

# Forecast CO<sub>2</sub> production using the AURORA<sup>xmp</sup><sub>TM</sub> Electric Market Model

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# What are we trying to do here?

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- Forecast a base case for future CO<sub>2</sub> production from Northwest electric power generating facilities.
- Scenarios incorporating the effects of various CO<sub>2</sub> abatement policies can then be tested to estimate the cost and effectiveness of these policies.

# Approach & Assumptions

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- Use AURORA<sup>xmp</sup>® Electricity Market Model
- For Northwest: mean development of the resource portfolio recommendations of the 5<sup>th</sup> Power Plan.
- For rest of WECC: use long-term resource additions and retirements from 5<sup>th</sup> Plan base case market price forecast.
- Medium 5<sup>th</sup> plan fuel price forecast
- Mean CO<sub>2</sub> cost assumptions of 5<sup>th</sup> Plan.

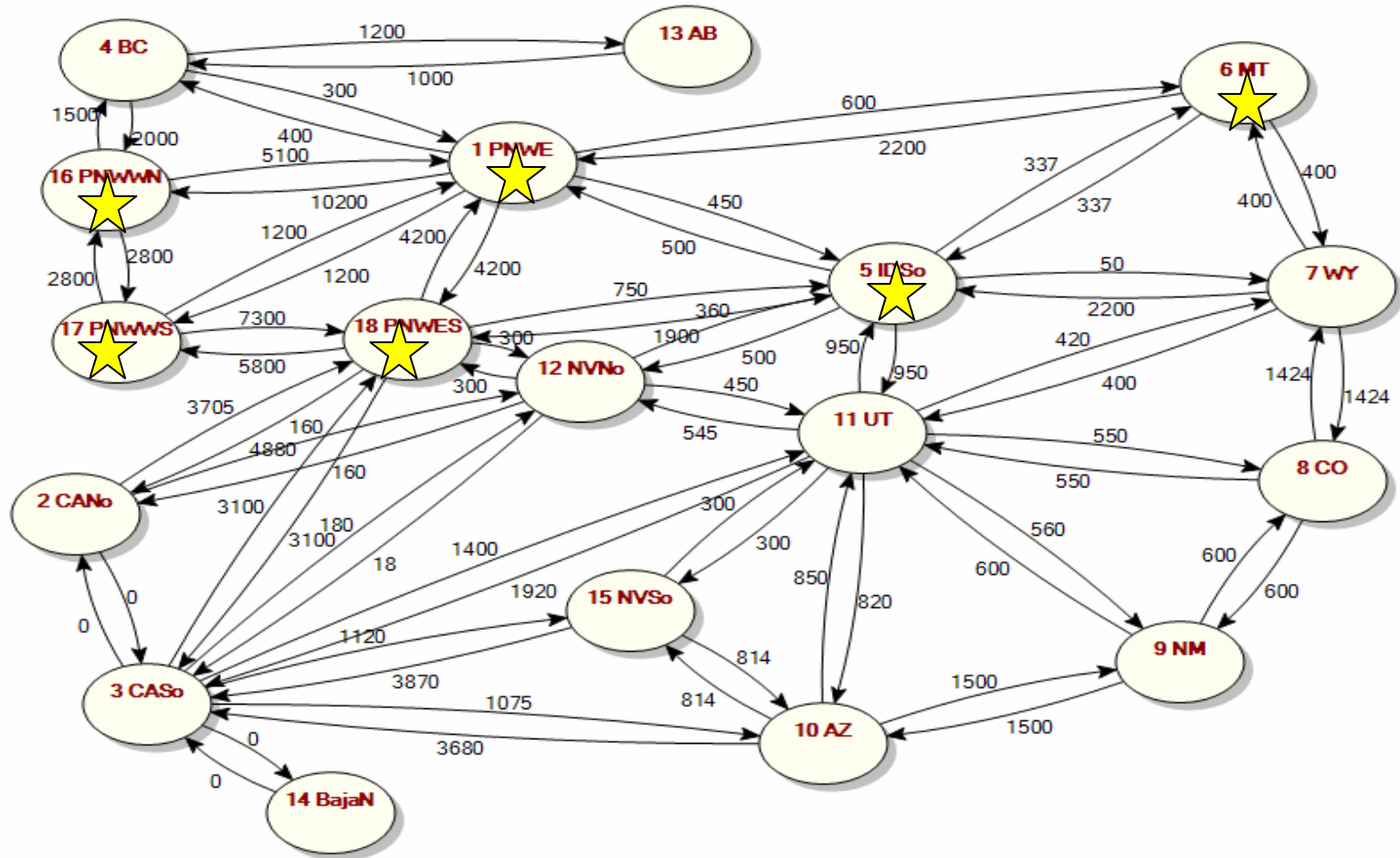
# AURORA<sup>®</sup>xmp<sup>®</sup> Electricity Market Model

