2020 Adequacy Assessment
Key Assumptions/Action Items

RAAC Steering Committee Meeting
March 9, 2015
Counting Resources

- Thermal – sited and licensed
- Wind/Solar – sited and licensed
- Energy Efficiency – 6th plan targets
- Demand Response
  - Existing – counted in the load forecast
  - New – added to standby resources
- Standby Resources
  - Not modeled explicitly
  - Included in post processor to assess final LOLP
Gas Supply Limitations

• Current Assumption: no gas limitation

• Options
  • Reduce gas availability (gas-fired generation) by fixed amount when NW temperatures are extreme
  • Make gas-fired generation availability a function of NW temperature
Capacity/Energy Values for Wind and Solar

- Current Assumptions
  - Wind Energy = 30%
  - Wind Capacity = 5%

- Options
  - Calculate Energy/Capacity ELCC for wind
  - Do the same for solar (need data)
Market Supply

- In Region – IPP
  - Winter - full capability (~ 3,200 MW)
  - Summer – 1,000 MW
- Spot Market – during hour of need
  - Winter – 2,500 MW over all hours
  - Summer – none
- Purchase Ahead
  - 3,000 MW limit
  - Month, week and day ahead
Market Supply (cont’d)

- Limiting factor is the S-to-N intertie limit
- Historic winter on-peak limit ranges from 1,500 MW to 4,500 MW (see next slide)
- Intertie limit set to 3,400 MW
Historic S-to-N Intertie Limit

Percent Limit is Equal to or Less Than - February

S-to-N Intertie Scheduling Limit (MW)

Percentile

Northwest Power and Conservation Council

nwcouncil.org
Market Friction

- Current Assumption – not modeled

- Options
  - **Out-of-region imports**: apply more severe limits to max available
  - **In-region**: Reduce availability of IPPs
  - Apply reduction as a function of severity of potential shortfall
Load Forecast

- Comparison to NRF loads
  - Similar monthly shape
  - Extreme winter peaks seem high
  - Summer peaks seem low
- Council staff is looking into this
Within-hour Balancing

• Current Assumptions
  • For BPA BA only
  • Carried by federal hydro
  • Incorporated INC/DEC directly into peaking

• Options
  • Extrapolate BPA need to entire region
  • Develop method to use thermal resources to carry remaining balancing reserves
Modeling Issues

- 3-Node Configuration
  - Split off southern Idaho
  - Code in place but problem with hydro correlation due to 1-dam model representation
  - Will consider using multi-dam logic for future

- Capacity Assessment
  - Aggregating hydro (1-dam) for hourly dispatch may be too blunt
  - Consider developing multi-dam logic for future
Future Considerations

- Review adequacy standard
- LOLP may not be precise enough metric
- Consider using Expected Unserved Energy (EUE) and Loss of Load Hours (LOLH) both adopted by NERC to measure adequacy
- Will need to develop new thresholds for EUE, LOLH or both
Additional Slides
## New and Standby Resources

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal</td>
<td>Sited and licensed</td>
<td>Sited and licensed</td>
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<tr>
<td>Wind</td>
<td>Sited and licensed (e.g. not RPS)</td>
<td>Sited and licensed (e.g. not RPS)</td>
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<tr>
<td>Existing demand response</td>
<td>In load forecast</td>
<td>In load forecast</td>
</tr>
<tr>
<td>New demand response</td>
<td>In standby resources</td>
<td>In standby resources</td>
</tr>
<tr>
<td>Standby resources energy</td>
<td>40,800 MW-hours</td>
<td>40,800 MW-hours</td>
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<tr>
<td>Standby resources capacity</td>
<td>623/833 winter/summer where winter = Oct-Mar, summer = Apr-Sep</td>
<td>623/833 winter/summer where winter = Oct-Mar, summer = Apr-Sep</td>
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<tr>
<td>Energy Efficiency magnitude</td>
<td>Council 6th plan targets</td>
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<tr>
<td>Energy Efficiency shape</td>
<td>Same as load</td>
<td>Same as load</td>
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# Market Supplies

<table>
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<tr>
<th>Assumptions</th>
<th>2019</th>
<th>2020</th>
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</thead>
<tbody>
<tr>
<td>NW market winter, where winter = Nov-May</td>
<td>3,467 MW (full IPP)</td>
<td>3,219 MW (full IPP)</td>
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<tr>
<td>NW market summer, where summer = Jun-Oct</td>
<td>1,000 MW</td>
<td>1,000 MW</td>
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<tr>
<td>BC market</td>
<td>0 MW</td>
<td>0 MW</td>
</tr>
<tr>
<td>Southern Idaho market</td>
<td>0 MW</td>
<td>0 MW</td>
</tr>
<tr>
<td>SW winter spot market</td>
<td>2,500 MW (on peak only)</td>
<td>2,500 MW (all hours)</td>
</tr>
<tr>
<td>SW winter purchase ahead</td>
<td>3,000 MW (off peak)</td>
<td>3,000 MW (off peak)</td>
</tr>
<tr>
<td>SW summer spot market</td>
<td>0 MW</td>
<td>0 MW</td>
</tr>
<tr>
<td>SW summer purchase ahead</td>
<td>3,000 MW (off peak)</td>
<td>3,000 MW (off peak)</td>
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<tr>
<td>Maximum SW import limit</td>
<td>3,400 MW</td>
<td>3,400 MW</td>
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## Within-hour Balancing Reserves

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<tr>
<th>Assumptions</th>
<th>2019</th>
<th>2020</th>
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<tbody>
<tr>
<td>Fed Hydro balancing reserves</td>
<td>900 MW INC</td>
<td>900 MW INC</td>
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<tr>
<td></td>
<td>1100 MW DEC</td>
<td>1100 MW DEC</td>
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<tr>
<td>Non-Fed Hydro reserves</td>
<td>Not modeled</td>
<td>Not modeled</td>
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<tr>
<td>Non-hydro balancing reserves</td>
<td>Not modeled</td>
<td>Not modeled</td>
</tr>
<tr>
<td>New balancing reserves</td>
<td>Not modeled</td>
<td>Not modeled</td>
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<tr>
<td>Energy Imbalance Market</td>
<td>Not modeled</td>
<td>Not modeled</td>
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<tr>
<td>Borrowed hydro</td>
<td>1000 MW-periods</td>
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