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IRP Public Input Meeting

August 27, 2004

Agenda

- » Front Office Transactions in the IRP
- » Distributed Generation
- » Renewable Assumptions for Portfolio Analysis
- » Transmission Expansion Scenario
- » Results of Initial Portfolio Runs
- » Risk Analysis Discussion
- » Action Plan Path Analysis
- » Next Steps



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Front Office Transactions in the IRP

Mark Tallman & Melissa Seymour

Overview of Front Office Transactions

- » Some amount of volume that the Front Office will procure on a rolling forward basis (as sellers demonstrate an interest) to cover net position.
- » Forward procurements made in advance for standard products using standard enabling agreements (i.e, EEI, WSPP). Solicitations made year(s) in advance and, if necessary, quarters in advance.
- » Standard Products (such as HLH, LLH, and/or daily HLH call options) to garner greatest response.
- » Transaction Timeline
 - Annual – Can be available as much as 3 or more years in advance (depending on POD and product),
 - Seasonal – Typically deliver during quarters. Can be available from one to three years in advance (depending on POD and product),
 - Custom – Typically single month or non-typical monthly patterns (i.e., June-September). Can be available up to 1-year in advance (depending on POD and product). Greatest opportunity for customized delivery patterns (i.e, super-peak 6X8 or 7X8).
- » Term - Varies by counterparty. Greatest number of offers can be expected for single year commitments (i.e., Q3 2006 as opposed to Q3 2006/2007/2008).

Portfolio Diversification

- » Having a portfolio of resources that is 100% very short-term would clearly be suboptimal
 - California markets in 2000-2001 - a load serving entity that is subject to meeting its load-serving obligations on a day to day basis is completely at the mercy of the market volatility. This can cause significant mismatches between revenues and expenses.
- » Having a portfolio of resources that is 100% very long-term or fixed price only would be suboptimal as well
 - Primarily due to the uncertainty in retail load levels and industry trends
 - In the near-term, the entity would be exposed to purchasing or selling when its resources don't equal its load.
 - Macro-economic trends at the regional, national and global level can impact cost structure such that long-term resources are either very economic or very uneconomic for long periods of time.
- » The optimal balance should be a mix of both short-term and long-term resources.
- » While PacifiCorp has not made any determinations on what the mix of varying term resources should be, the Company has reviewed historical operational data and its forward view of the markets in which the company operates to determine its recommendation for how much front office transactions should be included in its portfolio for Integrated Resource Planning purposes.

