Resource Adequacy Advisory Committee

Key Modeling Assumptions

Steering Committee Meeting
December 6, 2013

Topics

- What the Steering Committee provides
- Key Assumptions
  - Topography
  - Modeled uncertainties
  - Uncertainties not modeled explicitly
  - New & standby resources
  - Market supplies
  - Within-hour balancing reserves
- Study approach

What the Steering Committee Provides

- Review of key assumptions
- Review of study approach
- Comments and suggestions

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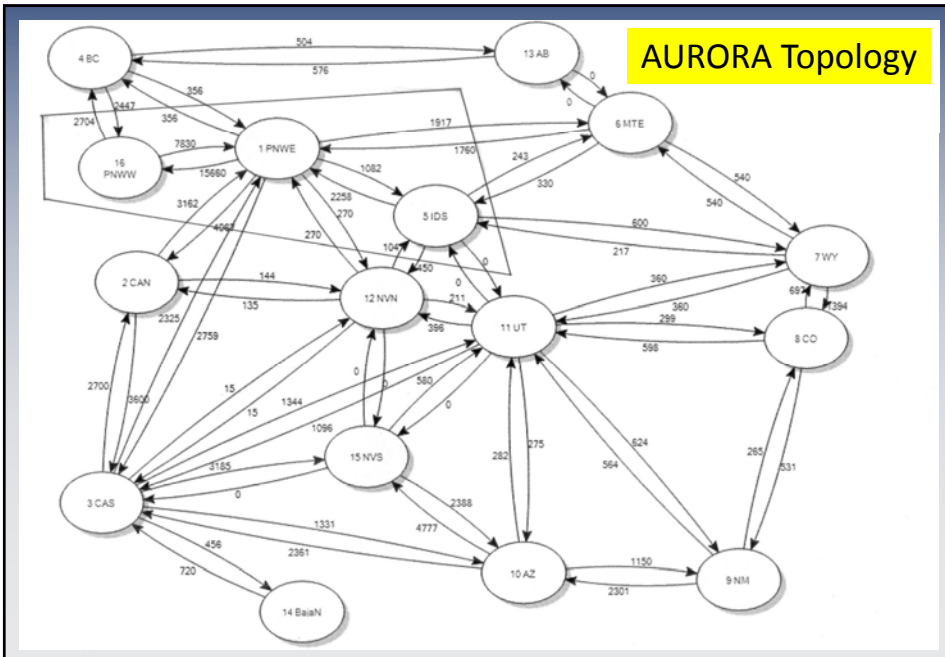

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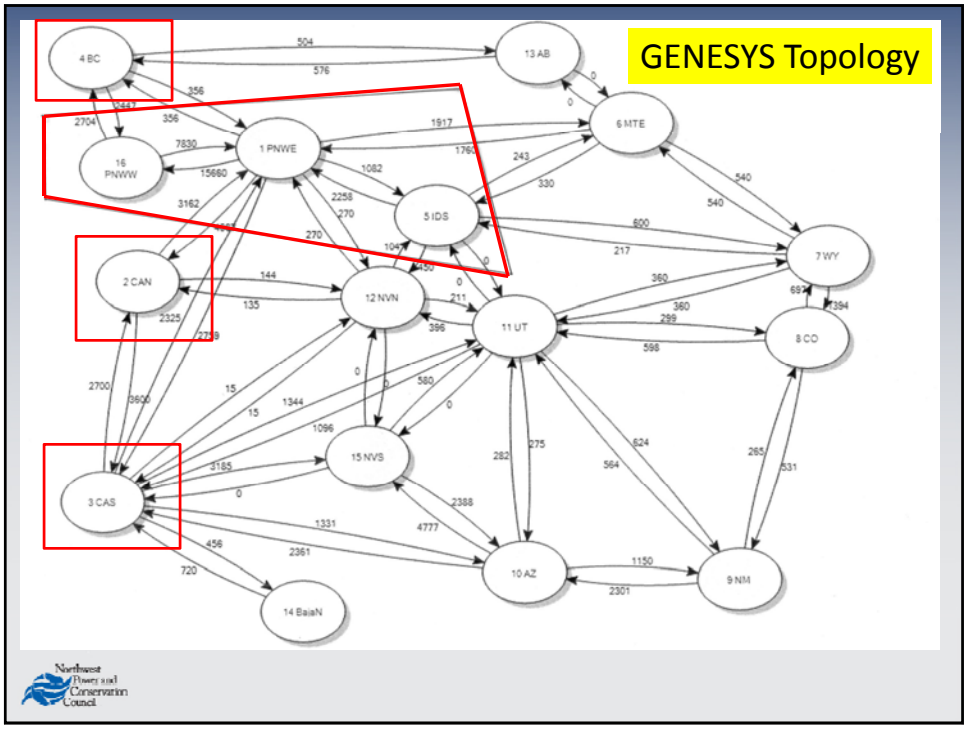
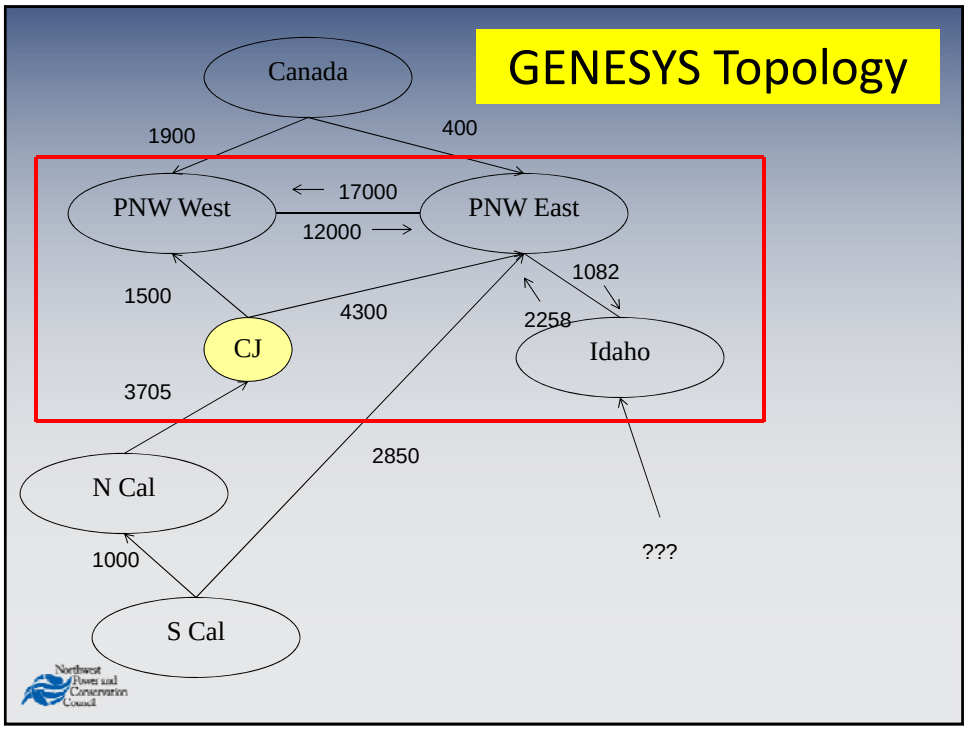

