Meeting Summary

NorthWestern Energy Electric Technical Advisory Committee

Butte, Montana

May 24, 2018, Open Meeting Process Discussion Only

Attendance:

Those participating in or attending the Electric Technical Advisory Committee (ETAC) meeting in person or via the web and by teleconference included:

ETAC Member Organization	Attendees
Consumer at Large	Chris Pope
District XI Human Resource Council	Tom Power
Northwest Energy Coalition	Diego Rivas
Montana Consumer Counsel	Jamie Stamatson
Montana Department of Environmental Quality	Jeff Blend
Montana Environmental Information Center	Brian Fadie
Montana Public Service Commission	Will Rosquist
MPSC Consultants	
- Ecosystems Research Group	Ben Fleischmann
- Synapse	Rachel Wilson
Natural Resources Defense Council	Chuck Magraw
Northwest Power and Conservation Council	Brian Dekiep
	John Fazio

Organization	Attendees
ETAC Facilitator	Beki Brandborg
Ascend Analytics	Gary Dorris
NorthWestern Energy	Bleau LaFave
	Frank Bennett
	John Bushnell
	Joe Stimatz
	Mike Babineaux
	John Hines
	Todd Johnson
	Jim Williams
	Todd Guldseth
	Bill Thompson

Agenda:

1. MPSC Notice of Commission Action – Will Rosquist
2. 9:30 - NWPPC Regional Adequacy – John Fazio, NWPCC (by phone)
3. VER Integration Study – Casey Johnston
4. PowerSimm – Gary Dorris, Ascend Analytics
5. Update on HDR Resource Definitions – John Bushnell
6. Future Meeting Dates

MPSC Notice of Commission Action N2015.11.91

An overview was provided about the consultant hired through a request for proposal process (RFP) by the Montana Public Service Commission to provide technical input to the planning process.

Question – What exactly is the scope and what is the consultant looking for in the plan?
Answer – Evaluation of the load growth and base assumptions including the optimization algorithm, price forecasts, and a general gage of the planning process.

ETAC –Discussion regarding the need for a consultant. Historical context was provided with a good discussion including the following topics:

- Transparency
- Montana Statutes and Rules
- The necessity of a deep dive into PowerSimm when RFP process ultimately decides resources
- PowerSimm modeling inputs and definitions

NWPCC Regional Resource Adequacy

The NWPCC presented an overview of its latest regional resource adequacy study focusing on the next five years. The full council has not approved the final draft, but is expected to at its' next meeting. The Genesis model is the basis for the council's assessment and includes a loss of load probability with a target of <= 5%. A full 8760 hours for the region is modeled hourly using stochastic runs of 7,040 variations of temperature and stream flow data. They also incorporate the base with consideration for Canada, southwest U.S.A. and the NWPCC region of the pacific-northwest.

Question – What does net demand mean?
Answer – The model assumes everyone in the region shares each resource as if it is one balancing area (BA) with no transmission constraints. The generation is adjusted for contracts outside of the region and considers thermal and hydro availability.

Question – Does it take into account net metered or behind the meter generation?
Answer – Yes, to the extent known it adjusts for net metering customers like rooftop solar.

Question – In the past there was a certain import for IPP's?

Answer – The model assumes all output is available only during winter months, but in summer months only one-third will be available.

Question – Do you model spin/non-spin or regulation?
Answer – Yes they are included in INC and DEC of approximately 900 MW of hydro and 900 MW of thermal generation with an adjustment for hydro.

Question – Doesn't the model assume that the entire region is one big happy family and everyone shares?
Answer – Yes, but the council realizes this is a shortfall and intends to address this with several nodes to represent the individual BAs within the region.

ETAC – There was a general back and forth discussion about the modeling of reliability based control (RBC) and reserves throughout the region compared to how it is viewed by RTOs. The council believes the 5% LOLP margin in the model is the correct limit.

Question – Is the resource stack fixed or what is in the future?
Answer – It changes with the heat rate but assumes in winter that there is about 2,500 MW of imports available out of region from October through April but zero the remainder of the year.

