

2019 Adequacy Assessment

Decision on SW Imports for the Reference Case

RAAC Steering Committee
Conference Call

April 25, 2014

Today's Actions

- 1. Review historic South-to-North intertie scheduling limit**
- 2. Review LOLP results for various SW import assumptions**
- 3. Tally opinions on SW import assumption for reference case**

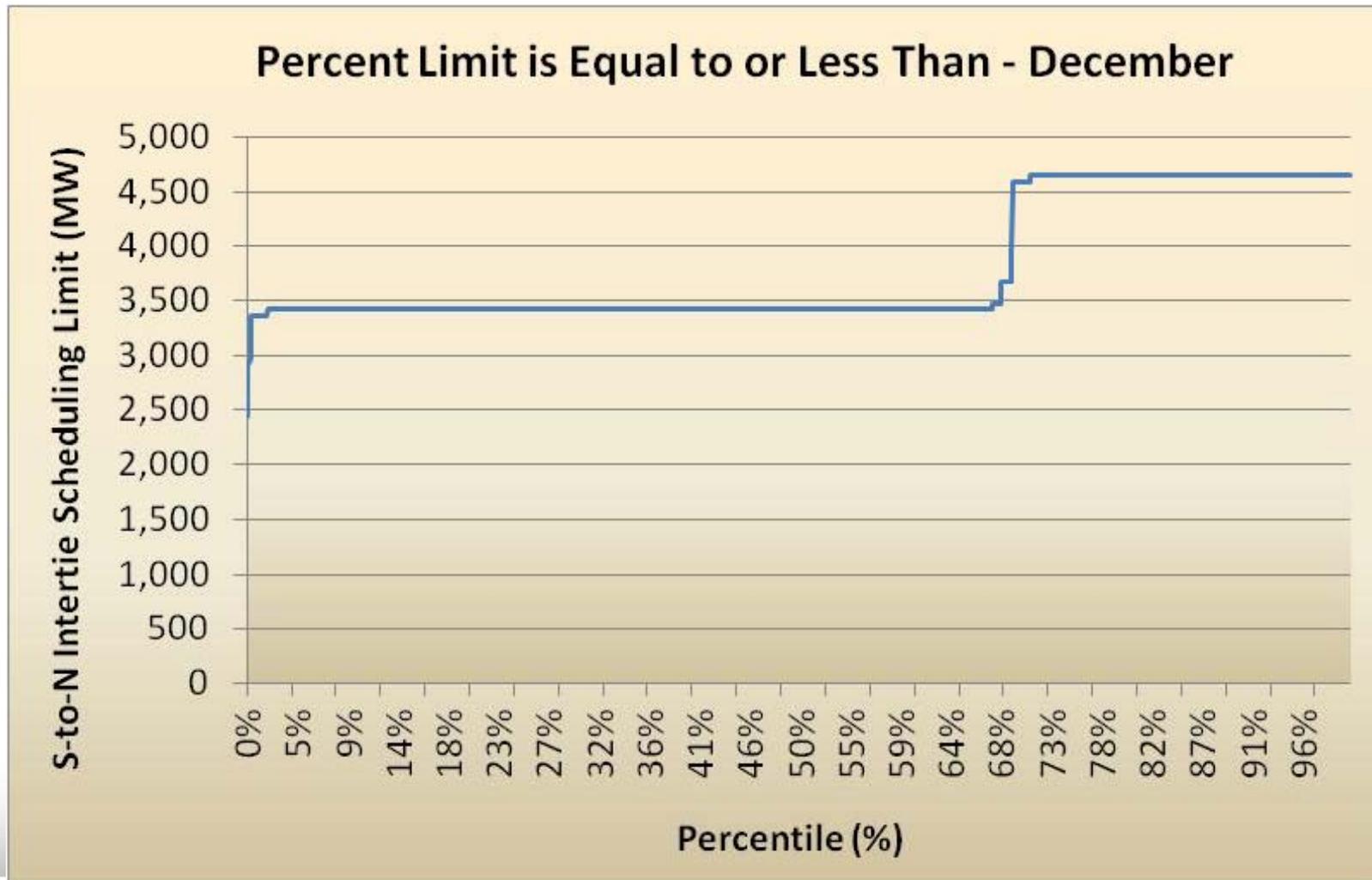
SW Surplus Capacity

(Energy GPS)