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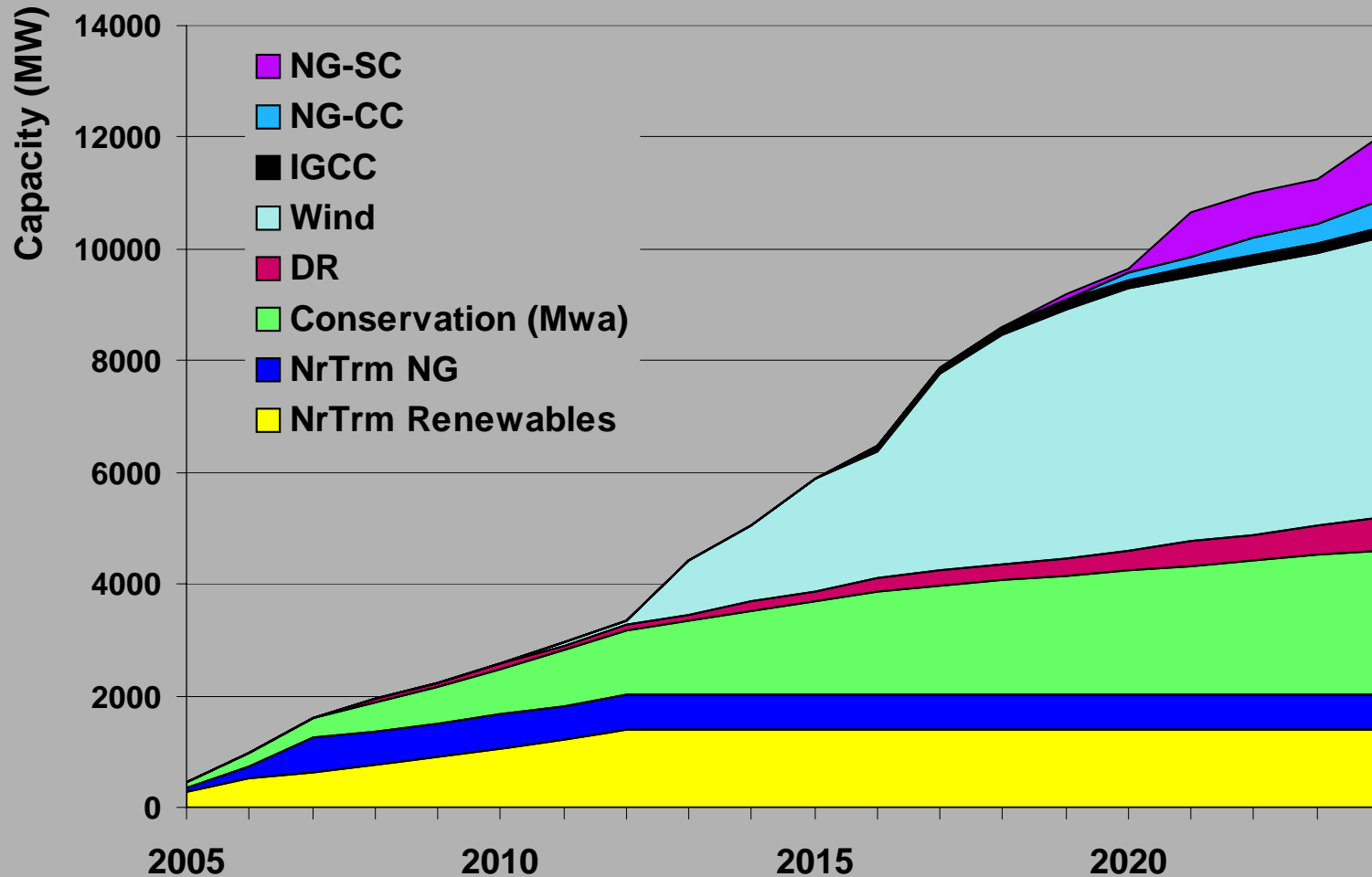
- WECC interconnected system
- 18 load-resource zones (6 in PNW), defined by transmission bottlenecks
- For each zone:
  - Load forecast
  - Current and future inventory of generating units
  - Fuel price forecasts
  - Load curtailment and demand reduction options
- Model dispatches generating or load reduction resources as necessary to meet load and hold operating reserves
  - Hourly or sampled hourly dispatch
  - Dispatch order is on variable cost basis
- Model can track emissions

