972 end “net-billing.” In Phase II of the Hydro-Thermal Power Program, utilities at Bonneville’s urging agree to build among other things 5,800 megawatts of nuclear power and 1000s of megawatts of new hydropower. These plans include most notably WPPSS 4 & 5. None are completed.

#### **4. Hydro-Thermal Power Program ultimately collapses in a cloud of massive financial losses, huge rate hikes, bond defaults, environmental shortcomings, and other legal and policy problems.**

- As noted above, cost overruns and an IRS ruling put an end to Bonneville’s use of the net-billing financing mechanisms.
- With the passage of the National Environmental Policy Act in 1969 (NEPA), federal courts (federal district court in Oregon and the Ninth Circuit Court of Appeals) will also shut down the Hydro-Thermal Program for failure by Bonneville to engage in a review of the environmental effects of spurring the development of this many thermal power plants

and acquiring the output and a review of possible alternatives. *Port of Astoria v. Hodel*; *NRDC v. Hodel*.

- Program also collapses under the sheer financial and management weight of the projects.
- Collapse leaves what can only be called a financial and public policy disaster in its wake:
  - At the end, billions invested with little power to show, especially in the realm of nuclear power and WPPSS.
  - Bond assumption: Bonneville assumes the debt obligation on the bonds for WPPSS 1-3. Huge financial burden that still carries forward into today -- Bonneville annual debt payments for one nuclear plant of roughly the same magnitude as the annual debt payments for entire federal hydro system.
  - Bond default. At roughly the same time, public utilities default on bonds for WPPSS 4-5, the nation's largest municipal bond default ever.
  - Huge rate increases. Absorbing the costs of these thermal plants also lead to huge rate increases. Bonneville power rates increase more than 400% over five years in the late 1970s/early 80s. Northwest retail electric rates saw a similar increase. (slide)
- Excellent sources for the Hydro-Thermal Program, its collapse, and its implications are:
  - U.S. Comptroller General (GAO), "Pacific Northwest Hydro-Thermal Power Program -- A Regional Approach to Meeting Electric Power Requirements" (1974)
  - U.S. Comptroller General (GAO), "Region at the Crossroads -- The Pacific Northwest Searches for New Sources of Electricity" (1978)
  - Lee, Klemka, and Marts, *Electric Power and the Future of the Pacific Northwest* (1980)
  - Bonneville Power Administration, *Columbia River Power For the People: A History of Policies of the Bonneville Power Administration* (1981)
  - Pope, *Nuclear Implosions: The Rise and Fall of the Washington Public Power Supply System* (2008)

and my favorite:

- Howard Gleckman, "WPPSS: From Dream to Default" in *The Bond Buyer* (1984)

## **5. Paving the road to the Northwest Power Act.**

- As the Hydro-Thermal Program collapses, it becomes more and more clear that the whole enterprise happened with an extraordinary combination of dubious legal authority; financially irresponsible investments; dubious demand forecasting assumptions and other misguided planning; horrendous project management; neither environmental review nor

internalization of environmental costs; complete lack of input from or even awareness by the public or the region's governors -- a public policy disaster of biblical proportions.

- And yet, the central problem statement remained: Did the region need new resources? And if so, who would bear the risk and cost of developing new resources while others would continue to benefit from low-cost hydropower? E.g.:
  - Notices of insufficiency from Bonneville (1976)
  - Oregon's plan to turn the entire state into a public utility
- Attention turns to Congress for help in finding a regional solution
- Chinook and sockeye runs collapse in Snake from depressed but fishable numbers in the 1950s to runs by early 1970s that are no longer fishable Idaho, with sockeye petitioned for listing under the new federal Endangered Species Act. Coincides with completion of Snake run-of-river projects and with systemwide storage and new water management operations. Those concerned about this development see everyone on the planes heading to DC to solve the peculiar energy crisis and get on the planes to join them.

## **6. Considerations out of the context that directly inform the power plan provisions of the Northwest Power Act.**

- **Bonneville role/Council and power plan.** Perhaps surprising in hindsight, given what had just happened with the Hydro-Thermal Power Program, the decision in the Northwest Power Act is to use the same model, just institutionalize it in law with some obvious protections:
  - Bonneville is given an obligation to serve that it did not have in law before. Expectation is that publics and IOUs will largely bring load growth to Bonneville to serve. Section 5 of the Northwest Power Act. Bonneville is also directed to issue new 20-year power sales contracts with the direct service industries.
  - Augment, not allocate. Bonneville is then authorized and even obligated to acquire new resources to serve load demands brought to Bonneville by its customers that cannot be served by the federal base system. Section 6. The expectation is that this load growth will come, and Bonneville will meld low-cost hydro with the output of higher-cost new resources, socializing the cost and risk. (In Section 7 on rates, the Northwest Power Act does not require Bonneville to meld the costs into one rate, but relatively clear this was the basic, expected premise.)
  - What was different?
    - (1) Clear legal authority, rules and constraints.
    - (2) Explicit direction to Bonneville in Section 6a to develop a program to acquire conservation. See below.

