



Electric Markets

Challenges and Solutions



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Challenges and Solutions

- **How did we get here?**
- **A quick outline of power markets (who are those guys, anyway?)**
- **The short history of spot prices in the Pacific Northwest**
- **Why were recent months so terrible?**
- **Updating forecasts for the California PX**
- **Updated Forecasts**
- **Hedging Options**
- **That's all**



How did we get here?

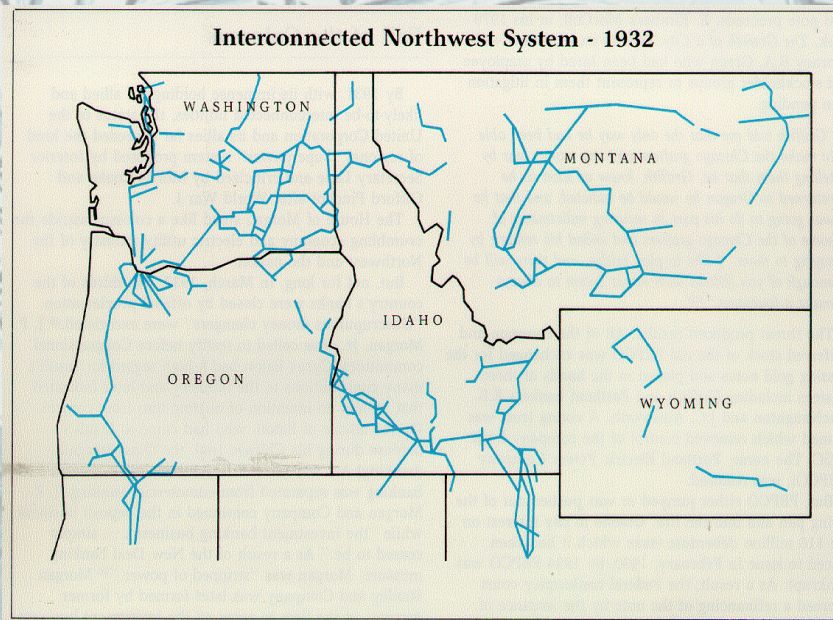
- **Like the rest of North America, the Pacific Northwest was electrified by the robber barons of the 20s**
- **Their collapse left so many gaps that Franklin Roosevelt stepped in the 30s**
- **The combination of diverse ownership and backbone transmission made the Pacific Northwest the first electric marketplace in the world**



