

**APPENDIX****2006 IRP – Candidate Portfolio Handout****Candidate Portfolios**

Candidate portfolios were developed according to five resource strategies intended to manage portfolio risk. These resource strategies are as follows:

- Minimize electricity market price risk exposure by eliminating long-term reliance on front office transactions after 2012.
- Acquire additional wind resources above the fixed amounts described above—with and without front office transactions included after 2012—as a means to reduce fuel and CO<sub>2</sub> cost risks.
- Plan to a 12 percent planning reserve margin with and without reliance on front office transactions after 2012.
- Acquire baseload coal resources early as a hedge against high gas and electricity prices and price volatility.
- Remove pulverized coal plants as a resource option. This strategy is designed to reduce CO<sub>2</sub> cost risk by relying on renewables, gas resources, and front office transactions until commercially proven IGCC can be acquired.

The table below describes the 12 candidate portfolios (CP1 through CP12) developed for stochastic risk analysis, and summarizes the rationale for selection based on the five alternative resource strategies.

**Candidate Portfolio Descriptions**

<b>ID</b>	<b>Description</b>	<b>Selection Rationale</b>
<b>CP1</b>	Medium alternative future study with wind, DSM, and CHP at fixed levels and front office transactions capped at quantities assumed for the 2004 IRP	Determines the optimal resource selections given a medium view of the future and constrained with fixed build patterns for wind, DSM, and CHP. The constrained build patterns are broadly representative of CEM resource selection across the alternative future scenarios.
<b>CP2</b>	CP1 with front office transactions removed as a resource option from 2012 onward (long-term asset-based portfolio)	Tests the strategy of eliminating the use of short-term market purchases (front office transactions) to meet long-term resource needs, and thereby reduce exposure to electricity market price risk.
<b>CP3</b>	CP1 with an additional 600 MW of wind added into the portfolio	Tests the strategy of using incremental amounts of wind to reduce CO <sub>2</sub> , fuel, and market price risks.
<b>CP4</b>	CP2 with 12% planning reserve margin and front office transactions removed as a resource option from 2012 onward (long-term asset-based portfolio)	Represents a variant of the “long-term asset-based” portfolio (CP2), but with the lower planning reserve margin to determine the associated cost/risk tradeoff.

<b>ID</b>	<b>Description</b>	<b>Selection Rationale</b>
<b>CP5</b>	CP2 with the model constrained to select a second Utah pulverized coal plant in 2013 and an east-side IGCC in 2014. Front office transactions are removed as a resource option from 2012 onward (long-term asset-based portfolio)	Tests the relative economics and risk of building coal early as a hedge against gas and electricity market price risk; the IGCC plant replaces an east-side gas plant.
<b>CP6</b>	CP1 with pulverized coal removed as a resource option	Tests the strategy of reducing CO <sub>2</sub> cost risks, as well as testing the risk impact of relying on higher variable cost, shorter lead-time resources until IGCC is commercially ready (i.e., gas-fired generation and market purchases).
<b>CP7</b>	CP2 with 600 MW of additional wind as in CP3 and front office transactions removed as a resource option from 2012 onward (long-term asset-based portfolio)	Tests additional wind in combination with the construction pattern resulting from limiting front office transactions.
<b>CP8</b>	CP1 with a 12% planning reserve margin	Tests the medium alternative future portfolio (CP1) with the lower 12% planning reserve margin.
<b>CP9</b>	CP8 with the model constrained to select Wyoming IGCC plants in 2013 and 2016	Tests an IGCC-intensive portfolio at the lower planning reserve margin level, assuming that the technology is commercially mature enough to acquire by 2013.
<b>CP10</b>	CP9 with a 15% planning reserve margin	Creates a version of CP9 that parallels others with the higher 15% planning reserve margin. Recommended by an IRP public stakeholder at the October 31, IRP public meeting.
<b>CP11</b>	CP3 (600 MW additional wind and front office transactions included) with the model constrained to select gas resources in 2012 and 2013 and an IGCC resource in 2014	Tests the strategy of reducing CO <sub>2</sub> cost risks with additional wind and restrictions on pulverized coal builds, as well as testing the risk impact of relying on gas resources and front office transactions to address resource deficits until an IGCC resource is acquired in 2014. <sup>1</sup>
<b>CP12</b>	CP11 with a 12% planning reserve margin	Creates a version of CP11 that parallels others with the lower 12% planning reserve margin. See the previous footnote.

<sup>1</sup> This portfolio, requested for study by OPUC staff, addresses the OPUC’s 2004 IRP acknowledgement order mandate to “fully explore whether delaying a commitment to coal until IGCC technology is further commercialized is a reasonable course of action.” (Order No. 06-029, p. 51)

The Table below shows the resulting Capacity Expansion Module megawatt capacity additions for fossil fuel generation resources (coal and gas, including CHP), average annual front office transaction amounts (2012 through 2016) for each of the 12 candidate portfolios by general location and year.

### Candidate Portfolio Resource Additions, Fossil Generation Resources

	Resource	CP1	CP2	CP3	CP4	CP5	CP6	CP7	CP8	CP9	CP10	CP11	CP12
Coal	Small Pulverized UT (340MW)	2012	2012	2012	2012	2012	-	2012	2012	2012	2012	2018	-
	Large Pulverized UT (600MW)	2017	2018	2018	2018	2013	-	2018	2017	2018	2018	2018	2018
	Pulverized WY 1 (750MW)	2013	2013	2015	2013	2013	-	2014	2014	2017	2017	2015	2016
	Pulverized WY 2 (750MW)	2018	2018	2018	2018	2018	-	2018	2018	-	-	2018	2018
	IGCC West (200MW)	2016	2017	2017	2016	2018	2016	2017	2018	2018	2018	2018	2018
	IGCC West (300MW)	2018	2017	2018	2017	2018	2018	2017	2018	2018	2018	2018	2018
	IGCC 1 WY (497MW)	-	-	-	-	2014	2016	-	-	2013	2013	2014	2014
	IGCC 2 WY (497MW)	-	-	-	-	-	2017	-	-	2016	2016	-	-
	IGCC UT (497MW)	-	-	-	-	-	2018 (x2)	-	-	-	-	-	-

Gas	West SCCT Frame (332MW)	2012	2012	2012	2012	2012	2013	2012	-	-	2012	2012	2012
	West CCCT F 2x1 w/DF (602MW)	-	2012	-	-	2012	-	2012	-	-	-	-	-
	West CCCT G 1x1 w/DF (392MW)	-	-	-	2012	-	-	-	-	-	-	-	-
	East SCCT Frame (302MW)	-	2012	2012	2012	2012	2012	2012	2012	-	-	2012	2012
	East CCCT F 2x1 w/DF (548MW)	-	2012	-	-	2012	2012	2012	-	-	-	-	-
	East CCCT G 1x1 w/DF (357MW)	-	-	-	2012	-	-	-	-	-	-	-	-

Front Office Transactions Ave Annual MW, 2012-2016	1,063	-	1,005	-	-	1,024	-	1,000	1,115	1,097	1,009	863
Planning Reserve Margin	15%	15%	15%	12%	15%	15%	15%	12%	12%	15%	15%	12%
CO2 Risk Mitigation: Wind/IGCC	-	-	Wind	-	IGCC	IGCC	Wind	-	IGCC	IGCC	IGCC Wind	IGCC Wind