

## **Applied Framework for Evaluation of Benefits and Costs of Smart Grid Investments: A Regional Case Study**

*Kevin Cooney, Navigant, Boulder CO*  
*Stuart Schare, Navigant, Boulder CO*  
*Erik Gilbert, Navigant, Boulder CO*  
*Brad Rogers, Navigant, Boulder CO*  
*Robin Maslowski, Navigant, Boulder CO*

The promise of smart grid and associated advanced metering infrastructure (AMI) includes increasing the information available to energy consumers as well as allowing appliances, home electronics, and energy management systems to autonomously respond to price and load curtailment signals. Recent investments made through the U.S. Smart Grid Investment Grant (SGIG) Program could have a profound effect on the way customers and utilities manage energy use in the future. The investment needed to realize the potential of the smart grid will only occur if current pilot programs can be appropriately evaluated to assess the likely benefits and projected costs of large-scale rollout of smart grid technology.

This poster illustrates the approach and initial business-case findings from a benefit-cost framework and computational model developed to assess the incremental costs and benefits of smart grid investments. The framework was developed considering phases of Smart Grid maturity and how technologies will interact to create impacts and thus value. The authors, in coordination with the Bonneville Power Administration, developed a bottom-up framework for assessing the regional costs and benefits of smart grid investments. The model covers a range of smart grid deployment scenarios and incorporates over 30 smart grid functional areas. It also has uncertainty analysis capability built into each parameter that drives costs and benefits. The capabilities of this *Model* are informing policy and executive-level decision making in the Pacific Northwest region.

This poster presents the details of the framework and initial results based on conservation voltage reduction and other energy efficiency functionality, using inputs from the SGIG-funded Northwest regional pilot. The paper is applicable to utilities and regional/national governments considering smart grid investments, as well as to program administrators trying to understand how smart grid will impact their future portfolios.