ICT4SMARTDG A Thematic Network On How ICT Can Promote Distributed Generation

TELECOM OPERATORS
- TELEFONICA
- DEUTSCHE TELECOM (T-SYSTEMS)
- EUTELSAT
- BT

DISTRIBUTION OPERATORS
- IBERDROLA
- EDF

TELECOM EQUIPMENT MANUFACTURERS
- ERICSSON
- ALCATEL-LUCENT
- NOKIA-SIEMENS

ICT4SMARTDG

THEMATIC NETWORK

DG EQUIPMENT MANUFACTURERS
- DISENCO
- SAMARES

SOFTWARE SYSTEMS DEVELOPERS
- SAP

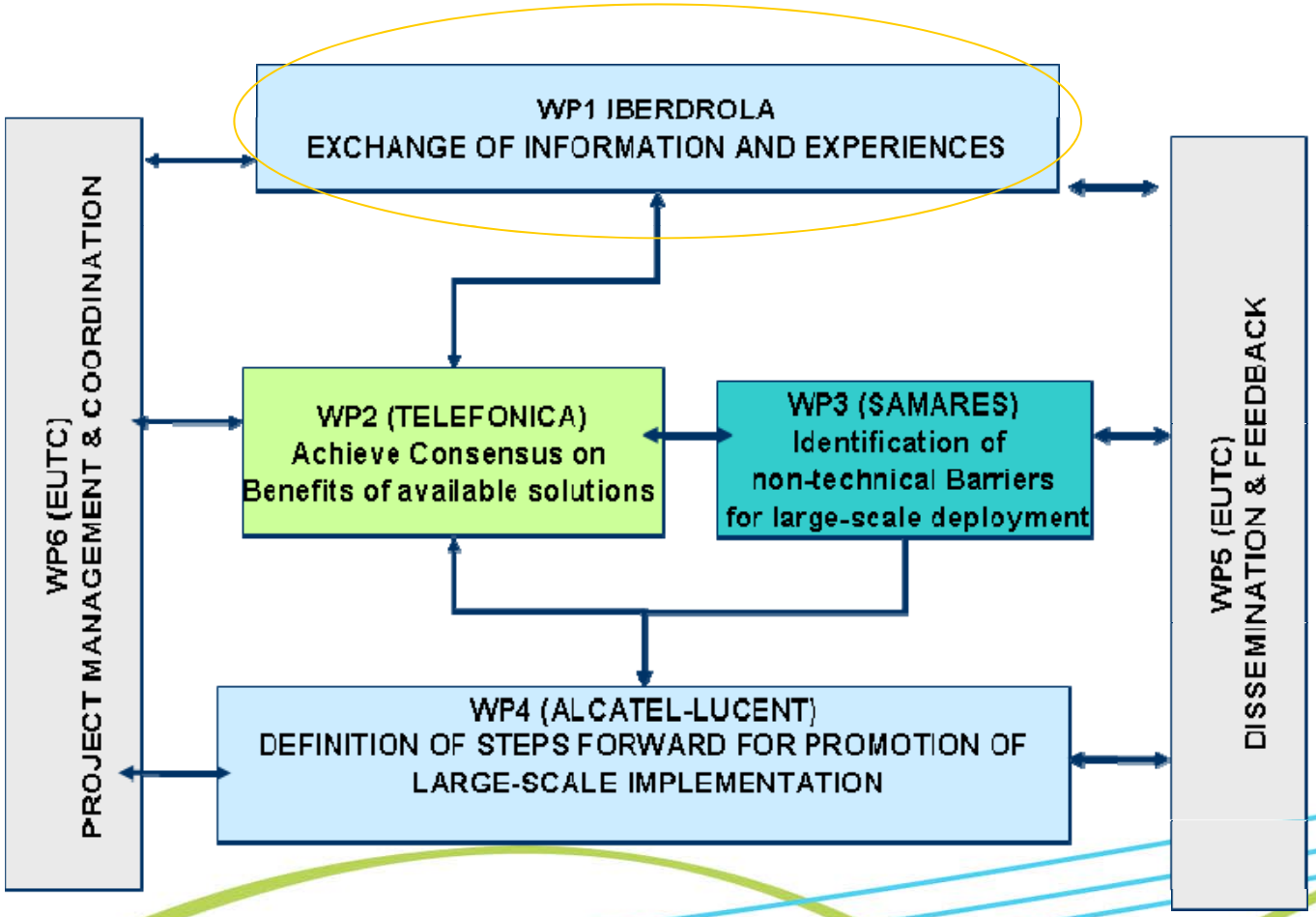
CONSTRUCTION COMPANIES
- ACCIONA (also energy operator)

ASSOCIATIONS
- EUTC
- EREC
- COGEN

General Objectives:

- Foster and promote large-scale integration of domestic and distributed micro generation and
- Improve energy efficiency
- Through the implementation of innovative ICT solutions into local smart power grids

Exchange of Information and Experience



Discussions Points from Work Packages WP1 and WP2

- **ICT community did not understand energy network architecture**
  - One way power flow
  - Layered networks of dfferent voltages
  - The number of asset points in Medium and Low Voltage Networks

- **Separate smart metering from smart infrastructure**
  - SM can exist without smart infrastructure