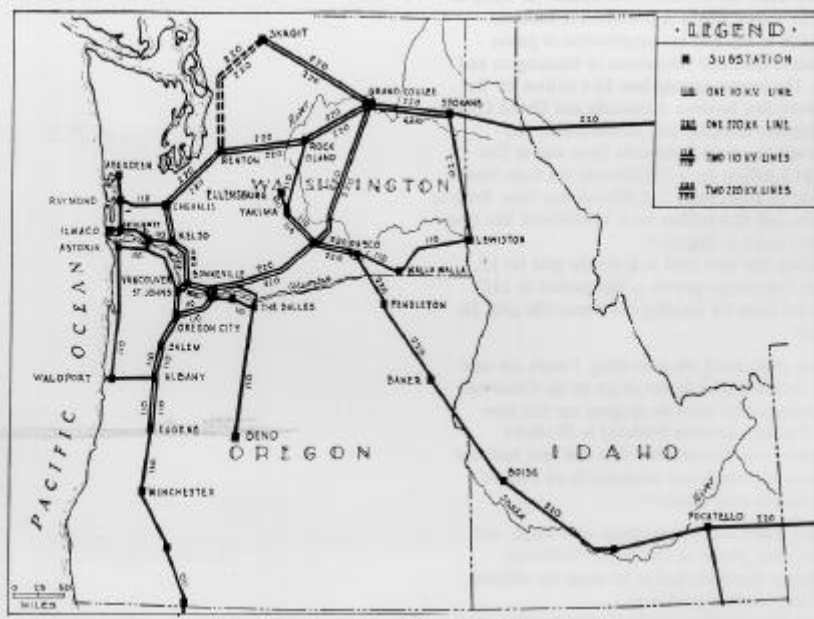
The Robber Barons



The Old System



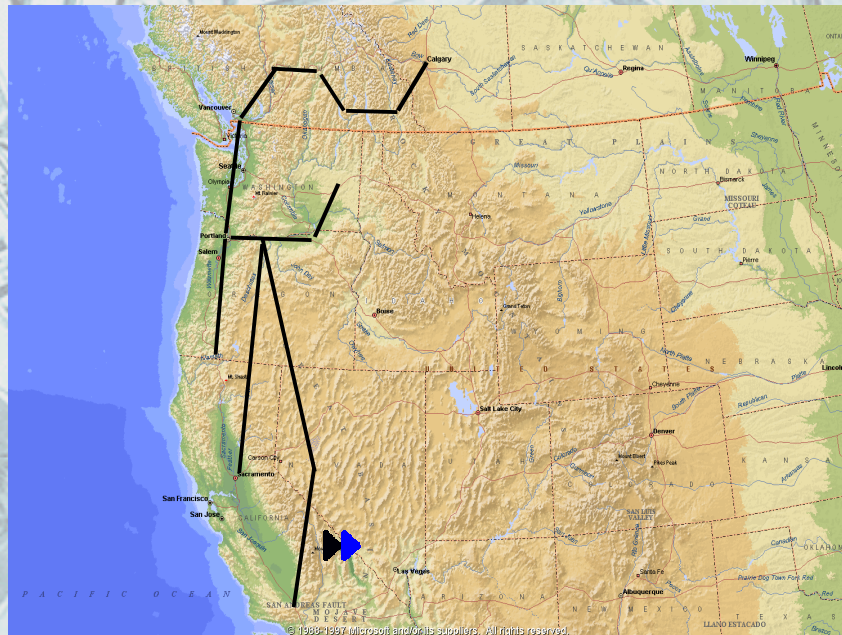
J.D. Ross Master Plan



You are Here



A Better Scale

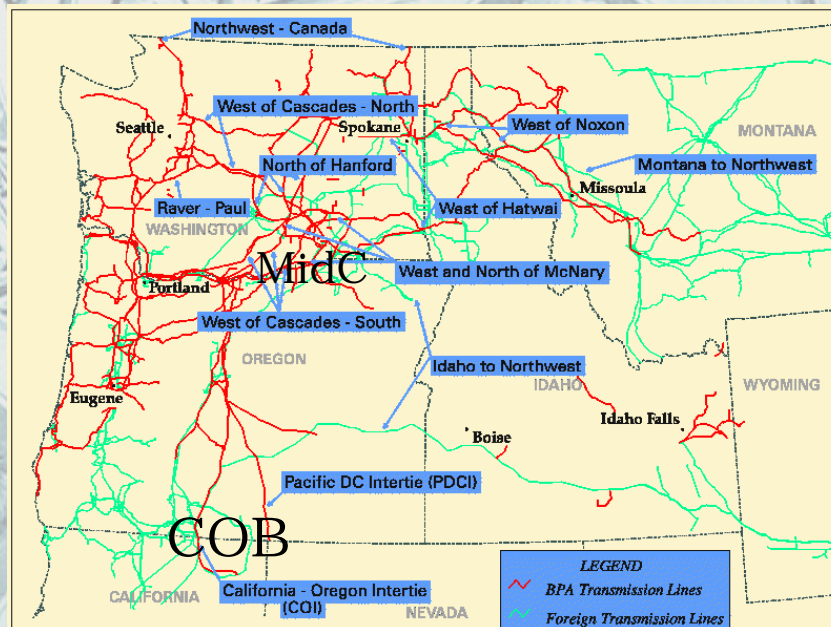


A quick outline of power markets (who are those guys, anyway?)

