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August 30, 2012

MEMORANDUM

TO: Power Committee Members

FROM: John Fazio, Senior Systems Analyst

SUBJECT: Progress Report on Resource Adequacy for 2017

The region's most recent official resource adequacy assessment was published in the Council's 6th Northwest Power Plan in 2010. That assessment concluded the region was expected to have adequate resources through 2015 but that the likelihood of summer capacity shortfalls was on the cusp of the adequacy threshold. In 2011 the Resource Adequacy Forum's methodology was peer reviewed, which led to a revised standard that the Council adopted in December of 2011. The new standard was tested last year and the analysis concluded (unofficially because it was a test) that the region would continue to have adequate resources both for energy and capacity needs through 2015.

Since then the Forum has upgraded the hourly hydro dispatch algorithms in its analytical tool (the GENESYS model) in order to more accurately assess capacity needs. Using the enhanced model, the Forum has undertaken its annual task to assess the adequacy of the power supply five years into the future. The Forum steering committee is meeting today to discuss preliminary results of that assessment for 2017.

At the Forum steering committee meeting, members will be presented a list of changes that have occurred in the region since the last (unofficial) adequacy assessment. The changes include:

- The region's loads are expected to grow by about 300 average megawatts (or about a 0.7 percent annual rate) between 2015 and 2017, net of conservation savings.
- During the same time period, only about 100 megawatts of new thermal generation is expected to become operational (must be sited and licensed to be included in the analysis) and about 250 megawatts of new small hydro and hydro upgrades should be realized.

- Wind generation serving Northwest loads is expected to grow from about 3,100 megawatts to about 4,400 megawatts.
- Unfortunately, this increase in wind generation decreases the hydroelectric system's peaking capability because the hydro system must carry higher incremental and decremental within-hour balancing reserves.
- In addition, a newly developed temperature-correlated synthetic wind data set is being used to simulate wind's hourly generation patterns.
- Finally, changes to generating resources in California may cause winter on-peak market imports from the southwest to drop from about 3,200 megawatts to somewhere around 1,700 megawatts.

Analysis to date indicates that, in aggregate, all of these changes will increase the loss of load probability (i.e., meaning a less adequate supply). Further data checking and refinement of the analysis is underway. Once that is completed, results will be presented to the Council and a new official resource adequacy assessment can be released.

A summary of today's Forum steering committee meeting will be sent under separate cover to Power Committee members.

Progress on Resource Adequacy Assessment for 2017



Outline

- Adequacy assessment process
- Adequacy assessment history
- Basic assumptions
- Uncertainties
- Draft results
- The “Message”

Adequacy Assessment Process

- **Council** – Adopts standard, issues assessment
- **Steering Committee** – Co-chaired by Council and BPA; Develops standard, sets policy assumptions, approves assessment (Utilities, PUDs, PUCs, states, federal, tribes, others)
- **Technical Committee** – Co-chaired by Council and BPA; Reviews data, assumptions and results (Utilities, PUDs, PUCs, states, federal, tribes, others)
- **Technical Committee Working Group**
Bulk of technical work; reviews data, assumptions and results (Council staff, BPA staff and contractors)
- **Council staff** – Analysis and review prior to forwarding results to the technical committee working group

Adequacy Assessment History

- **1998** – Concern about the large load/resource balance deficit
- **1999** – Ad-hoc committee recommended using LOLP
- **2000** – First assessment yields a 24% LOLP (very bad)
- **2001** – West Coast energy crisis
- **2005** – Resource Adequacy Forum is created
- **2007** – Unofficial assessment shows an adequate power supply
- **2008** – Council adopts first NW adequacy standard
- **2009-10** – Adequacy methodology peer reviewed
- **2010** – Council's 6th power plan shows a 5% LOLP for 2015
- **2011** – Council revises the adequacy standard
- **2012** – Draft 2017 assessment: LOLP likely higher than 5%