Question – What are sensitivities of the model?
Answer – The biggest is the hydro's that lead to curtailments in high temperature and bad hydro years.

ETAC -- The final LOLP exceeding the 5% limit after 2020 was discussed with the need for 300 MW blocks of generation to fill the gaps in 2021 and 2022. Impacts and discussion included:

- Reserves
- Demand response
- Variable resource capacity
- Eastern limit of planning region
- Double counting in using reserves
- Run of river vs. storage capability
- Summer problems seen in future years
- 7th Power Plan is the basis

Ascend Analytics Modeling in PowerSimm™

Ascend presented an extensive overview of the analysis used in developing inputs and modeling resources for the 2018 Plan including changing market dynamics, forecasting, and resource definitions, adequacy, and valuations.

Question – On the Pacificorp IRP for renewable resources, is this a concern?
Answer -- We need to capture the impact of variable resources on the market. There is no longer a need for baseload resources, the need is in flexible resources to meet the increased market volatility.

Question – Can PowerSimm capture economics and operational components?
Answer – How you model the future states sets this background. Operational components are a background engineering problem.

ETAC – General discussion about resource costs in the WECC and market equilibrium considering market changes caused by variable resources including:

- Increase negative prices
- Connection between oil and natural gas prices
- Forecast escalation of market prices, volatility
- Developer impacts
- Changing implied heat rate
- Intra hour price spikes
- Decker node in MT

ETAC – Good discussion about market volatility and the use of batteries for limiting intra hour price spikes to help reduce customer cost. Using batteries as energy resources is not yet economic but they are good at providing hourly and intra-hour capacity.

ETAC – Discussion regarding market participation in the region including membership requirements, membership advantages/disadvantages, price impacts, renewable additions, and market volatility. Discussion included:

- DSM restrictions
- Geographic diversity in SPP and Texas
- Renewables as baseload energy
- Batteries and ICE units
- Renewables are driving market prices down, to the point that new renewables are not cost effective; “renewables are pushing out renewables.”

PowerSimm utilizes mixed integer linear programming to select optimal portfolio out of a fleet of resources. NorthWestern will model other scenarios in addition to using the optimization module. A good discussion between participants covered:

- Constraints
- Reliability
- Generic resources
- Reserve margin 12%
- Resources and associated capacity contribution
- Organized market pressure - loss of market capacity
- Lead time to acquire flexible capacity
- RTO rules

The variability currently in the market will define our modeling need, but the RFP responses will define what the market is willing to offer to fill that need which may or may not be what was included in the Plan. No one today knows what will be available in 2022.

Variable Energy Resource (VER) Integration Study

NorthWestern presented the draft VER study report prepared by Navigant. Navigant was tasked with first modeling NorthWestern's existing system and then modeling the impacts of different levels of variable resources in NorthWestern's Queue and expected to come on-line. The Storm model was used to model minute-to-minute regulation resources and 15-minute load following resources. Historical data from July 2016 through June 2017 was used to incorporate current operating practices under RBC.

Question – How do you define the existing system?
Answer – The existing wind on our transmission system are used for the historical period.

Generic regulating resources were requested for modeling to avoid needing to duplicate the existing DGGS. The model output was compared with DGGS and it validated what was observed using DGGS for regulation. The modeling covered CPS1, INC, DEC, inadvertent, and other balancing area requirements of NERC and the WECC.

The study results depend on location and if future resources come on-line that are clustered or are not in the locations of queue projects then the results will be different. Navigant recommended a 1% threshold and NorthWestern agrees because a 0% would be very costly.

Question – Geographic diversity, does it impact the requirements here?
Answer – Geographic diversity has a diminishing effect as more wind resources are added.

ETAC will be provided the full report when final checks are completed.

Future ETAC Meeting Dates

June 22 meeting to be in Butte [meeting was moved to July 2, 2018].

July 31, 2018 meeting will be in Helena.

Note: Committee members provide advice to NorthWestern as individual professionals; the advice they provide does not bind the agencies or organizations that the members represent.