

# ETAC WORKSHOP AGENDA

## PLANNING FOR TOMORROW'S NEEDS & MARKET DYNAMICS

April 26 and 27, 2017 – 8:30AM

**NorthWestern Energy  
Lower Level Conference Room  
Octagon Building  
1313 N. Last Chance Gulch  
Helena, Montana**

**There is no call-in number for this meeting**

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### **Wednesday, April 26: Model Structure and Inputs**

**8:30 – 9:00 a.m. Registration / Preliminaries**

- Defining Model Objectives for Resource Evaluation
  - Consistency of physical operations and market dynamics
  - Determining and capturing constraints of flexible resource adequacy
  - Realizing “least cost and least risk” resources
  - Emerging market dynamics of WECC and MT
  
- Principal Model Drivers for Asset Valuation
  - Forward/forecast prices used
    - Fuel
    - Power
    - Hydro flows
  - Implications of weather on during delivery conditions
    - load
    - renewable generation
    - power prices
  - Fundamental determinants of the volatility of power prices
    - Impact of renewables on market price volatility
    - Flexible resource shortage
  - Long-run equilibrium evolution to high renewable penetration rates
    - Why traditional, thermal generation can't earn a “normal” return
    - How to establish new equilibrium conditions
    - Integrating regional fundamentals with long-run expectations of new generation costs

**10:30-10:45 a.m. Break**

- Assessing Over-supply Conditions and Their Price Ramifications
  - Potential and extent over the next decade of over-supply conditions
  - Impact of over-supply on market price dynamics

- Implications for cost-of-service and value of generation
  - Changing market price shapes
- Validation results
  - Forward price simulations
    - Gas prices
    - Power prices and implied heat rates, price paths
  - Weather
  - Load
  - Renewables
  - Spot

### **12:15-1:15 p.m. Break**

- Determination of resource adequacy
  - Capacity resource adequacy
  - Flexible resource adequacy as a function of renewables generation
    - Impact of resource diversity of solar vs wind
    - Impact of spatial diversity of solar and wind
- Evaluation of Flexible Generation Technologies
  - Regulation, ramping, and load-shifting
  - Capacity creation from thermal resources
  - EIM implications
    - Economics of Batteries
    - Economics of Internal Combustion Engines (ICE) and aero derivative engines
    - CT's
    - Pumped Storage
    - Power Purchase Agreements

### **2:45-3:00 p.m. Break**

### **PowerSimm Training**

- PowerSimm Configurations
  - Portfolio editor components
  - Market curves
  - Simulation parameters
  - Generation assets
- Current portfolio operations
  - Stations report of generation operations
  - Position report
  - Market interactions
  - Sample view of hourly dispatch
    - Energy
    - Ancillary services

**Thursday, April 27: PowerSimm Training - Continued from Wednesday  
Afternoon**

<b>8:30 – 9:00 a.m.</b>	<b>Registration</b>
<b>9:00 – 10:30 a.m.</b>	<b>PowerSimm Training</b>
<b>10:00-10:45 a.m.</b>	<b>Break</b>
<b>10:45-11:45 a.m.</b>	<b>PowerSimm Training</b>