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July 25, 2012

## MEMORANDUM

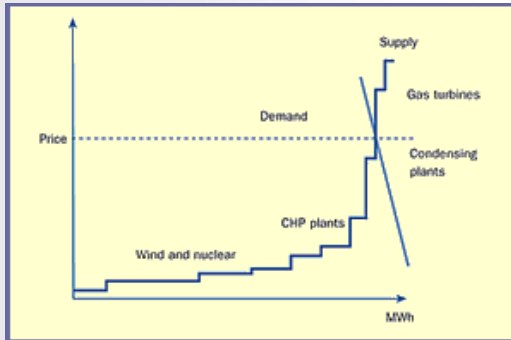
**TO:** Power Committee

**FROM:** Ken Dragoon

**SUBJECT:** Progress Report on Electricity Price Forecast

As part of the Mid Term Assessment, staff is preparing a long-term wholesale electricity market price forecast. Staff will review how the forecasts are made and some of the major assumption revisions and changes that will go into it. A brief progress report on work to date will be presented as well. The updated price forecast is expected to be presented to the Council at its September meeting.

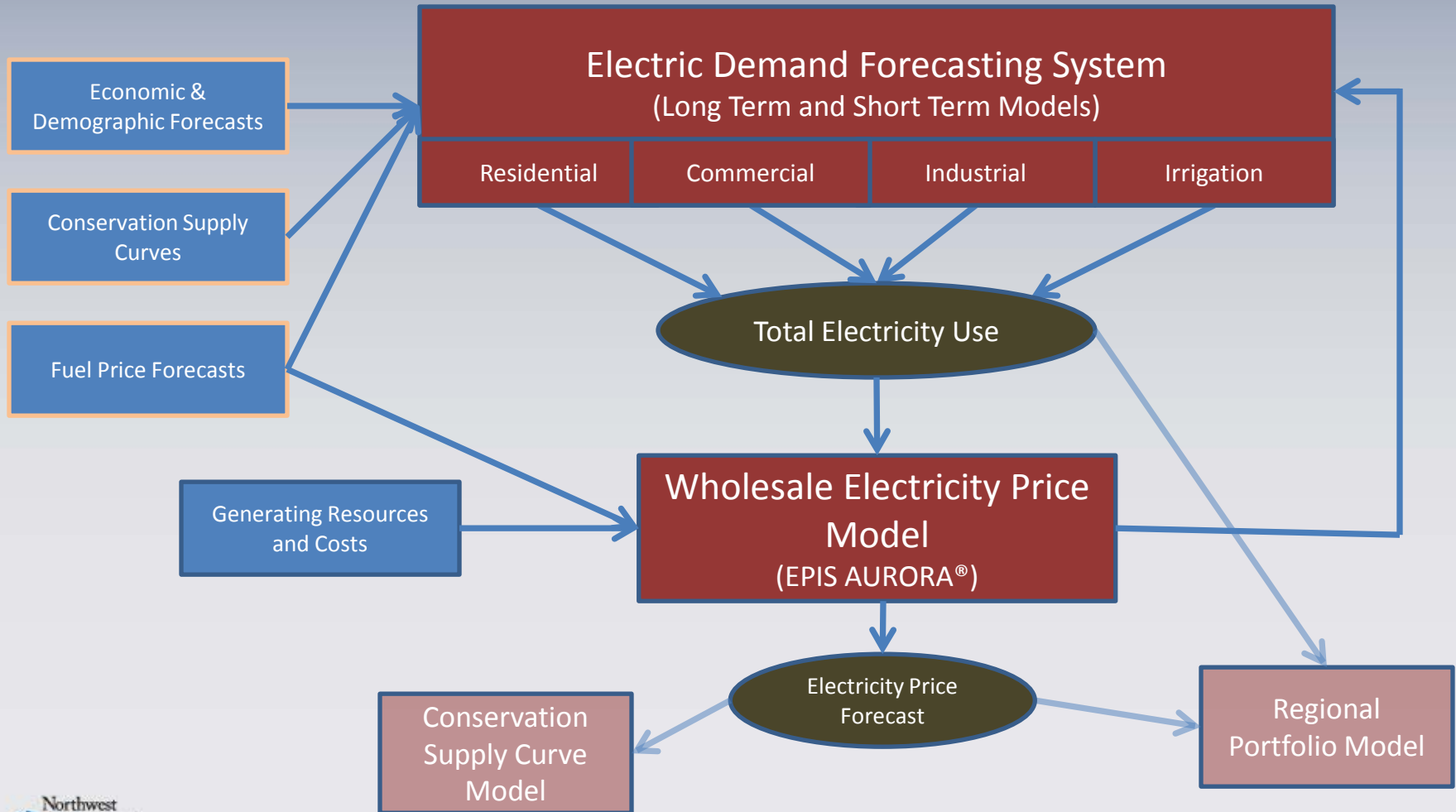
# Electricity Price Forecast Update



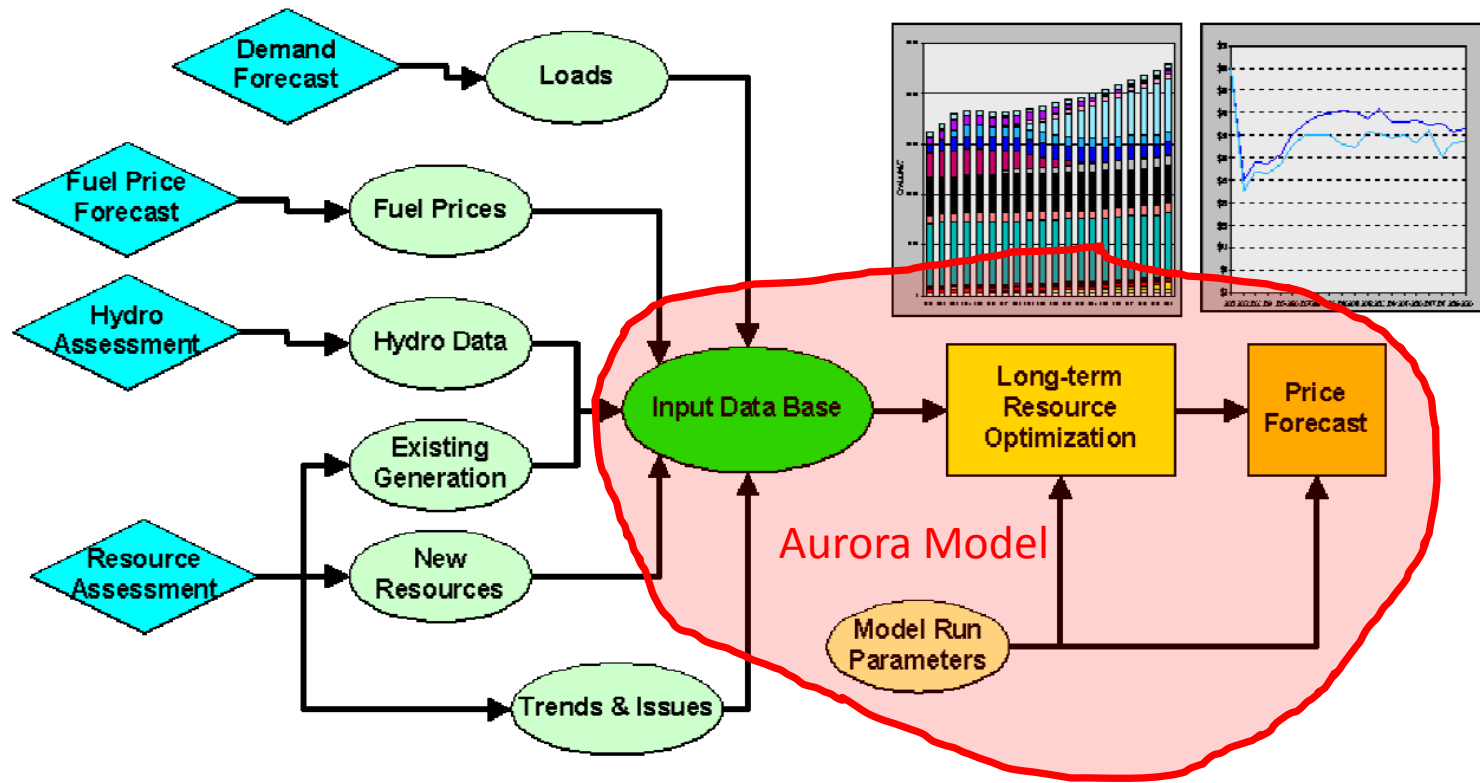
Methods, Data, Process,  
and Progress

**Ken Dragoon/Steve Simmons**  
**August 2012**

# Process Overview



# Modeling Detail

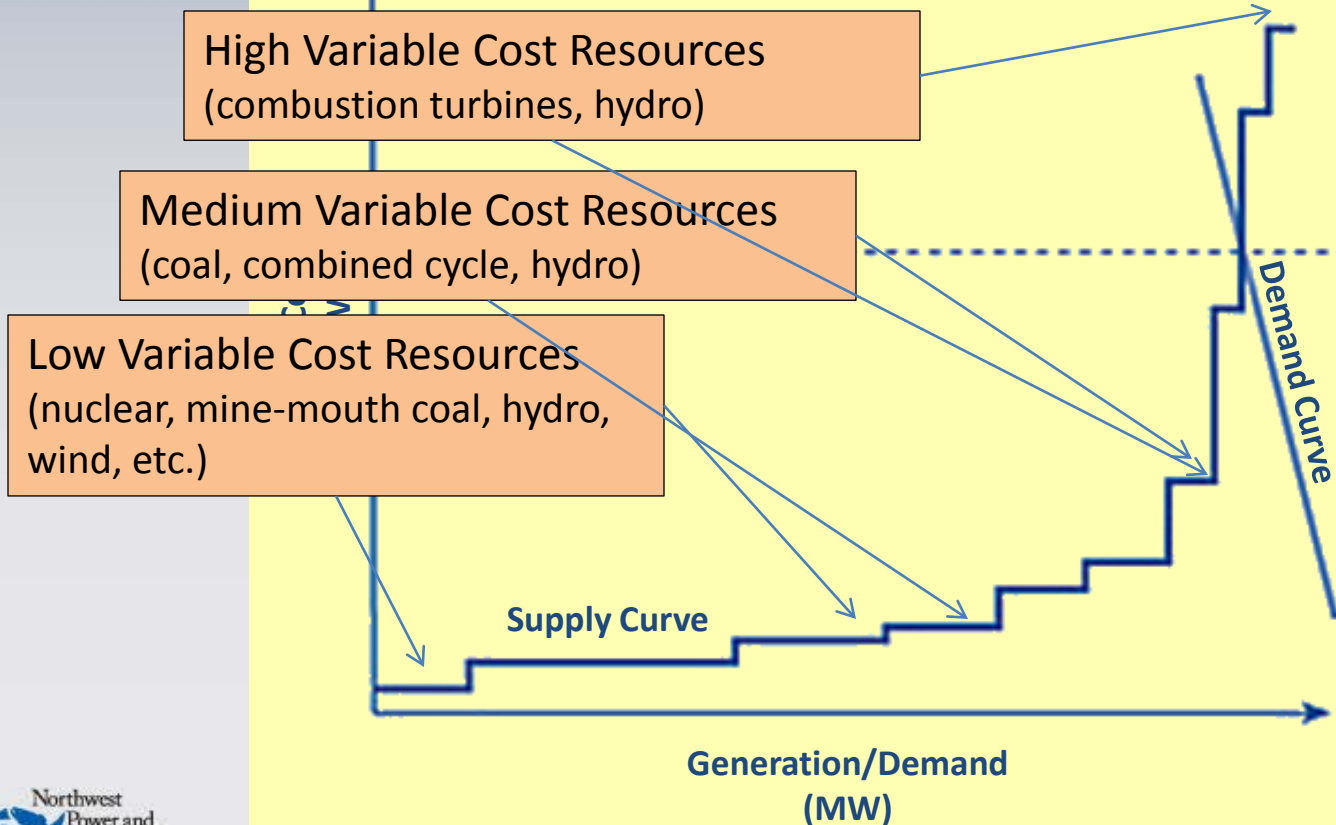




# Determining Hourly Prices

## Zonal Market Clearing Prices

Where the willingness to pay equals the cost to produce



# Resource Additions

- Aurora simulates utility resource addition decisions by adding resources to a zone if:
