

Regional GHG Emissions – Outlook

Greenhouse Gas and the Regional Power System Symposium

June 4, 2013
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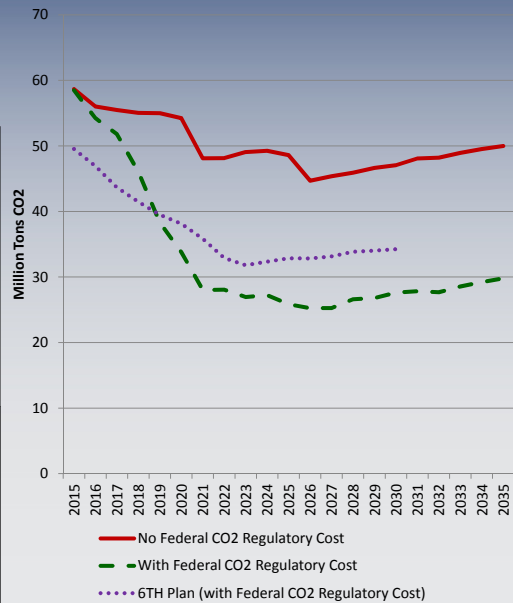
CO2 Emission Outlook for the Pacific NW (ID-MT-OR-WA)

Key Factors that determine Emissions Levels

- 1. Demand & Conservation
- 2. Hydro Power Production
- 3. Coal Plant Retirements
- 4. Renewable Portfolio Standards
- 5. Low Natural Gas Prices
- 6. Potential Federal CO2 regulatory cost policy

Two basic CO2 Cost scenarios were considered:

- 1. No Federal CO2 Regulatory Cost
- 2. Phased-in CO2 Federal Regulatory Cost beginning in 2015



CO2 Emission Modeling Overview

- The Northwest Power and Conservation Council uses a *Production Cost Model* or *Dispatch Model* to forecast long term market prices for power
- Currently using AURORAxmp[®] Electric Market Model by EPIS
- The model simulates the economic dispatch of resources to meet demand
- The model can also track CO2 emissions

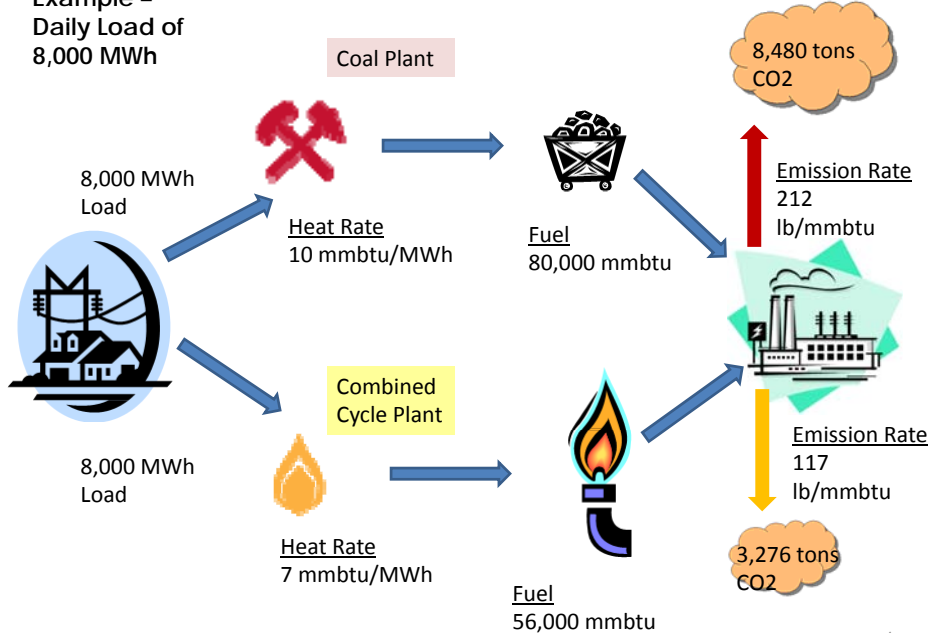
Important Model Assumptions Include

- Demand and Conservation
- Availability of generating resources
- Resource characteristics such as heat rates, emission rates, hydro shapes...
- Fuel prices
- CO2 regulatory costs



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Example –
Daily Load of
8,000 MWh