- Basic geography
- What are the products?
- Who sets the prices?
- What are the peculiarities?
- What's new?



Basic Geography



Energy And Capacity

- Capacity is the right to take energy at any point of time
- Energy is the amount of commodity taken over time



What are the products?

- All products are effectively firm
- One day prescheduled energy dominates the market
 - This is roughly equivalent to a standard commodity since its location and delivery can be relied upon
- Real time energy balances the system
 - Real time transactions offset weather excursions and plant outages
- Non-firm energy is not a marketable commodity, but poorly briefed market experts (usually Harvard professors) have continued to discuss it as if it were



Who sets the prices?

- There is no formal market in 90% of the West Coast
- Two regions -- Alberta and California have centralized markets mandated by regulators
- Market prices are set up telephone calls and collected by survey firms
- The market leader -- if there is one -- is BPA

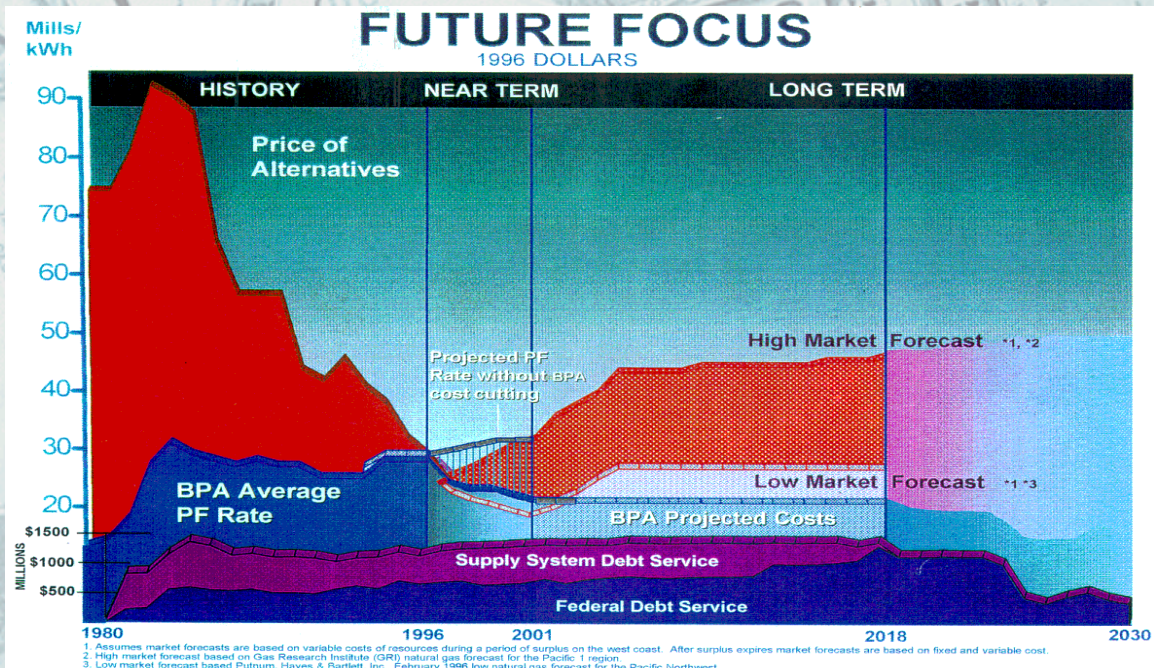


BPA's Daily Offer

BORNEVILLE POWER ADMINISTRATION			
BPA'S OFFER FOR TUESDAY, OCT. 13, 1998 THRU WEDNESDAY, OCT. 14, 1998			
Daily Surplus First Hour Ending NW Delivered COB Delivered			
300 LMDT	HE 7-22	\$29.00	\$29.00
COB/NOB (North to South Only) deliveries will depend on the transmission availability			
Limits shown above indicate total amount of power available for sale under this preschedule offer.			
Sales will be made on a first come, first served basis, up to the limits available.			
NW Public utilities have until 1410, 10:9 to make preference requests.			