(3) And especially, creation of the regional, interstate compact agency **Council** and its independent **power plan**. “Planning” is a core concept in the natural resource policy world of 1970s (e.g., Natural Forest planning; FLPMA and federal land use planning; state land use planning; even NEPA). And then shaped to our context are power plan provisions intended to force, among other things:

- an independent and publicly developed demand forecast
- a hard and total look at different resource costs and considerations;
- priority to conservation resources and renewable resources, and a required conservation part to the plan;
- requirements to involve regional political and public input;
- integrate environmental costs

Council’s plan has to look at entire region’s needs in planning for Bonneville resources, as entire region’s needs might very well come to Bonneville.

Bonneville then has an obligation to acquire resources consistent with the Council’s power plan, with narrowly-tailored exceptions that allow for Bonneville to deviate from the plan yet while also requiring consistency with the basic premises in the Act that are to drive the plan (or Congressional approval).

- **Demand forecast.** Beginning to be huge questions about how appropriate are the projections of high, inelastic demand growth. Hence, the explicit focus on the Council to do the demand forecast in the power plan provisions. Even so, expectations of continued economic development and continued load growth.
- **New resources -- conservation.** The “conservation revolution” as some have called it. This is also a moment in time when there is a conceptual shift, recognizing that the marginal cost of new generating resources, especially new big thermal plants, may be significantly greater than originally thought. Coupled with the growing recognition that conservation should be seen as a resource as well as generation; that conservation may have significantly lower costs than the cost of what was still seen as the obvious alternative resource (big thermal plant); and especially that the Pacific Northwest had particularly huge potential for low-cost conservation investments, given our history of development in a world of low-cost electricity. Hence, the provisions in Power Act so explicitly focused on conservation as a priority resource. (Even so, Power act is passed also with the sense that eventually the region would need new generating resources, too, and they would quite likely be big thermal plants with long lead-time and high costs and so also with the continued uncertainty and risk associated with those types of developments
- **Environmental considerations.** Another moment in time captured in Northwest Power Act: internalizing environmental costs of power system development. Do it within this central Bonneville resource/Council planning context. For new resources, factor in total system costs, including waste costs and other quantifiable environmental costs. and

emphasis or priority on conservation and renewable resources is another way of recognizing. For existing system resources, explicit protection and mitigation obligation; fish and wildlife program; ratepayers must bear the costs of the program.

- **Public/regional input.** Another key moment in time captured in the Northwest Power Act. One of the perceptions is that we found ourselves in this mess in part due to decisions made by Bonneville and utilities behind closed doors with no input from the public or the region, especially the region's elected officials. This particular mood combines with a revolution in administrative law and governance in the second half of the 20th century in terms of decisionmaking in public, with new requirements for making decisions in public meetings, involving the public's participation, explaining decisions on the public record; allowing the public to seek judicial review, etc. Hence, the provisions in the Power Act emphasizing regional and public participation.
- **Uncertainty and adaptive management.** While not explicitly stated in the Act, the power plan provisions and power plan quickly become a forum for recognizing and embracing the inherent uncertainty in trying to project the future, and thus figuring out how to plan and manage in the face of that uncertainty. This is a moment in time when concepts of "adaptive management" in the face of uncertainty become part of the natural resource conceptual landscape. *E.g.*, Holling, *Adaptive Environmental Assessment and Management* (1978). A natural fit especially given the locus of some of the problems in the demand projections of 1960s and 70s.



**Slides associated w/ discussion of “Historical context for the power plan provisions of the Northwest Power Act”**

**John Shurts**

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Northwest Power and Conservation Council

August 2013

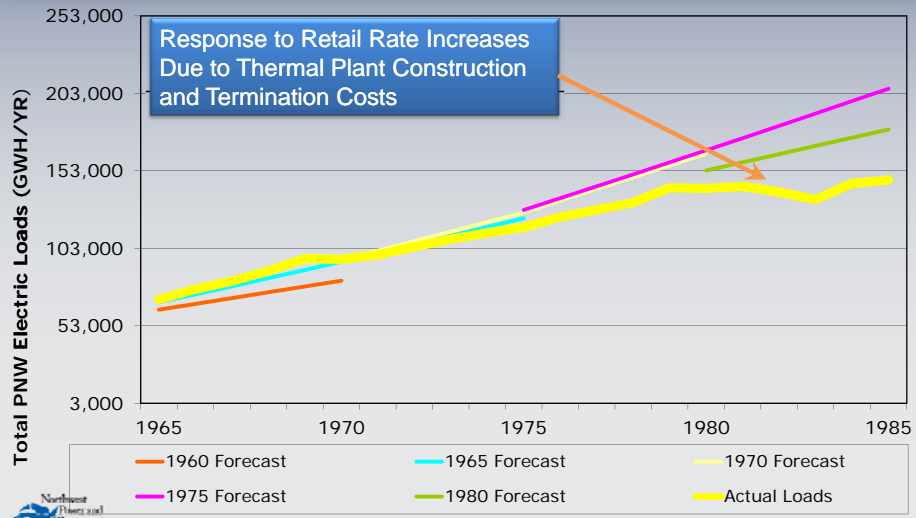


Road map of today's discussion:  
Historical context for the power plan provisions of the Northwest Power Act of 1980