IRP Treatment of Front Office Transactions

» 2003 IRP

- Used proxy resource to fill entire “gap” in load/resource balance

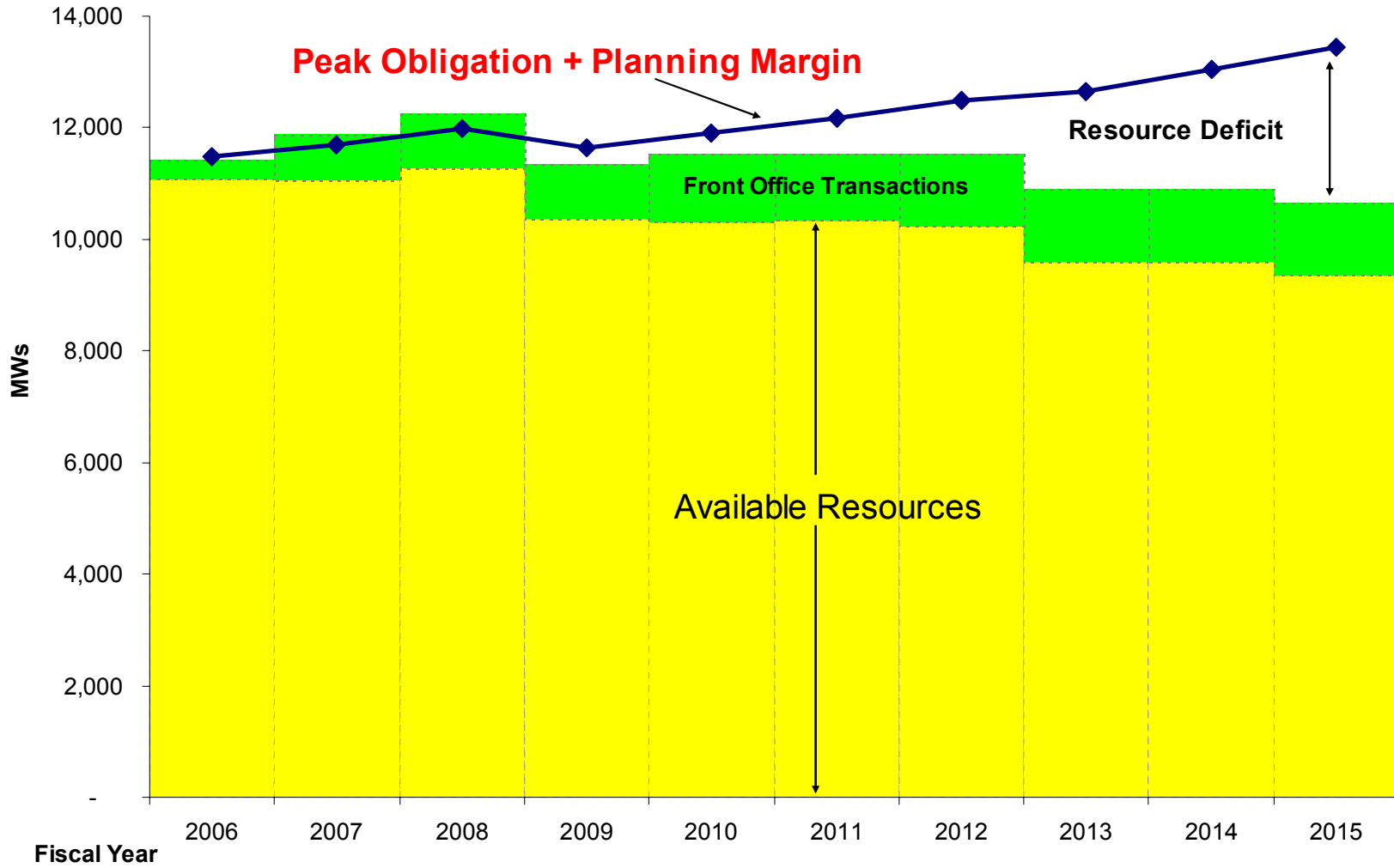
» 2004 IRP

- Directly assume an amount of Front Office transactions.
 - ⇒ Choose MW amounts, products, and delivery points based on experience.
 - ⇒ Portfolio construction target will be net of front office transactions (see capacity charts on next slides)
 - ⇒ Expected cost will be based on product-adjusted forward price curve