Supply	Dec 2018	Jan 2019	Feb 2019
Demand Response	2,512	2,537	2,537
Hydro	3,244	2,483	2,431
Nuclear	2,066	2,203	1,933
Natural gas	37,229	37,098	33,425
Biomass, geo, etc	3,518	3,525	3,525
Wind	580	443	576
Solar	816	139	194
Pumped Storage	2,943	2,943	2,943
Other Storage	719	719	719
Non-PNW Imports	7,183	7,766	7,766
Total Supply	60,809	59,855	56,049
Demand ¹	(40,136)	(40,538)	(37,533)
Reserves - hydro	(162)	(124)	(122)
Reserves - other	(2,582)	(2,664)	(2,457)
Supply	60,809	59,855	56,049
Net Available	17,929	16,529	15,937

Historic S-to-N Intertie Limit

December



Historic S-to-N Intertie Limit

January



Historic S-to-N Intertie Limit

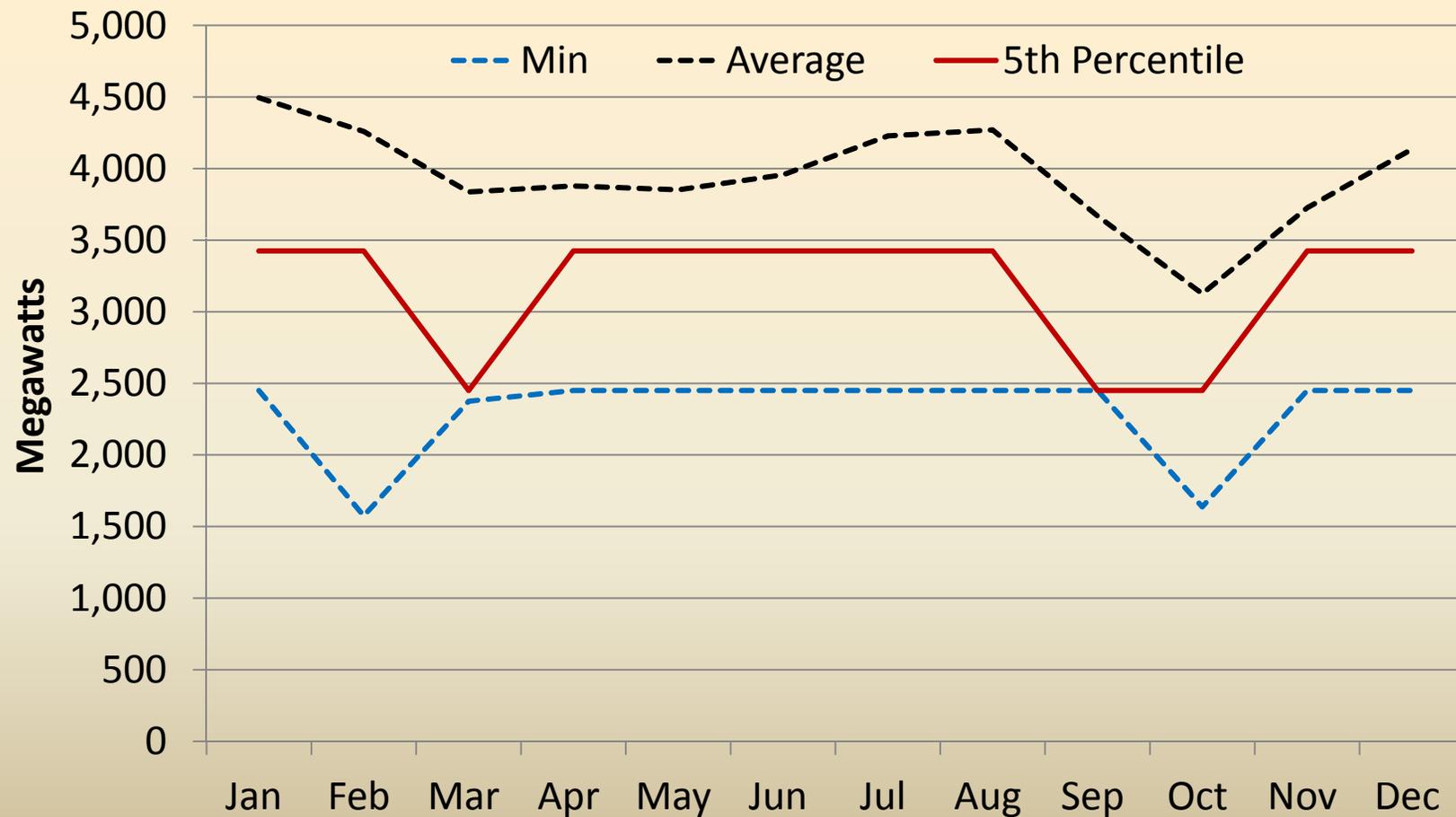
February



South-to-North Intertie Capacity

Month	Min	Average	5 th Percent
Jan	2,450	4,495	3,425
Feb	1,575	4,259	3,425
Mar	2,375	3,837	2,450
Apr	2,450	3,879	3,425
May	2,450	3,852	3,425
Jun	2,450	3,957	3,425
Jul	2,450	4,228	3,425
Aug	2,450	4,270	3,425
Sep	2,450	3,669	2,450
Oct	1,637	3,126	2,450
Nov	2,450	3,726	3,425
Dec	2,450	4,135	3,425

South-to-North Intertie Capacity



Import Availability using 5th Percentile¹

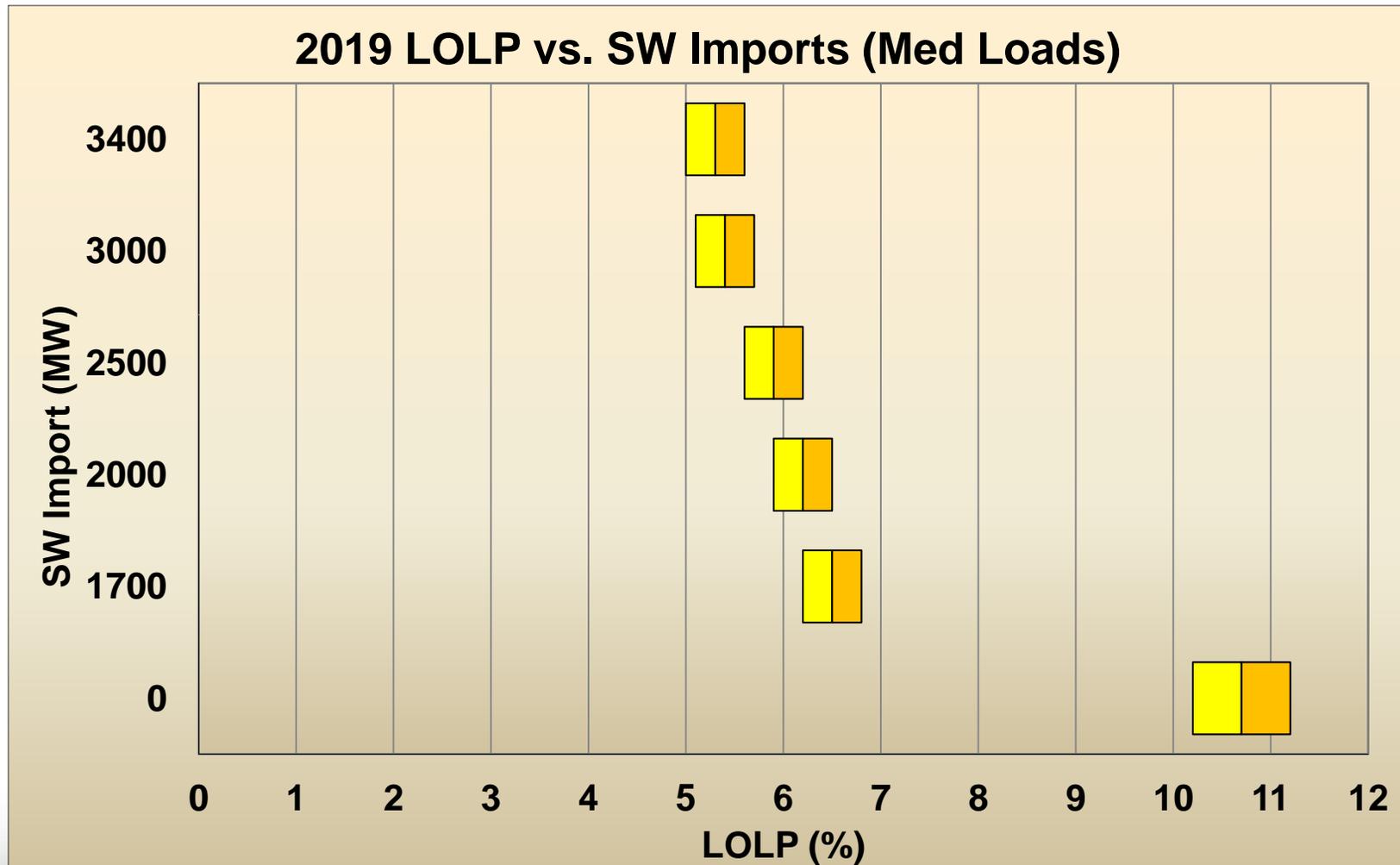
Month	Avail in SW	P5 Tie Limit	Avail to NW
Jan	16,529	3,425	3,425
Feb	15,937	3,425	3,425
Mar	17,316	2,450	2,450
Oct	21,923	2,450	2,450
Nov	20,264	3,425	3,425
Dec	17,929	3,425	3,425

