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January 6, 2010

## MEMORANDUM

**TO:** Power Committee

**FROM:** Terry Morlan

**SUBJECT:** Carbon Target and Other Scenarios

One of the most significant new aspects of the Power Plan is the analysis of meeting a specific carbon emissions target. Staff has developed three scenarios that accomplish about the same carbon reduction, but with different assumptions. The first is the carbon risk scenario (\$0 to \$100 carbon price uncertainty), second is the coal plant retirement strategy as an alternative to carbon pricing, and finally a fixed carbon price of \$45, which also achieves the reduction target. Staff will discuss the results and implications of these scenarios and how we would propose including them into the Power Plan.

As of today, we have completed one additional scenario for the final Power Plan. That is a scenario that assumes carbon pricing risk (\$0 - \$100), but no new conservation. This scenario illustrates the effect of the Power Plan's conservation on costs and carbon emissions.

Additional scenarios we expect to complete are the Current Policy Scenario, the No-RPS scenario, and the No Policy scenario. We expect the effects of these additional scenarios will be similar to their effects in the draft plan, which included similar scenarios. One additional case that we hope to complete is a coal-plant retirement scenario combined with carbon price risk.

Staff will discuss the results of these scenarios with the Power Committee. A PowerPoint presentation is attached that summarizes the findings of the carbon target analysis.

Attachment

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q:\tm\council mtgs\2010\jan10\p-2\carbontargetcm.doc

