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September 5, 2018

### **MEMORANDUM**

**TO: Council Members**

**FROM: Ben Kujala**

**SUBJECT: Summary of topics in Mid-Term Assessment for full Council**

### **BACKGROUND:**

Presenter: Ben Kujala

Summary: Staff has done in-depth presentations on topics related to the mid-term assessment for the power committee over the last few months. Topics included updated generating resource profiles, updates on the load forecast, as well as gas and electricity price forecasts, conservation, adequacy, and demand response.

Staff will present a high-level summary of these issues for the full Council and highlight the key findings in each area. This is in preparation for the Council's consideration of the draft mid-term assessment report at the October Council meeting.

Workplan: Power Division workplan, Section A6.1: "The power division will prepare a draft mid-term assessment of the Seventh Power Plan in coordination with the Power Committee for approval for release by the Council."

## Summary of Mid-term Assessment

## Sections Presented to Power Committee

- **Action Plan Progress**
- **Markets and Demand Updates**
- **Conservation Updates**
- **Demand Response Updates**
- **Generation Resource Updates**
- **Resource Strategy Implications**

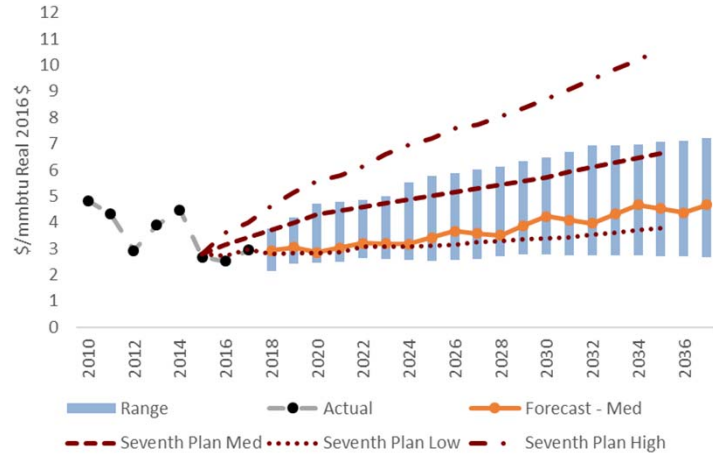
## Action Plan

- **Substantial regional progress since the 7<sup>th</sup> plan**
- **Many action items on-track, e.g.**
  - Conservation target
  - GENESYS redevelopment
- **A few action items with limited progress, e.g.**
  - Distribution efficiency
  - Studying effects of new resource development and associated transmission lines on wildlife and the environment, outside the direct effects of hydropower

## Market and Demand

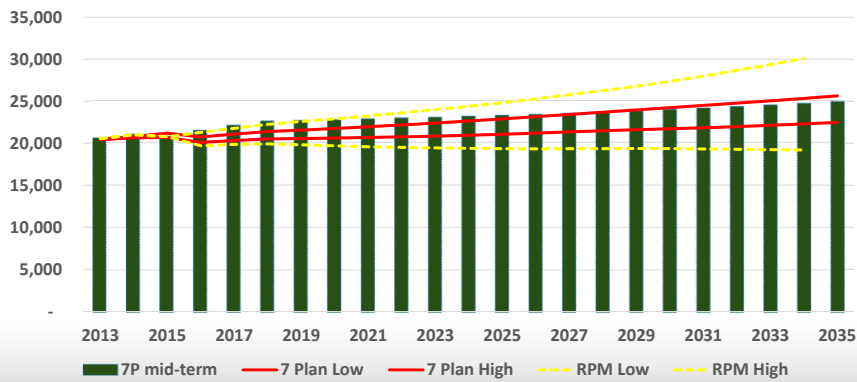
- **Key Economic drivers**
  - Population increasing faster than 7P.
  - More residential units are being built.
  - Commercial floor space is growing.
  - Industrial sector output growth is flat
- **Price-effect load forecast, with preliminary updates on key economic drivers indicates**
  - Energy is within the 7<sup>th</sup> plan range
  - Winter peak is within the 7<sup>th</sup> plan range
  - Summer peak is in the high range of 7<sup>th</sup> plan

