

Resource Adequacy Advisory Committee

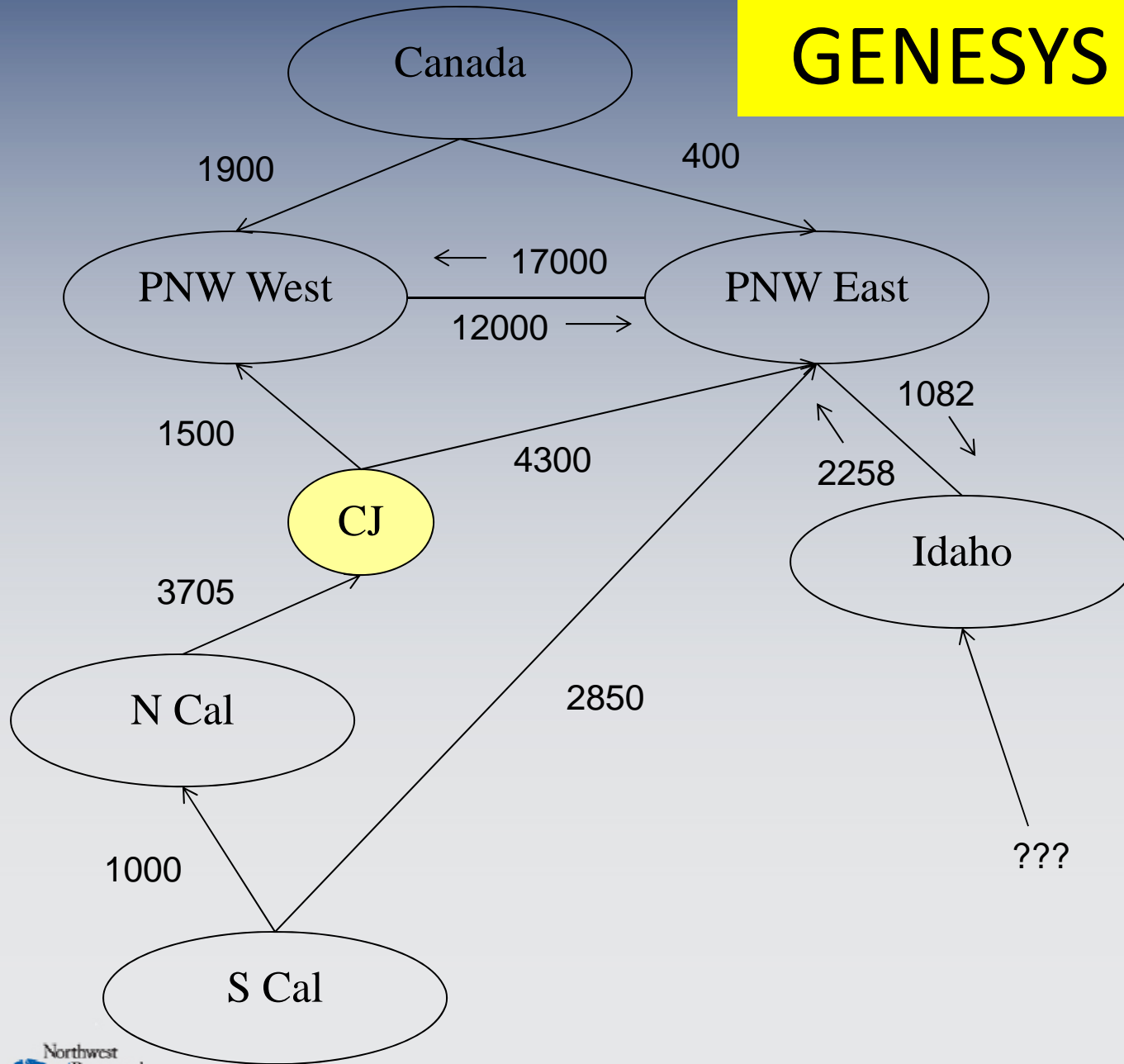
Modeling Approaches

Technical Committee Meeting
November 20, 2013

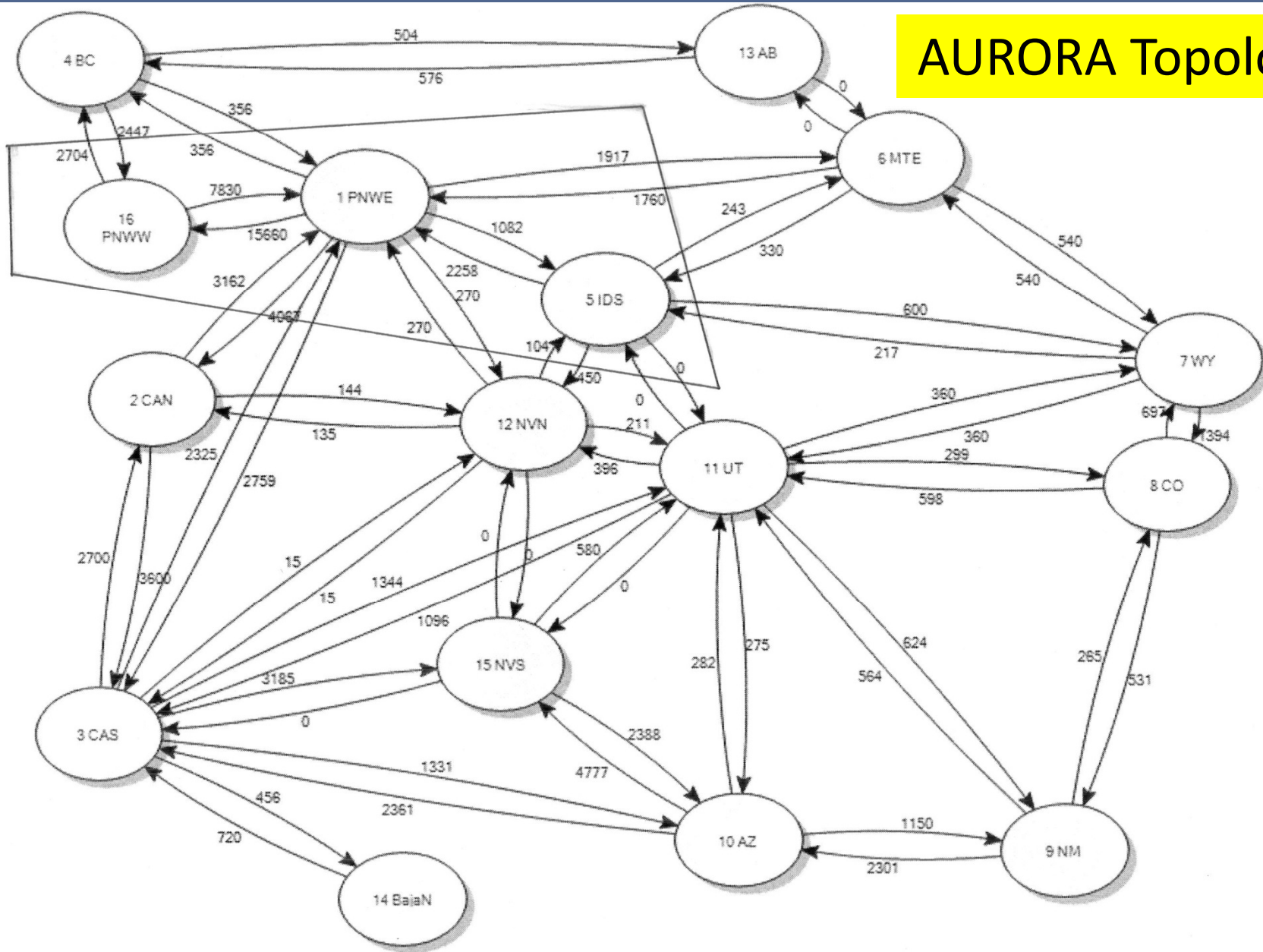
Topics

- **Topography**
- **Modeling Assumptions**

GENESYS Topology



AURORA Topology



Major Resources Modeled in the Idaho Node

- **Bennett Mountain 180 MW**
- **Danskin 275.4 MW**
- **Bridger 2120 MW**
- **Langley Gulch 300 MW**
- **North Valmy 261 MW**

Modeling Assumptions

Random Variables

- Hydro: Sequential 1929-2008
- Temp/Load: Random 1929-2005
- Wind:
 - Lockstep with temp (1929-2005)
 - 20 wind profiles for each temp year
- Thermal Forced Outage: On

Major Uncertainties Not Modeled Explicitly

- Economic load growth (not temp related)*
- Market availability*
- Climate change
 - Impacts to load
 - Changes in river flows
- Policy impacts to resource development/costs
- Fuel/electricity prices
- Fuel supply

Specific Assumptions

Random Variables

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

Specific Assumptions Markets

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	0 MW
Southern Idaho market	Not in model	Unknown
SW market winter on-peak	1,700 MW	Unknown
SW market winter off-peak	3,000 MW (purchase ahead)	Unknown
SW market summer on-peak	0 MW	Unknown
SW market summer off-peak	3,000 MW (purchase ahead)	Unknown
Maximum SW import limit	3,200 MW	Unknown

Specific Assumptions

New Resources

Assumptions	2017	2019 (proposed)
Thermal	Sited and licensed	Sited and licensed
Wind	Sited and licensed	RPS or Sited and licensed?
Solar	Not modeled	Unknown
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	Unknown
Standby resources capacity*	660/720 MW winter/summer	Unknown
Energy Efficiency magnitude	Council 6 th plan targets	Council 6 th 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.

Specific Assumptions

Thermal

Assumptions	2017	2019 (proposed)
Seasonal capacity	Off	On, if model allows
Ramp rates	Off	On (needs testing)
Coal day must run	On	Off, if ramp rates are used
CGS (nuke) maintenance	All of May and June	Part of May and June
Coal maintenance	Reduce cap based on aggregate	Reduce cap based on aggregate
Gas maintenance	Reduce cap based on aggregate	Reduce cap based on aggregate
Operating reserves	7% Hydro/5% Thermal	7% Hydro/5% Thermal

Specific Assumptions

Other

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