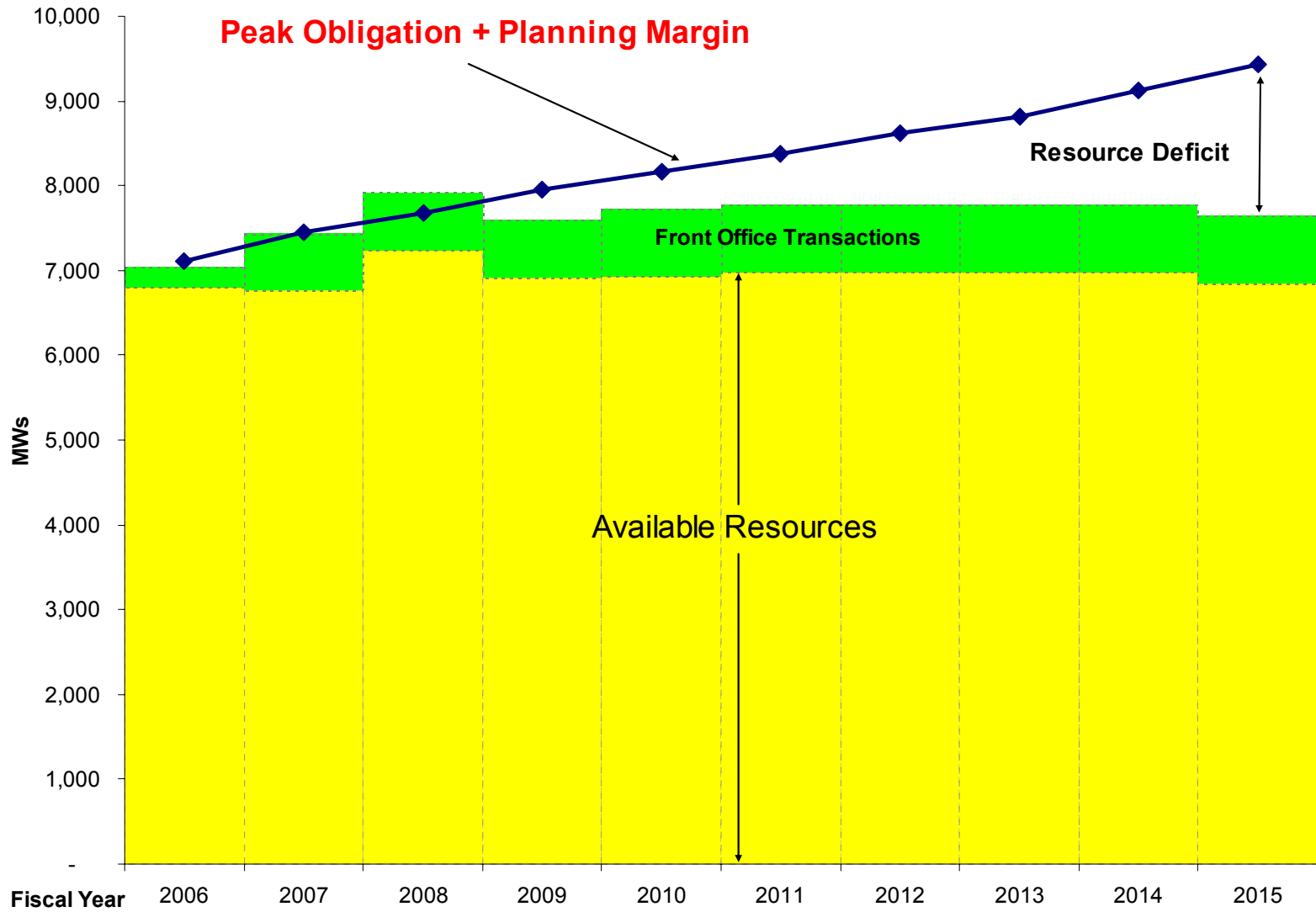
Proposed Front Office Transactions

- » Proposed Front Office Transaction Amounts
 - PAC West – 500 MW, Annual, 7x 24 product
 - PAC East
 - ⇒ 500 MW @ 4-Corners, Q3, 6x16 products
 - ⇒ 200 MW @ Mona, Q3, 6x16 products
 - ⇒ 100 MW @ Wasatch Front, Annual, 7x24 products
- » Avoid double-counting
 - Front Office transactions in early years are netted against proposed amounts
- » A sensitivity will be run on the reference case portfolio
 - Remove Front Office transactions and replace with proxy resources

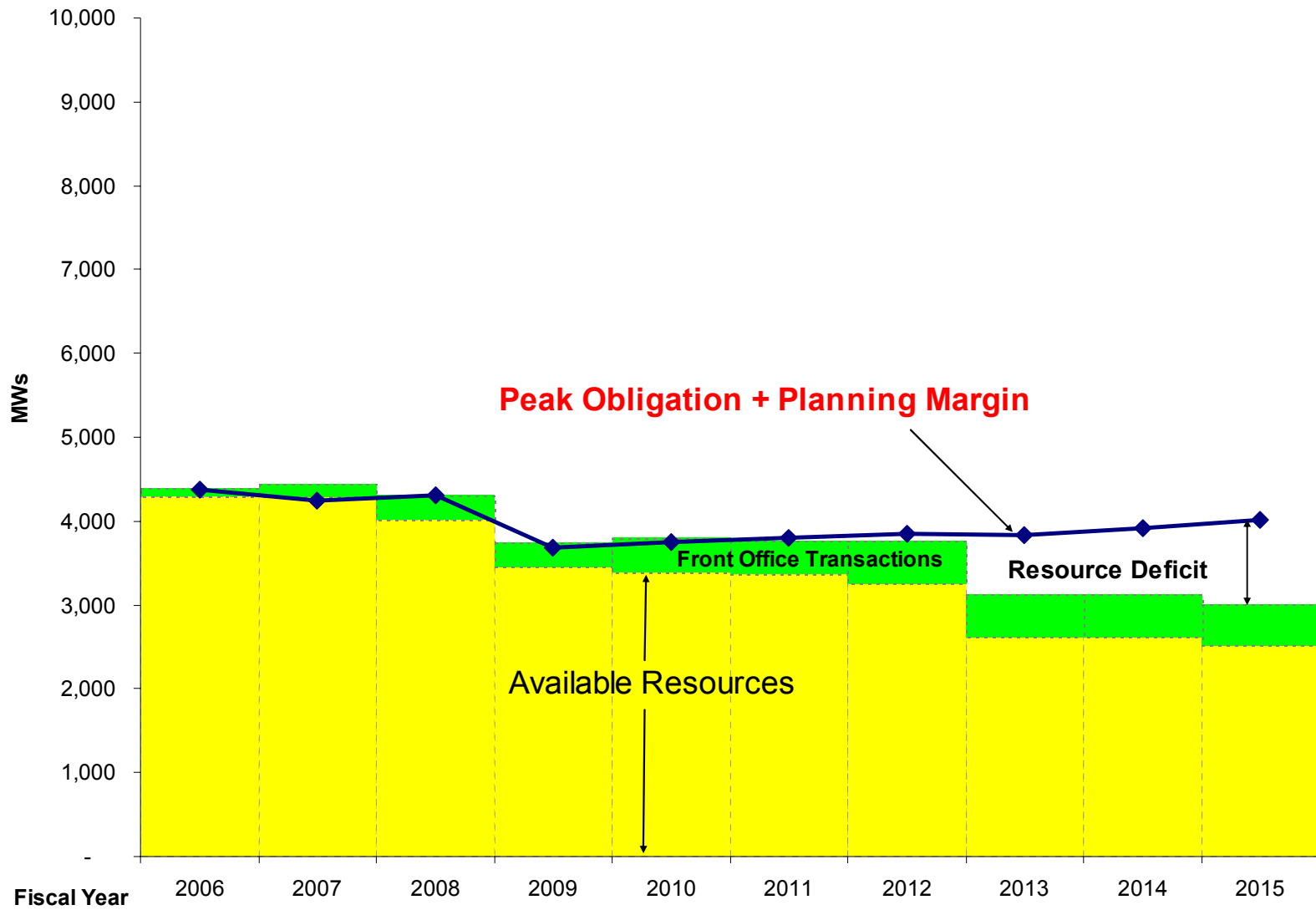
System Capacity Chart



PAC East Capacity Chart



PAC West Capacity Chart





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Distributed Generation

Mike Koszalka

Distributed Generation (DG) Definition

- » DG has been defined in many ways - this has created confusion.
 - » Most commonly defined as the generation of electricity near the intended place of use
 - » Some parties define it with a size limitation
 - » Some exclude back-up generation
 - » Some offer no distinction between generation connected to the transmission or distribution system
 - » DG can be customer sited or grid sited
- » The California Energy Commission definition: DG is electric generation connected to the distribution level of the transmission and distribution grid usually located at or near the intended place of use