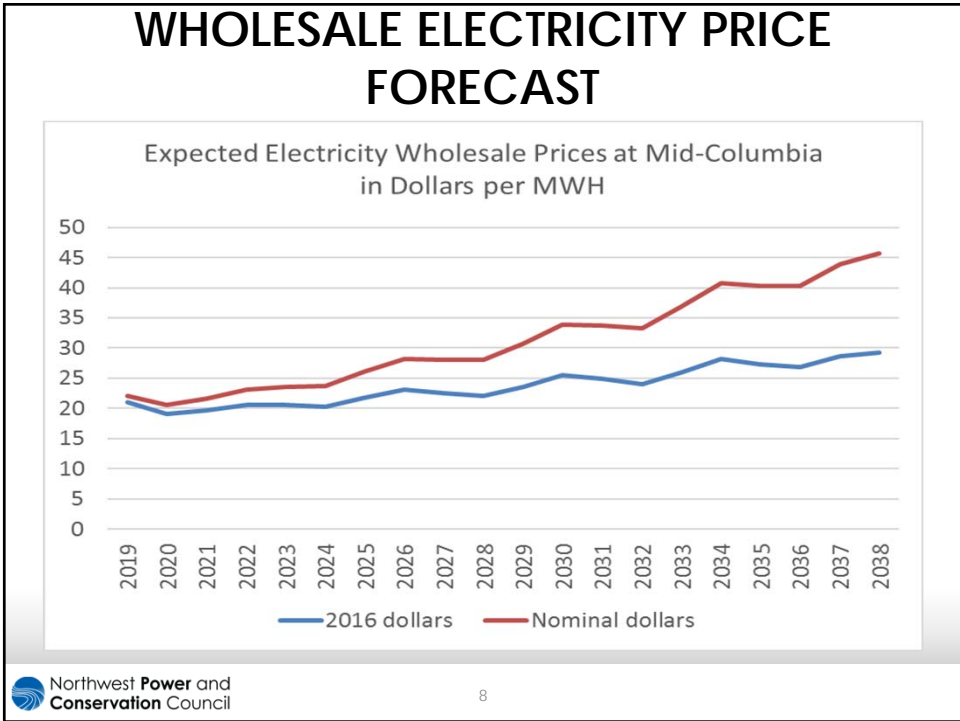
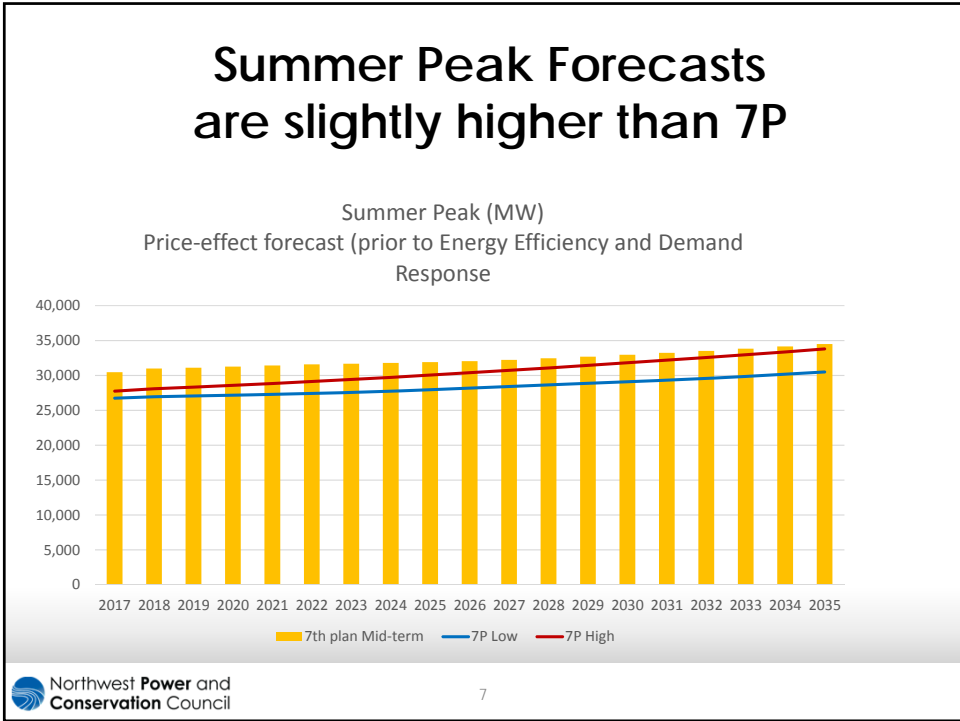
## Natural gas prices act as another driver



## Mid-term Price-Effect Forecast is within Range of the 7<sup>th</sup> Plan

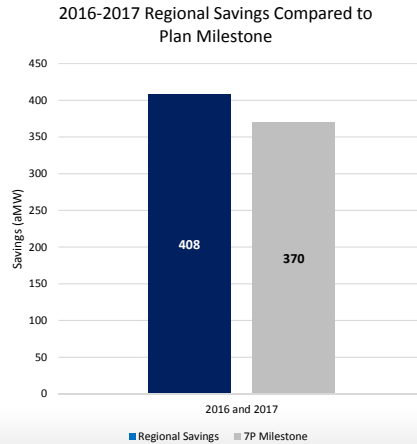
Comparison of Price-Effect and Frozen Efficiency Load Forecasts  
aMW





## EE: 2016-17 Achievements

- **The Seventh Plan EE goal is 1400 aMW by 2021**
- **The region has met the two-year (2016-17) energy efficiency milestone**
- **These savings also represent 865 MW of winter capacity and 500 MW of summer capacity**



