

CHAIRMAN'S COMMENTS



It has been a busy month for GSGF, with major steps in the development of the organization. Turkey is in the final stage of becoming the fifteenth member and I welcome this fast growing economical country containing so much potential.

The Global Smart Grid Federation (GSGF) and the International Smart Grid Action Network (ISGAN), a multilateral initiative among governments and their affiliates, announced that they have approved a framework for formal cooperation. The framework brings together the leading global private and sector initiatives on Smart Grid, providing a forum to identify the best tools and knowledge to accelerate the deployment of Smart Grid systems.

Michele de Nigris and I will sign the agreement in the next week. The collaboration will enable a faster development and deployment of the smart grid technologies worldwide, by joining forces and bringing together high level human capital. Decision makers will have access to the best knowledge and tools on smart grids from both the private and public sectors.

On March 21-22, EDSO for Smart Grids, the European organization of the largest DSO's in Europe, gathered in Brussels. 170 participants exchanged ideas on business opportunities for smart grids, to bring them into reality. The input of GSGF was well noticed by adding a real international viewpoint to all sessions, widening the discussions and providing new ideas. Certainly, this type of exchanges will be repeated in other places in the world, showing the added value by GSGF to its members.

Paddy Turnbull

EXECUTIVE DIRECTOR

It is a key development in Europe, the academic thinking process on energy matters that has been working for the last three years. With the THINK project we responded to a call from the European Commission (7th Framework Program) for a scientific and multidisciplinary think tank. Now, after three years, THINK will have produced twelve reports, 2 per semester.



Following the call to engage in the most convincing method of conducting research to support energy policy making at EU level, each report went through the same three-step quality process:

1. After two months the research team presents the project orientations to a team of experts from various groups of stakeholders, including academics, international organizations, European decision makers and regulators. Through in depth debate we coordinate the existing sources of knowledge and information. We then ask for the insights of specialists from companies with an important place in the energy value chain, such as ABB, Areva, BASF, EDF, Electrabel, Elia, Endesa, Enel, Eni, Exxonmobil, Fluxys, Gas Natural, GDF-SUEZ, Iberdrola, Infrabel, Laborelec, Renault, RTE, Amprion, SAP, Tennet, Total and Vattenfall. Their input includes the economic and technical boundaries in the THINK process.
2. The Scientific Council scrutinizes the first draft of the report.
3. We make the provisional draft assessment report public.

We used this unique and efficient technique again at the last Expert Hearing on the 28th of February and 1st of March, discussing topic 11 and 12 of the THINK project in Brussels:

- Topic 11: From distribution networks to smart distribution systems: rethinking the institutional organization of European DSOs
- Topic 12: Shift, not drift: enable active demand response with smart meters

Thus contributing to the on-going work of the Smart Grid Task Force of the European Commission (DG ENER), in April the draft reports will be up for consultation on the THINK website. After finalization in May, early June our clear policy recommendations will be published.

As the chairman of the Expert Hearing and the Industrial Council of THINK, I can only thank all contributors for their commitment. I urge the members of GSGF to have a look at the reports, as an input for global thinking on these important matters, while looking forward to continuing this endeavour in the last semester of the THINK project.

Website: www.eui.eu/Projects/THINK/Home.aspx
Ronnie Belmans

SMART ENERGY- START-UP NATION: ISRAEL- R&D CENTRE FOR SMART ENERGY

Israel is a young nation, rich in conflicts and poor in natural resources. Yet over the past fifty years, it has managed to turn its relative disadvantages into driving forces that have transformed it into one of the most innovative and technologically advanced countries in the world.

Most of Israel's national decision making considerations, and innovative activity, flow from its most dominant physical and strategic needs. These include:

- Strong need for defence
- Lack of natural resources
- Relatively small population
- Geographical isolation

These factors have driven the success of the local High Tech industry since the 80's which is now adapting itself to the energy industry. With poor local energy resources, yet plenty of sun, it was only a matter of time until scientists and entrepreneurs began focusing their efforts and capital on developing solar technologies.

The dominant player is, the Israeli Electric Corporation (IEC). The only electrical utility in the country, the IEC delivers all generation, transmission, transformation, distribution, supply and sale of electricity across the country.

IEC is conducting these days a smart metering trial consistent of 5000 Households. Based on the marketing and technical results it will be followed by the role out of 2.5 million customers.

Even though IEC is a monopoly it managed to establish an internal venture unit, currently named KARAT (the Hebrew acronym for "Accelerating Technological Ideas") which provides a framework of investment and support services to develop, advance, and commercialize innovative ideas in energy-related fields.

