

Smart Grid Business Case Analysis and Support Services

Provided by the Smart Grid Research Consortium (SGRC)



Assisting Electric Cooperatives, Municipal and Other Public Utilities with Independent, Objective Smart Grid Investment Analysis

- Smart Grid Executive Decision Support
 - Current Trends and Best Practices Presentations
 - Benchmarking
 - Investment Strategy Facilitation
- Full Turnkey Business Case Analysis
 - Utility-Specific Smart Grid Investment Model™ Application
 - Comprehensive SG investment analysis
 - Communications, AMI/Metering, DA, Volt/VAR, CVR, Customer Engagement, DR, Management Systems (MDM, OMS, DMS, etc.), Other Applications
 - Investment Prioritization, Strategy Development, Risk Analysis



Formed in 2010 by Professor Jerry Jackson at Texas A&M University to support cooperative, municipal and other public utility smart grid investment analysis, the Smart Grid Research Consortium (SGRC) has transitioned to a full-service research and consulting firm supporting smart grid investment analysis and strategy development. Dr. Jackson continues to manage SGRC, leading a team that has completed investment analysis for 16 utilities.

SGRC Smart Grid Investment Model™ (SGIM)

SGIM is the only commercially available comprehensive smart grid business case software tool available for coop, municipal and public utility applications. Developed over 2 years and vetted with 15 utility applications, the SGIM includes the following application areas:

- AMI/Smart Meters
- Distribution Automation
- Volt/VAR Control (Including CVR)
- Customer Reliability Valuations
- Customer Technologies and Programs (Including Demand Response)
- Communications and IT
- Meter Data Analytics
- Utility Management Systems (OMS, DMS, etc.)

Comprehensive Evaluations

SGRC provides financial smart grid investment analysis ranging from executive overviews to detailed individual substation/ transformer/ feeder level distribution automation financial evaluations. Analysis capabilities include all important technology and program analysis areas including customer demand response technologies and engagement programs.

Smart Grid Executive Decision Support

We Understand Your Issues. The SGRC has undertaken smart grid business case analysis for 16 electric cooperatives, municipal and public utilities ranging in size from small coops with fewer than 2,000 meters to large municipal utilities with over 600,000 meters. We recognize that each utility is different: current infrastructure, utility characteristics, customer characteristics and management objectives make each analysis unique.

The SGRC provides executive decision support services to meet individual needs of each utility including:

Let us provide an in-house overview of smart grid **Current Trends and Best Practices** to help you evaluate your own smart grid options and strategies.

Our **Benchmarking Process** will compare your current activities and strategies to utilities with similar characteristics to help identify areas where you can improve returns on your smart grid plans and activities.

Let us work with your executives and staff to **Facilitate** integrating smart grid evaluations across departments and applications to develop a comprehensive, enterprise SG strategy.

Turnkey Smart Grid Business Case Analysis

Let objective, vendor-neutral, SGRC staff evaluate your utility's smart grid business case using the industry's only comprehensive financial framework developed in applications at fifteen utilities. SGRC provides all financial data development, Smart Grid Investment Model implementation, analysis, recommendations, a final report and continuing support for each utility smart grid business case evaluation.

No matter where you are in the smart grid process - that is, before or after AMI or other upgrades, SGRC analysis will help you improve returns on future smart grid investments. Business case analysis activities include:

- Consortium staff interviews to develop information on utility costs, current infrastructure and utility investment criteria
- Utility-specific cost/benefit parameter development
- Smart Grid Investment Model (SGIM) Implementation
 - AMI/communications systems
 - Distribution automation, volt/VAR control, CVR
 - Substation/feeder level analysis
 - DR, Direct load control, PCTs and other in-premise technologies, pricing programs, etc.
 - Utility management systems

- Estimation of monthly customer-class, end-use hourly load models to reflect technology and program impacts on peak period system loads
- Individual smart grid technologies and strategy evaluations
- "What-if" scenario evaluations to examine results under different future assumptions
- Evaluation of alternative investment strategies
- Analysis results final report documentation
- Onsite presentation of results
- Future support to update business case analysis as a result of:
 - Specific vendor proposals
 - Pilot program results
 - New technologies/program impact information
 - etc.
- Maintenance of each utility's Smart Grid Investment Model to avoid "reinventing the wheel" for future investment analysis applications.

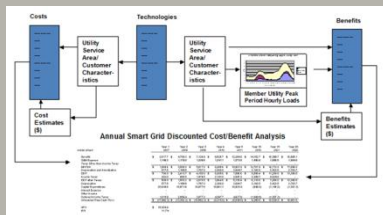
Business case analysis costs are standardized for most municipal and cooperative utility applications. Contact us for a no-obligation proposal to evaluate your smart grid investment options and strategies.

Extended DA Analysis Option

applies financial cost/benefit analysis at the substation/transformer/feeder level. Supports distribution systems upgrade cost/benefit analysis.

Hourly Load Impact Analysis

Each utility SGIM includes utility-specific monthly customer-class, end-use hourly load forecasting models to calculate impacts of customer-oriented programs and Volt/VAR control including CVR on system loads. Avoided power costs and avoided capacity costs (generation, transmission and distribution) are calculated using these system load impacts.



Detailed Demand Response and other Customer Engagement Programs are Represented.

Alternative pricing programs, information programs, direct load control, programmable communicating thermostats and other DR and customer engagement technologies and programs are included in SGIM analysis.

SGRC is located in Orlando Florida.

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SGIM Provides Comprehensive, Objective SG Analysis

The Smart Grid Investment Model provides the quantitative framework and analysis engine applied in SGRC smart grid business case analysis. Each utility application is customized to reflect utility infrastructure, utility and customer characteristics. SGIM analytic capabilities provide the industry's most comprehensive business case analysis.

The model's Excel user interface, graphics output, and tabular results worksheets have been designed to facilitate comprehensive SG investment analysis and evaluations across all utility smart grid areas.

Extensive documentation generated by the SGIM is included as appendices in each utility's final report.



Optional In-House SGIM Implementation



As an option, the Smart Grid Investment Model can be installed at client utility sites after completion of model implementation and analysis. The model is delivered, online training sessions are conducted and Consortium staff is available to offer telephone support. This option is provided to clients who wish to have in-house access to SGIM investment analysis. A separate license fee is required for in-house application.

Hourly Loads Data and Impact Analysis

Utility hourly loads play a critical role in determining benefits associated with demand response, customer engagement, and Volt/VAR control including conservation voltage regulation (CVR). Avoided power cost and avoided generation, transmission and distribution capacity costs associated with these investments can account for more than 50% of future benefits.

Each utility's hourly loads are determined by its customer

characteristics, electric appliance holdings, weather, and other variables.

The Consortium has exclusive access to MAISY (www.maisy.com) Utility Customer Hourly Load Databases in its utility-specific hourly load impact modeling. Each utility application includes development of detailed monthly, customer class, end-use hourly load forecasting models, providing a detailed financial analysis of monthly load impacts.