Assumptions

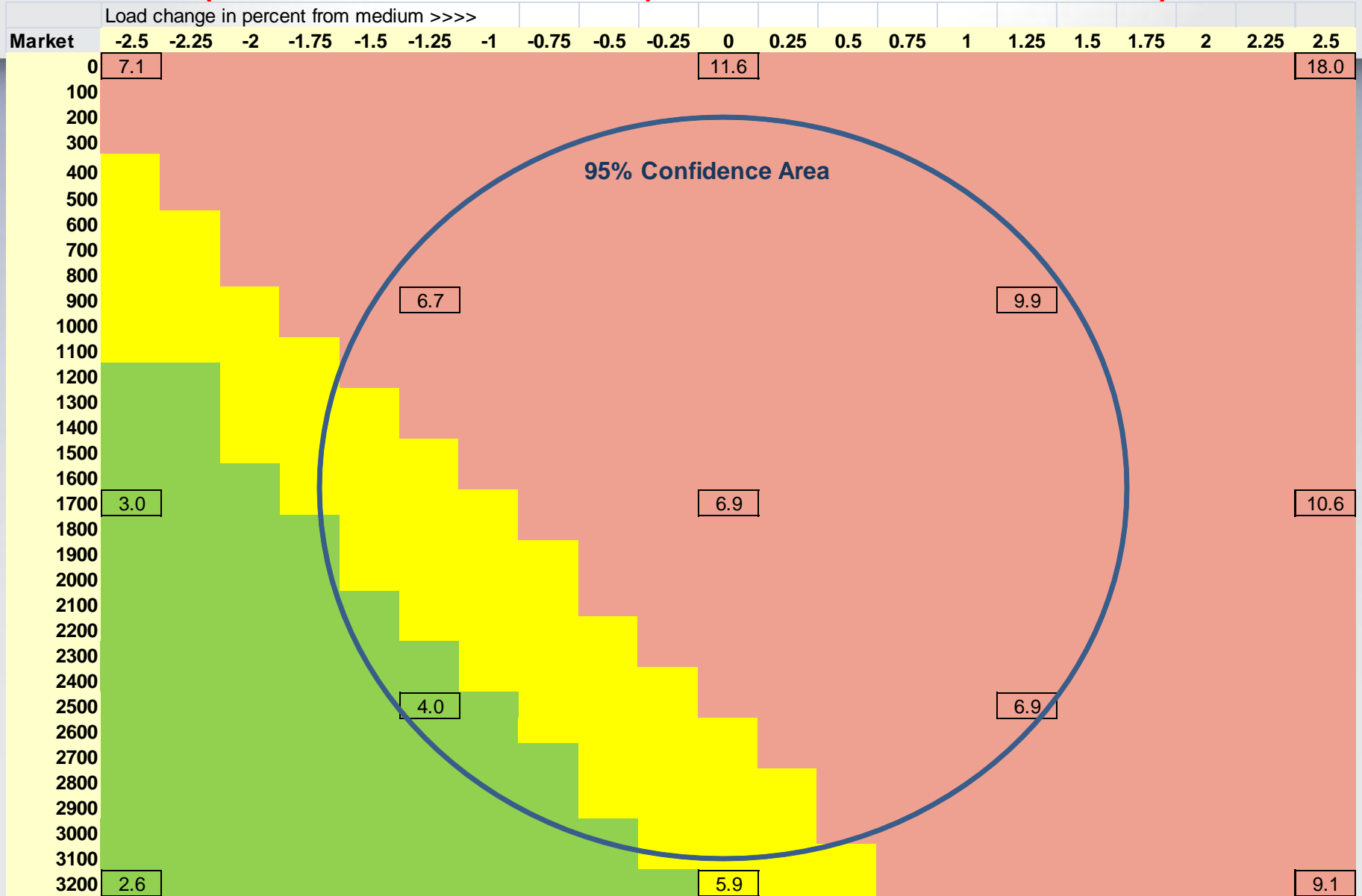
- Existing resources (sited and licensed)
- 6th Power Plan conservation
- Market supplies
 - NW: all in winter, 1,000 MW in summer
 - SW on-peak: 1,700 MW winter, 0 in summer
 - SW off-peak: 3,000 MW year round

Uncertainties

- Explicitly modeled
 - Water supply
 - Temperature load variation
 - Wind
 - Forced outages
- Not modeled
 - Economic load growth
 - Uncertainty in SW market
 - Variations in maintenance schedules
 - Systemic variations in wind modeling

Draft Results

(For Discussion Only – Not for Distribution)



Expected Changes 2015-17

- **2015 LOLP = 5% (6th Power Plan)**
- Loads increase by about 300 MWa
- Resources up about 100 MW
- Wind increases 1,300 MW
- Hydro increases by 270 MWa
- SW winter market decreases by 1,300 MW
- **Draft 2017 LOLP ~ 6% to 7%**

The Message

- Relying only on existing resources and conservation yields a power supply with a likelihood of curtailment above our tolerance level
- Single LOLP value doesn't tell whole story
- LOLP is likely to be greater than 5%
- Does not mean a recurrence of the 2001 crisis
- The “gap” can be filled by generating resources, demand response or more conservation.
- But that is a separate process from an adequacy assessment