Distributed Generation Types

- » QF's (obligated by law to purchase power at avoided cost)
 - CHP (cogeneration)
 - Solar (photovoltaic)
 - Wind
 - Biogas fueled engine
 - Small hydro
- » Non-QF's (not obligated to purchase)
 - Fuel Cell
 - Internal or external combustion engine (gensets)
 - ⇒ Conventional combustion turbine generator (natural gas, oil)
 - ⇒ Gas turbine
 - ⇒ Reciprocating engine
 - ⇒ Microturbine (non CHP)
 - ⇒ Stirling engine

Distributed Generation Issues in Planning

- » Customer sited
 - Customer determined timing
 - Customer Economics, not utility or utility customer economics
 - Operates according to customer need/process
 - Customer determines operation & longevity (i.e. customer may go out of business)
- » Costs
 - QF's come in at avoided cost at any time they are constructed.
 - Non-QF's must compete against other supply side alternatives
- » Forecasting construction
 - Customer economics and opportunities prevail
 - ⇒ To be economic for the customer, the generation opportunity usually needs to be timed with a boiler replacement, major remodeling or new construction project

IRP Distributed Generation

Policy

- » PacifiCorp is very supportive of acquiring cost effective DG to meet our future resource needs
- » Sensitivity analysis will be performed on the least cost portfolio to replace front office transactions with CHP. Indicative costs for CHP will be used.
- » IRP Action plan supply side RFP's will not preclude CHP (may displace market purchase contracts or other supply side resources).

Benefits

- » Assures that the company has plans in place to meet resource needs.
- » Allows distributed resources to be constructed as part of the least cost portfolio.
- » Distributed Resources can displace planned resources (front office transactions or power plants) as sufficient projects are defined.



Renewable Assumptions for Portfolio Analysis

Virinder Singh

Background

- » In 2003, we found that 1,400 MW of renewables were cost-effective
 - Characterized as wind resources
- » Now, we must determine approach and total MWs for 2004 IRP
- » This determination is taking place amid evaluation of bids in the renewable RFP
 - Balance between drawing upon market information in existing RFP for the current IRP, while maintaining sufficient confidentiality in the RFP process

Current Analytic Approach

- » Load and resource balance has 1,400 MW in ALL portfolios
- » Characterize renewables as wind
 - 20% planning contribution
 - Generally understood as the least cost renewable technology today
 - 85% of RFP bids were wind
 - Note that we did receive numerous, credible bids for geothermal in the RFP

FY	WEST	EAST	TOTAL
2006	100		100
2007		200	200
2008	200		200
2009		200	200
2010	200		200
2011		200	200
2012	100	100	200
2013		100	100
TOTAL	600	800	1,400

Recommendation - Renewables in Portfolios

- » Recommend holding at 1,400 MW
- » While we received a number of strong bids, we are uncertain about likelihood of meeting our entire RFP target in this round
 - That assumes passage of the PTC. Without passage, it is unlikely we will reach the 1,100 MW's we targeted in the RFP.
- » Until we near the IRP target through procurement, we suggest maintaining renewables as is in our planning process
- » Q: Why not make it higher?
 - A: Without fulfilling the current target with actual purchases, we would be creating an even larger hole to fill for future needs.
 - A: Need to get a better understanding of the operational implications of adding a significant amount of wind generation on our system.
- » Q: Why not make it lower?
 - A: If we were not able to fulfill our target in the current RFP, future RFPs can give developers time to prospect for resources, study transmission, etc.



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Transmission Expansion Scenario

Mike DeWolf

Status of RMATS

- » RMATS = **R**ocky **M**ountain **A**rea **T**ransmission **S**tudy
- » Phase 1 Report due in late September. Two recommendations for transmission expansions:
 - To meet Rocky Mountain load growth
 - To export to West Coast load centers
- » Technical studies, siting issues, ownership/financing arrangements, and cost allocations will be addressed in Phase II
- » Website:
<http://psc.state.wy.us/htdocs/subregional/home.htm>

RMATS Scenario for IRP

- » IRP transmission scenario assumes PacifiCorp share of Bridger 5 is 2/3, and Idaho Power share 1/3
- » Transmission build is limited to transporting the new generation and Renewable RFP wind in Wyoming to load in the Wasatch Front
 - New 500 kV lines from Jim Bridger area to Ben Lomond; the assumed company's ownership in these lines is 50%
 - New 500 kV line from Ben Lomond to Terminal; the assumed company's ownership in these lines is 50%
- » Two 600 MW phase shifters would be installed at Naughton, one for back up, to force a full 600 MW flow from Powder River to the Wasatch Front
- » Total transmission Cost ~ \$260 Million
- » The transmission could come on line as early as FY 2011
- » Scenario does not include PacifiCorp participation in new export path, although participation may be warranted to improve liquidity and access to markets

IRP Transmission Build





Results of Initial Portfolio Runs

Melissa Seymour & Peter Warnken

Agenda

- » Portfolio Construction
 - Timing of Resource Additions
 - Process
 - Proxy Resources
 - Treatment of DSM & Standby Generation
- » Review of Candidate Least Cost Portfolios
 - Portfolio Tables
 - Portfolio Results
 - What did we learn?
- » Review of Stress Cases
 - Portfolio Tables
 - Portfolio Results
 - What did we learn?