# WECC and the Northwest Region ( )

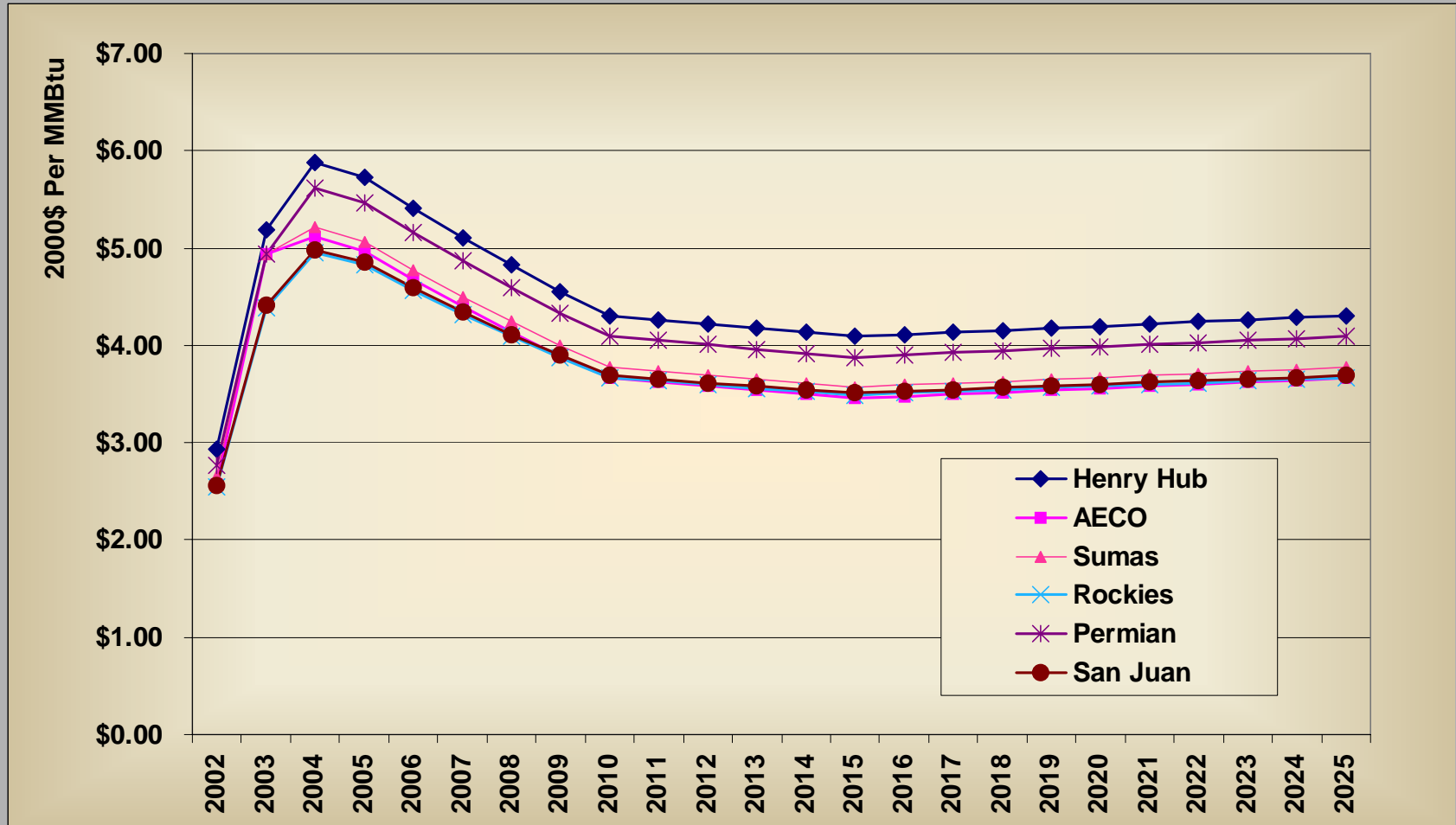
Not running



