

**NIST SMART GRID ADVISORY COMMITTEE (SGAC)**

**MINUTES OF APRIL 2, 2019, VIRTUAL MEETING**

**ATTENDANCE**

**NIST Smart Grid Advisory Committee Members**

Centolella, Paul (Chair)  
Cosgriff, Kevin  
Fine, James  
Gracio, Deborah K.  
Handley, Jason P.  
Holland, Michael J.  
Kiesling, Lynne  
Lee, Audrey  
McDonald, John D.

**NIST Staff**

Anand, Dhananjay  
Bilil, Hasnae  
Boehm, Jason  
Dickens, Corey  
Gopstein, Avi  
Greer, Chris  
Guo, Wendy  
Halba, Khalid  
Harary, Howard  
Holmberg, David  
Li-Baboud, Ya-Shian  
Linn, Thomas  
Nguyen, Cuong  
O'Fallon, Cheyney M.  
Wollman, David

**Others**

Brooks, Richard, Reliable Energy Analytics  
Marchionini, Brian, National Equipment Manufacturers Association  
Saavedra, New York Power Authority  
Villarreal, Chris, Plugged in Strategies

**Call to Order and Welcome – Dr. Chris Greer, Director, Smart Grid and Cyber-Physical Systems Program Office**

Dr. Greer called the meeting to order at 11:05 a.m. He conducted a roll call for Committee members and attendees and reviewed the meeting agenda.

### **Opening Remarks – Mr. Paul Centolella, Chair, NIST Smart Grid Advisory Committee**

Mr. Centolella thanked NIST for its work on the next version of the Smart Grid Interoperability Framework and for conducting a productive series of Framework workshops to engage stakeholder. Also, he noted that NIST has relevant upcoming events: Smart Grid testbed workshops at the University of Tennessee and University of Vermont, as well as, a privacy framework workshop at Georgia Tech. Additionally, Mr. Centolella noted in his work with utility regulators, he appreciated NIST's important framing of the smart grid as a cyber-physical system and recognized the need to look at smart grid as an entire cyber-physical system. Mr. Centolella also complimented NIST on its recent publication on the convergence of cyber-physical systems and the Internet-of-Things and concluded that NIST continues to have impact.

### **Engagement Subcommittee Report Out – Mr. Paul Centolella, Chair, NIST Smart Grid Advisory Committee**

This subcommittee's goal was to provide feedback on NIST's engagement strategy. The subcommittee suggested stakeholders' outreach to manufacturer groups, research institutions, energy policy experts, analytics experts, and various energy users. The message: the world is changing, technologically and economically, and, thus, changing how we look at the power grid. Those standing still, will fall behind, in terms of the value propositions for electricity and interoperability, and how the power system interrelates with its components and other systems. The power system could become less valuable if it doesn't change. The subcommittee also addressed challenges with distributed resources, cybersecurity, decentralized markets, and the value of testing and certification.

For more details, see the [Engagement Subcommittee Report](#).

### **Technical Subcommittee Report Out – Mr. John McDonald, Member, NIST Smart Grid Advisory Committee**

The technical subcommittee's goal was to provide feedback on draft materials for the smart grid interoperability framework 4.0; these included communication pathways scenarios, main models, cyber-physical system concerns, and smart grid matrix.

For reference, the subcommittee used the communication pathways scenario in the version 3.0 Framework, reproduced as-is, as the legacy reference scenario. For the high distributed energy resource scenario, the subcommittee reported gaps in coverage and noted that the diagram was too complex. Regarding the micro-grid scenario, the subcommittee pointed out that market connections were inconsistent and limited in types. The subcommittee also recommended splitting the diagram into two diagrams. The subcommittee found the hybrid scenario graphic and the term, "hybrid," confusing. Additionally, subcommittee proposed functional requirements, as a new way of understanding the system architecture's impact on interoperability. The approach aligns with the framework. Lastly, to enable more programs for testing and certifying smart grid interoperability standards, the subcommittee recommended making implementation of standards and associated testing requirements less complex.

NIST accepted the input, which will be used to revise scenarios. For more details, see the Technical Subcommittee's [presentation](#).

