

Review: Resource Adequacy 2019

RAAC Technical Committee
October 9, 2014
Portland, Oregon



Outline

- **Changes since the 2017 assessment**
- **Sensitivity to imports and load**
- **Effect of standby resources**
- **Other adequacy metrics**
- **Schedule for 2020 assessment**

Going from 2017 to 2019¹

Item	Change from 2017 Assessment
2017 LOLP	7%
Net Load Growth (incl. EE targets)	260 MWa
EE Targets	700 MWa
Dispatchable Generating Capacity	670 MW
New Wind Capacity	260 MW
Standby Energy	- 42,200 MW-hours
Standby Winter Capacity	37 MW
Standby Summer Capacity	113 MW
Winter HLH Import Availability	800 MW
2019 LOLP	6%

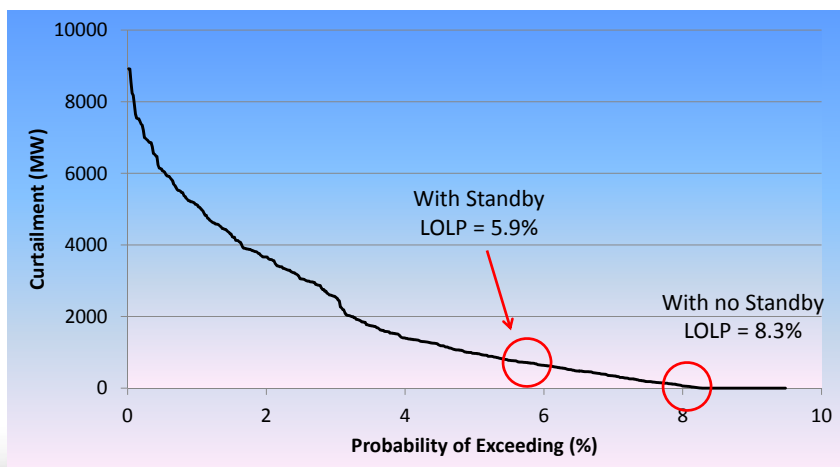
LOLP Results for 2019 (%) (Effects of Load and Import Uncertainties)

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

Resource Dispatch Order

Resource	Description	
Firm Hydro and Thermal	From lowest to highest operating cost	Modeled in GENESYS
Non-firm and Markets	In-region and out-of-region markets, surplus hydro, borrowed hydro	
Standby Resources Type 1	Non-declared utility resources (diesel generators, etc.)	Modeled in Post Processor
Standby Resources Type 2	Buy-back provisions on load	
Emergency Action 1	More expensive non-declared resources or contract provisions	Not Modeled
Emergency Action 2	Governor's call for conservation	
Emergency Action 3	Rolling black outs or brown outs	

2019 Adequacy Assessment (Peak-Hour Curtailment Probability Curve)



Other Adequacy Metrics

Metric	Description
LOLP (%)	Loss of load probability = number of games with a problem divided by the total number of games
EUSR (%)	Use of standby resource probability = Number of games that dispatch standby resources at least once divided by total games
CVaR - Energy (MW-hours)	Conditional value at risk, energy = average annual curtailment for 5% worst games
CVaR - Peak (MW)	Conditional value at risk, peak = average single-hour curtailment for worst 5% of games
EUE (MW-hours)	Expected unserved energy = total curtailment divided by the total number of games
LOLH (Hours)	Loss of load hours = total number of hours of curtailment divided by total number of games
PGC (%)	Percent of games with curtailment = Same as EUSR

Adequacy Summary

Metric	2017	2019	Units
LOLP	6.6	5.9	Percent
EUSR	9.7	8.3	Percent
CVaR - Energy	99,000	59,200	MW-hours
CVaR - Peak	4,000	3,337	MW
EUE	5,000	3,000	MW-hours
LOLH	2.7	1.7	Hours/year
PGC	9.7	8.3	Percent

Schedule for 2020 Assessment

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Tech	Review load, resource and other data; review model enhancements; identify key assumptions						
	Steering	Review all data; review and recommend key assumptions					
			Tech	Review preliminary 2020 assessment			
			Steering	Review preliminary 2020 assessment			
					Tech	Review final assessment	
					Steering	Review final assessment	
						Council Power	Review final
							Council Approval