



2017

Integrated Resource Plan

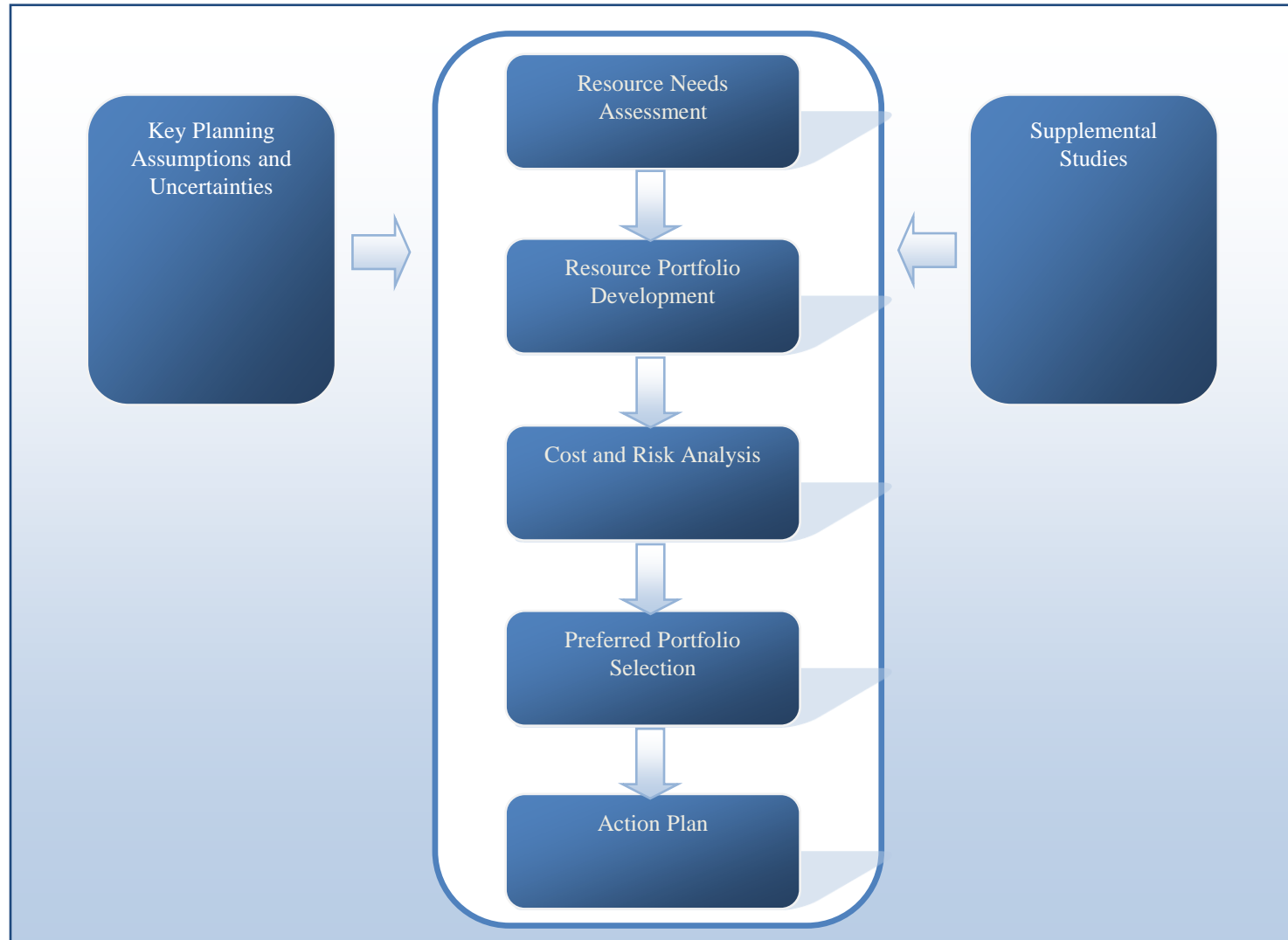
Kick-Off Meeting

June 21, 2016

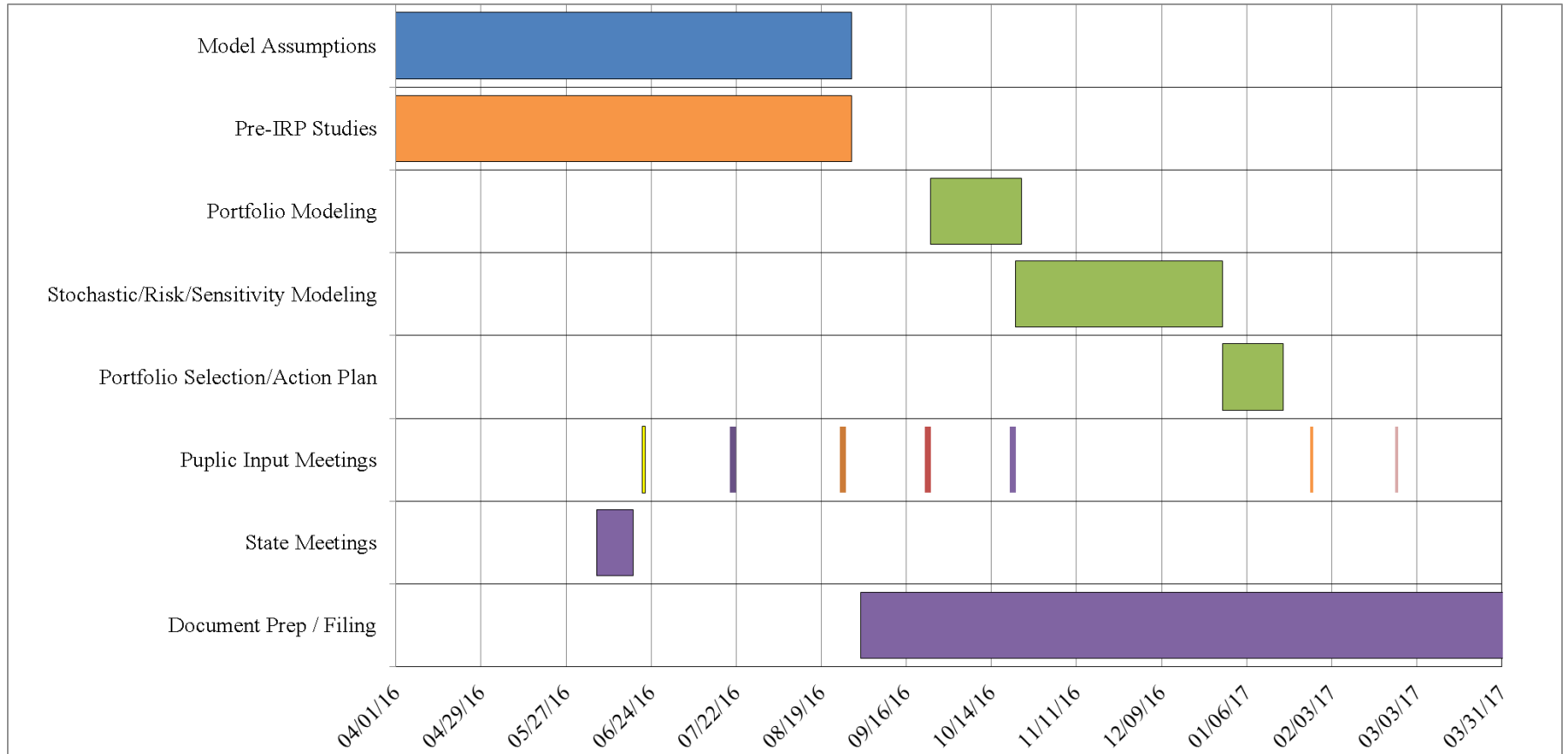
Agenda

- Introductions
- IRP Process Overview
- 2017 IRP Timeline
- 2015 IRP Update Highlights
- Overview of Key Changes Since 2015 IRP
- Lunch Break (1 hour) 11:30 PT/12:30 MT
- 2015 IRP Order Requirements
- 2015 IRP Action Plan Status Updates
- Additional Information and Next Steps

IRP Process Overview



2017 IRP Activity Timeline



2017 IRP Supplemental Studies

- Loss of Load Probability (LOLP) Study
- Wind and solar capacity contribution study
- Flexible capacity reserve study (wind and solar integration costs)
- Conservation potential assessment (DSM potential study)
- Distributed generation market penetration study
- Stochastic parameter updates
- Western resource adequacy evaluation

2017 IRP Public Input Meetings

Tentative Public Input Meeting Schedule and Topics (*topics are tentative and subject to change*)

- July 20-21
 - Environmental Policy
 - Transmission
 - Portfolio Development
 - Sensitivities and Risk Analysis Process
 - Load Forecast/Load and Resource Balance
 - Renewable Portfolio Standards
- August 25-26
 - Supply-Side Resources
 - Conservation Potential Assessment
 - Distributed Generation Study
 - Energy Storage

2017 IRP Public Input Meetings

Tentative Public Input Meeting Schedule and Topics (*topics are tentative and subject to change*)

