National Institute of Standards and Technology (NIST) Smart Grid Federal Advisory Committee (SGFAC) Status Report

SGFAC Subcommittee 4

INTRODUCTION

This chapter summarizes perspectives based on 8 interviews of stakeholders across the Smart Grid regarding NIST Smart Grid research activities. Specific recommendations on research areas are included.

OVERVIEW

The following are the overarching themes that emerged from the interviews.

- *Besides the SGIP, other NIST activities, in general, and the kinds of research it conducts in particular are not very well known across the industry.*
- *Cyber security needs to be a main focus of NIST smart grid activities. Development of cyber-security standards needs to be a coordinated effort between SGIP, utilities, vendors and regulators so as to reduce the confusion and complexity about implementing standards.*
- *Rigorous and transparent processes and techniques for interoperability testing and certification of individual smart grid products as well as integrated systems are important.*
- *There is a need to sort out the large amount of research sponsored and/or done by various federal agencies (e.g., NIST, DOE, DHS) to remove duplicative work, and to get the useful results of the research to utilities' and vendors for further development and commercialization.*
- *NIST does not appear to be a major research organization in smart grid.*
- *Generally, the private sector should be the primary vehicle for applied smart grid research. Universities, research institutes and national laboratories do the basic research. NIST smart grid research should be in support of standards development and measurements.*
- *The smart grid will generate a mountain of information. There is a need to develop business analytics that can produce information from the data in real time to positively impact the operation of the system.*
- *NIST technical experts in different smart grid domains should interact more with their counterparts at utilities to better understand how the standards affect or could affect utility operations in terms of grid reliability, security, and business processes.*
- *Utilities need metrics to support the deployment of smart grid. There is a need for a systemic view of the benefit to the customer from smart grid improvements to the grid. The industry as a whole has to quantify the financial benefits in a way that is convincing to the customers, regulators, and utility leaders. Without clear metrics to the customer and the business, people cannot judge the benefits of the various programs.*

RECOMMENDATIONS

Marketing and Advertising of NIST Research Activities

NIST should improve its communication outreach to utilities and the public at-large explaining its goals and activities in general, and smart grid in particular. NIST domain experts should speak at more industry forums both at the executive and technical/engineering levels.

NIST Research Activities

The key research areas for NIST should be interoperability, cyber-security testing and certification, and how to measure the interoperability, vulnerability, resilience and other properties of complex systems such as the emerging smart grid.

Laboratories for Testing and Certification

NIST should promote the establishment of for-profit independent laboratories for interoperability and cyber-security testing and certification of smart grid products as well as systems. These labs should not be operated by the Federal government or particular state, but must adhere to appropriate Federal and/or State guidelines and regulation.

Accreditation of Testing and Certification Laboratories

NIST should conduct the research into the development the processes and procedures to provide accreditation to independent laboratories that will be authorized to test and certify that products and systems comply with the smart grid interoperability and cyber-security standards. NIST should also conduct research about the lessons learned from other industries that have develop certification and compliance regimes, and how the findings can be adapted for smart grid. As both smart grid and interoperability and cyber-security standards are constantly evolving, NIST should conduct research to continuously improve the accreditation processes for the independent laboratories. NIST research activities in this area should be funded in part by fees paid by laboratories and by the Federal government.

Collaboration with Utilities and Private Sector

NIST should invite and promote strong collaboration with utilities and private sector on research into metrics for interoperability and other properties of the smart grid. Such collaboration could lead to more jointly-funded R&D efforts, and also improve the support for NIST activities by Congress.