KARAT invites entrepreneurs, "innovators," inventors, and others to submit ideas and proposals in energy-related fields. Selected proposals are nurtured to become early stage business ventures which operate within the KARAT framework.

IEC is not the only one. We now see leading companies taking steps into the smart energy space, in particular in the communications, security, monitoring, data management, and applications areas.

In addition to the ICT industry, some of the largest Defence industry players have recently diversified into the new energy field. The government as well as the Israeli Academy play a major role with the involvement of most Cleantech related technologies. The Smart Energy field is lagging behind, but numerous new initiatives indicate that smart grid will shortly find its appropriate place.

The most promising initiatives for entrepreneurs in early stage are the establishment of accelerator and incubator dedicated to smart grid.

The primary goal of these programmes is to transform innovative technological ideas, that are too risky and in too early stage for private investments, into viable startup companies that after the accelerator and incubator term are capable of raising money from the private sector and operate on their own.

The development and maturation of the Israeli Smart Energy industry has benefited from the coordinated activities of The Israeli Smart Energy Association (ISEA), which serves as a national platform bringing together local and global Smart Energy players to share knowledge, drive initiatives, and build partnerships. The goal of the ISEA is to position Israel as one of the leading countries in the Smart Energy domain, both in terms of local innovative industry and scale of local adoption and deployment of Smart Energy solutions.

Israel holds the potential to become a world leader in the Smart Energy space, a position that could be achieved most easily by leveraging the innovation capacity, human capital, and market access held by established ICT leaders.

GRIDWISE ALLIANCE DEVELOPING GRID MODERNIZATION INDEX FOR EVALUATING AND COMMUNICATING STATUS OF GRID MODERNIZATION IN THE U.S.

The GridWise Alliance and its foundation, the Smart Grid Policy Center, are creating a Grid Modernization Index (GMI) for the purpose of evaluating and communicating the status of electric grid modernization in the United States. The GMI will be a simple, easy to understand scorecard that will use a clearly defined set of criteria to evaluate and convey the progress and impact of this transformative set of improvements to the nation's electric infrastructure.

Grid modernization activities or smart grid deployments are taking place in many parts of the United States. Investor owned utilities, rural electric co-operatives and municipal electric utilities are at various stages of modernizing their networks. Some entities and states have moved very aggressively while others have taken more of a "wait and see" approach.

Clearly, smart grid investments can present special challenges for rulings by state utility commissions. They are a relatively new type of utility investment, lacking a track record of cost and value. They have increased costs compared to the traditional grid investments, and their benefits may not be truly realized until later when distributed energy resources (e.g., DG, DR, e-storage, renewables) are added to the grid system. However, despite these challenges, a number of states and their utility commissions have created a policy and regulatory environment that encourages and assists in the deployment of these technologies.

- The objectives of the Grid Modernization Index (GMI)
- Develop and implement state ranking index
- Identify policies and regulations that promote investments in grid modernization
- Identify policies and regulations that hinder investments
- Leverage index and results to advocate for grid modernization investments at state level

WORK GROUP 1

The **Grid Connected Distributed Generation (GCDG)** work group has now finalized its white paper approach, the outline, and an initial list of key research questions. The intent is to approach the development of the paper by focusing on each of the three driver sections (financial, technological, policy/regulatory), rather than make it geographically focused, but with adequate comparisons and contrasts across the various geographies within each driver section. The work group members agreed that this will provide the best approach to identifying the key issues and summarizing potential solutions as the research unfolds.

We are also gathering supporting documents including previous public reports, white papers, or work artifacts that we can reference for our topic prior to initially developing sections of the report. It was felt that given the strong focus on distributed renewable energy systems in Germany, we needed to reach out to colleagues to ensure that we have adequate representation from this country, as well as seeking to include a view of the focus on renewable energy systems in Brazil and other parts of Latin America.

During the next call, we will seek to reconfirm our development schedule and level of effort to ensure we have good momentum and research over the next several months. We are still early enough in our effort to take on new volunteers, so please contact Rob Wilhite (Robert.wilhite@dnvkema.com) with your ideas, suggestions, and offers of assistance.

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.

TURNING THE GLOBAL SMART GRID CHALLENGES INTO SUCCESSES

The conference, jointly hosted by EDSO for Smart Grids and the Global Smart Grid Federation on 21-22 March, attracted some 160 high level Smart Grid stakeholders from around the world. Here are some highlights.

Livio Gallo, the chairman of EDSO for Smart Grids, welcomed everyone and opened the conference by emphasizing the strong development of larger and larger cities and their need of smart infrastructure to efficiently meet all their resident's needs. He described the important challenges for the development of smart grids and pointed out the urgency if we want to be ready to face those challenges.