- September 22-23
 - Flexible Capacity Reserve Study (wind / solar integration)
 - Wind and Solar Capacity Contribution
 - LOLP Parameters / Planning Reserve Margin
 - Stochastic Modeling
 - Smart Grid Update
- October 20-21
 - Portfolio Results

2017 IRP Public Input Meetings

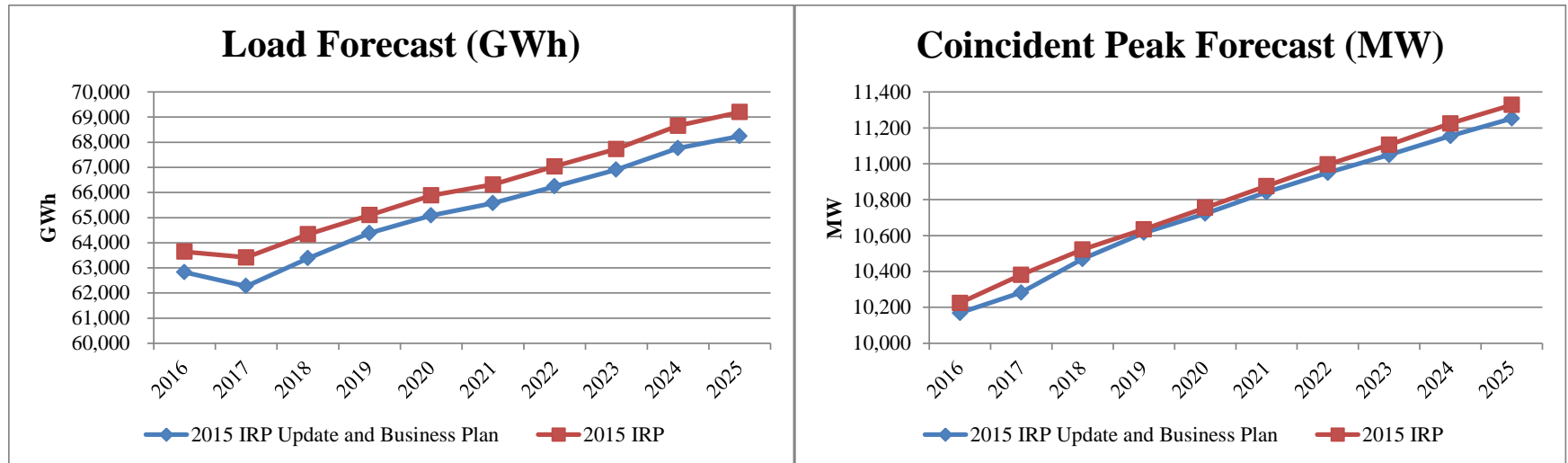
Tentative Public Input Meeting Schedule and Topics (*topics are tentative and subject to change*)

- January 2017
 - Confidential Coal Analysis
 - Stochastic Results
 - Sensitivity Results
 - Preferred Portfolio and Action Plan
- February 2017
 - Final Report