¹Celilo-Sylmar DC transmission line is scheduled to be upgraded from a maximum capacity of 3,100 MW to 3,800 MW before 2019.

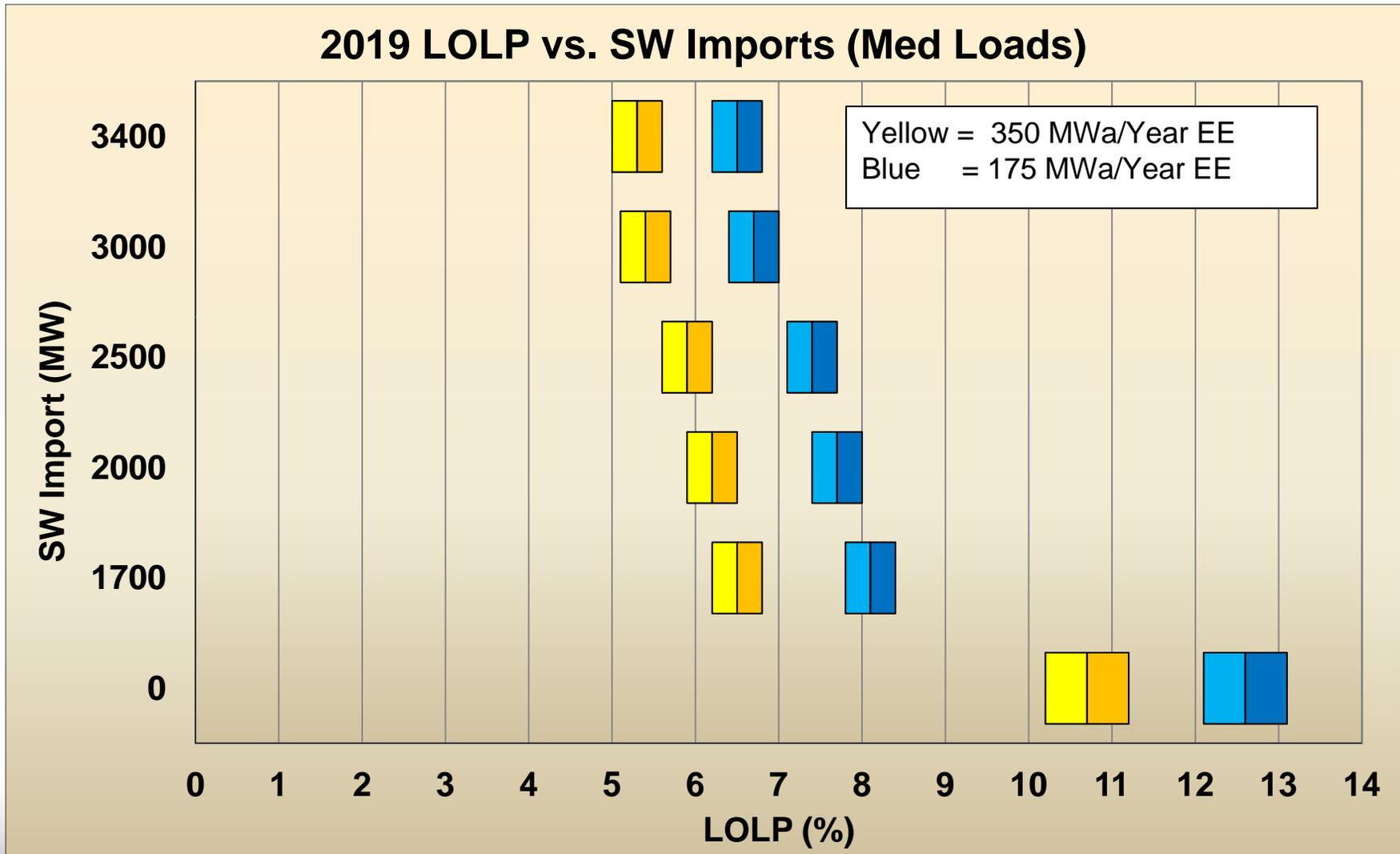
Data Updates 2017 to 2019

- **Major resource additions 667 MW**
 - Carty Generating Station (440 MW)
 - Port Westward 2 (220 MW)
- **Wind additions 267 MW**
 - Tucannon River
 - Only count sited, licensed and under utility contract
 - From 4266 MW in 2017 to 4533 MW in 2019
- **Boardman change in allocation**
 - 90% in region for October to December
 - 100% in region from January to September

2019 LOLP Results



Effect of EE on LOLP (approx.)



Additional Information

LOLP Results for 2019 (%)

(error is approximately $\pm 5\%$)

Load	-2.5%	-1.5%	0%	+1.5%	+2.5%
Import					
0 (MW)	<u>7.5</u>	<u>8.6</u>	10.5	<u>12.9</u>	<u>14.9</u>
1700	<u>4.5</u>	<u>5.3</u>	6.5	<u>8.0</u>	<u>9.3</u>
2000	<u>4.3</u>	<u>4.9</u>	6.2	<u>7.7</u>	<u>9.0</u>
2500	<u>4.0</u>	<u>4.7</u>	5.9	<u>7.2</u>	8.5
3000	<u>3.8</u>	<u>4.5</u>	5.4	<u>6.7</u>	7.9
3400	<u>3.7</u>	<u>4.4</u>	5.3	<u>6.4</u>	7.7

Modeled Uncertainties

Assumptions	2017	2019
Operating Year	Oct 2016 to Sep 2017	Oct 2018 to Sep 2019
Number of Games	6160 (all comb hydro and wind)	6160
Random Thermal Outage	On	On
Water year selection	Sequential	Sequential
Water year range	80 years historic 1929-2008	80 years historic 1929-2008
Temperature year selection	Exhaustive pairing w/water	Exhaustive pairing w/water
Temperature year range	77 years 29-05 (to match wind)	77 years 29-05 (to match wind)
Wind year selection	Correlated to temp year	Correlated to temp year
Wind year range	77 years synthetic 1929-2005	77 years synthetic 1929-2005
Wind/temp uncertainty	1 wind set per temp year	Random, 20 sets per temp year