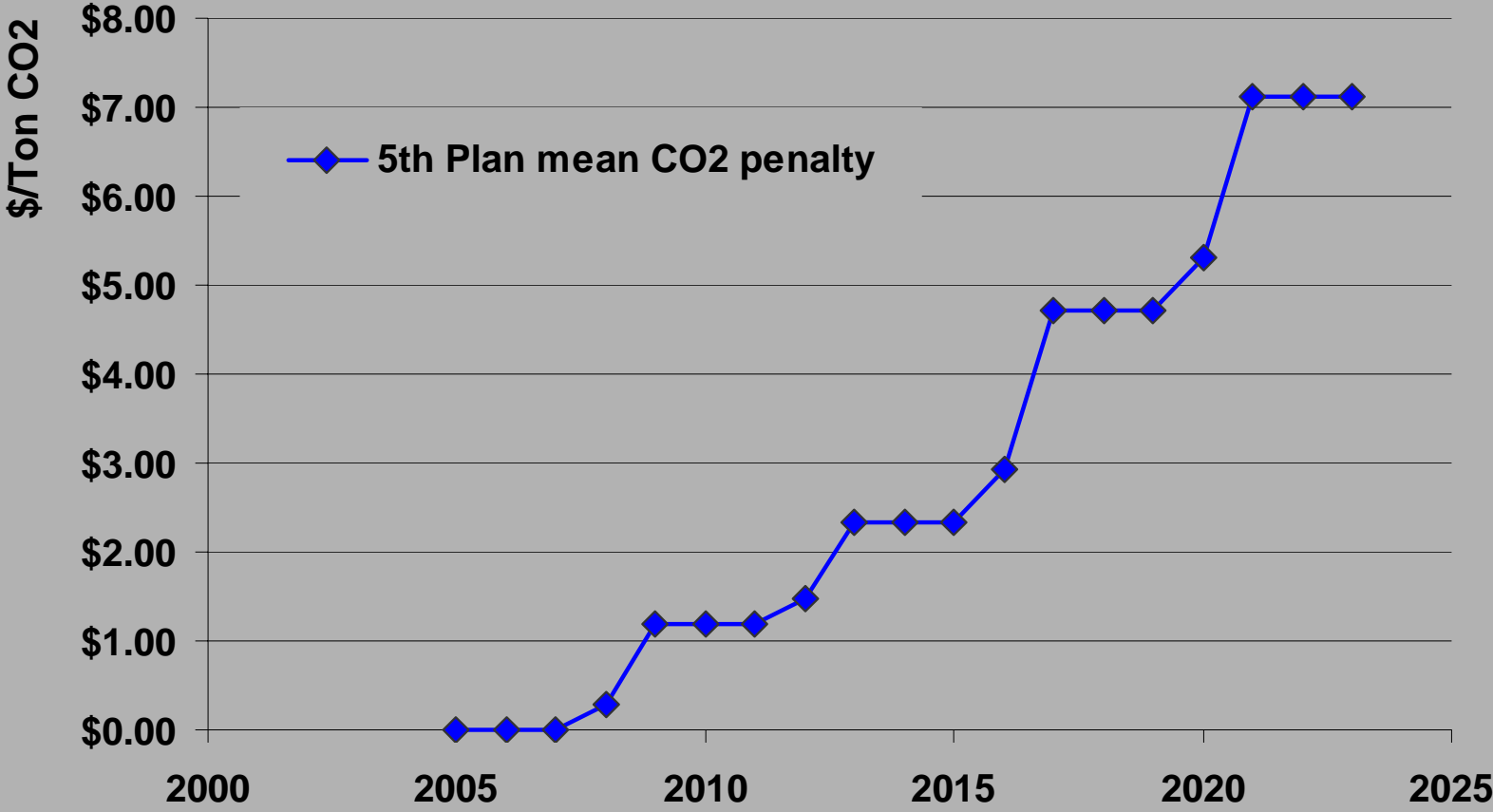
# 5<sup>th</sup> Plan mean values of resource development