2015 IRP Update Highlights

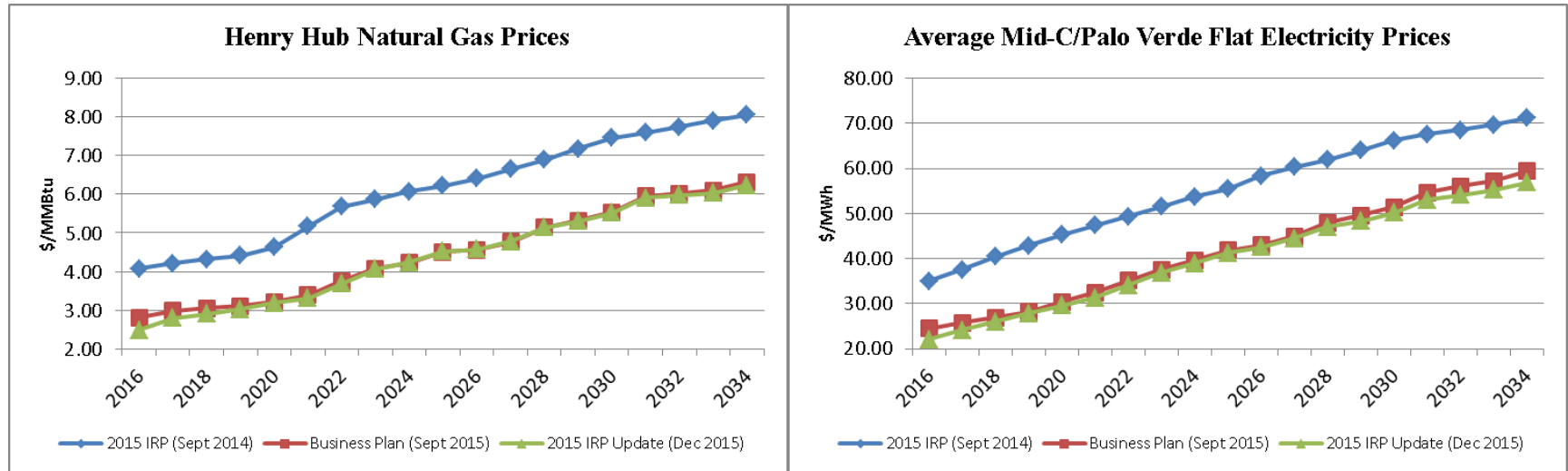
- With reduced loads, lower market prices, and increased costs for gas conversion, analysis shows retirement of Naughton Unit 3 at the end of 2017 is a lower cost alternative than the assessed gas conversion approach (Updated Action Item 4a).
- Similar to Naughton Unit 3, PacifiCorp assumes Cholla Unit 4 is retired at the end of 2024 for capacity planning purposes.
- With a reduced coincident system peak forecast and lower market prices, the updated resource portfolio continues to show that customer loads over the front ten years of the planning horizon will be met with front office transactions (firm market purchases) and through energy efficiency.
- PacifiCorp assumed a mass-based emission target to limit CO₂ emission from its affected generation facilities covered by the CPP. The U.S. Supreme Court issued a stay of the Clean Power Plan suspending implementation.
- RPS requirements increased with the passage of Oregon Senate Bill No. 1547-B (SB 1547) and California Senate Bill No. 350.

Load Forecast Comparison



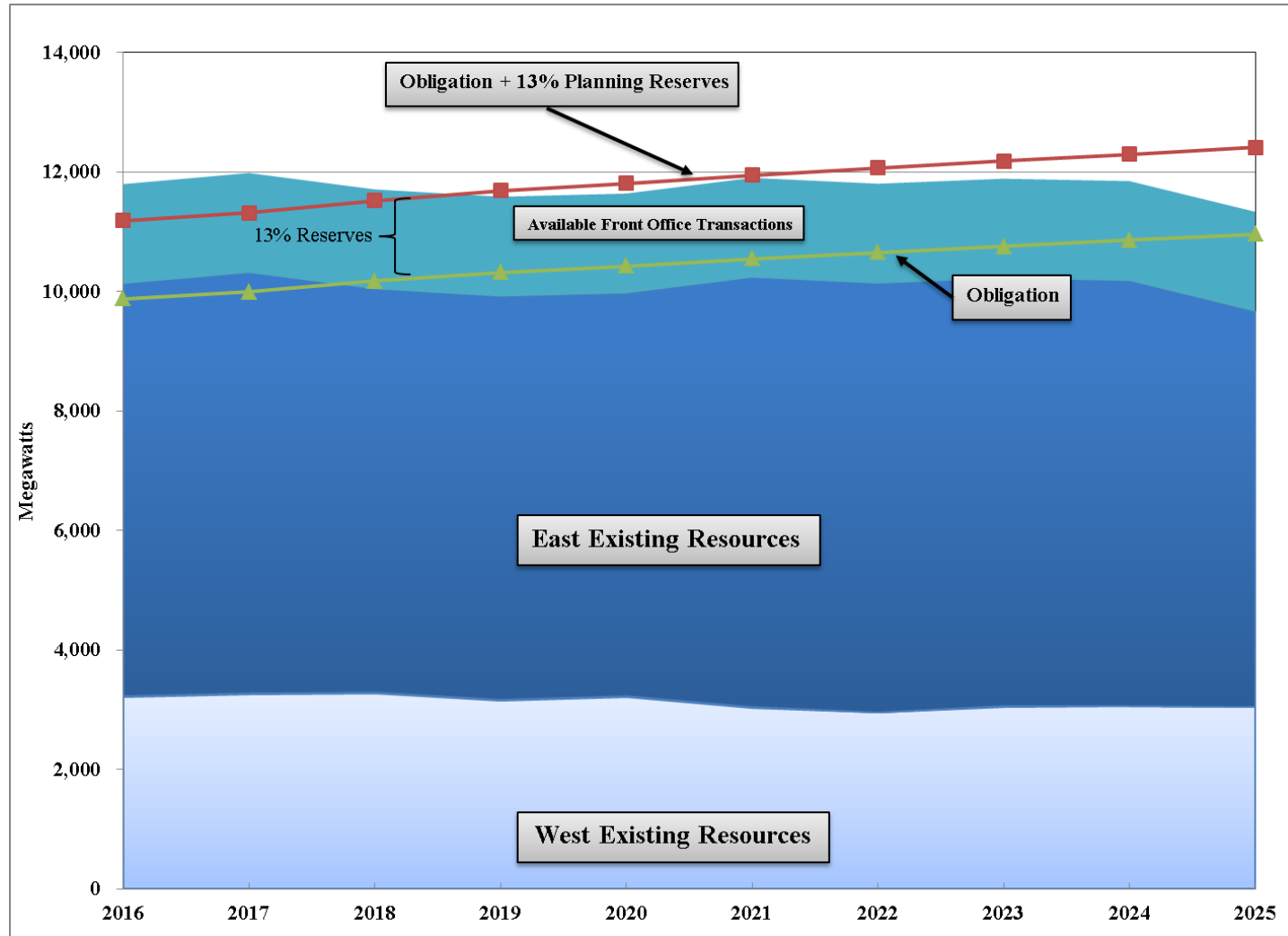
- Data excludes projected load reductions from new energy efficiency measures (Class 2 DSM)
- Projected load growth in residential and commercial classes is offset by weakness in the industrial class
 - Declines in commodity markets drive declines in industrial sales on the east side of the system
 - Projected loss of a large industrial customer drives declines on the west side of the system