# Carbon Reduction Target Scenarios

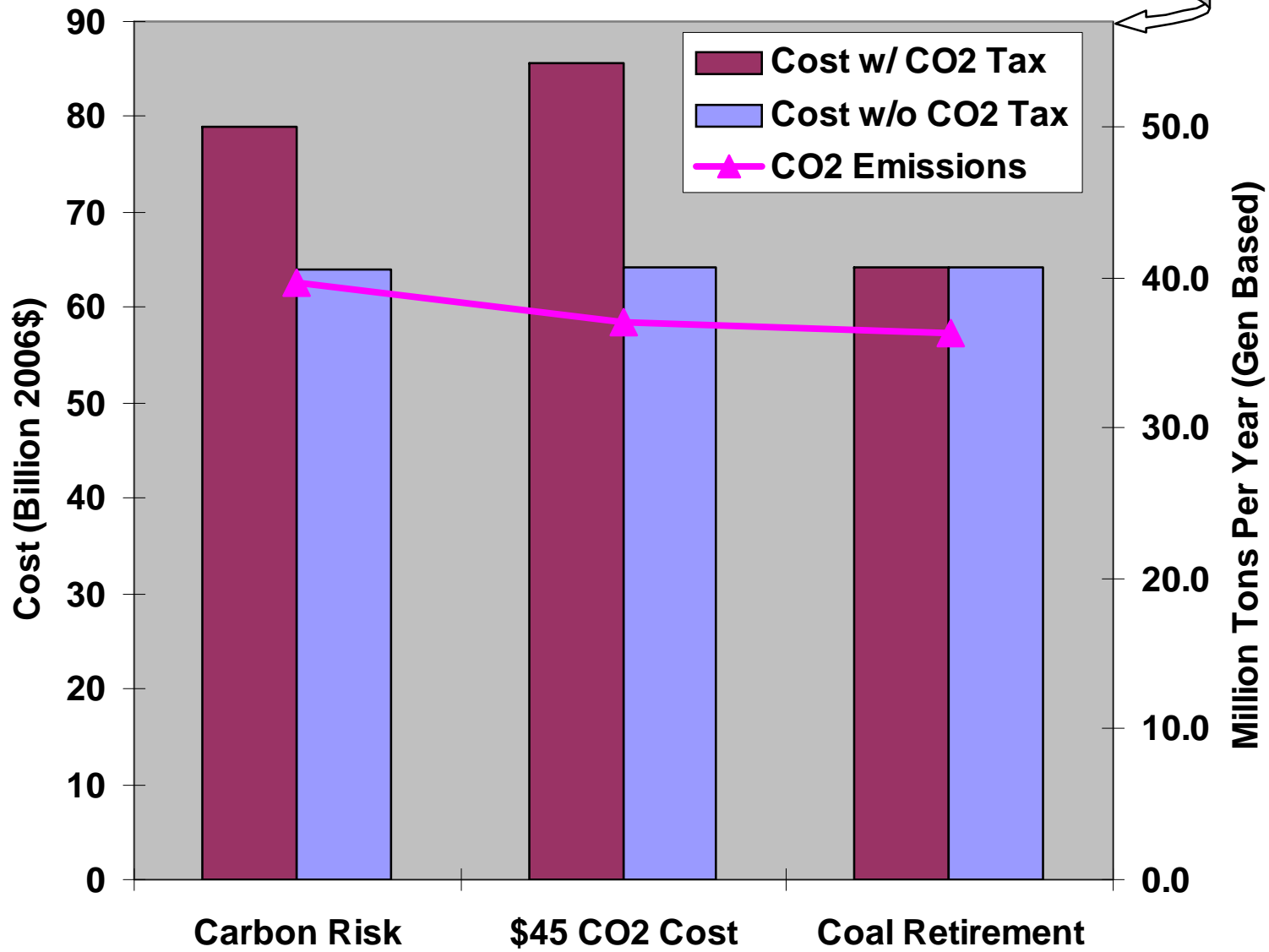
Power Committee  
January 12, 2010

# Three Scenarios

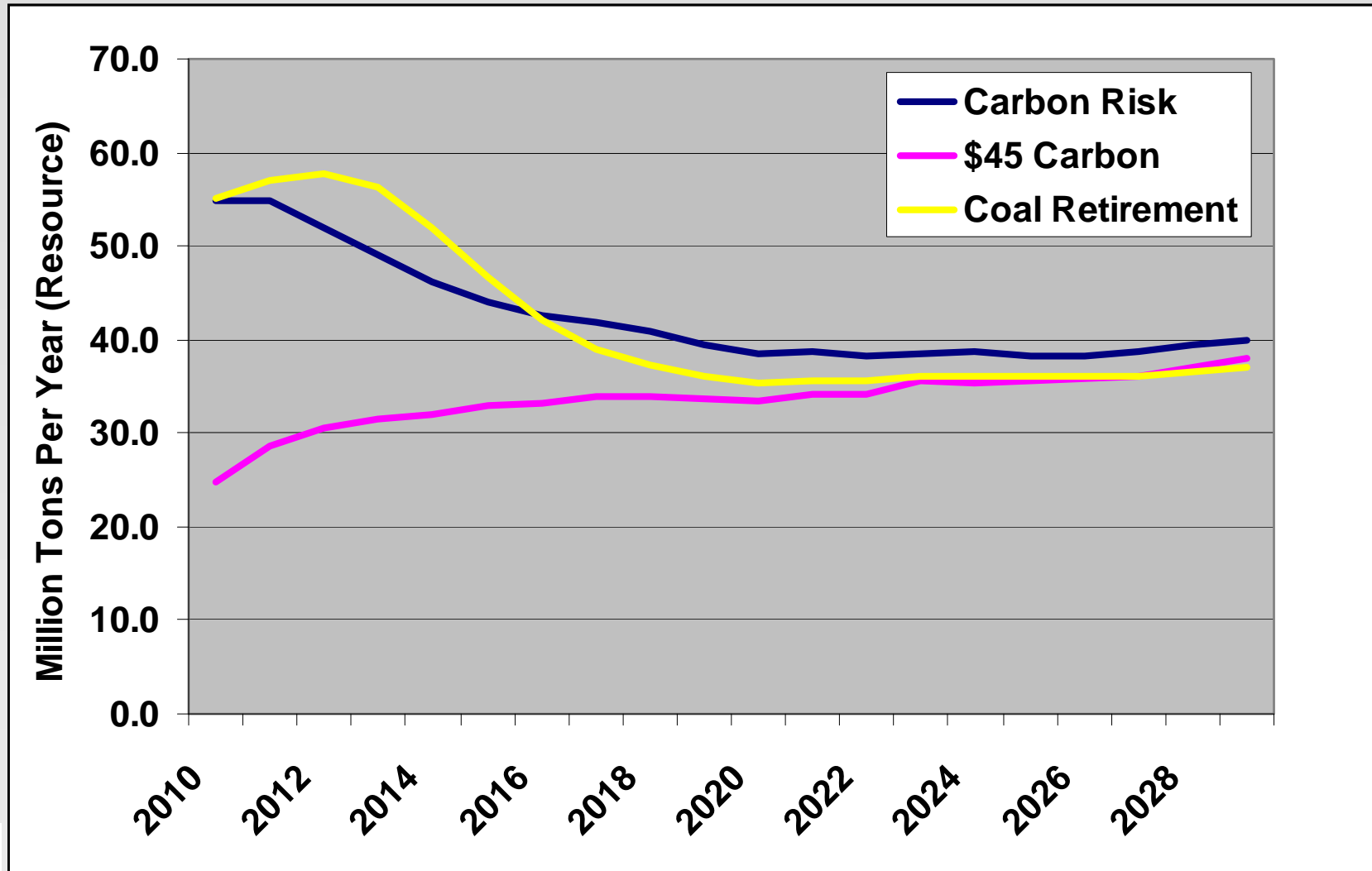
- Carbon Risk
  - Carbon price \$0 to \$100 dollars, average \$47 by 2030
- \$45 Carbon
  - Assumes a fixed carbon price of \$45 starting in 2010
- Coal Retirement
  - Assumes phase-out of 54% (2,708 MWa) of regional coal-fired generation

