

## Jeremy Petersen, Xcel Energy

**Presentation Title:** How Much Is That Worth? An In-Depth Analysis of Electric Energy Avoided Costs in the World of Time Varying Low Carbon Generation

**Abstract:** Renewable generation of electricity is supported by numerous policies across several states. As a consequence, resource planning of the electric generation systems in those states is now based on more than just the traditional “least cost” method, driving fossil fuel retirement scenarios and increasing non-dispatchable renewable generation. The result is divergence between short-term energy avoidance valued through internal system and regional system operator dispatch models, and long term energy avoidance resulting from the change in generation build valued through resource planning models. This difference is now being seen in the increasing calls for more flexible demand-side management (DSM), which must in turn leverage revisions to the methods that value the electric energy avoided by DSM.

The paper will explore three different ways of valuing DSM in a Midwestern utility that is rapidly shifting away from coal energy. The analysis will look at how a time valuation of savings approach for DSM sees convergence of DSM avoided costs for some measures (regardless of method) while other measures are less consistent and it will suggest that more than one value stream may be preferred or that the preferred method may involve multiple approaches.

Using data that is already available to the analysis team, the analysis will use end use energy savings profiles and each of the three value streams to compare four different energy efficiency “measures”. Value streams that will be examined are: (I) Isolated system dispatch marginal cost assuming that the utility supplies 100% of load with its own generation, i.e. system planning parameters; (II) Regional system operator forecasted marginal price, and; (III) Early coal plant retirement, i.e. proxy plant avoided costs. While the source data is not identical in format, it is of sufficient quality to perform the analysis with some interpolation (e.g. linear trend assumed between system operator forecasts at 5-year intervals). However, the raw isolated system dispatch data is trade secret and will need to be provided in the paper in aggregated form.

Preliminary findings for three measure types when comparing between isolated system dispatch and regional system operator indicate that values do converge in some cases and diverge in others. It may be appropriate to look at combining more than one method to account for anticipated system changes that may not be included in another model.

Since a key task expected from many evaluations is assessment of cost effectiveness, knowing the nuances of avoided cost is critical to ensuring that the value of DSM to all customers is characterized appropriately and that program recommendations are in alignment with the local and regional grid. As more regions across the nation increase the proportion of non-dispatchable generation and more granular valuation of energy savings in their energy supply portfolios, an analysis such as this will prove valuable in determining the ways that DSM can contribute to, and not conflict with efforts to implement a low carbon future.