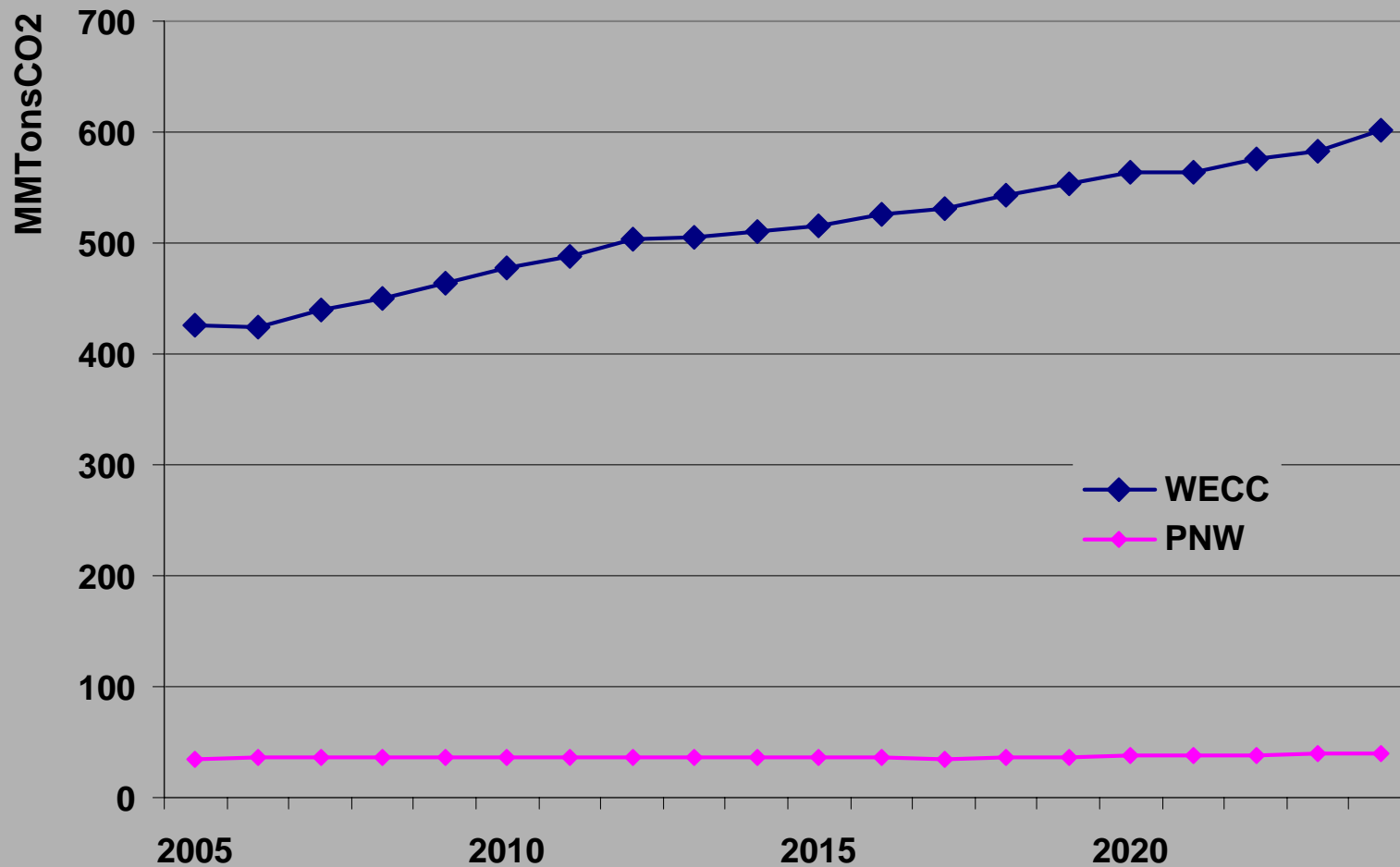
# Medium case natural gas price forecast (constant year 2000 dollars)



