

MODELING WORKING GROUP REPORT

June 13-14, 2023

SPS IRP Stakeholder Workshop

Presentation summary

#1 - System Resources

- Big 5 commercially available technologies
 - CC,CT
 - Wind, Solar, BESS
- Long duration energy storage
 - Xcel has 10 MW/100MWhr pilot with Form Energy
- Future CTG, CC – hydrogen, CCS capable
- Types of hydrogen
- Small modular reactors
- Linear turbine generators

#2 - Natural gas and market forecast methods

#3 – Future demand projections

Questions/Topics raised for discussion in Modeling Working Group

1. Modeling of paired solar and storage
2. Further explain modeling of investment tax credit vs. production tax credit
3. Capacity accreditation of hybrid sources – SPP “sum of the parts” method
4. Modeling of long duration energy storage (LDES) discharge
5. Cost assumptions for LDES
6. Timeline for data from Xcel pilots with LDES
7. Water usage for small modular nuclear reactors?
8. Benefits of linear generators?
9. Availability of geothermal, biomass, and hydro in SPS territory
10. Water availability for electrolysis to create hydrogen
11. Availability of water from oil and gas extraction for power generation
12. Possibility of converting coal to nuclear
13. Rate of cost decrease to recycle water from oil and gas extraction
14. Modeling of full supply chains for different resource types – renewable, hydrogen
15. Challenge of modeling uncertainty of future hydrogen supply
16. Commercial attractiveness vs. technical feasibility of hydrogen supply
17. Possibilities to model adjustments to EE, DR
18. Do loads/customers ask for green fuels?
 - a. SPS is proposing renewable connect program
19. Uncertainty in oil and gas industry load forecasts

Feedback topics

1. Developing group consensus on resource characteristics for existing technologies
2. Developing group consensus on emerging technologies to model
3. Confirmation of NG forecast methods
 - a. SPS provides Hi, Lo, and Base pricing
 - b. Group confirms method/assumptions
4. Confirmation of SPP market pricing
 - a. SPS provides pricing information
 - b. Group confirms methods/assumptions
5. Deeper dive on components of demand forecasts and alternative scenario(s) with demand-side resources - Demand-side resource modeling subgroup formed to address this

Workplan

Post-workshop homework

- SPS provides Natural Gas (NG) and SPP market price information
- SPS sends scenario request form to stakeholders
 - Requests should be submitted as soon as feasible

June 30

- Sub-group discussion on demand-side resource modeling and developing scenario(s)
- Stakeholder scenario modeling requests are due
- Stakeholder requests to model emerging technologies are due
- Group feedback to SPS on NG and market pricing methods
- Group feedback to SPS on assumptions for existing commercial generation technologies
 - CT, CC
 - Wind, Solar, and BESS

July 6 – Stakeholder meeting scheduled

- SPS presents results from base model runs
- Review and discussion of scenario requests
- Further discussion on modeling assumptions, as needed

August 1-2 - Stakeholder meeting scheduled

- SPS presents modeling results from requested runs