- **Energy companies do not know how many of these assets points will require communications**
  - Approximately 90,000 MV asset points to support 4M customers
  - When will the smart infrastructure being required
  - Difficult to define a set of communications requirements for smart infrastructure
  - Evolution to smart infrastructure
  - Communications to MV/LV networks will become mission critical
  - Cyber security protocols to protect local grids and wider energy networks

Discussions Points from Work Packages WP1 and WP2

- **Within ICT4SMARTDG Partners - Strong Focus on ICT in the Managed Service & Outsource Environment**
  - Members of ICT4SMARTDG not surprisingly have looked towards the commercial sector for network solutions
  - There is a fundamental belief in utility sector that commercial services can not deliver on reliability, resilience to power outrages, latency requirements. In addition utilities lose control of service provision and service support functions for mission critical services
  - International research shows utilities reliant on TDM technology, slow to accept IP in operational networks
- **Research confirms virtually all applications providers, system integrators and solution vendors have a view of smartgrid;**
  - Very few will provide details of what can actually be delivered

Discussions Points from Work Packages WP1 and WP2

- **Strong play being made by SW Industry (SAP, IBM, ORACLE, Microsoft, etc) to use SOA models**
  - A lot of companies creating applications, most of them currently focus on smart metering and home networks

Major Telecom operators favour NGN services to deliver all requirements for Smartgrid

  - Focus on M2M solutions
  - Telcos have experience in managing a lot information from millions of devices, and users (for billing, charging, etc).
- **Suggestion future SM/SG solutions should utilise SOA and NGN**

Output of WP3 Generate new proposal: Action Plan with ten major actions to reduce Barriers

To reduce Business Practice Barriers:

1- Adopt standard and light commercial practices for interconnection

2- Establish standard business terms for interconnection agreements

3 Develop tools for Utilities to assess the value and impact of distributed power at any point on the grid

Output of WP3 - Generate new proposal: Action Plan with ten major actions to reduce Barriers

To reduce Regulatory Barriers:

4- Develop new regulatory principles compatible with distributed power choices in both competitive and utility Market.

5- Adopt stable regulatory tariffs and utility incentives to fit the new distributed power model

6- Establish expedited dispute resolution processes for distributed generation project proposals

7- Define the conditions necessary for a right to interconnect

Output of WP3 - Generate new proposal: Action Plan with ten major actions to reduce Barriers

To reduce Cultural Barriers:

8- Create a “green benchmark” of energy efficiency to increase the awareness of people en push for Smart Grid adoption.

9- Promote Micro Grid as the solution to permit the adoption of different technology in different networks.

10- Promote specific information campaigns to push people to consider energy saving investment linked with earth sustainability

Key Messages taken into Work Package WP4

Key Message - 1

ICT for distributed generation must be an integral part of ICT for the overall smart grid

- Support distributed generation as well as other smart grid applications
- ICT spans across all domains including the utility critical infrastructure and delay sensitive applications.
- Support for legacy applications and protocols

Key Messages taken into Work Package WP4

Key Message - 2

With distributed generation sources expected to be spread widely over the utility territory – often inaccessible to wire-line networks, utility access to wireless networks is necessary

- Exclusivity of access (or sharing with other mission critical services)
- SLA guarantees from Carriers
- Develop a wireless access blueprint
- New technologies including LTE and WiMAX

Key Messages taken into Work Package WP4

Key Message - 3

While current utility OpTel* service delivery methods favor self-provided communication networks, incorporating carrier (service provider) networks may be considered for some of the applications over a period of time

- Mix of self-provided and carrier networks
- Smart grid pilots are using carrier networks
- Support for the utility requirements on network access, performance, reliability, and security.

Key Messages taken into Work Package WP4

Key Message 4:

In addition to supporting integration of distributed generation in the utility grid, ICT will need to support many other applications that will be expanded or developed for energy and grid management."

These applications include:

- The "virtual power plant"
- Retail Energy Markets
- Role of aggregator
- Demand Response

Key Messages taken into Work Package WP4

Key Message 5:

"Communication network performance (including QoS), reliability, and security must be managed so as not to adversely affect electric grid operations when integrating distributed generation into the utility grid"

- Eg, minimize communication network delays' impact on power grid transients

Key Messages taken into Work Package WP4

ICT4SMARTDG
ICT FOR SMART DISTRIBUTED GENERATION

Key Message 6:

"Utilities and suppliers of ICT (communication service providers and software companies) need a detailed dialog about the viability and actual availability of new ICT technologies for use by the smart grid"

- NGN and SOA
- IP as the networking protocol
- Need for new data management architecture
- Standardization
- Ensure standards bodies like ETSI and CENELEC make rapid progress with smart grid ICT requirements in their standardization efforts.

Near-term ICT Recommendation – Four Network Architectures

Scenario 1: DG is a component of the smart grid

- Solution 1: Integrated IP network supporting all smart grid applications including distributed generation

Scenario 2: ICT access to the large scale DG deployment

- Solution 2: Effective, efficient, and practical wireless access networking technologies for the smart grid

Scenario 3: DG-specific ICT requirements

- Solution 3: ICT for DG including at microgrids and homes in support of DG applications

Scenario 4: Explosive growth in data sources

- Solution 4: Secure network-based data management

ICT4SMARTDG
ICT FOR SMART DISTRIBUTED GENERATION

Questions and Discussion