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GSGF
Global Smart Grid Federation

CHAIRMANS COMMENTS

In writing this first piece about the Global Smart Grid Federation's (GSGF) activities during the past year, the obvious temptation is to reflect on the increase in our membership from nine to fourteen. While that is a great achievement, I think it is important that we ask ourselves why did so many national organizations join the Federation?

I believe that the answer can be found in our mission statement in which we commit ourselves to dynamically knowledge-share best practices across the full range of barriers to deployment of smart grid technologies in all regions of the world. That is a powerful statement and I am pleased to say that, thanks to the enthusiastic collaboration of our members, we are delivering on our promise.

So what are the barriers? Increasingly we hear that one of the critical challenges is to work out how to scale the multitude of pilots and demos that have been deployed, up to a national level. As a first step in looking at this issue, GSGF has created three work groups to address key areas: (i) Interoperability (ii) User interfaces for storage and EVs (iii) Connection of small DG.

The work group chairmen will talk about these in detail in another part of this newsletter.

The challenge facing GSGF is to make our speed of response to issues a unique value-added proposition that will enable GSGF to become the recognized voice of industry in the smart grid sector around the world.

I am looking forward to the next year with confidence and to using this forum to share important learning experiences.

EXECUTIVE DIRECTOR

The first four months as executive director of the Global Smart Grid Federation have been very interesting. Studying all the input available with the members on the intriguing topic of smart grids has led to many new ideas that we will try to work out in close collaboration, and with the input of our members.

The results of this work are an interesting number of tasks we have set for ourselves to better serve our members.

Three work groups will be established, each headed by a member out of one of the economic zones: Asia/Australia, North-America and Europe.

The first results of these activities will be presented at the joint conference (GSGF and EDSO for smartgrids) March 21-22, 2013 in Brussels. Taking the input from the conference, the work will be continued, leading to a GSGF working papers to be completed by spring 2014.

The members will be asked to provide regular input for the GSGF website whenever they have interesting news to share. This will enable us to learn from each other, as is the key task of GSGF. Clearly, when studying the material available, common drivers for smart grids are sustainability, reliability and affordability of the electric energy supply. Empowering the grid user will be at the center of the developments. Beyond any doubt, in a more and more decarbonised energy supply, electricity will take a growing place. Increasing energy efficiency and using more renewable resources will lead to more electricity use. However, the old paradigm "demand drives supply" is continuously moving to "supply drives demand", with the need for storage becoming prominent. Smart grids are the field on which this new game will be played. The transition from the present system to the new one has to be performed in a seamless way: it is like redesigning an Airbus 380 in flight, without the passengers noticing it.

The GridWise Alliance was created in 2003 as a direct result of a study done by the U.S. Department of Energy entitled, "Grid 2030 – A National Vision for Electricity's Second Hundred Years". This study presented the first detailed view of what is now known as a "smart grid" and the many benefits that could be derived from a "fully automated power delivery system…" As a result, the GridWise Alliance became the first national association of private electricity industry stakeholders dedicated solely to the modernization of its nation's electricity grid.

The Alliance has a broad and varied membership representing all areas of the smart grid ecosystem; from investor-owned utilities to small technology innovators, from home area network providers to venture capitalists. The Alliance focuses on three strategic objectives:

- Continued Thought Leadership - Continue as the pre-eminent cross-industry collaborative to transform the electric system and create value for all through policy development.
- Advocate for Investment and Innovation – Advocate policies to promote investment in infrastructure, innovation, and transformation of the electric system.
- Educate and Reach Out to Key Constituencies – Build the framework that supports the continued development of a modern grid to provide a sustainable energy future through education and aggressive outreach to multiple stakeholders.

Since it's founding, the GridWise Alliance and its members have advocated for the development and deployment of smart grid technologies. These efforts culminated in the passage of the Energy Independence and Security Act of 2007, which declared that it is the policy of the United States to modernize the electricity system and included an entire section on smart grid. In 2009, the Alliance joined with a number of other energy-related organizations in advocating for the inclusion of smart grid investment grant dollars in President Obama's stimulus funding: 99 smart grid investment and 32 smart grid demonstration projects were awarded a total of $4.3 billion in matching funds.

Within the next several months, the U.S. Department of Energy is expected to provide insight into the impacts of the over $8 billion in smart grid investment grant projects (15.5 million smart meters to be deployed ($4.5B, 65% complete); 6,500 circuits to be automated ($2.5B, 40% complete); 800 networked phasor measurement units ($1B, 20% complete))

Over the past two years, new investment in smart grid deployments in the U.S. has slowed. The economic downturn has slowed approval of additional projects, as regulators are reluctant to increase rates to consumers. State regulators are waiting to assess the benefits from the over $8 billion in smart grid investment grant projects before approving future projects. The leading utilities that received the smart grid investment grant dollars are focused on completing their current projects before initiating new ones.