Maria Da Graca Carvalho, member of the European Parliament and rapporteur for the Horizon 2020, the EU framework programme for research and innovation, described the programme and stressed that it is a major step forward to push technology innovation led by industry, especially for small and medium size enterprises

Panel on Incorporating Renewables, EV charging infrastructure and Storage

The basis is enabling renewable energy generation to be used at its full potential at the same time as system reliability is ensured. Voltage and frequency deviations are among the identified issues of integrating renewable energy generation and there can be an over-capacity of renewable energy generation for example when there is strong sun and wind during off peak hours. Grid flexibility; active demand and storage facilities is crucial in order to manage the distribution grids.



Electric vehicles charging is a vital part of smart grids, increasing the need for capacity and flexibility. There is not yet a high penetration of electric vehicles on the market, mostly due to shortcomings of battery capacity and that Electric Vehicles are expensive and so far, penetration seems to need economic incentives. These local grid issues need to be taken into account by the market design with clear objectives within the regulatory frameworks. Those need to enable research, development and demonstration and motivate industry to find the best solutions. A central question is whether change should be driven by a technology push or a policy pull. The DSO is a central player in this topic, and it is crucial that the customer is involved, directing the innovation.

Panel on Smart metering/Active demand, flexibility and balancing

The smart meter is core to enable active demand, load flexibility and local system balancing in times of need. A smart meter is defined as enabling two-way communications, where other functionalities also can be included, but the definition changes with almost every new smart meter model available. The question is whether to wait for harmonisation of standards or go ahead and invest in one of the available technologies.

Standards and interoperability are important factors for the grids of the future, but it should be designed in a way that permits technological change in the future. There are also other barriers to investing such as a lack of a clear market design, stakeholder roles definition, consumer involvement, and unclear returns on the investments. National and international governments should together with regulators set the market design, clarifying the roles of the stakeholders. Consumers must be able to be aware of their energy consumption and actively participate in the market. There should be incentives so that smart meter roll-out will be profitable for all parties involved in proportion to the risk they take.



The DSOs are at the centre of the smart grids development; their remuneration should incentivise them to invest in smart grids. Regarding the smart grids technology choices, it is best to leave this open, given a clear market design. The regulator needs to be properly advised, by all stakeholders in the system, on their advantages of smart meters.



Keith Sequeira, from the European Commission and the Cabinet of Commissioner Geoghegan-Quinn, referring to the Horizon 2020 initiative, he outlined the role of bringing together research and innovation in order to meet the challenges of the future.

Panel on Control ICT Technology, data and information security

Smart metering opens up a world of possibilities in terms of data availability; the amount of information that could be collected is so massive that the information management itself becomes a challenge. New technologies are important and can provide increased functionality at a lower cost and information management system should integrate the needs of both technical and market aspects. What information gets transmitted and how it adds value to consumers and market participants is also essential for the design of the information management system. The proposed solution is to decentralise information and manage it from the bottom up, so that only key aggregated data reaches the top of the operational chain.

Consumers should be informed of the value for them of sharing their data, trust must be established allowing operators to handle their data and the issues of security and privacy must be discussed. Communication in the smart grid will involve a trade-off between functionality, security, performance and cost. Certain security standards must be enforced and the user or operator should then be enabled to choose whether a higher level of security is needed. The goal of these technologies is the integration of renewable energy and demand participation in order to ensure a sustainable, reliable electricity supply for the future.



Panel on Business objectives and market organisation

The implementation of smart grids represents an industry-wide change that will affect all the involved stakeholders, from generation to distribution and the consumers. The European electricity industry is different, having certain activities liberalised, generation and sales, while others, transmission and distribution, are recognised as natural monopolies and regulated. It is essential to clarify the benefits for each involved stakeholder.

Key factors are establishing dynamic price signals that enable efficient use of the smart grid and to make policy allowances that permit the DSOs to reap rewards for pushing the smart meter roll-out forward. Allowing regulated network actors to participate in market activities and perceive the benefits of a free market actor, would further motivate DSO involvement in the smart grid implementation and customer involvement.



Customer involvement is crucial. The energy sector needs to understand what creates value for customers and the customer needs to understand what is going on in the energy sector, what the benefits are of being active, for example implementing a smart system in their homes, and the consequences of doing nothing. But only certain gains from smart grids can be monetised, the rest are societal gains. The industry needs to move from being a "confusopoly" to creating value for consumers and nations.



Paddy Turnbull, the chairman of GSGF, closed the conference, calling for initiatives in consumer awareness and grid modernisation that will allow us to turn the global smart grid challenges into successes.