Timing of Resource Decisions

- » Attempt to maintain annual system planning margin at target level or above for each year
- » The current deficit, net of front office transactions and including planning margin requirements, implies a requirement for large resource blocks in the following pattern:
 - East – FY2009, FY2011, FY2014, FY2015
 - West – FY2013
- » Focusing on Decisions that need to be made within Action Plan time horizon
- » Constraints on resource block timeline:
 - If they are not already under construction, neither a coal plant nor a large scale transmission expansion can be completed by FY2009
 - Process schedules (IRP, RFP, CCN, etc) could also create timeline delays

Timing of Resource Decisions

- » What affects PacifiCorp's decision to acquire resources in the timeframe identified in the IRP?
 - Timeline to complete RFP & CCN processes (~18 months)
 - Other resources displace the need
 - ⇒ Outstanding RFP's
 - RFP 2003-B (Renewables RFP)
 - RFP 2004-X (West Valley RFP)
 - ⇒ QF's – More than 2,500 MW currently in the queue
 - ⇒ Economic opportunity presents itself
 - DG&T Transaction for 100 MW
 - ⇒ Transmission
 - ⇒ DSM
 - Lower or higher loads than normal
 - Rate Design
 - Changes in economic conditions

Portfolio Construction Process

- » Created a reference portfolio representing a mix of resource types and reasonable build pattern; used as the starting point for further portfolio development
- » Candidate Least Cost Portfolios
 - Starting with the reference case, created 8 candidate least cost portfolios
 - Most portfolios involve a single change to capture influence of:
 - ⇒ Sequencing of Plants
 - ⇒ Fuel Type (Coal vs. Gas)
 - ⇒ Build Location (East vs. West)
 - ⇒ Technology Type
 - ⇒ Transmission Expansion
 - Resource-type substitutions (to test portfolio concepts) attempt to match as closely as possible the capacity size for the substituted and new resources
- » Stress Cases
 - Planning Margin level – 12 and 18%
 - Replacement of Front Office Transactions with proxy resources

Proxy Resources

- » What are Proxy Resources?
 - Represents estimated costs for building a resource
 - Surrogate for either a purchase or a build option
 - Represents the characteristics of a resource block PacifiCorp is trying to fill (i.e. daily dispatchable, 7x 24, etc.)
- » In the IRP, is PacifiCorp committing to build the resource at the cost identified in the final portfolio?
 - No! This is just a proxy.
 - RFP will determine best cost/risk alternative
 - PacifiCorp will determine the evaluation benchmark on an RFP by RFP basis.

Treatment of DSM & Standby Generation

» Class 1 DSM & Standby Generation

- Manual build process
 - ⇒ A number of potential programs have been designed based on DSM RFP responses
 - ⇒ Standby generators are being considered as a daily dispatchable resource
 - Market size determination will be based on air permitted facilities
 - ⇒ These programs/resources will be used to improve the preferred supply-side portfolio
 - ⇒ These programs/resources will be inserted in to the preferred portfolio with the objective of delaying the timing of supply-side resources and lowering the overall PVRR
- CEM tool
 - ⇒ The potential programs/resources have the opportunity to be selected as any of the supply-side plants can be selected on an equal basis.

» Class 2 DSM

- Decrements will be run on the preferred portfolio.
- This will establish values for various load shapes of DSM



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Candidate Portfolio Results

Pete Warnken

Candidate Portfolio Tables

Portfolio	Unit Type	Region												Total MWs	Portfolio Total PM MW's
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			

Reference

P1: Reference														2808	
East	Brownfield Coal	Utah-S						575						575	575
	Greenfield IGCC	WY										368		368	368
	Dry Cool CCCT w/ DF	Utah-S				525								525	525
	Wet Cool CCCT w/ DF	Utah-N										560		560	560
West	Dry Cool CCCT w/ DF	WMAIN										586		586	586
	IC Aero SCCT	WMAIN										194		194	194

Changes shown are in comparison to the Reference Portfolio

Fuel Type

P2: Remove Hunter 4, Replace w/ Gas														2758	
East	Greenfield IGCC	WY											368	368	368
	Dry Cool CCCT w/ DF	Utah-S				525		525						1050	1050
	Wet Cool CCCT w/ DF	Utah-N										560		560	560
West	Dry Cool CCCT w/ DF	WMAIN										586		586	586
	IC Aero SCCT	WMAIN										194		194	194

Tech Type

P3: Replace CCCT with Aeros														2805	
East	Brownfield Coal	Utah-S						575						575	575
	Greenfield IGCC	WY											368	368	368
	Wet Cool CCCT w/ DF	Utah-N										560		560	560
	IC Aero SCCT	Utah-N												522	522
West	Dry Cool CCCT w/ DF	WMAIN										586		586	586
	IC Aero SCCT	WMAIN										194		194	194