Power and Natural Gas Comparison



- Domestic natural gas prices continue to be driven down by growth in shale gas plays
- Low gas prices (and low loads) lead to lower power price forecasts

System Capacity Position



Qualifying Facility Wind and Solar PPAs

	2015 IRP		2015 IRP Update	
	Capacity (MW)	L&R Balance Capacity at System Peak (MW)	Capacity (MW)	L&R Balance Capacity at System Peak (MW)
Solar	566	218	1,057	406
Wind	250	39	170	28
Total	816	257	1,227	434

- Figures represent executed PPAs for projects that have come on-line since 2015 and that are projected to come on-line by the end of 2017
- Relative to the 2015 IRP, wind and solar PPA capacity has increased by 411 MW (177 MW on a peak contribution basis)

2015 IRP Update Compared to 2015 IRP

2015 IRP Update

Summary Portfolio Capacity by Resource Type and Year, Installed MW												
Resource	Capacity (MW)											10- year Total
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2016-2025
Expansion Options												
Gas - CCCT	-	-	-	-	-	-	-	-	-	-	-	-
Gas- Peaking	-	-	-	-	-	-	-	-	-	-	-	-
DSM - Energy Efficiency	143	128	138	146	158	142	149	155	161	162	135	1,476
DSM - Load Control	-	-	-	-	-	-	-	-	-	-	39	39
Renewable - Wind	-	-	-	-	-	-	-	-	-	-	-	-
Renewable - Geothermal	-	-	-	-	-	-	-	-	-	-	-	-
Renewable - Utility Solar	-	-	-	-	-	-	-	-	-	-	-	-
Renewable - Biomass	-	-	-	-	-	-	-	-	-	-	-	-
Front Office Transactions *	764	903	748	1,094	1,246	1,203	970	1,060	965	993	1,440	1,062
Existing Unit Changes												
Coal Early Retirement/Conversions	(222)	-	-	(280)	-	-	-	-	-	-	(387)	(667)
Thermal Plant End-of-life Retirements	-	-	-	-	-	-	-	-	-	-	-	-
Coal Plant Gas Conversion Additions	-	-	-	-	-	-	-	-	-	-	-	-
Total	685	1,031	886	960	1,403	1,345	1,120	1,215	1,126	1,155	1,227	