The fact remains that the U.S. electricity infrastructure is aging and is badly in need of modernization. Recent weather events have brought the fragility of the system into sharp focus. The challenge for the industry is to insure that the grid is modernized as it is replaced with two way power flows and new devices that can intelligently respond to system conditions.

As we move into 2013, the GridWise Alliance is planning to redouble its smart grid advocacy efforts highlighting the critical need for further investment in the electricity infrastructure. The Alliance is developing comprehensive smart grid legislation designed to overcome obstacles to smart grid deployment and incent investment in innovative and non-traditional grid modernization technologies. In addition, the Alliance is developing a Grid Modernization Index for the purpose of evaluating and communicating the status of electric grid modernization in the United States using a clearly defined set of criteria:

- To determine the regulatory and legislative environment that needs to exist in order to incentivize and enable smart grid investment.
- To identify specific policies, mandates and goals that have helped or hindered smart grid development.
- To develop and populate a Grid Modernization Index to depict progress achieved in implementing smart grid in each state.

WORK GROUP 1

On November 14th, the Grid Connectivity of Distributed Generation (GCDG) Work Group conducted its first call of volunteer participants. The enthusiasm for this subject was quite high, and many of the participants have already brought forth great ideas and focus to the initial work plan. Of the initial list of nine volunteers, we find that all four major regions of the world are represented, but the work group may seek additional contributions from select countries as deemed necessary.

Distributed generation, as outlined by the GCDG, is generally considered to be small (up to 20 MW) electric production facilities dedicated to the support of nearby associated load. DG can utilize both renewable (photovoltaic, wind, water, farm waste, etc.) and non-renewable energy sources (natural gas or other fossil fuels for conventional engines, turbines and fuel cells). When considering power grid connectivity for each of these forms of DG, there are numerous issues that arise with conventional power transmission and distribution systems. On the distribution level, small-scale renewable energy systems can cause concerns with the loading, harmonic content, and voltage support effects. Over the coming weeks, the GCDG will continue to outline this initial perspective and corresponding issues.

The proposed objective is to produce a white paper, addressing core issues of connecting distributed generation to distribution grids, but with a holistic view that does not promote a specific technology or particular manufacturer or supplier. The intent of the paper, to be delivered in late 2013, is to be highly relevant in its findings and recommendations, but will not try to be all-encompassing to avoid being slowed by attempts to include all forms of emerging technologies.

WORK GROUP 2

Electrification of automobiles is an effective way to implement CO2 reduction and energy saving in the transport sector. For a larger effect, a higher rate of electrification is desired. Therefore, diffusion of vehicles equipped with large capacity batteries and connectable to the power system, like EV or PHEV (Plug-in Hybrid EV), is expected in the near future.

When we view the issue from the power system, those batteries on the vehicles could work as energy storage equipment at charging and as a distributed power source at discharging. In other words, batteries in EVs/PHEVs could work as a buffer for stabilizing the system. For EV/PHEV users, it might create further convenience if the charging and discharging is optimized.

This working group aims to sort out the present situation and potential subjects for future developments regarding activities toward EV/PHEV diffusion, interaction between EV/PHEV and the power system, and their interface. We will study and analyze the outcomes to increase the people's buying intention, in other words, demand, for EV/PHEVs, considering situations of each member's own country and region.

In order To ensure that we do not duplicate the work and outcome of the other work groups we consider the following points:

- Sharing information on grid-connecting EV/PHEV (Actual cases of EV/PHEV diffusion, subsidies, systems, regulations and institutions)
- Identifying developments for the future
- (Obstacles on diffusion of EV/PHEV, problems at connection of EV/PHEV to the power system)
- Studying and analyzing the way to increase people's buying intentions considering the diffusion of EV/PHEVs

WORK GROUP 3

The development of Smart Grids is key to reaching a sustainable, competitive and secure future economy. The whole energy value chain is undergoing a paradigm shift from a centrally focused system towards a more distributed and dynamic one. This brings about great challenges for technologies, systems and organizations to operate and work together, with new roles and responsibilities, new business models, new services and products, and new social interactions. To make this possible, well-developed standards and inter-operability are needed to ensure that new products and services can operate in a multi-vendor, multi-standards, local manufacturing and multi-operator environment. The distributed architecture of the future needs the ability to share, aggregate, and execute on data in the field on a near real-time basis. This cannot happen without inter-operability.

Inter-operability is the focus of the third of the working groups started within the Global Smart Grid Federation, where the scope and set-up will be further developed during the coming weeks. The general idea is to bring forward a paper by the end of 2013, describing the importance of inter-operability and identifying areas where further work is needed, areas where standards are being/should be developed, where other measures are needed, and to bring forward a reference to best practices for smart grid interoperability. The work will be focused on a few important areas.