GENESYS Topology
4 BC
13 AB
6 MTE
16 PNWW
1 PNWE
5 IDS
7 WY
2 CAN
12 NVN
11 UT
8 CO
15 NVS
3 CAS
10 AZ
9 NM
14 BajaN


GENESYS Topology
Canada
1900
400
PNW West
17000
12000
PNW East
1500
4300
1082
2258
CJ
Idaho
3705
2850
N Cal
???
1000
S Cal

Major Resources Modeled in the Idaho Node

- Bennett Mountain
- Danskin
- Bridger
- Langley Gulch
- North Valmy

Modeled Uncertainties

1. Columbia River flows
2. Temperature (load variation)
3. Wind generation
4. Forced outage of thermal resources

Modeled Uncertainties

Assumptions	2017	2019 (proposed)
Operating Year	Oct 2016 to Sep 2017	Oct 2018 to Sep 2019
Number of Games	6160 (all comb hydro and wind)	6160
Random Thermal Outage	On	On
Water year selection	Sequential	Sequential (random not ready)
Water year range	80 years historic 1929-2008	80 years historic 1929-2008
Temperature year selection	Random	Random
Temperature year range	77 years 29-05 (to match wind)	77 years 29-05 (to match wind)
Wind year selection	Random (lockstep with temp)	Random (lockstep with temp)
Wind year range	77 years synthetic 1929-2005	77 years synthetic 1929-2005
Wind/temp uncertainty	No, 1 wind set per temp year	Random 20 sets per temp year

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Uncertainties Not Modeled Explicitly

- Economic load growth (not temp related)*
- Market availability*
- Climate change
- Policy impacts
  - Carbon tax
  - Columbia River Treaty
  - Changes to fish and wildlife operations
- Fuel/electricity prices
- Fuel supply

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*Were used last year for sensitivity analysis.

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New and Standby Resources

Assumptions	2017	2019 (proposed)
Thermal	Sited and licensed	Sited and licensed
Wind	Sited and licensed	RPS
Solar	Not modeled	TBD
Demand response	In standby resources	In standby resources
Load call back provisions	In standby resources	In standby resources
Standby resources energy*	83,000 MW-hours	41,650 MW-hours
Standby resources capacity*	660/720 MW winter/summer	673/733 winter/summer
Energy Efficiency magnitude	Council 6th plan targets	Council 6th plan targets
Energy Efficiency shape	Same as load	Same as load

*The effects of existing (and implemented) standby resources are assumed to be incorporated into the load forecast.

Market Supplies

Assumptions	2017	2019 (proposed)
NW market winter	3,451 MW (full IPP)	3,451 MW
NW market summer	1,000 MW	1,000 MW
BC market	0 MW	TBD
Southern Idaho market	Not in model	TBD
SW market winter on-peak	1,700 MW	TBD
SW market winter off-peak	3,000 MW (purchase ahead)	TBD
SW market summer on-peak	0 MW	TBD
SW market summer off-peak	3,000 MW (purchase ahead)	TBD
Maximum SW import limit	3,200 MW	TBD

Within-hour Balancing Reserves

Assumptions	2017	2019 (proposed)
Fed Hydro balancing reserves	900 INC and 1100 DEC	900 INC and 1100 DEC
Non-Fed Hydro reserves	Not modeled	TBD
Non-hydro balancing reserves	Not modeled	TBD
New balancing reserves	Not modeled	TBD
Energy Imbalance Market	Not modeled	Not modeled
Borrowed hydro	1000 MW-periods	1000 MW-periods
Hydro constraints	Draft 2017 regulation	Final 2019, new BiOp

Review of Study Approach

- Key assumptions for reference case
- Assess LOLP for reference case
- If > 5%, assess needed capacity/energy to comply with standard
- Design sensitivity studies based on non-modeled future uncertainties
- Build LOLP surface chart