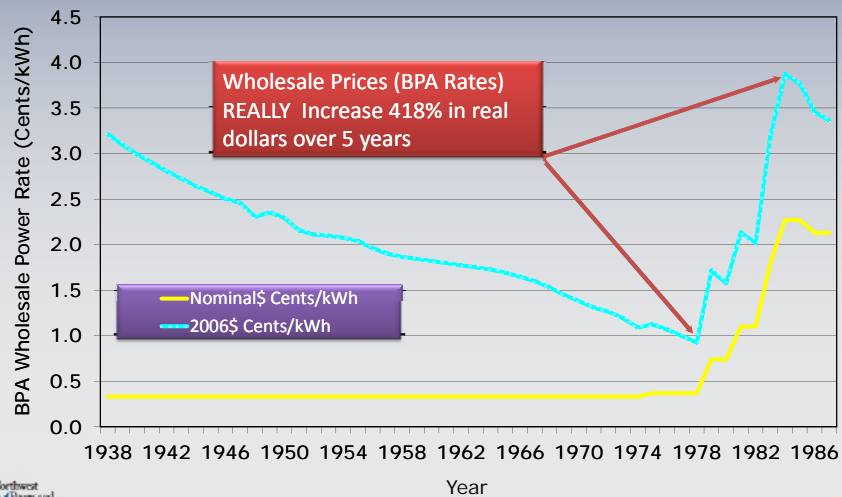
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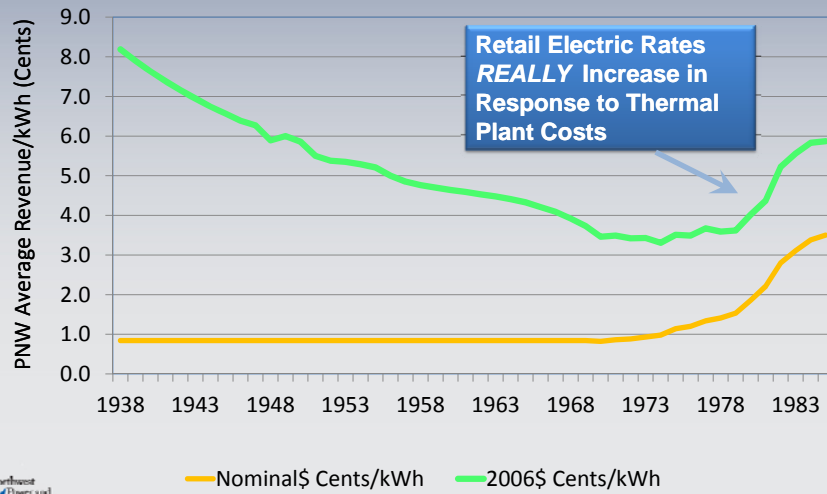
## Demand Forecasts vs. Actual Use 1960 to 1985



## Bonneville rates 1938 to 1986

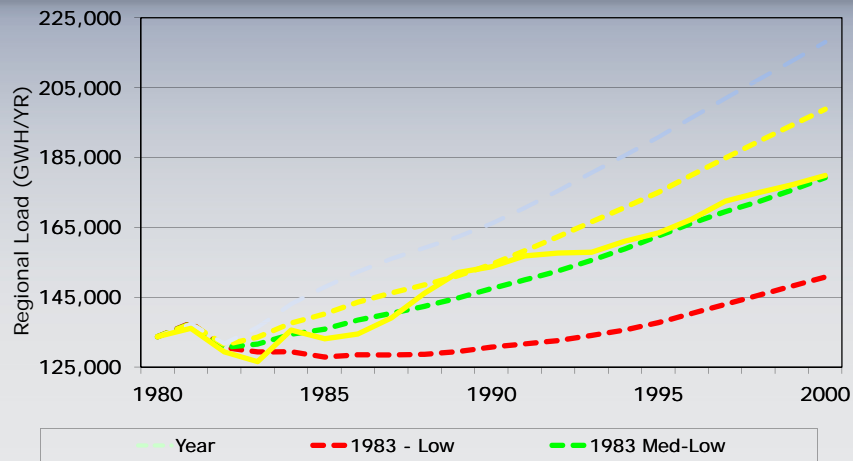


### PNW Retail Electric Rates 1938 to 1985



slide 5

### First Power Plan (1983) Demand Forecast for 1983 to 2003



Notice that there was no "Medium" or "Base Case" Forecast!



slide 6