Any NW Public utilities' request received after 1410, will be taken at BPA's discretion.			
Other NW IOUs' request will be taken until 1420, 10:9 if energy is available.			
Any NW IOUs' request received after 1420, will be taken at BPA's discretion.			
SW Public utilities have until 1430, 10:9 to request energy, if energy is available.			
Any SW Public utilities' request received after 1430, will be taken at BPA's discretion.			
To place an order, call the power marketing phone line at 503-230-3372.			
Updated Oct. 9, 1998 by Don Le 503-230-3144, nls@bpa.gov .			



BPA's Future



What are the peculiarities?

- Anybody with a telephone can play, but most of the real market participants are the same old suspects
- Mid-Columbia describes a largely mythical location where the prices take place
- California-Oregon Border is completely mythical -- there is only a clearing in the forest with a substation
- California is a "command and control" state where prices have been largely dictated by liberal political agendas -- after their reform they are now a "command and control" state where prices are largely dictated by state bureaucrats



What's new?

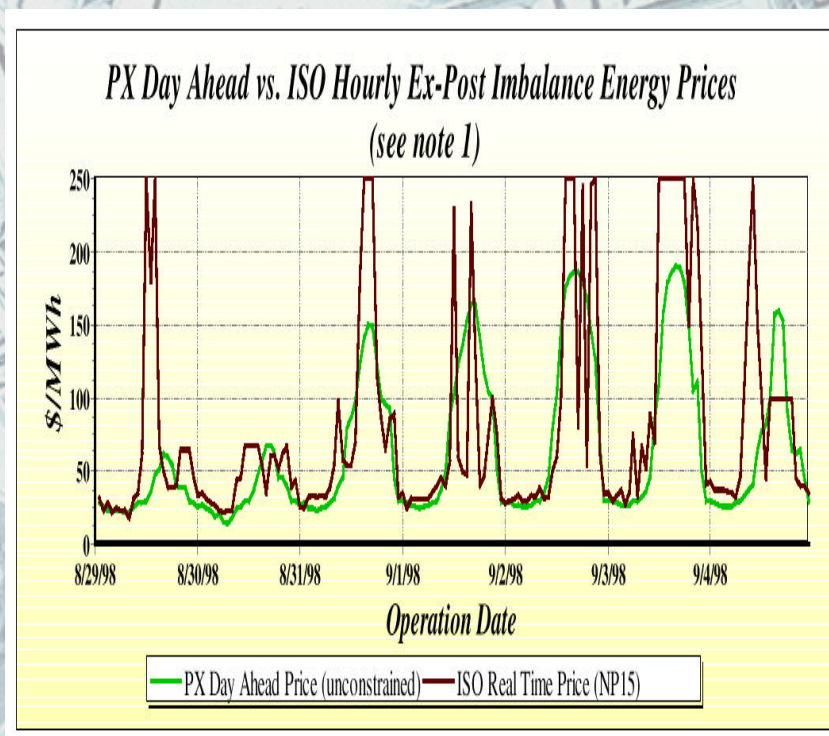
- Basically the only change from previous years is the arrival of California's "deregulated" power market
- California has deregulated by implementing a \$300 million dollar computer program to schedule power for the customers of investor owned utilities in the state
- The program is a triumph of complexity and sophistication -- like loans to Russia the problem is so large that everyone in California is forced to take it seriously
- Few, if any, understand the program and its relationship to regional power markets