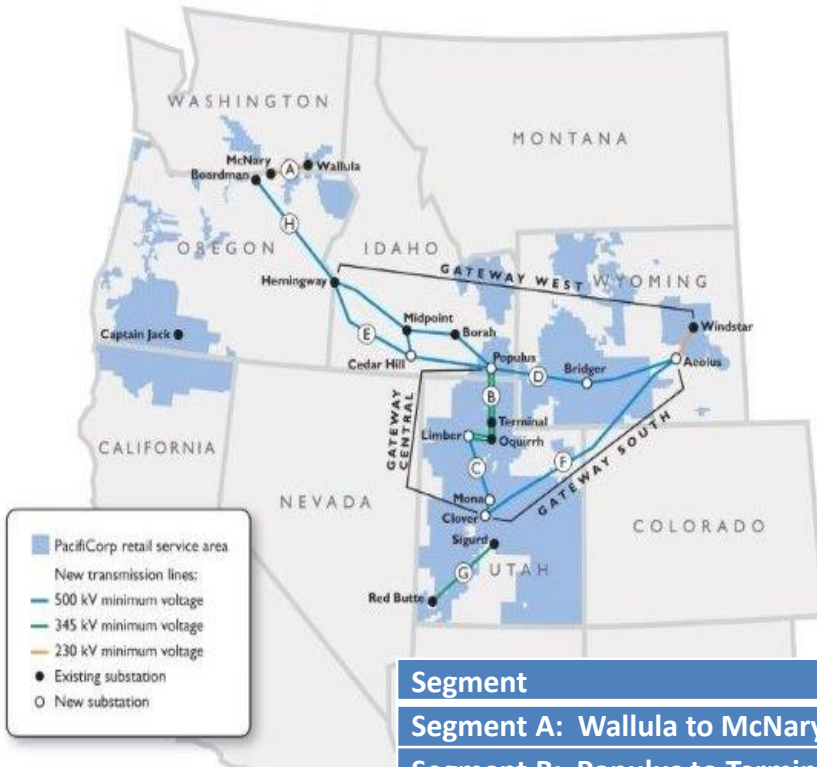
FOT in resource total are 10-year averages

Difference - 2015 IRP Update less 2015 IRP Preferred Portfolio

Summary Portfolio Capacity by Resource Type and Year, Installed MW												
Resource	Capacity (MW)											10- year Total
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2016-2025
Expansion Options												
Gas - CCCT	-	-	-	-	-	-	-	-	-	-	-	-
Gas- Peaking	-	-	-	-	-	-	-	-	-	-	-	-
DSM - Energy Efficiency	10	(11)	(8)	(0)	5	8	12	11	15	14	12	58
DSM - Load Control	-	-	-	-	-	-	-	(5)	(11)	-	39	23
Renewable - Wind	-	-	-	-	-	-	-	-	-	-	-	-
Renewable - Geothermal	-	-	-	-	-	-	-	-	-	-	-	-
Renewable - Utility Solar	-	-	-	-	-	-	-	-	-	-	-	-
Renewable - Biomass	-	-	-	-	-	-	-	-	-	-	-	-
Front Office Transactions *	37	(34)	(157)	224	311	224	202	269	205	239	670	215
Existing Unit Changes												
Coal Early Retirement/Conversions	-	-	-	-	-	-	-	-	-	-	-	-
Thermal Plant End-of-life Retirements	-	-	-	-	-	-	-	-	-	-	-	-
Coal Plant Gas Conversion Additions	-	-	-	(337)	-	-	-	-	-	-	(387)	(724)
Total	47	(45)	(164)	(113)	315	232	214	275	209	252	333	

FOT in resource total are 10-year averages

Energy Gateway Transmission



Segment	2015 IRP	2015 IRP Update
Segment A: Wallula to McNary	2017 – sponsor driven	2017 – sponsor driven
Segment B: Populus to Terminal	Completed Nov 2010	Completed Nov 2010
Segment C: Mona to Oquirrh	Completed May 2013	Completed May 2013
Segment C: Oquirrh to Terminal	June 2021	June 2021
Segment D: Windstar to Populus	2019-2024	2019-2024
Segment E: Populus to Hemingway	2019-2024	2019-2024
Segment F: Aeolus to Mona	2020-2024	2020-2024
Segment G: Sigurd to Red Butte	Completed May 2015	Completed May 2015
Segment H: West of Hemingway	Sponsor driven	

Overview of Key Changes Since 2015 IRP

- CA SB 350 legislation passed into law – October 2015
- Extender of federal Production Tax Credit and Investment Tax Credit – December 2015
- Oregon SB 1547-B legislation passed into law – March 2016
- EPA issued final rule of its Clean Power Plan. In February 2016, the U.S. Supreme Court issued a stay suspending implementation pending outcome of the merits of litigation before the D.C. Circuit Court of Appeals
- EPA issued Federal Implementation Plan for Utah regional haze compliance – June 2016

2015 IRP Acknowledgement Process

- 2015 IRP was acknowledged/accepted:
 - Oregon – February 29, 2016; Docket No. LC 62
 - Washington – November 13, 2015; Docket No. UE-140546
 - Idaho – October 9, 2015; Docket No. PAC-E-15-04
 - Utah – January 8, 2016; Docket No. 15-035-04
 - Wyoming – January 11, 2015; Docket No. 20000-474-EA-15
 - California – filing requirements tied to RPS compliance reporting
- Requirements from OR and WA for incorporation in the 2015 IRP Update have been addressed
- Specific Oregon requirements related to DSM programs will be addressed this summer in OPUC public meetings or the Oregon Portfolio Options Committee as required

