e-GOTHAM

Sustainable - Smart Grid Open System for The Aggregated Control, Monitoring and Management of Energy
e-GOTHAM overall details

- Coordinator: Inabensa
- Start: April 2012
- Duration: 36 months
- Total investment: 6,84 M€
- Participating organisations: 17
- Number of countries: 5
e-GOTHAM technological challenge

- To design an open reference architecture and to develop a middleware that enables the needed communications to manage and optimize microgrids in the residential, tertiary and industrial sectors, to support the development of a leading-edge market and new business models for energy efficient products and to assemble a system, which can ensure scalability, security, reliability, real time measurements and interoperability
e-GOTHAM concept and deployment

- e-GOTHAM will define and implement a complete solution for a microgrid in the residential, tertiary and industrial sectors that include different configurations of loads, distributed generators, and energy storage components.
e-GOTHAM consortium

- The project includes the RTD and industrial organizations

RTD institutions and universities contribute to the three pilots.
The residential pilot in e-GOTHAM will be a part of Demo Steinkjer, which is a large scale living lab for smart grid activities located about 120 km north of Trondheim.
Specific objectives for the residential sector microgrid pilot

- To reduce the chance for power failure in the distribution grid
- To reduce the peak values impact in the distribution grid to reduce the number of hours with extremely high power rates and the loss of energy in the grid to achieve a possible saving
- To gather knowledge and experience in general in microgrids for the residential sector and, especially, what concerns to scalability, security, reliability, real time system and interoperability
- To develop new business models
- To reduce the cost (bill) for the consumer without loss of comfort
- To develop new products
- To use open and standardized interfaces for HW and SW
The industrial pilot in e-GOTHAM will be a part of an industrial complex that carries out several different production processes:

- Vegetable oil refining
- Vegetable oil filtration and blending
- Vegetable oil bottling and packaging
- Production of plastic bottles and caps
- Printing of labels and boxes
Specific objectives for the industrial microgrid pilot

- Reduction of energy costs
  - by means of:
    - Integration of energy resources, particularly CHP
    - Storage (is out there a viable energy storage systems?)
    - Centralized management of assets, measurements and commands
    - Implementation of a decision support tool to find the best combinations among power sources and loads
- Elimination of voltage drops
- Effectiveness of the architecture
  - RoI
  - Cost-benefit analysis
The tertiary pilot in e-GOTHAM will be a part of the town of Ylivieska (Finland) and will involve several public buildings:

- Päivärinta School centre
- Sports centre
- Fire Station
- Elderly house
- Village school

Centralized energy production
- Delivery through underground water lines
- Heat exchangers in every building
Specific objectives for the tertiary sector microgrid pilot

- To reduce energy costs of tertiary buildings
- To reduce maintenance work related to routine inspections of the microgrid tertiary buildings
- To increase savings derived from energy balancing
- To increase the optimization possibilities of the district heating network
Market approach

Different actors can be grouped, according to their interests:

The power producer and the grid owner, who want to earn money in terms of

- Save money by avoiding investments by better utilization of already installed infrastructure
- Reduce the extra loss of energy in the grid due to the peak load effect
- Earn money with new business models (e.g. bundling power to electric equipment, providing new services which give the consumer a feeling of “added value”)
- Improve company image by contributing to the overall social corporate responsibility
Market approach

The consumer, who

- Expects stable power supplies
- Wants energy as cheap as possible
- Does not want to lose comfort or get extra work in terms of active power management
- Might be interested in “added value” services, even if he has to pay extra

Third party service providers, which might earn money on

- Equipment and services for power management in for example residential and commercial buildings
- New business models, which consumers (and power producer and the grid owners) find so attractive that it is worth paying for
- Offer the consumer improved and cheaper services (other than power management) not possible without this infrastructure
Market approach

National and pan-European governmental and regulative authorities, which should supervise and provide for

- Social consideration
- Solutions which take care of the consumers (the weak party)
- Solutions in harmony with larger areas, to assure interoperability across national borders, and by that promote international trading
Conclusion

Smart grids can also be considered as an ICT infrastructure of a smart city.
Thanks you for your attention!

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