Portfolio Tables...Continued

Changes shown are in comparison to the Reference Portfolio

Timing

Portfolio	Unit Type	Region												Total MWs	Portfolio Total PM MW's
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
P4: Defer Hunter 4, Replace w/ WC-CCCT													2808		
East	Brownfield Coal	Utah-S										575	575	575	
	Greenfield IGCC	WY											368	368	
	Dry Cool CCCT w/ DF	Utah-S				525							525	525	
	Wet Cool CCCT w/ DF	Utah-N							560				560	560	
West	Dry Cool CCCT w/ DF	WMAIN										586	586	586	
	IC Aero SCCT	WMAIN										194	194	194	

Tech Type

Portfolio	Unit Type	Region												Total MWs	Portfolio Total PM MW's
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
P5 Replace IGCC w/ PC Coal													2823		
East	Brownfield Coal	Utah-S							575				575	575	
	Brownfield Coal	WY											383	383	
	Dry Cool CCCT w/ DF	Utah-S				525							525	525	
	Wet Cool CCCT w/ DF	Utah-N										560	560	560	
West	Dry Cool CCCT w/ DF	WMAIN										586	586	586	
	IC Aero SCCT	WMAIN										194	194	194	

Expand Trans

Portfolio	Unit Type	Region												Total MWs	Portfolio Total PM MW's
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
P6: RMATS Scenario													2616		
East	Brownfield Coal	Wyoming							383				383	383	
	Greenfield IGCC	Utah-N											368	368	
	Dry Cool CCCT w/ DF	Utah-S				525							525	525	
	Wet Cool CCCT w/ DF	Utah-N										560	560	560	
West	Dry Cool CCCT w/ DF	WMAIN										586	586	586	
	IC Aero SCCT	WMAIN										194	194	194	

Portfolio Tables...Continued

Changes shown are in comparison to the Reference Portfolio

E/W
Location

Portfolio	Unit Type	Region												Total MWs	Portfolio Total PM MW's	
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015				
P7: Build on East Side versus West Side														2788		
East	Brownfield Coal	Utah-S								575					575	575
	Greenfield IGCC	WY												368	368	368
	Dry Cool CCCT w/ DF	Utah-S				525									525	525
	Wet Cool CCCT w/ DF	Utah-N											560		560	560
	IC Aero SCCT	Utah-N												174	174	174
West	Dry Cool CCCT w/ DF	WMAIN											586		586	586

IC Aero SCCT's removed from the West; built in the East instead

Tech
Type

P8: Compressed Air Energy Storage														2571		
East	Brownfield Coal	Utah-S								575					575	575
	Greenfield IGCC	WY												368	368	368
	Wet Cool CCCT w/ DF	Utah-S				525									525	525
	Compressed Air ES	WY											323		323	323
West	Dry Cool CCCT w/ DF	WMAIN											586		586	586
	IC Aero SCCT	WMAIN											194		194	194

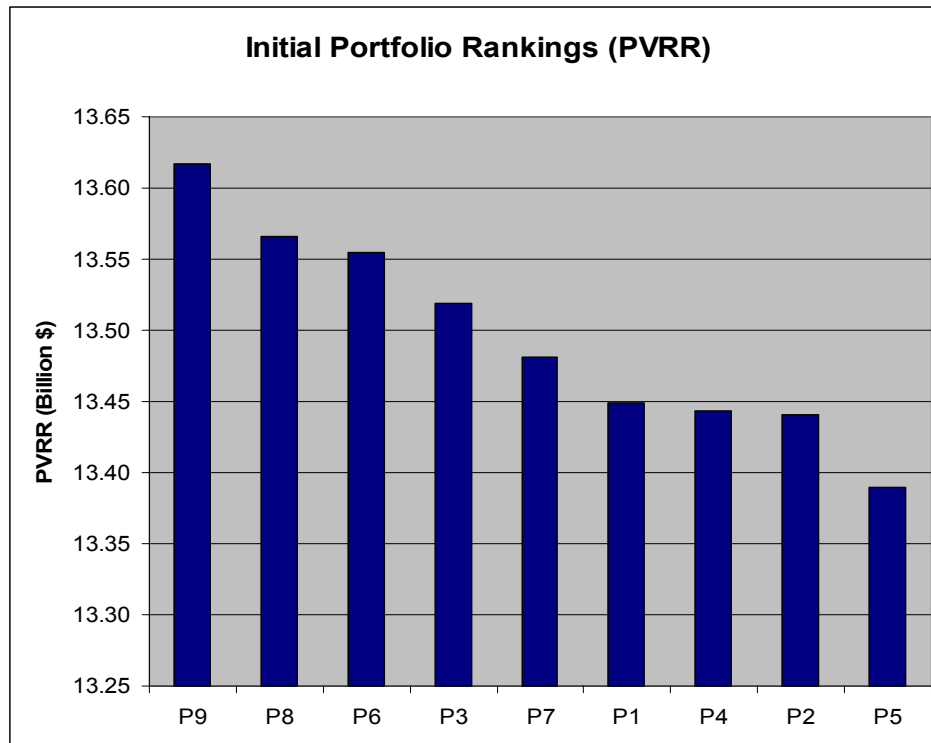
Replaces WC-CCCT (560MW)