# Power System Costs and CO2 Emissions: 2030

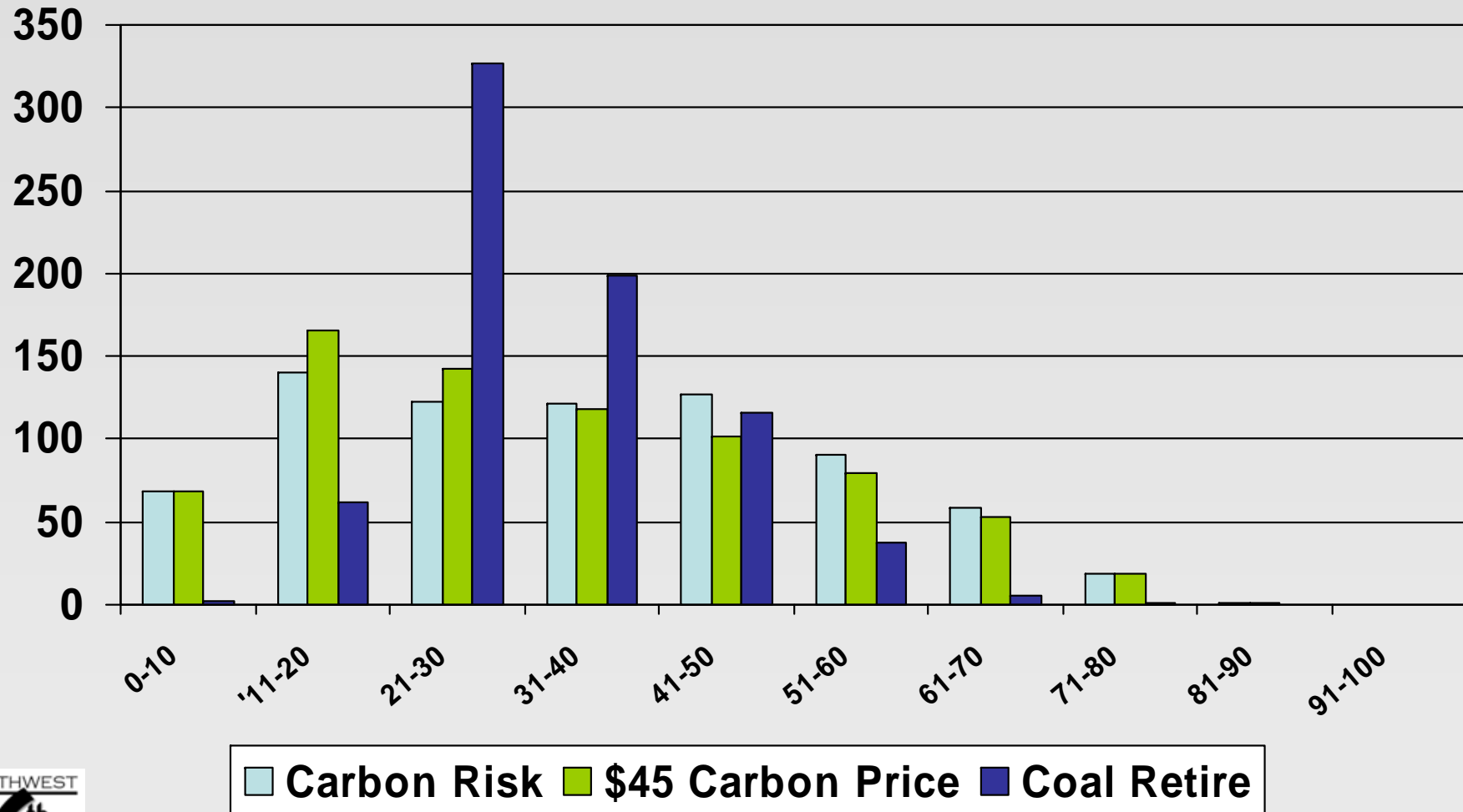
2005 CO2 Emissions



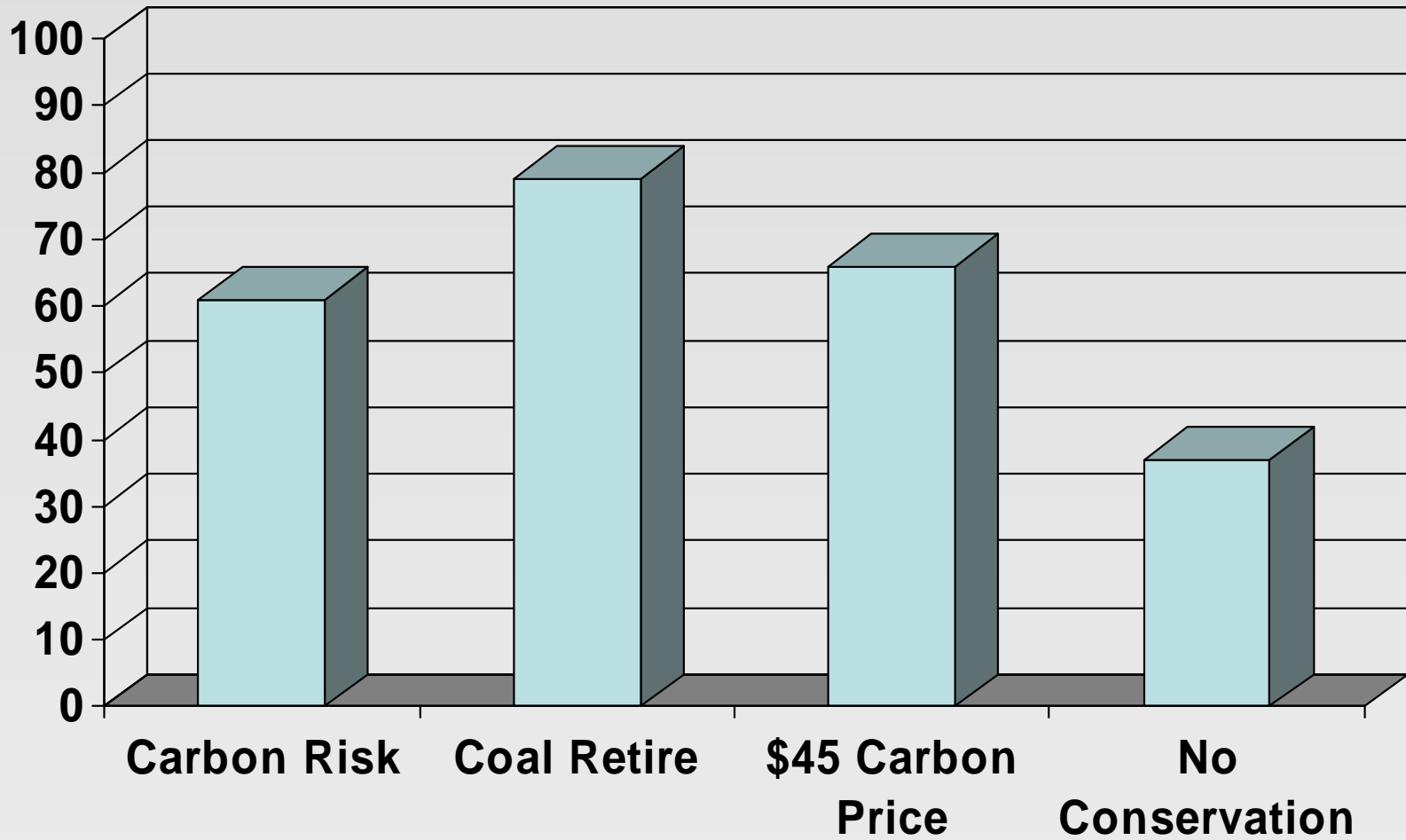
# Annual Carbon Emissions



# Frequency Distribution of CO2 Emissions in Carbon Target Scenarios



# Probability of Carbon Emissions Being Below 40 MMtpy



# Resource Development

	Carbon Risk	\$45 Carbon	Retire Coal
<b>RESOURCES</b>			
Total Conservation (Average Development)	5895	5933	5825
RPS Resources (Forced in)	1453	1450	1459
<b>CCCT (Amount Optioned)</b>			
Earliest Option	3402	1890	756
Earliest Construction Date	2019	2019	2015
Maximum Optioned	3402	1890	3024
Average Built	402	233	352
<b>SCCT (Amount Optioned)</b>			
Earliest Option	162	162	162
Earliest Construction Date	2015	2017	2015
Maximum Optioned	648	1620	3240
Average Built	20	59	185
Demand Response	4	4	4
Average Market Purchases	-1977	-1772	-1648
<b>Total New Energy</b>	<b>7774</b>	<b>7679</b>	<b>7825</b>



# Meeting the Carbon Target

- Targets area averages, will vary with hydro conditions, loads, fuel prices
- What has to be done:
  - Carbon prices at \$45 or higher needed to reduce coal dispatch enough to meet target
  - Retiring 58% of regional coal plants (if no carbon pricing) would meet target
  - Achieving 5,900 MWa of conservation is important
  - Meet RPS requirements

# Efficiency Improvement is Vital to Meeting Carbon Targets