## EE: Looking forward

- **The Bi-Annual energy efficiency milestones increase from 370 aMW ('16-17) to 460 aMW ('18-19), and to 570 aMW in ('20-21)**
  - **1400 aMW 6-year goal**
- **Challenges to reach 6-year goal:**
  - **Planned program budgets are flat or declining**
  - **Federal efficiency standards have slowed/stalled**
  - **Savings from outside programs are uncertain**

## DR: Key Topics

- **Demand Response Definition**
  - Developed by DR Advisory Committee
- **Planned and existing DR in region**
  - DRAC has developed template for collecting information on historical and planned DR from regional entities
  - Little incremental (to 7P baseline) DR currently contracted
  - Many regional utilities finding in IRPs long-term (5-10 year) value in DR

## DR: Key topics, cont

- **Key barriers to DR implementation**
  - Explored by DRAC and BPA in their DR Assessment
  - Barriers include: economic (most critical), organizational, infrastructure/technological, regulatory, perceptions
- **Regional attributes supporting DR**
  - Synergies to EE, involvement in EIM, high technical potential resources (e.g. electric water heaters)

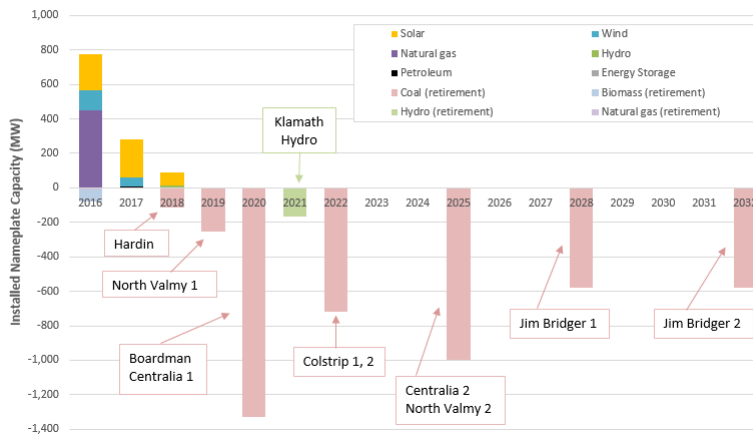
## Updated capital cost estimates for generating resources generally decreasing since Seventh Plan

Technology	Seventh Plan (\$2016)	Proposed Mid-term Update (\$2016)	Trend
CCCT Adv Wet Cooling	\$1,220	\$1,100 - \$1,300	↓ Slight decrease
CCCT Adv Dry Cooling	\$1,369	\$1,200 - \$1,400	↓ Slight decrease
Frame GT (East)	\$859	\$500 - \$650	↓ Decrease (30-40%)
Reciprocating Engine	\$1,382	\$1,250 - \$1,450	↔ No change
Wind	\$2,382	\$1,500 - \$1,700	↓ Decrease (30-40%)
Solar PV (low/avg)	\$1,791/ \$2,566	\$1,350 - \$1,500	↓ Decrease (25-60%)

- Increased competition for fewer plants has driven natural gas development costs down (single cycle)
- Wind and solar continued to decrease; Tariffs on steel, aluminum, and imported solar cells may marginally increase future costs



Additions and Retirements since the Seventh Power Plan  
(excl. projects under construction & incl. announced planned retirements)

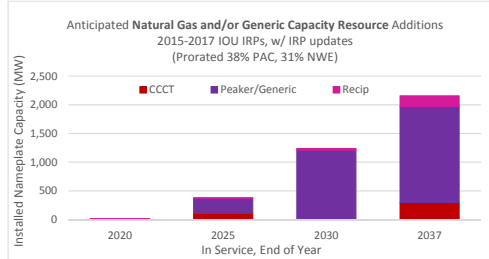


- Recent solar development, primarily in Idaho and Oregon, through PURPA and some RPS
- Planned retirement of approx. 3,600 MW coal capacity between 2018 and 2037; of which 1,900 MW is directly owned by utilities to serve their load





## Net Balance of Coal Retirements and Anticipated New Capacity Additions



- Anticipated capacity resources as identified in latest IOU IRP's
- Utilities are also contemplating ~3,000 MW of new or repowered renewable energy resources
- IRPs are updated every two years, resource plans often change as time of need approaches

	2018 thru 2020	2021 thru 2025	2026 thru 2030	2031 thru 2037	Cumulative 2018-2037
Anticipated Additions	17	379	1,237	2,155	3,788
Anticipated Coal Retirements <i>(prorated to reflect % serving Northwest)</i>	(1,397)	(854)	(1,010)	(339)	(3,600)
Net Balance Over Period	(1,380)	(475)	227	1,816	188

## Resource Strategy

- 7<sup>th</sup> Plan put forward a robust resource strategy
- Changes since the 7<sup>th</sup> Plan of note:
  - Increased California RPS
  - Decreased Generating Resource Cost
  - Increased Summer Peak Forecast
  - Additional Thermal Retirements
- Not anticipated to substantially shift resource strategy

Questions?