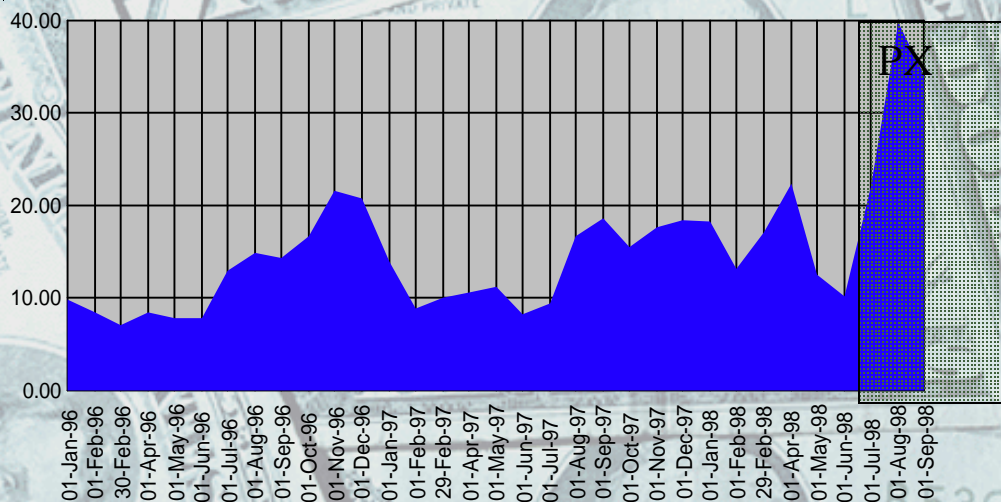
California's System



PX/ISO Operations



The short history of spot prices in the Pacific Northwest



Why were recent months so terrible?

- The simple fact is that there were no major problems in recent months
 - Hydro was a bit less than normal
 - There were no major plant outages
 - There were no transmission outages
 - Loads were higher, but not markedly so
- California's PX has had an enormous impact in two ways:
 - Terms of trade have turned towards the Pacific Northwest as the theorists in California have attempted to offset market power by California's big three utilities
 - The PX simply doesn't work very well

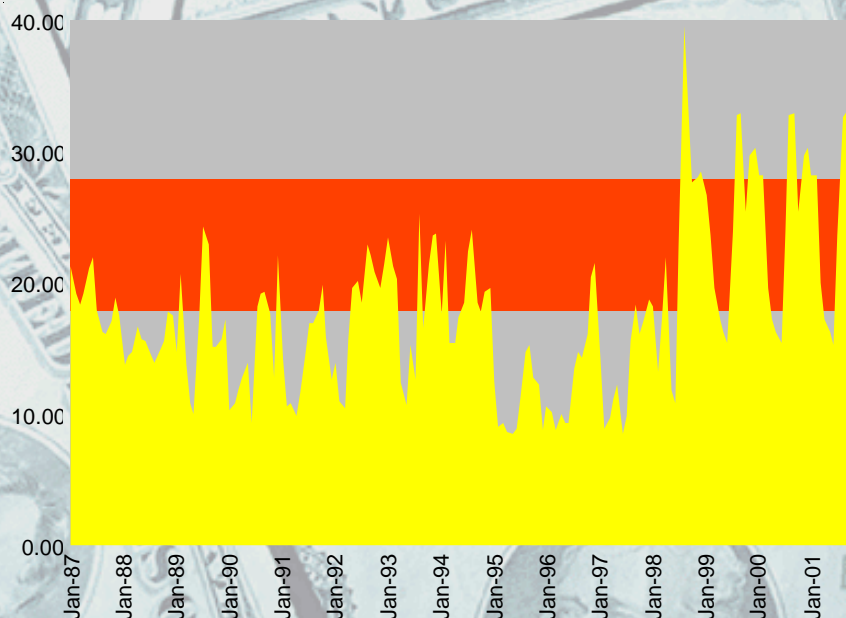


Updating forecasts for the California PX

- Our current results indicate that the California PX has added 9.26 mills to on-peak prices and 4.82 mills to off-peak prices
- Close examination indicates that the impacts are very dependent on problems within the PX itself
- As a working hypothesis, we expect that PX excursions will only occur during high load months in California
- This should mean that November through January will not be affected by PX problems