  - It recognizes that adding a resource is economically justified (benefit greater than cost); or
  - Resources are needed to meet zonal planning reserve margin.
- Model tests available resources to determine most cost effective ones to add.
- Important to add resources, otherwise market prices would unrealistically reflect shortages.
  - Shortages in near term are possible, and can occur if the model is unable to add resources in time to avoid them.

# Data Updates Progress

- **Loads**
  - Mostly updated.
- **Fuel Prices**
  - Revised per new Council forecast.
- **Hydro Capability**
  - Unchanged from Sixth Plan (except for new small hydro additions).
- **Existing Generation**
  - Comprehensive update of resource inventory and capacity through 2010.
  - Selective (time permitting) update of post-2010 actual and committed additions and retirements.
  - Review of generator operation characteristics.
    - Heat rates, up-times, down-times, maintenance schedules, etc.
- **RPS resources**
  - Adjustment of future RPS builds based on update of existing generation.
- **New Resources**
  - Same as Sixth Plan (but using new fuel costs).



# Significant Changes

- New version of Aurora.
- Fuel Prices
- CO2 Assumptions
  - Moved back carbon cost assumption by 5 years.
  - Revising state CO2 cost estimates.
- Coal Plant Retirements
  - Boardman and Centralia
  - Others due to new EPA (MACT) regulations
- California Once Through Cooling Plant Retirements.

# Some Preliminary Observations

- Wholesale (spot) power prices lower, especially in near-to-mid-term.
  - Slower recovery of loads.
  - Front-loaded development of RPS resources.
  - Lagging CO<sub>2</sub> allowance costs.
- CO<sub>2</sub> production lower than previously forecast.
  - Coal and OTC retirements replaced by efficient gas generation.
  - Front-loaded development of RPS resources.

# Going Forward

- Making changes incrementally to verify and validate the results.
  - Need to make sense of effects of each change in data or assumptions for quality control.
- Process is sometimes slow as the kinks get worked out.
- Targeting preliminary results for September Council Meeting