White paper on standardization of Smart Grids

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INTRODUCTION

Europe and the US have identified Smart Grids as a major means for the necessary transformation of the power grid and to unlock the potential for innovation in the electric sector. Overall goals include reduction of carbon emissions and security of supply. Improved energy efficiency and usage of renewable energy are seen as key to reach these goals. Both measures call for modernization of our energy supply system leading to Smart Grids as key enabler for the required innovation. To promote this transformation both the US and EU have taken a number of actions including the EISA[1] (2007) and ARRA[2] (2009) in the US and the 3rd Package for the internal energy market[3] (2009) in the EU. These have resulted in a number of standards initiatives like the NIST Interoperability framework4 in the US and a Smart Grid mandate in the EU. Similar activities have been started in other countries, e.g. in China, Japan, Korea and others.

Standardization of Smart Grids is not "*business as usual*". The multi-sectoral nature of Smart Grids, the need for integration of multiple technologies, huge number of stakeholders, the necessary speed, the many international activities and the ever changing technical solutions make it a challenging task for standardization organizations worldwide. For reference or details see NIST interoperability report [4] and EU report on standards for Smart Grids [5].

NIST and SG-CG promote a number of common positions and areas of collaboration to ensure a consistent set of standards.

BASIC PRINCIPLES

- **Strive for global solutions where appropriate within the constraints of our policy objectives**
  Cooperate with international and other relevant national Smart Grids standardization activities.
- **Do not reinvent the wheel**
  Use existing mature standards whenever appropriate.
- **Build up a flexible standards framework**
  Market business models, players and technical solutions are still changing. A flexible model or architecture must be available to map services and use cases.
- **Agree on common conceptual model**
  Conceptual models and reference architectures are the base of further development of standards. It is therefore absolutely vital to align as far as possible the US and EU view.
- **Use a system level top down approach**
  Different applications, which will be deployed over time need to fit together. This can only be assured by strong coordination of different domains. NIST and SG-CG acknowledge the need to take a system approach in coordinating the involved stakeholders and domains. The top down approach must drive toward a future vision of Smart Grids that can evolve cost-effectively from the legacy infrastructure.
- **Adapt the organization and processes for standardization**
  Smart Grids are a system issue rather than a product issue. The NIST and SG-CG promote this approach in close collaboration and cooperation with the existing international standardization organizations.
- **Avoid de-synchronization of work**
  Regional initiatives are characterized by different goals and different timescales reflecting policy and regulatory mandates. NIST and SG-CG will take every necessary effort to synchronize as far as possible and to take optimal advantage of each other's efforts in a collaborative way.

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[1] EISA: Energy Independence and Security Act of 2007, P.L. 110-140

[2] ARRA: American Recovery and Reinvestment Act of 2009, P.L. 111-5

[3] EU directives: 2009/72/EC; 2009/73/EC

[4] NIST, Special Publication 1108, "NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 1.0"

[5] CEN/CENELEC/ETSI, Final report of the CEN/CENELEC/ETSI Joint Working Group on Standards for Smart Grids

A large amount of standardization work has already been done and coordinated by NIST and SG-CG and a vast set of important and mature standards is already in place. Smart Grids implementations based on these standards can begin on this basis. Reduction of the known gaps and overlaps is underway. In addition, longer term improvements are necessary to provide a coherent and future-proof framework and processes for standards development.

NIST and SG-CG agree on above mentioned positions in order to promote an international coherent standards framework for Smart Grids.

AREAS OF COLLABORATION

- **Continous alignment of key messages**
  NIST and SG-CG will continuously work on a number of common key messages and high level objectives.This whitepaper is the first version of this effort.

- **Collaboration on reference architecture**
  NIST and SG-CG will work on a harmonization of conceptual model and reference architecture by organizing common meetings of the respective groups.

- **Exchange of priorities**
  In order to avoid di-synchronization and to take maximum benefit of each others effort, NIST and SG-CG will continuously exchange priorities set by the organization.

- **Regular and continuous information exchange and common understanding of...**
  Legislation, regulation, and other policies underpinning NIST and SG-CG work
  Respective work methods, work programs and respective time lines
  Standardization deliverables
  Testing and certification frameworks
  Cybersecurity requirements and technologies

The above stated areas of collaboration will be reviewed and updated where necessary on a regular basis. Exchange of information between NIST and SG-CG is already ongoing. The stated areas of collaboration will be implemented through mutual exchange of information by telecons, face-to-face meetings and workshops according to the needs agreed upon by both sides.

We foresee that a Letter of Intent between the NIST-initiated Smart Grid Interoperability Panel (SGIP) and SC-CG will be developed to describe more specific areas and methods of cooperation between SGIP and SC-CG consistent with the principles established in this white paper.

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