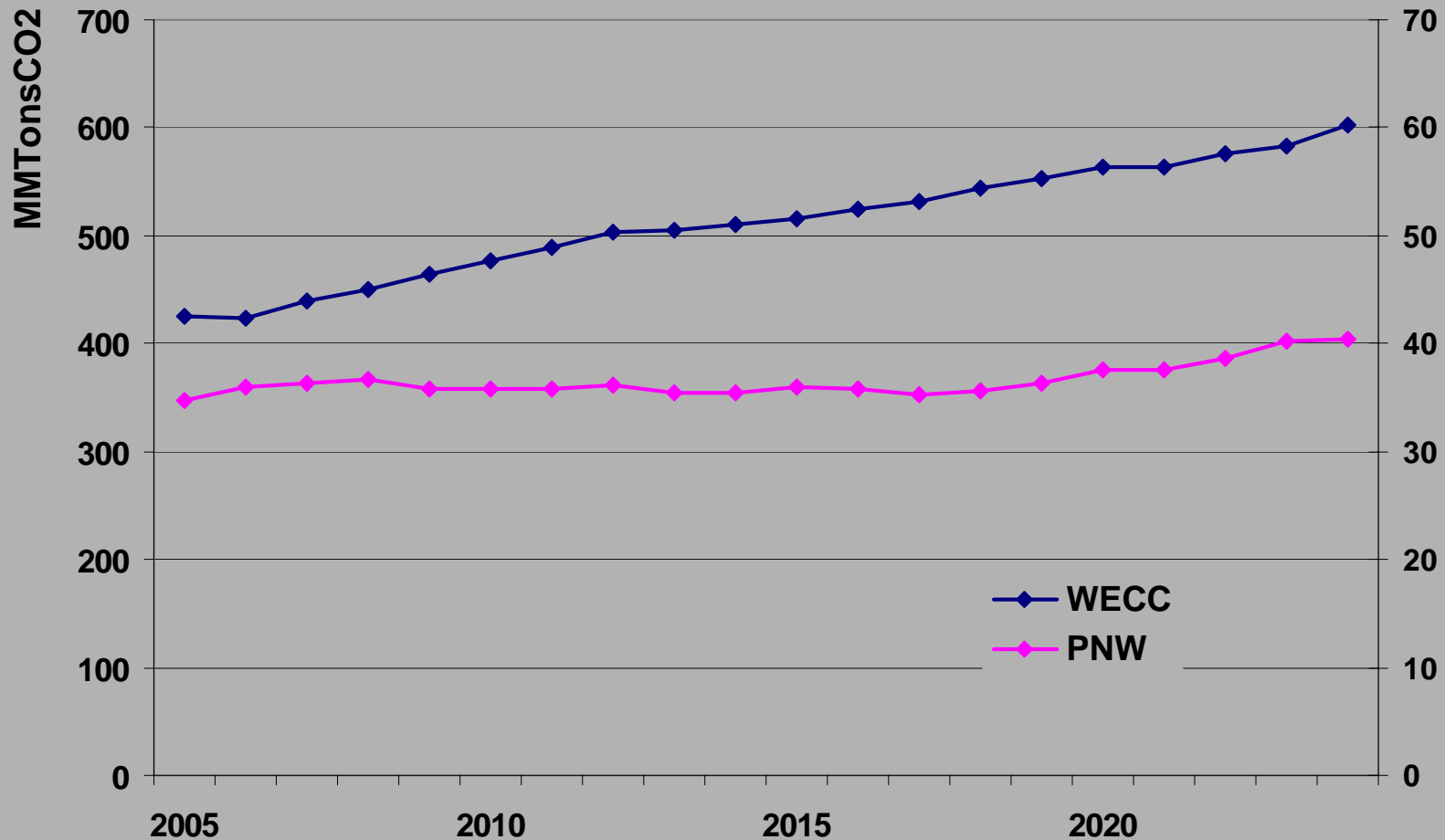
# 5<sup>th</sup> Plan mean CO2 penalty