New and Standby Resources

Assumptions	2017	2019
Thermal	Sited and licensed	Sited and licensed
Wind	Sited and licensed	Sited and licensed
Demand response	In standby resources	In standby resources
Load call back provisions	In standby resources	In standby resources
Standby resources energy*	83,000 MW-hours	40,800 MW-hours
Standby resources capacity*	660/720 MW winter/summer, where winter = Oct-Mar, summer = Apr-Sep	623/833 winter/summer
Energy Efficiency magnitude	Council 6 th plan targets	Council 6 th plan targets
Energy Efficiency shape	Same as load	Same as load

*The effects of existing (and implemented) standby resources are assumed to be incorporated into the load forecast.

Market Supplies

Assumptions	2017	2019
NW market winter, where winter = Nov-May	3,451 MW (full IPP)	3,467 MW (full IPP)
NW market summer, where summer = Jun-Oct	1,000 MW	1,000 MW
BC market	0 MW	0 MW
Southern Idaho market	Not in model	Not in model
SW market winter on-peak	1,700 MW	To Be Determined
SW market winter off-peak	3,000 MW (purchase ahead)	3,000 MW (purchase ahead)
SW market summer on-peak	0 MW	0 MW
SW market summer off-peak	3,000 MW (purchase ahead)	3,000 MW (purchase ahead)
Maximum SW import limit	3,200 MW	3,400 MW

Within-hour Balancing Reserves

Assumptions	2017	2019
Fed Hydro balancing reserves	900 INC and 1100 DEC	900 INC and 1100 DEC
Non-Fed Hydro reserves	Not modeled	Not modeled
Non-hydro balancing reserves	Not modeled	Not modeled
New balancing reserves	Not modeled	Not modeled
Energy Imbalance Market	Not modeled	Not modeled
Borrowed hydro	1000 MW-periods	1000 MW-periods
Hydro constraints	Draft 2017 regulation (the final 2017 regulation was used in the revisited assessment)	Final 2019 regulation