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## **Pacific Northwest Resource Adequacy Assessment for 2010 and 2012**

### **Summary**

In 2006, the Northwest Power and Conservation Council adopted a resource adequacy standard for the regional power supply based on recommendations from the Resource Adequacy Forum. The term "standard" in this context does not mean mandatory compliance nor does it imply an enforcement mechanism. Rather, it is meant to be a gauge used to assess whether the power supply is adequate in a physical sense -- that is, in terms of "keeping the lights on."

Every year the Council will look ahead three and five years to assess the adequacy of the power supply. Should resources fall below the standard's thresholds, this would signal an unacceptably high risk of shortages. In this sense, the standard can be viewed as an early warning system. Failure to meet the threshold in the third year would signal a serious or "red light" warning. Failure in the fifth year would signal a less serious or "yellow light" warning.

The adequacy standard calls for the average annual generating capability to at least equal the average annual demand. It also calls for the system's peaking capability to be able to meet expected peak hour demands and to have sufficient surplus to cover operating reserves, prolonged generator forced outages and demand deviations due to extreme temperatures. The peaking capability surplus (or reserve margin) should be at least 25 percent in winter and 19 percent in summer over a sustained peaking period.

In this year's assessment, looking ahead three and five years, the average annual generating capability is expected to exceed the annual demand by 4,260 average megawatts in 2010 and by 4,050 average megawatts in 2012. Both of these values are well above the adequacy threshold of zero. Winter peaking capability reserve margins are estimated to be 48 percent and 46 percent for 2010 and 2012, respectively – both above the 25 percent target. Summer reserve margins are estimated to be 32 percent and 30 percent for 2010 and 2012 – both above the 19 percent target.

While this assessment indicates that the region's access to resources is sufficient to minimize curtailments, it does not address the issue of high prices nor does it address the status of individual utilities. Utilities, therefore, should decide whether to take actions now to secure resources to meet their needs and to reduce their exposure to high prices.

This report along with a more detailed assessment and related documents will be posted on the Council's website at <http://www.nwcouncil.org>.

## Background

The regional resource adequacy standard consists of a metric (something that can be measured) and a target (an acceptable value for that metric) for both annual capability (energy) and the peaking capability (capacity) of the system.

The targets for both the energy and capacity metrics are derived from a loss-of-load-probability (LOLP) analysis. Using a sophisticated computer program, the operation of the power supply is simulated over a large number of possible futures, in which water conditions, temperatures and availability of thermal resources are selected at random. For each simulated future, the program dispatches available resources to meet demands and notes when insufficiencies occur.

An LOLP of 5 percent is used as the threshold to determine the energy and capacity targets. In other words, if the power supply were precisely at the standard's target levels, the likelihood of the region experiencing a future year with a significant curtailment would be 5 percent (or once in 20 years).

Briefly, the adequacy assessment summarized above indicates that resources available to the region as a whole are sufficient to keep the likelihood of blackouts well below the currently accepted value of 5 percent. While this is good news for the region, the assessment does not address the possibility of periods of high prices nor does it address the status of individual utilities. In fact, almost all of the surplus capability comes from uncommitted or market supplies, which the Forum believes would be available during emergencies but whose price most likely would be high.

The type and magnitude of these uncommitted resources is at the heart of an ongoing Forum discussion about what signal is being sent to utilities, in terms of resource and conservation acquisition actions. The Forum is developing a message statement document that will be made available on the Council's website when finished.

For example, while the region may have sufficient resources to "keep the lights on," the Council's Fifth Power Plan calls for continuing aggressive efforts to develop conservation and renewable resources to minimize price and environmental risks. Those efforts are crucial to ensuring the region of not only an adequate but also an efficient, economic and reliable power supply for the future.

Also, many of the region's utilities are working to capture conservation opportunities and to acquire generating resources, as called for in their individual integrated resource plans. Utilities need to continue these efforts to ensure that they achieve an appropriate balance of resources in order to minimize price risks and environmental risks to their customers.

There remain, however, a number of important and still unresolved issues regarding the adequacy standard. For this reason, the Council, in conjunction with the Forum, will continue to evaluate the methodology and data underlying the current standard. As new information becomes available, the metrics and/or the targets will be changed in order to keep the standard current and meaningful. This process is intended to be dynamic, meaning that an assessment of the region's power supply will be made at least annually and a reevaluation of the methodology will be made whenever appropriate.

The more detailed description of the energy and capacity standards below is taken directly from Council document 2006-5 and Council document 2006-23, which together comprise the Northwest resource adequacy standard.

## The Energy Standard

The **energy metric** for the Pacific Northwest is defined to be the annual average load/resource balance in units of energy (average megawatts), where:

- The load/resource balance is defined as the available average annual energy minus the average annual firm load.
- The resource total is defined as the sum of:
  - the annual energy capability from all non-hydro resources (accounting for maintenance and forced-outage rates and limited by fuel-supply constraints and/or environmental constraints) plus
  - the hydroelectric-system annual energy based on critical water conditions plus
  - 1,500 average megawatts of “planning-adjustment” energy, which is derived from the currently used 5 percent loss-of-load probability (LOLP) guideline.
- The load total is defined as the average annual firm load based on average temperature conditions and is adjusted for firm out-of-region energy contract sales and purchases.

The **energy target** for the Pacific Northwest is zero, that is, on an annual basis; resources (as defined above) should at least match the expected annual load.

## The Capacity Standard

The capacity metric for the Pacific Northwest is defined to be the planning reserve margin (PRM), which is the surplus *generating capability over expected peak load* during the *peak load hours* for each month (also referred to as the surplus sustained-peaking capability), in units of percent, where:

- *Generating capability* is defined as the sustained peaking capability<sup>4</sup> from:
  - All non-hydro resources (adjusting for fuel-supply limitations and/or environmental constraints and not counting resources on scheduled maintenance and assuming that no resource is on forced-outage)
  - Uncontracted in-region Independent Power Producer (IPP) resources: 100 percent in winter but in summer only that portion of IPP generation that may be accessible to northwest utilities during peak load conditions (1,000 megawatts will be used as a placeholder until better information is obtained)
  - Hydroelectric resources available to meet 1 in 2, or expected loads, based on critical water conditions
  - Hydro flexibility (a conservative estimate of additional hydroelectric generation that can be provided over the peak load hours during a 1 in 20 year temperature event without invoking emergency actions): 2,000 megawatts in winter and 1,000 megawatts in summer

- Out-of-Region spot market resources: 3,000 megawatts in winter and 0 megawatts in summer
- The net of firm imports and exports into and out of the region
- The *peak load hours* are defined to be the same 10 consecutive hours per day over 5 consecutive days that yield the highest average load.
- *Expected peak load* is defined as the average load over the peak load hours, based normal daily-average temperature.
- Until better information is obtained, the capacity targets will be assessed using daily average regional temperatures and loads.

The pilot capacity target for the Pacific Northwest is 25 percent for winter and 19 percent for summer. The generating capability of the power supply in these months should be at least this much higher than the expected peak load over the peak load hours of the day. The capacity targets are comprised of:

- A component to cover operating reserve requirements: 6 percent<sup>7</sup> for both winter and summer, and
- A component to cover planning adjustment reserve requirements: 4 percent for winter and 7 percent for summer, and
- A component to cover the load increase arising from a one-in-twenty year temperature deviation from the expected coldest/hottest day: 15 percent for winter and 6 percent for summer.

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