Updated Forecasts



Energy and Capacity Revisited

- **New entrants to the market assume that capacity will simply disappear**
- **The market evidence doesn't support this view**
- **We can expect "iron" to be a central portion of markets as we reach load/resource balance over the next decade**
- **Evidence from Illinois already supports this conclusion**



New Resource Choices

- **All market participants plan on new generation in the early to middle users of the next decade**
- **The resource choice is natural gas fired combined cycle generation**
- **Estimated "all in" prices are 25 mills**

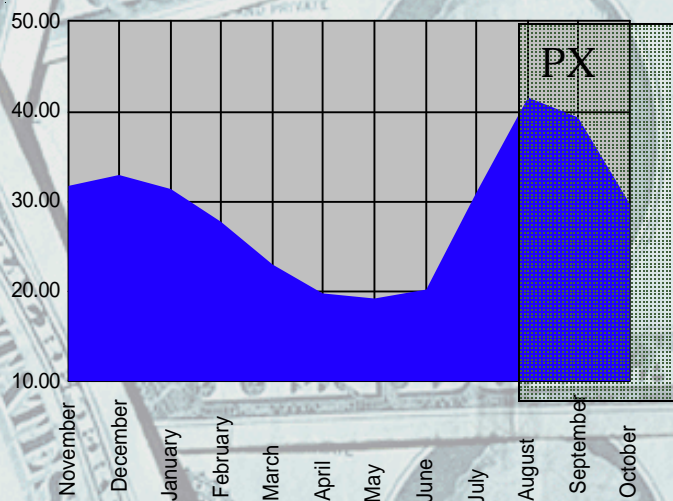


Hedging Options

- Numerous hedging options exist
- The most formal is the NYMEX futures contract
- NYMEX only hedges on-peak sales
- a simple hedge can easily be constructed by buying power flat over the next year and reselling into the spot market
- Most utilities will provide hedges without much trouble
- All brokers and financial houses will provide hedges -- but require a long sales talk first



Current NYMEX Futures

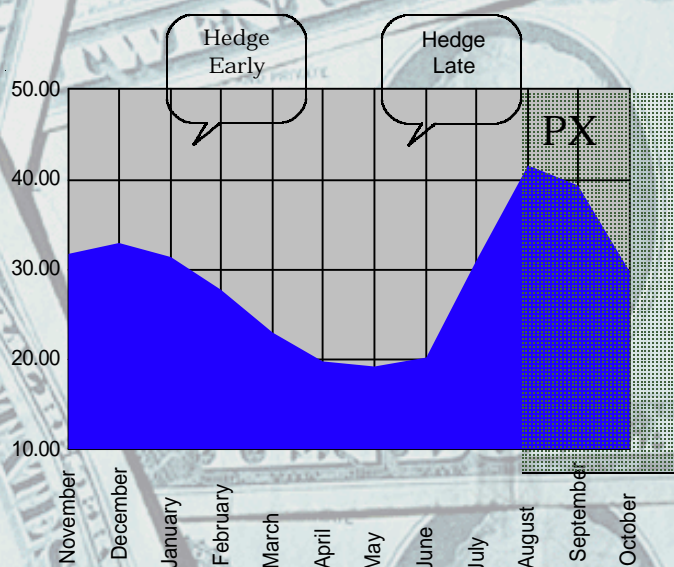


NYMEX tends To Be Naive

- NYMEX has yet to include water years
- Surprises tend to show up across the entire NYMEX futures series without reference to the cause
- NYMEX futures are likely to be lower after price decreases in the spring



NYMEX Hedging Strategy



That's All, Folks!

- **After twenty years our electric market is seasoned and rational**
- **Neighboring experiments are likely to provide more uncertainty than market fundamentals**
- **Long term prospects continue to be good**



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