2015 IRP Order Requirements

Req. No.	Topic	State	Description
1	III(d)	WA	Requests the company model a sensitivity for both trading system and carbon tax system in the 2017 IRP, and consult with commission staff regarding appropriate assumptions and inputs.
2	III(d)	WA	Useful to develop a supply curve of emission abatement that considers all mechanisms for reducing emissions (energy efficiency, emissions controls, plant conversions, etc. and their costs) and identifies specific to Pacific Power, available technologies and associated costs that could reach a given emission goal.
3	III(d)	WA	Encourage the company to consider demand response along with traditional energy efficiency programs in the context of CPP compliance planning.
4	III(d)	OR	Provide alternative III(d) rule compliance paths, including mass-based solutions, with stochastic analysis for each.
5	III(d)	OR	Include constraints needed for III(d) rule compliance in all cost risk analysis (“PaR” analyses).
6	III(d)	OR	Estimate the effects of III(d) rule compliance on western wholesale power prices.
7	Balancing Authority Areas	WA	Cost impacts in the S-10 in the 2015 IRP were on a system basis and the commission would like to see them on a balancing authority area basis. Requests analysis be redone in the 2017 IRP and that inputs be consistent with staff MSP power flow data or explain why different inputs are more appropriate. Also, request that the company incorporate the balancing authority area analysis in all future IRPs.
8	Class 2 DSM	OR	Provide more risk analysis on portfolios that include accelerated energy efficiency as a resource.

2015 IRP Order Requirements

Req. No.	Topic	State	Description
9	Class 2 DSM	OR	Include annual incremental summer and winter peak demand capacity (MW) corresponding to 2015 through 2018 Class 2 DSM annual energy savings targets.
10	Class 2 DSM	OR	Perform stochastic modeling on all portfolios with accelerated DSM.
11	Class 2 DSM	UT	Encourage PacifiCorp to explain in the 2017 IRP how the effects of the federal standards on lighting technologies are accounted for in updated potential studies or load forecasts.
12	Demand Response	WA	Request that the 2017 IRP re-assess the overall potential and levelized costs for demand response and add a sensitivity analysis that evaluates the portfolio impact of adding additional demand response resources.
13	Distributed Generation	UT	Value DG analysis and support modeling DG as a load reduction. Expect continued analysis of this issue. Direct PacifiCorp to identify the amount of DG included in the baseload forecast in its load and resource table, as it does for existing DSM and curtailment.
14	EIM	WA	Encourage the company to continue to integrate the EIM into the IRP model, in particular to develop modeling capability to capture how different resources with different generation profiles would interact with the EIM, based on the company's experience with the market.
15	Energy Storage	WA	Expect the company to conduct a more in-depth analysis of energy storage in the 2017 IRP. Analysis should include benefits associated with ancillary services such as frequency regulation and include batteries and other forms of storage. It should also value specific projects on Pacific Power's system both at the transmission and distribution levels and ensure costs assumptions are based on current price trends.

2015 IRP Order Requirements

Req. No.	Topic	State	Description
16	Energy Storage	UT	Encourage PacifiCorp to file an update of the energy storage screening study in the 2017 IRP, update the storage cost assumptions, and consider modeling changes for energy storage following discussion with stakeholders. Request that PacifiCorp present the findings of the updated study, with the study authors accessible for stakeholder questions and discussion, at a public input meeting.
17	Energy Storage	OR	Provide analysis of the system benefits of storage.
18	FOTs	OR	Provide quantitative justification for assumed levels of trading hub liquidity and depth.
19	FOTs	UT	Direct PacifiCorp to continue to evaluate the depth of the western wholesale market, and to use sensitivity cases and acquisition path analysis, including the development of a contingency plan, to monitor the feasibility of long-term reliance on FOTs to meet near-term load growth.
20	Modeling	OR	Include more robust analysis regarding the west BAA winter peak load/resource balance and portfolios to meet this peak load.
21	Modeling	OR	Provide quantitative justification for the planning reserve margin of 13 percent.
22	Modeling	OR	Utilize the balancing authority's ACE Limit (BAAL) NERC standard in forthcoming wind integration studies, and confirm and demonstrate that the study is based on implementation of the BAAL standard.
23	Modeling	OR	Use the same regional haze assumptions when directly comparing portfolios.

