

Appendix C

Aurora

Aurora is a chronological, hourly dispatch model that performs market-level production cost and power price forecasting analysis, as well as utility-level portfolio accounting for resource planning.¹ In addition to projecting prices in the MISO market, Aurora is capable of evaluating utility portfolio costs through its Portfolio Module. This functionality allows the user to identify specific utility loads and resources to evaluate variable cost of service or power supply costs. The model can dispatch owned and contracted resources, while balancing against market purchases and sales in every hour. As a result, utility costs can be calculated in a fully integrated fashion with other market dynamics. CRA has also used its proprietary PERFORM model, which is a companion tool to Aurora, to build a full annual revenue requirement, inclusive of capital investments, fixed operating and maintenance costs, and financial accounting of depreciation, taxes, and utility return on investment.

The key attributes of the Aurora-PERFORM modeling framework used in the 2018 IRP are described and illustrated in the figure below:

- The core portfolio module performs an hourly chronological dispatch of NIPSCO's portfolio of resources using a series of user inputs including fuel prices, emission prices, power prices, utility load, and portfolio parameters.
- As part of the evaluation of new resource options, Aurora's portfolio optimization functionality was deployed in the 2018 IRP. The portfolio optimization tool evaluates the least cost solution for meeting a specific future peak load target (inclusive of a reserve margin requirement) based on user inputs for key market assumptions and new resource options (including DSM and RFP bids).
- Once specific portfolios are defined (including the eight retirement portfolio options and the six replacement portfolio options in the 2018 IRP), the Aurora model can be used to evaluate costs under a variety of scenarios or stochastic inputs. In stochastic format, the portfolio evaluation was run 500 individual times using different inputs for commodity prices. Scenario or stochastic runs produce a summary of plant dispatch, market sales and purchases, and total variable costs associated with operating the portfolio.
- The PERFORM financial module takes the variable cost data as an input, along with information on existing rate base (generation only), future capital and fixed operations and maintenance plans associated with the relevant portfolio option, and other financial assumptions. The model produces an annual revenue requirement and a net present value of revenue requirements (NPVRR) calculation for each scenario or stochastic iteration that was evaluated.

¹ Aurora is licensed by Energy Exemplar. For more information, see: <https://energyexemplar.com/products/aurora-electric-modeling-forecasting-software/>

Aurora-PERFORM Model Architecture

