



"Price and security are fighting in the energy markets! In fact prices are increasing continuously."

R&D collaboration for DG-Ready Grid Architecture Workshop. 6th of December 2010.

Don Hawkins was the moderator: New Mexico utility (FHF, Sandia National Labs)
Main points...

Future standards, architectures that allow distributed resources to be integrated in the grid. Focus and challenges. How to provide incentives, regulatory frameworks. What needs to be done, priority gaps, collaboration among industry and research. Actionable steps as a group.

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- **Australia Smart Grid Trials- Graham Foulger. smart Grid Partners.**

Price and security of energy. De-carbonize the energy sector. 200% increase in the last 6 months. Penetration of solar is enormous because of regulatory push. Build Public and corporate awareness. Investigate synergies in Australia. Storage trials are going on. Disaggregated model in Australia. Needs of retailers Networks and customer needs have to meet in order to get mutual benefits and keep the grid going to a smart architecture. "Customers lives are more than energy". So the energy efficiency services have to be integrated smoothly in their portfolio.

DG- Ready Grid Architecture WSHP

Beywatch Project,
www.beywatch.eu

4th Conference

Integration of renewable and Distributed Energy Resources

December 6-10/2010;
Albuquerque, USA.



Overview of strategies and goals of the Smart-grid in Europe

Old top down architecture, with problems related to security. Now we have prosumers that are bringing in problems. Increase of global power demand. Enable active participation of consumers, harmonics in the system. Vision in US: New grid architecture, allowing generation and storage, consumers participation. Europe situation is complex, different cultures, regulation frameworks, Grid architectures and possibilities. EERA and EEGI initiatives created for the EC to know where to subsidize. The second one is driven by the industry. DERLAB (Distribution Energy resources labs all over Europe) is important in the domain of energy research in Europe.. The vision is similar to the US. Deployment priorities: Corporate investments: 69%, Public 7%, EU 24%. Now the money goes to trials. In US 8,17 Billion dollars invested by the Government.



ICT is a need to be able to control efficiently the complex new Grid structures: new energy sources and moving loads.

- **Resolving the conflict of interest between DSO and TSO. Oliver Gehrke- Denmark.**

25 % Wind penetration and the target is 50% in the coming months. Controlling small DER. HEATING (HEAT PUMPS and charging e-cars is a challenge). The problem with wind is shutdown: they will provide in moments far more than the 100% of the needed energy. DSOs have to activate services that have to be provided by TSOs. The TSO buys distribution occasionally. Capacity upgrades to tackle e-cars is very expensive. In Remote locations, voltage problems at the end of long lines. Grid capacity must be shared between different entities. Need of local arbitrator entity connected to the BRE to regulate the balance of energy. Newtwork topology info and of the connection points is needed. This is to measure efficiently the loads.

- **Decentralized Energy Management and Virtual Power Plants. KEMA VP- Robert Welch.**

1,700 professionals, more than 100 utilities as customers. Generation is outdated. Edison designed a One-way flow. New system : Two way systems. Matching Generation with Loads. EU ROADMAP 2050- De-carbonization for the EU-27. Grid with 80% renewables. Power flows from South to north in a summer day (From Spain 47 GWatts to the south). Where is the fuel and where is the power needed? Moving to 33% renewables in the US. Modifying the actual systems: Operation and Maintenance costs are ramping up with wind for example. Real time Aggregation of distributed loads. Auto Demand response (ADR) if it comes will make life easier. What about the storage: Wind does not coincide with peaks (12 hours out of phase).A t the moment storage is almost only carbon piles or Hydro storage. ICE can help utilize wind blowing at night. Coupling renewables with energy storage is a solution.



PHEV is developing but it will take some time for them to really be commercialized in the market. Peak demand, Potential overload, shorter transformers' life are only some examples of the problems that will surge.

- **MetaPV Project (demonstration project EC). 3E is the coordinator.**

27 million Euros budget. PV developments.

PV on the rise: 12% energy generation capacity for the whole EC market. But the distribution among regions is not balanced. Shifting from troublemaker to solution. Active PV is the answer. Active grid control. Possible autonomous operation. PV installation trial in Belgium by the end of 2011. 10% of systems equipped with storage.

Trials in the USA in this... Some of the main objectives: Smart distribution, measurement on the electricity phase to see what is happening in the grid. Standardization is advancing for the grid (Wimax is also on the agenda...). Integration of distributed resources in to the whole distribution system. Get the lessons learnt from the trials and feed them to the actual activities in the industry. Smart inverters are key for the integration challenge of renewables into the grid.

Coordination and Acceleration of standards for smart grid.

Congressional priority in the states to fund smarter grids. High use of Renewables. The NIST role: framework development for interoperability of devices within the grid. Committee in the white house. BACNET preferred application layer for HVAC and building automation. AHAM (Association of Home appliance Manufacturers). SEP v2- one of the preferred application layer protocol. International standards are really a need, to focus the industry efforts and get to affordable solutions for the customers.

Beywatch approach to demand side management and Home interconnection was presented: RG use to host and energy efficiency agent interconnecting all energy actors in the home and then connecting it to the Supervisor to aggregate the information at a neighborhood level.



Interconnection to the grid is done through a dedicated API at this level, allowing utilities to receive information and provide energy related commands.

CONFERENCE INTRODUCTION:

Conference numbers: 350 registrations, 15 countries.

Previous conferences: Brussels, Napa, Nice and now Albuquerque.

Host : Marjorie Tatro, Director of Fuel and Water Systems of Sandia National Labs.

Economics, environment and security are the main poles of the energy challenge. They are also talking about Public Private partnerships between the industry, universities and government.

Important off the record comment: Beywatch has been screened as a very relevant project by the organizers (EPRI, SANDIA, DER). That is why we have been invited to the pre-conference.

After our trial in 2011, they are planning to have us in the next edition of the conference in order present the results.