2015 IRP Order Requirements

Req. No.	Topic	State	Description
24	Modeling	UT	Requirement to present the Business Plan as a sensitivity case for future IRPs.
25	Modeling	UT	Recommend continued analysis of the PRM in future IRPs using results from both loss of load probability (LOLP) studies and analysis of the tradeoffs between reliability and cost.
26	QFs	UT	The Commission is interested in examining the impact of PVRR and investment decisions of varying levels of QFs on the system. Directs PacifiCorp to develop a set of sensitivity runs addressing this issue following discussion with interested stakeholders.
27	Regional ISO	WA	Expect the company to work with staff on incorporating an analysis of CAISO membership in the 2017 IRP as appropriate.
28	Regional ISO	OR	Incorporate analysis of CAISO membership in the 2017 IRP as appropriate.
29	Renewable Resources	WA	Encourage the company to continue to evaluate how its method compares to the load carrying capability method on which it was based to ensure its yielding accurate results.
30	Renewable Resources	OR	Include sensitivity studies around solar costs.
31	Renewable Resources	UT	Encourage PacifiCorp to provide a stronger determination of the reasonableness of the range of renewable resource costs analyzed.
32	Resource Acquisition Path Analysis	WA	Analysis behind Near-Term and Long-Term Resource Acquisition Paths (Table 9.3 in the 2015 IRP) could be improved in terms of identifying potential exogenous changes that would cause a significant change in acquisition path. In future IRPs, we encourage PacifiCorp to further define the critical contingencies that would be required to potentially trigger movement to any of the different paths listed in the table.

2015 IRP Order Requirements

Req. No.	Topic	State	Description
33	Resource Adequacy	WA	The company agreed as a condition to the commission's granting waivers in UE-151694, to conduct a market reliance risk assessment in conjunction with the 2017 IRP. Encourage the company to work with staff on the design of that analysis.
34	Solar	ID	The Commission suggests PacifiCorp consider conducting a reasonable evaluation, similar to the Wind Integration Study previously commissioned, of the costs and benefits associated with the integration of additional solar resources into its system.
35	Transmission	OR	Evaluate the benefits of freed-up transmission due to plant closures.
36	Transmission	OR	Update the available dynamic transfer capability between east and west balancing authority areas in modeling.
37	Transmission	UT	If PacifiCorp plans to use the System Benefit Tool type of transmission analytical tool in future IRPs, PacifiCorp should introduce and vet the tool in an IRP workshop setting prior to utilizing the tool.

2015 IRP Action Item Updates

- Action Item 1a – RPS Compliance
 - Updated for new compliance requirements
 - Issued RFPs for RECs and renewables April 2016
- Action Item 1b – REC Optimization
 - Will continue to issue reverse RFPs in 2016
- Action Item 1c – OR Solar Capacity Standard
 - No longer applicable due to Senate Bill 1547-B
- Action Item 2a – Front Office Transactions
 - Company continues to procure energy through multiple means
- Action Item 3a – Class I DSM
 - OPUC approved a pilot in place for the 2016 irrigation season

2015 IRP Action Item Updates

- Action Item 3b – Class 2 DSM
 - On-track to achieve 2016 Class 2 DSM target to acquire 584 GWhs of cost-effective Class 2 DSM in 2016
- Action Item 4a – Naughton Unit 3
 - Company will continue to review emerging technologies, re-assess conversion technologies and costs and consider other potential alternatives in the 2017 IRP
- Action Item 4b – Dave Johnston Unit 3
 - Company continues to monitor results of appeal of EPA’s final regional haze FIP
- Action Item 4c – Wyodak
 - Company continues to monitor results of appeal of EPA’s final regional haze FIP

2015 IRP Action Item Updates

- Action Item 4d – Cholla Unit 4
 - Company continues to evaluate alternative compliance approaches that avoid installation of SCR
- Action Item 5a – Energy Gateway Permitting
 - Company continues to pursue permitting and outreach for its Energy Gateway segments
- Action Item 5b – Wallula to McNary 230 kV Transmission Line
 - Company continues to pursue permitting and outreach for this segment estimated in-service 2017

Additional Information and Next Steps

- Meeting presentation and materials:
<http://www.pacificorp.com/es/irp.html>
- 2017 IRP Stakeholder Feedback Form:
<http://www.pacificorp.com/es/irp/irpcomments.html>
- Email / distribution list contact information:
 - IRP@PacifiCorp.com
- Upcoming Public Input Meeting Dates:
 - July 20-21, 2016
 - August 25-26, 2016
 - September 22-23, 2016
 - October 20-21, 2016
 - January 2017 – TBD
 - February 2017 – TBD