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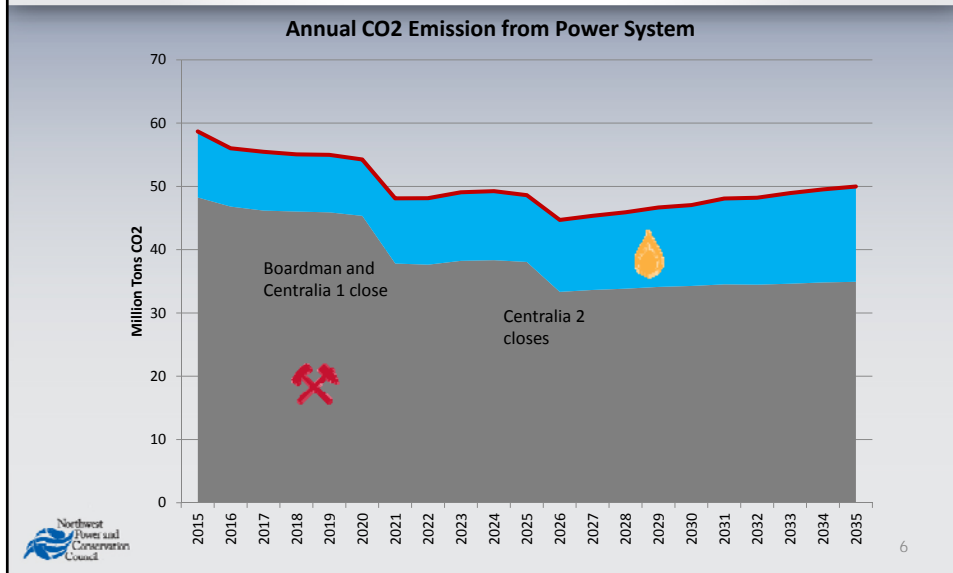
Coal Retirements

Unit	Location	Began Operations	Scheduled to Close	Capacity
J.E. Corette	Billings MT	1968	2015	154 MW
Boardman	Boardman OR	1980	2020	600 MW
Centralia 1	Centralia WA	1972	2020	730 MW
Centralia 2	Centralia WA	1973	2025	730 MW



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GHG Emission Outlook with No Federal CO2 Regulatory Cost



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GHG Emission Outlook with No Federal CO2 Regulatory Cost

	2015	2025	2035
<u>Generation Source</u>		<u>% of Overall Generation</u>	
Coal	19 %	15 %	13 %
Natural Gas	10 %	10 %	14 %
Wind & Other Renewables	8 %	12 %	13 %
<u>Emission Source</u>		<u>% of Overall CO2 Emissions</u>	
Coal	82 %	78 %	70 %
Natural Gas	18 %	22 %	30 %