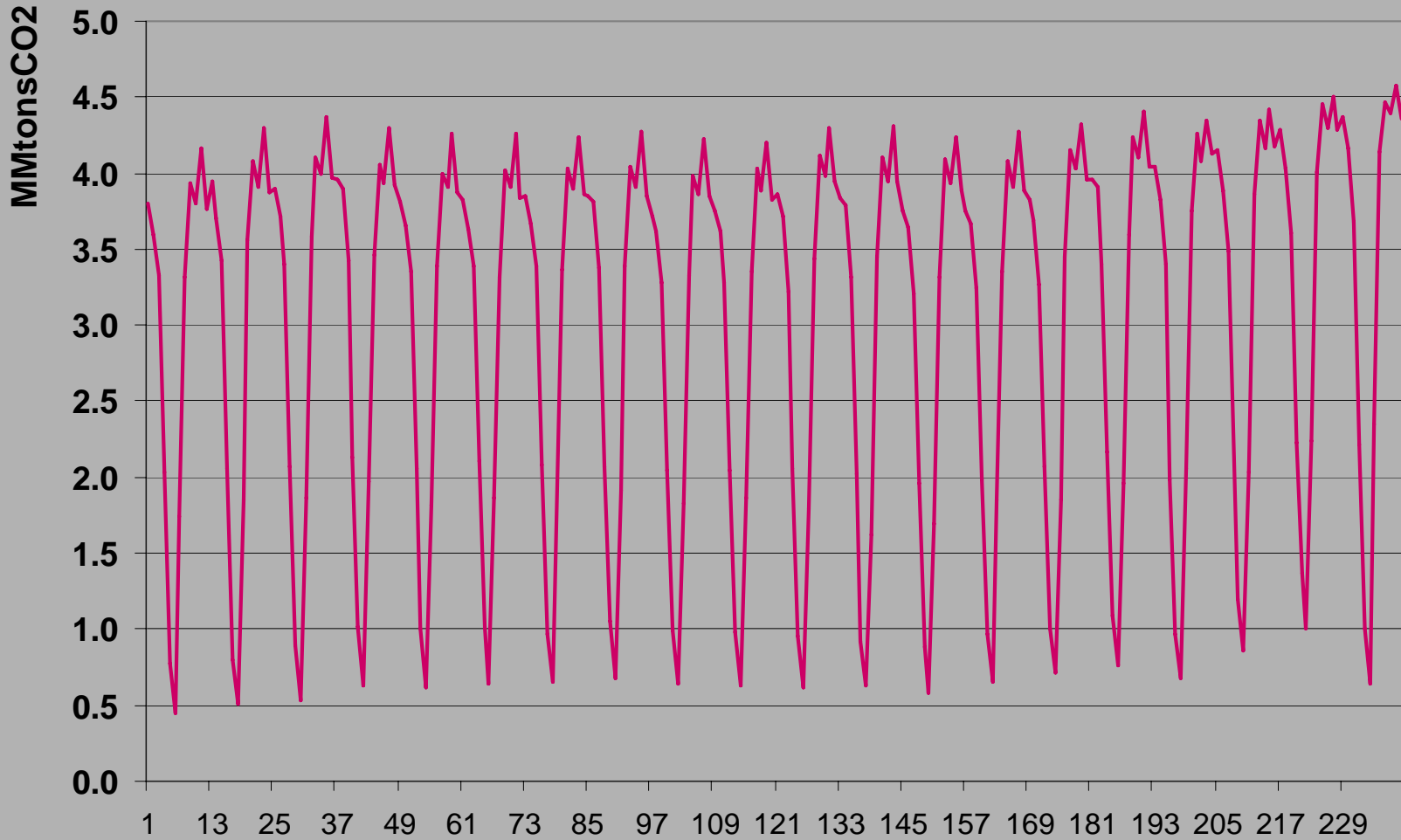
# CO2 Production from electricity generation



