

PNW Capacity Metric and Target—Pilot Study and Next Steps

Mary Johannis

PNW Resource Adequacy Technical Committee Meeting

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NWPPCC Offices, Portland, OR

Steering Committee Decisions on Form of Capacity Metric & Target

Capacity Metric: the sustained peaking capability of the power supply available to meet regional load, reserve requirements and for export during the peak load month in winter/summer

Capacity Target: the sustained peaking capability of the power supply over the sustained peak load of highest load month should be at least $z\% > \text{peak load}$

Z % could consist of:



⇒ y % Load Forecast & Adverse Load Uncertainty

⇒ x % Outage Uncertainty

⇒ 5 - 7% Contingency Reserve

Agreement on Approach for Sustained Peaking Capacity Analyses

- Use Regional Model to validate Results of a Spreadsheet Analysis
- This approach is similar to the linkage of the GENESYS LOLP Analysis to an annual load resource balance, i.e. the methodology already approved by the Steering Committee for the Energy Metric and Target
- Regional Model is the Council's GENESYS Model, at least for now

Spreadsheet Approach for Pilot Regional Sustained Peaking Capacity Study

- Option 2 was agreed to at last Technical Committee Meeting:
 - Request Entities with Hydro Storage to perform Sustained Hydro Capacity Analyses for their Hydro Power Plants for Various Durations, i.e. 1 hour, 2 hours, 4 hours and 10 hours
 - This information will be submitted to Council with understanding that it is Confidential
 - NWPCC staff to perform Regional Sustained Capacity Analysis consistent with Methodology developed by Technical Committee

Pilot Study: Sustained Peaking Capacity Assumptions

- Cold Snap Assumptions:
 - Use Historical February 1989 Cold Snap
 - Use Council's February 1989 loads at current level of development
 - Council will perform resource assessment with information on sustained hydro capacity from individual utilities
 - Technical Committee decided that various durations during the day and over the cold snap should be investigated to understand which definition of timeframe is most critical for Region
 - Define Reasonable Assumptions for the Availability of Out-of-Region Surplus Capacity and In-Region IPP Generation to meet Peak Capacity Needs in HLHs or to replace Energy in LLH; this Assumption should be consistent with Assumptions of LOLP Study linked to Energy Metric and Target Assessments

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Avista Sustained Peak Estimate—2005

Sustained Peak Period L&R Calculation Comparison
2005

Peak Period Considered	1 -Hour	4 -Hour	8 -Hour	12 -Hour	24 -Hour	72 -Hour	168 -Hour	336 -Hour
Load								
Peak Load	(1,619)	(1,598)	(1,579)	(1,542)	(1,450)	(1,377)	(1,369)	(1,175)
10% Contingency	(162)	(160)	(158)	(154)	(145)	(138)	(137)	(117)
Load Subtotal	(1,781)	(1,758)	(1,736)	(1,696)	(1,595)	(1,515)	(1,506)	(1,292)
Hydro Capability								
Hydro @ 90% CI	208	208	208	326	326	326	326	326
Hydro Storage	959	871	825	550	275	211	154	77
River Freeze Up	(60)	(60)	(60)	(60)	(60)	(60)	(60)	(60)
Hydro Subtotal	1,107	1,019	973	816	541	477	419	342
Thermal Capability								
Coyote Springs II	308	308	308	308	308	308	308	308
Colstrip	222	222	222	222	222	222	222	222
Rathdrum	184	184	184	184	184	184	184	184
Northeast	69	69	69	69	69	69	69	69
Kettle Falls	62	62	62	62	62	62	62	62
Boulder Park	25	25	25	25	25	25	25	25
Fuel Delivery System Freeze Up	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)
Thermal Subtotal	839	839	839	839	839	839	839	839
Contracts								
Net Contracts	139	139	139	139	139	139	139	139
PGE Adjustment	0	0	0	25	38	46	105	105
PPM Wind @ 25% of Capacity	0	0	0	0	0	0	0	0
000 MW Spot Purchases	0	0	0	0	0	0	0	0
Contracts Subtotal	139	139	139	164	177	185	245	245
Net Position	304	240	215	123	(38)	(14)	(3)	134

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Pilot Study: Sustained Peaking Capacity Assumptions

- Calculation of Sustained Hydro Peaking Capacity:
 - Technical Committee decided to use 1937 Hydro, i.e. Critical Hydro
 - For most ROR, use installed capacity and the capacity factor over the specified peaking duration; fish constraints on Mid-C's may require reverse load factoring; some ROR may be able to generate more on-peak
 - Individual hydro utilities to provide sustained hydro for various timeframes for their projects considering storage and physical/environmental constraints
 - Hydro Projects located in Tandem on River System, especially a long system like Columbia River, need to consider Lag Times between Reservoirs
 - Potentially reduce Hydro Capability due to Freeze-Up of Side Streams Flows, or other issues

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Pilot Study: Sustained Peaking Capacity Assumptions

- Define Sustained Thermal Capacity during Cold Snap:
 - Look to Terry Morlan's natural gas group to decide the likelihood that sufficient natural gas supplies will be available for both direct use and electricity generation needs during a cold snap.
 - Technical Committee decided that capacity increases for some gas-fired units is likely to be offset by capacity decreases in coal and possibly other plants due to extreme temperatures
- For Pilot Study, Sustained Wind Capacity Available to meet Peak Loads is defined as follows:
 - Technical Committee adopted assumption for now → wind peaking capacity should be zero for a single hour duration but then ramp up to 20 percent for a 50-hour duration
- Ignore Deliverability issues for Pilot Study

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Pilot Study: Sustained Peaking Capacity Assumptions

- Council to Perform Regional Assessment using agreed upon In-Region Market Resources and Out-of-Region Surpluses
- Compare the results of the Regional Sustained Peaking Capacity Assessment under a Cold Snap to the 1 in 2 Winter Peak Load Condition Assessment to estimate a Reasonable Adverse Load Component of the Target Reserve Planning Margin
- Validate the Results using a Regional Model

Next Steps

- When can Hydro Utilities provide Council Sustained Hydro Peaking Capacity Numbers?
- How long does Council Staff require to perform Regional Assessment?
- What is the Process to Calibrate GENESYS Model to Validate Spreadsheet Assessment?