Tech
Type

P9: Pumped Hydro														2648		
East	Brownfield Coal	Utah-S								575					575	575
	Greenfield IGCC	WY												368	368	368
	Wet Cool CCCT w/ DF	Utah-S				525									525	525
	Pumped Hydro	Utah-N												400	400	400
West	Dry Cool CCCT w/ DF	WMAIN											586		586	586
	IC Aero SCCT	WMAIN											194		194	194

Replaces WC-CCCT (560MW)

Scorecard Rankings: Candidate Portfolios



- P1: Reference**
- P2: Remove Hunter 4, Replace w/ DC-CCCT**
- P3: Replace CCCT with Aeros**
- P4: Defer Hunter 4, Replace w/ WC-CCCT**
- P5: Replace IGCC w/ PC Coal**
- P6: RMATS Scenario**
- P7: Build on East Side vs. West Side**
- P8: Replace CCCT with Compressed Air Energy Storage (preliminary)**
- P9: Replace CCCT with Hydro Pumped Storage (preliminary)**

- » Not able to determine least-cost portfolio from deterministic analysis since PVRR's are so closely grouped
- » Preferred portfolio will be determined via risk analysis

Summary of Scorecard Results

» Financial Analysis

- **Variable Cost:** Main driver for gas plants
- **Capital Cost:** Main driver for portfolios with coal plants and transmission expansions
- **Emissions Cost:** All portfolios have a cost credit due to emission levels below caps due to coal plant retirements in latter years
 - ⇒ largest credit is typically for NOx, followed by SO2, and then CO2 (large accruals beginning in 2020's)

» Purchases & Sales

- **Purchases:**
 - ⇒ Not a significant factor for portfolio rankings; in the East, represents less than 0.1% of load in FY2008
 - ⇒ Increases for all portfolios by FY2010, then decreases to negligible amounts by FY2015 as new capacity comes on-line

Summary of Scorecard Results

» Purchases & Sales

- **Sales:**

- ⇒ Increases sharply for all portfolios in FY2010 to maximum levels dictated by available transmission capacity, and then levels off to small increases by FY2015

» Capacity Factors

- In the East, new coal units tend to displace existing coal and CCCT units
- In the West, new CCCT units displace existing CCCT's, while existing coal units are unaffected by new CCCTs

What Did We Learn?

» New Technologies

- New technologies (IGCC, Compressed Air Storage) have potential, however currently appear uneconomic when compared to traditional resource options
- Anticipate costs will continue to decline over time and PacifiCorp will continue to monitor these new technologies
- An action item will be included in the IRP to continue to actively monitor progress on these technologies

» Transmission Expansion

- When compared to building resources close to load, transmission expansion options appear uneconomic
- Continue to participate in RMATS and other regional transmission initiatives to determine regional interest and cost sharing opportunities that may improve economics

What Did We Learn?

- » Coal versus Gas - *This is the primary issue in the action plan time horizon*
 - Portfolios that change the timing of coal and gas plant additions or replace one technology for the other are within a 0.5% PVRR difference of each other
 - Portfolios P1 – P4 will be the focus of the next phase of analysis.
 - ⇒ Based on the results of P5, we will re-run these portfolios to include PC Coal in FY2015 instead of IGCC
 - ⇒ Will also do an “all gas” portfolio by replacing the FY2015 with a gas-fired plant

Risk will be the discriminator for selecting the preferred portfolio



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Stress Case Results

Stress Case Portfolio Tables

	Portfolio	Unit Type	Region	Year											Total MWs	Portfolio Total PM MW's
				2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
Reference	P1: Reference													2808		
	East	Brownfield Coal	Utah-S							575					575	575
		Greenfield IGCC	WY										368		368	368
		Dry Cool CCCT w/ DF	Utah-S				525								525	525
		Wet Cool CCCT w/ DF	Utah-N										560		560	560
	West	Dry Cool CCCT w/ DF	WMAIN										586		586	586
	IC Aero SCCT	WMAIN										194		194	194	
PM Level	P10: 18% PM													3156		
	East	Brownfield Coal	Utah-S							575					575	575
		Greenfield IGCC	Utah-N										368		368	368
		Dry Cool CCCT w/ DF	Utah-S				525								525	525
		Wet Cool CCCT w/ DF	Utah-N										560		560	560
		IC Aero SCCT	Utah-N						174				174		348	348
West	Dry Cool CCCT w/ DF	WMAIN										586		586	586	
	IC Aero SCCT	WMAIN										194		194	194	
PM Level	P11: 12% PM													2447		
	East	Brownfield Coal	Utah-S							575					575	575
		Greenfield IGCC	WY										368		368	368
		Wet Cool CCCT w/ DF	Utah-N										560		560	560
		IC Aero SCCT	Utah-N						87		87	87			261	261
	West	Dry Cool CCCT w/ DF	WMAIN										586		586	586
	IC Aero SCCT	WMAIN										97	97	97	97	
Replace Trans w/ Proxy Resources	P12: No Front Office Transactions													4444		
	East	Brownfield Coal	Utah-S							575					575	575
		Greenfield IGCC	WY										368		368	368
		Dry Cool CCCT w/ DF	Utah-S				525						1050		1575	1575
		Wet Cool CCCT w/ DF	Utah-N				560								560	560
	West	Dry Cool CCCT w/ DF	WMAIN				586						586		1172	1172
	IC Aero SCCT	WMAIN										194	194	194	194	

Summary of Scorecard Results

<i>As compared to the reference portfolio</i>	18% Planning Margin	12% Planning Margin	Removing Front Office Transactions
PVRR	~ 2% Higher	~ 2% Lower	~ 4% Higher
Market Sales	Minimal Increase	Minimal Decrease	Decrease in early years, increase in latter years
Market Purchases	Minimal Decrease	Minimal Increase	Increase in early years, decrease in latter years
Capacity Factors	Minimal change	Increase in capacity factors of gas fired facilities	Increase in capacity factors of existing resources in early years, decrease in capacity factors of new gas fired plants in latter years.