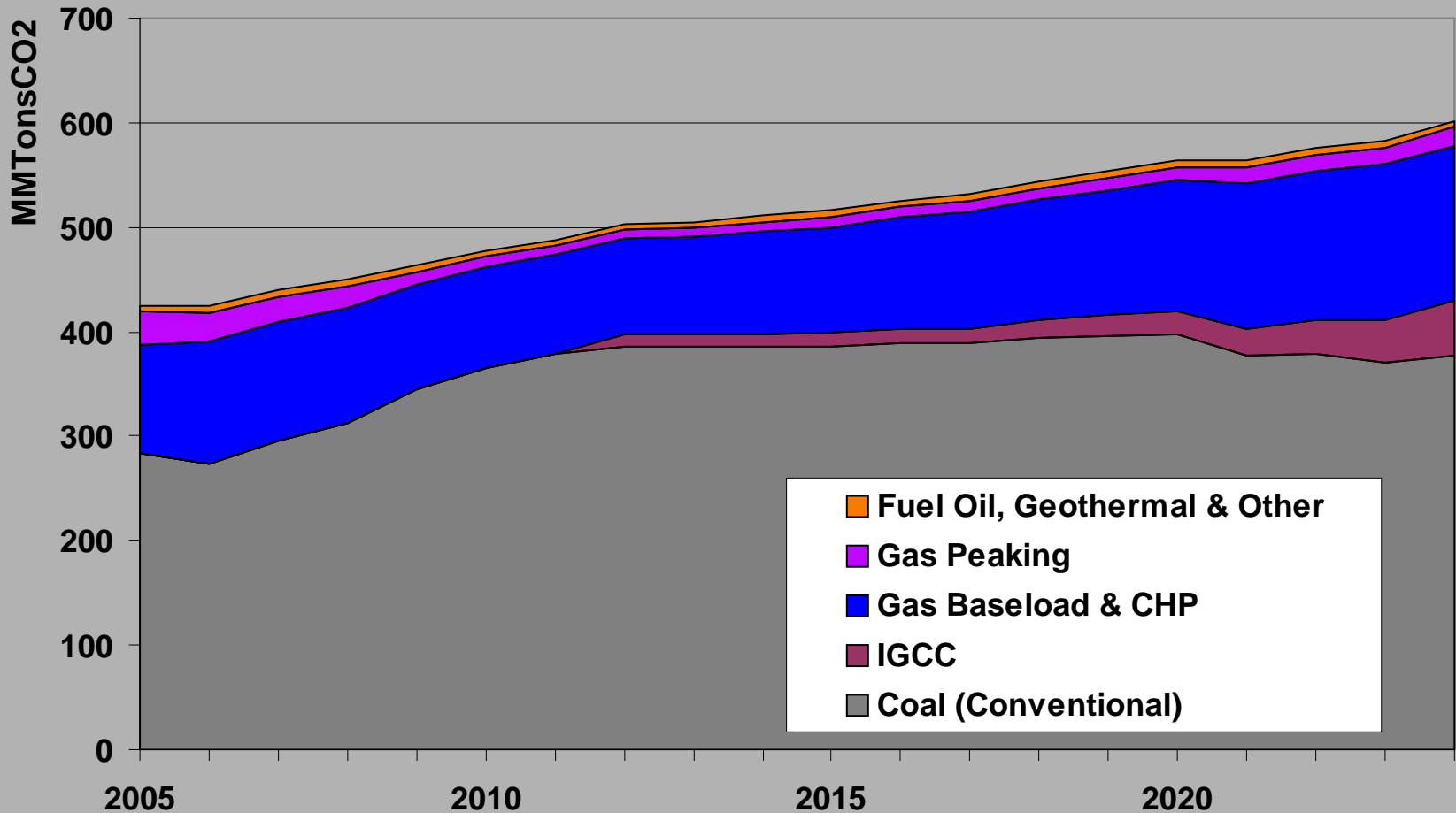
# CO2 Production from electricity generation (PNW rescaled)



# A monthly look for the Northwest



# CO2 production by resource type (WECC)



# Where to now?

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- Is this the right base case?
- What scenarios should be tested?