### **NIST Smart Grid Framework Update – Mr. Avi Gopstein, Associate Director, Smart Grid & Cyber-Physical Systems**

Since June 2018, NIST has conducted seven stakeholder engagements, across the US, to inform development of the 4.0 Framework. These involved 261 non-NIST participants, representing regulators, state governments, standards organizations, manufacturers, technology providers, utilities, service providers, laboratories, consultants, foreign governments and users. NIST's June webinar unveiled the updated Smart Grid Conceptual Model. This was followed by a testing and certification workshop, four regional workshops (Atlanta, Indianapolis, San Francisco, and Providence) and a Smart Grid Cybersecurity workshop. The following are takeaways from these engagements:

- Standards landscape was quantified and confirmed by participants.
- Lack of interoperability is already costing companies millions.
- Lack of interoperability limits where data can be used.
- Interoperability requirements must be better described to facilitate improved tests.
- The business case for interoperability isn't clear to decision makers.
- Unanticipated benefits of interoperability are significant.
- Data sharing is an important part of interoperability.
- Broad support exists for an interoperability profile.
- Open-source requirements and test harnesses would be revolutionary.
- Grid is switching from capacity to resource-based reliability models.
- Key grid interfaces are customer-focused: e.g., electric vehicles, storage, automation devices.
- A common language (ontology) is important.
- Trustworthiness is a growing concern.
- Complexity is a driving feature of cybersecurity.
- Cybersecurity and trustworthiness tradeoffs need to be explored.
- Timeline for change is accelerating.

For more details, see Mr. Gopstein's [presentation](#).

### **Proposed FY2020 Budget for NIST– Dr. Jason Boehm, Director, Program Coordination Office**

The 2020 President's Budget request cuts NIST's top line budget by 30 percent, relative to 2019, impacting all its appropriations budget lines and many research portfolios. The Budget shows a significant budget decrease for NIST's Scientific and Technical Research Services (STRS), which funds the NIST Laboratories and includes NIST's work on the Smart Grid. For 2020, the proposed appropriation is \$611 million, down \$112 million from 2019. In addition, the President's Budget also proposes to eliminate NIST's Manufacturing Extension Partnership

program and significantly reduces construction of research facilities.

As part of actions necessary to implement these reduced funding levels, NIST's Smart Grid and Cyber-Physical Systems program is proposed to be cut in its entirety. As part of these actions, NIST would also have to eliminate about 421 research positions across its labs, including the positions within the Smart Grid and Cyber-Physical System program. At the same time, the President's Budget calls on NIST to increase funding allocated to quantum science, artificial intelligence, microelectronics and related R&D, to support the administration's priorities for defense.

The Advisory Committee responded. One committee member said that the smart grid is critical to the operation of our economy and society, also stating that it has a significant defense component. Another member said, it was tough to take these huge cuts after working on the smart grid so long. And, another member asked if funds would be taken from other NIST areas, besides the smart grid program. Dr Boehm said that the budget would impact NIST's entire programmatic portfolio. Several committee members expressed a desire to help. A subcommittee was formed to provide input and recommendations to the Director of NIST for use in future prioritization considerations.

### **Committee Discussion**

Discussions addressed NIST's research following the 4.0 Framework, which will be guided by its language and concepts. This research will include a scenario-based examination of demand response issues, such as frequency of communications with smart grid devices, like thermostats in residences, and how to manage congestion on the grid. Research will also address a risk profile for voltage support on a distribution feeder. Additionally, research will assess how cybersecurity risks, and, thus, communications requirements change, as a function of system architecture. NIST will explore these cybersecurity issues, also, through scenario-based analysis.

### **Planning for June Face to Face Meeting**

The Advisory Committee plans to address the following:

- Dynamic changes to the grid and sources of information on those changes
- The draft Smart Grid Interoperability Frame 4.0, assessing it for:
  - Coverage of all key points, as well as, any gaps
  - Strategy for executing the priorities of the framework
  - Research portfolio
- Efforts to educate regarding how NIST's smart grid work impacts America's future

### **Public Comments**

Members of the public did not offer any comments.

### **Close**

The meeting was adjourned at 1 p.m. on April 2, 2019.