What Did We Learn?

- » Planning Margin:
 - 12% planning margin case results in lower PVRR
 - ⇒ The model assumes hourly balancing purchases that more closely fit load shape
 - ⇒ Greater risk to electric price volatility because of reliance on market
 - Planning Margin cases will be run stochastically
- » Resource Proxies for Front Office Transactions:
 - Front office transactions that more closely fit load shape, are more cost-effective than building/buying long-term assets



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Risk Analysis Discussion

Christine Jerko

What is Risk?

- » Risk is relevant as a cost or measure of future uncertainty
- » Types of Risk:
 - 1) Paradigm**
 - ⇒ Cannot be represented by a known statistical process
 - ⇒ Example - Regional Transmission Organization (GridWest)
 - 2) Scenario**
 - ⇒ PVRR takes on a structurally different path due to an abrupt difference in a risk factor, such as high carbon taxes
 - 3) Stochastic**
 - ⇒ Quantifiable and complex
 - applies to five variables: electricity price, gas price, hydro availability, load, and unplanned outages

Update on Stochastics

- » Detailed review of the stochastic methodology used within the ProSym application in Appendix H (pages 319-328) of 2003 IRP
- » Methodology has remained the same, however, all parameters have been updated

Risk Incorporation into 2003 IRP

- » Risk observations were made based on stochastic analyses
 - Performed various risk measures
 - Least cost portfolio coincided with least amount of risk
 - ⇒ produced a clear winning portfolio in terms of cost and risk
 - Unclear as to how to proceed if least cost portfolio was not the least risk portfolio

Incorporating Risk in 2004 Portfolio Analysis

- » Step 1: Starting Point
 - ⇒ Subset of selected portfolios based on deterministic results
- » Step 2: Risk Analysis
 - ⇒ Two big risk drivers: Gas prices and carbon tax
 - ⇒ Two Views: **Stochastic** Potentially eliminate 'Risky' portfolios
Scenario Deterministic look at changed future assumptions
- » Step 3: Determine preferred least cost portfolio with acceptable risk exposure
- » Step 4: Perform DSM and Stand-By generator evaluation
- » Step 5: Apply path analyses to final portfolio

Step 2 Risk Analysis Review

» Stochastic Risk Analysis

- Review variances of entire distribution for differences between portfolios
- View Risk/Cost tradeoff between average of 95th percentile tail and total portfolio cost
 - 1) All stochastic variables
 - ⇒ An extreme look, but possible
 - 2) Gas and electric only
 - ⇒ Gas presents highest risk
 - ⇒ Gas and electric are highly correlated

» Scenario Risk Analysis

- Test a range of carbon tax scenarios
- Test high gas prices

Final Portfolio Determination

- » Comprehensive review of all of our risk analyses to arrive at a final portfolio
- » Expecting a somewhat evolving process as we gather risk results
- » Confident given all of our tests that we will arrive at a portfolio that is least cost, yet exhibits acceptable risk



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Action Plan Path Analysis

Mike Rife

What is Action Plan Path Analysis?

- » The IRP Action Plan outlines the actions PacifiCorp will take in the next 3-5 years
 - Action plan based on the preferred portfolio
 - Action plan is based upon the best information available at the time the IRP is filed
- » Within Action Plan horizon, things *will* change
- » Action Plan Path Analysis allows us to adjust our future actions based on changes in assumptions
- » Allows for Action Plan flexibility

Action Plan Path Analysis

- » What Action Items should be the focus of the Path Analysis?
 - Action items that could be significantly affected by a major change in the projected future
 - Action items that may be capital intensive and have long-lead times
- » Possible changes in futures or other considerations in the Path Analysis include:
 - Paradigm Risks, i.e. RTO
 - Legislative/Regulatory Mandates, i.e. Open Access, Air Initiatives
 - Technological Improvements, i.e. IGCC, Solar, Fuel Cells
 - Capital Adequacy
 - Timeline Risk – long lead time resources
 - Changes in Load

EXAMPLE – CO₂ Adder

- » The baseline assumption in the preferred portfolio for the CO₂ adder is \$8 per ton in 2008\$.
- » If the CO₂ adder is legislated to be higher than the baseline assumption, then future resource actions may change from the preferred portfolio.



PACIFICORP

Next Steps

Melissa Seymour

Next Steps

- » Future IRP Public Input Meetings
 - September 30
 - November 10
 - December 9
- » Possible Topics for Next IRP Public Input Meeting
 - Results of Portfolio Runs – Deterministic & Stochastic
 - Results of Scenario/Stress Analysis
 - Review of Top Performing Portfolios