a large system view French Pilot project on Smartgrids

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On behalf of the consortium

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GREENLYS
- Call for demo projects from (ADEME / French government)
- Pilot project proposal in two cities: Grenoble and Lyon
- Kick off November 2011
GREENLYS: A value through system view of Smartgrids

Massive integration of distributed generation, including renewable energy resources

Communication network
Smart meter and information system
Advanced Electrical Network
Aggregation Tools
Commercial tools
Demand Response Management (flexible load)

Electrical vehicle & distributed storage
GREENLYS: Main characteristics

1-A consortium involving different types of smartgrids stakeholders
   ✓ Covering the value chain of the electrical system:
     ✓ DSO, TSO, suppliers, technology providers (energy systems, ICT)
     ✓ Universities and R&D centers
     ✓ End-users, local communities, producers associations

2-A project to build up a systemic vision
   ✓ Coupling an advanced distribution network (operations and assets management) and advanced management of a complete DER portfolio (distributed generation, flexible loads and electrical vehicles) through AMI (Advanced Metering Infrastructure) including the LINKY smart meter

3-A demonstrator to experiment SG at real and significant scale
   ✓ Fours districts within two cities, representatives of a diversified population
   ✓ An ambition which could reach 2000 residential end-users (1000 in each city)
   ✓ Two complementary sites:
     ✓ Nation wide DSO (ErDF – Lyon) and Integrated local DSO (GEG Grenoble)
     ✓ Complementary experimentations (technological options, regulated or not tariff)

4- Expected results
   ✓ Analysis of the added value chain for market development
   ✓ Analysis of the transitions for larger scale smart grid deployment
The consortium

Electrical chain actors

- TSO

CORE CONSORTIUM TEAM

- Nation wide DSO
- PROJECT COORDINATOR

- Local electricity company (integrated)

Technology Providers

- Energy Technology Providers
- ALSTOM
- Energy Technology Providers
- ICT Technology Providers

Academic & Research center

- LEPII
- Economic University
- R&D Center

Scientific University

- Grenoble INP

R&D Center

- HESPUL
- Distributed Producers Association

National suppliers

- GDF SUEZ

Local communities association

- RHONEALPENERGIE
- Environment

- Local electricity company (integrated)

- Local communities association
GREENLYS Structure

=> smart interaction of actors and functions
Project structuring and Management

WP 0
Project Management

WP 1
Communication

WP 2
Economy and environmental interest of a Smartgrid

WP 3
Advanced Network Operation

WP 4
Assets management of the Network

WP 5
Smart meter and Advanced Metering Infrastructure

WP 6
Integration of EV, storage and distributed generation

WP 7
Aggregation

WP 8
New Tariffs and energy services For Load control

WP 9
Technological Platforms of the demonstrator

WP 10
Specifications, management of transitions and technological steps
A Real Scale Experimentation - GRENOBLE

GRENOBLE: 2 DISTRICTS
Caserne de Bonne Presqu’île

1 HIGH LEVEL CHARGING STATION FOR EV
500 RESIDENTIALS
20 TERTIARY

18 PHOTOVOLTAÏC
BtoB

15 COGENERATIONS
BtoB

36 ELECTRICAL VEHICLES
(distributed Storage)

10 ECOGENERATORS

ADVANCED TRANSFORMERS

UP TO 1000 SMART METER

AMM + Sites multi fluides

Offres MDE + Action D/R + alerte conso

Services aux producteurs
Services à l’agrégateur

Services opérateurs
Services fournisseurs

Réseau Auto-cicatrisant et supervision BT

Prévision production décentralisée

Services opérateurs
Services fournisseurs
A Real Scale Experimentation - LYON
3-c Lot 9.1:
DEMONSTRATEUR ZONE LYON
3-d: Lot 9.1 :
ZONE LYON CONFLUENCE

1. Place des Archives
2. Groupe scolaire, crèche et piste d'athlétisme
3. Bureaux et logements
4. Stade de football
5. Parc de Saline 2e modèle (1 hectar)
6. Saline Park 3e logements
7. Lyon Islands 4e logements
8. Le Monolithe
9. Capitainerie et MJC
10. Place nautique
11. Pôle de loisirs et de commerces + hôtel - En construction
12. Hôtel de région
13. Immeuble de bureau Effage
14. Quai Rambaud
15. Le Terroir
16. Espace Group (séminaires de salons)
17. Les Salons
18. Espace design (rénovation)
19. Pavillon 6 (face Rivoli)
20. Pavillon 7 (Jakob Mac-Farlane)
21. Pavillon 8 (Gérard Deup-Benoît Germain)
22. Musée
3-e Lot 9.2 :
*Caserne de Bonne*

**Plan masse**

- **Cogénération**
- **Photovoltaïque**
- **Poste HTA/BT de distribution**
3-f Lot 9.2 : Presqu’île
Expected results
Added value chain

To identify and quantify the added value of the smart grids

1. Security and quality of networks
2. Economical added value
3. Environmental added value
4. Societal added value

Global vision

To build up a system vision of an innovative electrical system
For requirements

Environmental
Economical
Societal
Industrial

Services for the network

Experimentation of the technologies for the massive integration of the distribution generation, in particular intermittent renewable energy resources

Services for the end-users

Participation of the end-users (active end-users, distributed producers)
Specifications and management of transitions/technical steps

**Specifications**
- Quality and reliability
- Equal access to energy
- Competitive cost of energy

**Technological transitions**
- IC Technologies
- Power/energy technologies

**Regular transitions**
- DG integration and grid access
- System functions / and grid services
- Balancing mechanisms, etc.

**Economical transitions**
- Cost of system operations
- Investments
- Asset management...

**Power grid with enforced intelligence**
- Increased integration
- DG (REN), diffuse storage, PHEV
- Charging mangt DR (BI)

**Transition scenarios**
- Step structured

**METHODOLOGICAL TOOLS FOR GRID TRANSITION**

**TRANSFER FOR LARGE SCALE DEPLOYMENT**

**LONG TERM TRANSITIONS**
→ The project has been submitted Nov. 2009!!
→ The largest SG pilot project demo in France
→ 40 M€ (Smartmeters/AMI not included - already funded)
→ High expectations and foreseen difficulties
→ A solid and engaged consortium