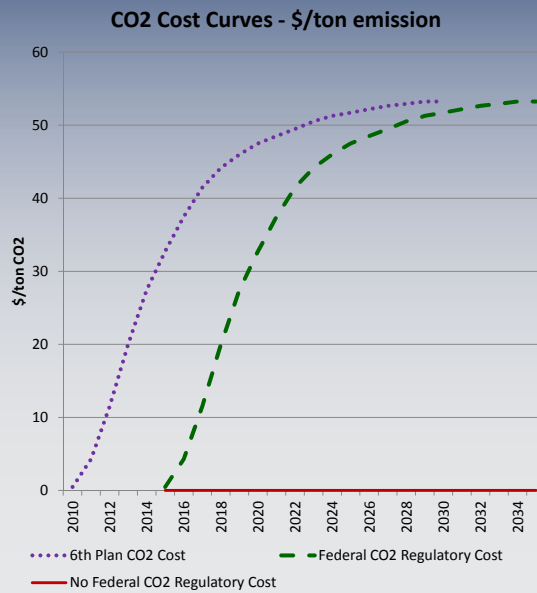
CO2 Emission Regulatory Cost Scenarios

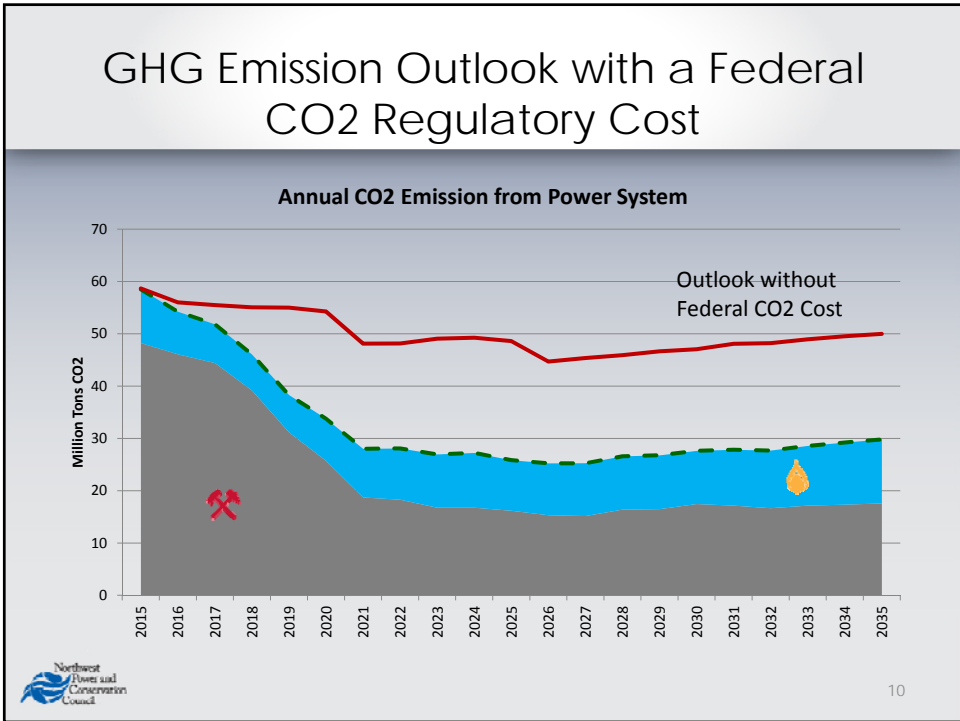
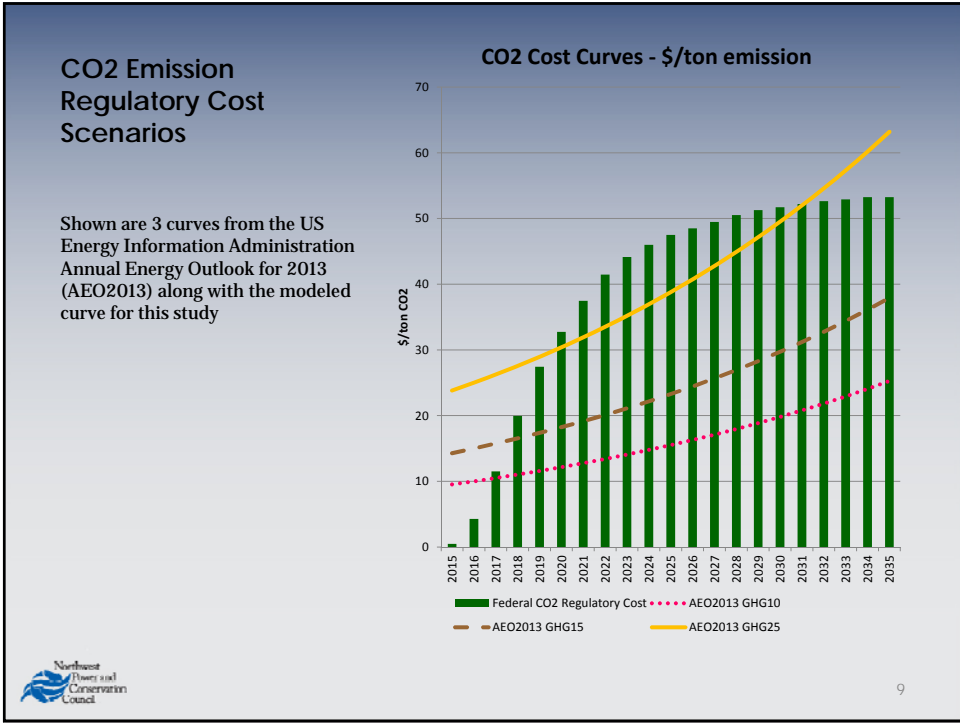
The Council modeled two cases:

1. No Federal CO2 Regulatory Cost
2. Phased-in CO2 Federal Regulatory Cost beginning in 2015

The CO2 cost curve used in this study is the Council 6th Power Plan curve deferred for 5 years.

As modeled, for those power plants that emit CO2 when they generate electricity, a cost in \$/ton is attached to the generation





Reduction in CO2 emissions with a Regulatory Cost Policy

Modeling indicates that both emission levels and emission intensity (tons CO2 per MWh of electricity generated) would drop with a CO2 Regulatory Cost

Coal unit retirements result in lower emissions in cases with and without a regulatory CO2 cost policy. With a cost policy in place, existing coal units operated at a lower capacity factor further reducing emissions.

