NorthWestern Energy Public Meeting

November 29, 2017

John Bushnell - Manager of Energy Supply Planning & Regulatory
Joe Stimatz - Manager of Asset Optimization
Electric Provider
**MONTANA:**
- 353,600 customers in 187 communities

**SOUTH DAKOTA:**
- 62,500 customers in 110 communities

Natural Gas Provider
**MONTANA:**
- 189,000 customers in 105 communities

**NEBRASKA:**
- 42,000 customers in 4 communities

**SOUTH DAKOTA:**
- 45,500 customers in 60 communities

- Forecast supply need
- Plan for new gas & electric resources
- Acquire new supply, balance system
- Operate & maintain generation fleet
- Operate electric trading floor
Primary purpose of today’s public forum is to discuss technologies that could be used to help meet our customers’ energy needs

- Inform NorthWestern
- Inform NorthWestern’s Electric Technical Advisory Committee (ETAC)
• Resource planning process is defined by law
  – “A utility should routinely communicate with the commission and stakeholders regarding portfolio planning and resource procurement activities”
  – “A utility should use an independent advisory committee of respected technical and public policy experts as a source of upfront, substantive input to mitigate risk and optimize resource procurement outcomes in a manner consistent with these guidelines.”
  – “Provide customers adequate and reliable electricity supply services, stably and reasonably priced, at the lowest long-term total cost.”

• Resource planning process (greatly simplified)
  – Identify resource needs
  – Identify resource alternatives
  – Optimize resource additions to achieve objectives
Load Composition by Customer Class

Residential and GS-1 Secondary account for approximately 85% of energy supply load serving obligation.
• **Retail Load Forecast**
  
  – Forecast load growth for base case is 0.8%, including losses and net of DSM (red line)
  
  • Low load growth scenario 0.4%
  
  • High load growth scenario 1.2%
2014 Retail Load Shape (MW)
(including losses)

Heavy Load Hours: Hour Ending 7 through 22 (Pacific Prevailing Time)
Monday through Saturday excluding NERC Holidays

- Winter Peak Day
- Summer Peak Day
- Average of All Days
- Minimum Load
Variations in Loads and Resources Over a Two Day Period (modeled)
Energy Balance – Heavy Load Hours

NorthWestern Energy EOP
Monthly 5-Year Heavy Load Hours

- Maximum Wind
- Minimum Wind

- Hydro Rate Based Assets
- Colstrip Unit 4
- Basin Creek
- DGGS (Optimized)
- RFP (Morgan, PPL, Transalta)
- Small Hydro PPA
- Distributed Gen. (Rbottop Solar)
- Tier II O&M (No Wind)
- Small QF-1 with Solar
- Wind (Boson, Judith, QF)

- Maximum Wind (Nameplate)
- Minimum Wind (No Generation)

Retail Load with DSM
NWE’s Capacity deficits are very large and grow over time

- Winter Peak
- Winter Peak + 15%

368 MW Deficit
688 MW Deficit
NorthWestern Energy
2017 Resource Mix
(Including contracted and ordered)

- **Wind**: 448 MW (4.7% Nameplate Capacity, 4.7% Capacity Contribution)
- **Hydro**: 466 MW (51% Nameplate Capacity, 51% Capacity Contribution)
- **Coal**: 222 MW (93% Nameplate Capacity, 93% Capacity Contribution)
- **Natural Gas**: 202 MW (95% Nameplate Capacity, 95% Capacity Contribution)
- **Thermal QF**: 87 MW (58% Nameplate Capacity, 58% Capacity Contribution)
- **Solar**: 97 MW (6.1% Nameplate Capacity, 6.1% Capacity Contribution)
2015 Plan - Comprehensive Evaluation

20-year portfolio simulation results:

- $5.944M
- $5.922M
- $5.482M
- $5.624M
- $5.462M
- $5.726M
- $5.72M
- $5.549M
- $5.607M
- $5.502M
- $5.378
- $5.241
- $5.127
- $5.084
- $5.031
- $4.988
- $4.945
- $4.893
- $4.841
- $4.788
- $4.736
- $4.684
- $4.632
- $4.581
- $4.529
- $4.477
- $4.425
- $4.373
- $4.321
- $4.269
- $4.217
- $4.165
- $4.113
- $4.061
- $3.909
- $3.757
- $3.605
- $3.454
- $3.302
- $2.137
- $1.983
- $1.829
- $1.675
- $1.521
- $1.367
- $1.213
- $1.059
- $0.905
- $0.751
- $0.597
- $0.443
- $0.289
- $0.135
- $0.081
Flexible Capacity Need and Resources

Flexible Capacity Need vs. Resources

Intra-hour Need
- Within-hour INC: 150 MW
- Contingency Reserves: 65 MW
- Regulation: 50 MW

Flexible Capacity
- DGGS: 150 MW
- Basin Creek: 52 MW
- Hydro: 45 MW
- Colstrip 4: 24 MW

Total: 265 MW
Total: 271 MW
2018 resource planning process is currently underway
- Seven ETAC (Electric Technical Advisory Committee) meetings to date
- Three ETAC sub-committee meetings on modeling to date
- Today’s public meeting

2018 Resource Plan to be filed by December 15, 2018

NWE will continue to consult with ETAC and will hold at least one additional public meeting during its planning process
Delivering a bright future

NorthWestern Energy
Last 4 Years - Summer Peak

2012 Retail Load Shape (MW) (including losses)
- Heavy Load Hours: Hour Ending 7 through 22 (Pacific Prevailing Time)
- Monday through Saturday excluding NEHC Holidays

2013 Retail Load Shape (MW) (including losses)
- Heavy Load Hours: Hour Ending 7 through 22 (Pacific Prevailing Time)
- Monday through Saturday excluding NEHC Holidays

2014 Retail Load Shape (MW) (including losses)
- Heavy Load Hours: Hour Ending 7 through 22 (Pacific Prevailing Time)
- Monday through Saturday excluding NEHC Holidays

2015 Retail Load Shape (MW) (including losses)
- Heavy Load Hours: Hour Ending 7 through 22 (Pacific Prevailing Time)
- Monday through Saturday excluding NEHC Holidays
Last 4 Years - Winter Peak

2012 Retail Load Shape (MW) (Including losses)
Heavy Load Hours: Hour Ending 7 through 22 (Pacific Prevailing Time)
Monday through Saturday excluding NRIC Holidays

2013 Retail Load Shape (MW) (Including losses)
Heavy Load Hours: Hour Ending 7 through 22 (Pacific Prevailing Time)
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