Many organisations are presently involved in work on smart grids standards and inter-operability and the idea is to connect to the on-going work and findings to date. A first set of smart grid standards is being presented by NIST and CEN/CENELEC/ETSI at the end of this year, where further work on inter-operability will follow during 2013.

The working group has representation from North America, Europe and Asia and we are looking for further volunteers to widen the views

ISGAN

It is with great pleasure that I accepted the invitation from GSGF to write a few words about ISGAN on the present issue of the GSGF newsletter.

ISGAN, the co-operative program on smart grids, is an initiative of the Clean Energy Ministerial (CEM) organized in the form of an Implementing Agreement within the IEA. Launched together with the GSGF at the first CEM meeting in 2010, the initiative aims at promoting policies that contribute to the deployment of smart grids technologies leveraging their outstanding potential to enable the flexibility of the power system. Smartening the transmission and distribution networks increases the ability of the system to host variable renewables unveiling the potential of demand response and user participation in the electricity market. Functions potentially triggered by smart grids technologies are numerous and their impact on the society as a whole motivates the great interest that Governments devote to the subject, addressing issues that traditionally were left to engineers. ISGAN activities center on those aspects where Governments have regulatory authority, expertise or convening power such as policy standards and regulation, finance and business models, technology system development , workforce skills and knowledge and users and consumers engagement.

Membership in ISGAN is voluntary, and currently includes 22 countries: Australia, Austria, Belgium, Canada, China, Finland, France, Germany, India, Ireland, Italy, Japan, Korea, Mexico, Norway, the Netherlands, Russia, Spain, Sweden, Switzerland, the United Kingdom and the United States; several other countries have expressed vivid interest and are expected participation in the near future.

The working organization of ISGAN spans over six working groups, named "Annexes", according to the IEA working manual, and in particular:

Annex 1: identifies countries' specific motivating drivers for pursuing smart grids, catalogues the wide range of smart grid activities underway, and collects and organizes the wealth of experience being generated into a resource available to a global audience.
Annex 2: captures and communicates the lessons learned from real-life demonstration or deployment projects and helps stakeholders to understand the true promise and challenges of deploying smarter electricity grids.
Annex 3: analyzes the benefits and costs of smart grid technologies, practices, and systems, from both top-down and bottom-up perspectives at the light of specific toolkits to inform smart grid policy and deployment priorities at project- and utility-scales.
Annex 4: develops information packages that explain clearly and concisely smart grid benefits and costs and offers an intuitive experience to help capture the attention of decision makers and provide them the information needed to advance more effective smart grid-enabling policies and programs.
Annex 5: is the Smart Grids International Research Facilities Network. It gathers research test-bed facilities selected based on their complementary capabilities to conduct specialized, controlled laboratory evaluations of integrated smart grid technologies including cyber security, plug-in hybrid integration, load management, automated metering infrastructure, protection, network sensing, energy management, renewable energy integration and similar applications.
Finally Annex 6: establishes a long term vision for the development of "Smarter" total electricity systems. Power transmission and distribution provides the enabling infrastructure for integration of distributed and large-scale renewable energy and has to be recognized as such.

At its third Executive Committee meeting, in Mexico City, in April 2012, the decision was taken to pursue a collaboration with GSGF in view of leveraging each other's resources towards the recognized commonality of interests and focus. The process was then started to set up a Memorandum of Understanding between the two organizations. This signature will be an important formal step to formalize a relationship that we already know will be very fruitful, mutually enlarging the respective audience and cross-fertilizing each other's work with specific insight, knowledge and resources to help accelerate the understanding of smart grids concepts and harvesting their important potential to the implementation of clean energy technologies in developed and emerging technologies, thus contributing to the availability of energy for each inhabitant of the planet.

Michele de Nigris – ISGAN Chair of the Executive Committe

IEEE SMART GRID WORLD FORUM

This year's technical program theme – "Smart Grids as Enablers for Smart Cities and Other Smart Community Solutions" – of the 2012 IEEE Smart Grid World Forum, held 6-7 December 2012 in Geneva, was crafted to foster wide-ranging, international debate and resource-sharing on technology, applications, standards and policy relevant to the subject. The Forum has been a unique opportunity for networking, and for establishing new mutual beneficial links and cooperation, which is one of the prime aims of the IEEE SGWF.

One key question that engaged attendees was whether smart grid is a case of "technology push" or whether it could be designed to respond to "policy pull." The properness of a global need to develop more sustainable energy practices and paradigms for "smart cities and communities" was supported by many speakers, who also mentioned how this will likely drive investments that foster economic development, locally and globally. The IEEE technical/scientific community has been mentioned as one example of ideal framework where smart city solutions, requiring the multi-disciplinary competence peculiar of IEEE, can be appropriately conceived and developed: the 2012 IEEE Geneva SGWF has been probably one of the first evidences of that within the IEEE community.