

# Possible Joint work

Wireless & Mobile Communications  
Faculty of Electrical Engineering,  
Mathematics and Computer Science



# Electrical energy – a concern

- The generation and distribution are not matched with each other.
- Usually the generation and consumption locations are geographically isolated
  - Hence these two are also seen in isolation.
- Problems causing concern
  - centralized production of power (from fossil fuels, nuclear fuel, windmills and large hydro projects)
  - a complex distribution system that needs to be managed
  - In 1996, a sagging power line in Oregon brushed against a tree, and within minutes 12 million customers in eight states lost power. Such is the vulnerability of today's power grid.
  - Efficiency – an issue
- It is imperative to look beyond the current solution ...

# Calls

- **ICT Work Programme 2011-12** : This work programme for the ICT theme of the FP7 Specific Programme 'Cooperation' defines the priorities for calls for proposals closing in 2011 and 2012
- **2012 COOPERATION THEME 5: ENERGY** : Adapting the current energy system into a more sustainable one, less dependent on imported fuels and based on a diverse mix of energy sources, in particular renewables, energy carriers and non polluting sources; enhancing energy efficiency, including by rationalising use and storage of energy; addressing the pressing challenges of security of supply and climate change, whilst increasing the competitiveness of Europe's industries.

# ICT Work Programme 2011-12

- Challenge 6 : ICT for a low carbon economy
  - Objective 6.1 : Smart Energy grids
    - STREP : EUR 29 million
    - Deadline : January 17<sup>th</sup>, 2012
  - Objective 6.3 ICT for efficient water resources management
    - STREP : EUR 15 million
    - Deadline : January 17<sup>th</sup>, 2012
  - Objective 6.5 : ICT for energy positive neighborhoods
    - STREP : EUR 30 million
    - Deadline : December 2<sup>nd</sup>, 2011

# Overall Objectives of Challenges 6

- **ICT for a low carbon economy** : This Challenge explores how ICT can contribute to delivering a sustainable, **low carbon society** and help progress towards the Europe 2020 targets on **climate and energy**. ICT can assist in reshaping the :
  - **1) demand side of our energy-dependant society,**
  - **2) reducing energy consumption, and**
  - **3) subsequently CO2 emissions,** in particular in electricity distribution, buildings and construction, transport and logistics, the **public sector, rural areas and cities.**

# Overall Objectives of Challenges 6.5

- **ICT for energy positive neighborhoods** : Energy-efficient buildings, neighborhoods as well as urban and rural areas improving the buildings construction cycle, improving the use of energy beyond buildings, advancing complex urban systems, and optimizing the dynamics of energy supply and demand in neighborhoods and extended urban and rural communities. This research will contribute to the Energy-Efficient Buildings Public-Private-Partnership launched in 2008 as part of the European Economic Recovery Plan;

# Call features-Target outcomes

- Projects supported under this objective shall contribute to the European Energy-Efficient Buildings Initiative by
  - *developing management and control systems*, and
  - *decision-support systems*addressing the dynamics of energy **supply and demand** in neighborhoods and extended urban/rural communities.

These **systems** shall optimize the use of energy i) beyond the **buildings** (considering for instance **street lighting, urban heat production, electrical vehicles**), and they shall include the integration of **renewable energy** sources and the connection to the **electricity distribution grid** in order to take advantage of variable tariffs and diversity of supply.

# Call features-Target outcomes

- In addition to technical developments, projects shall consider appropriate **business models**,
  - *how to split incentives, and*
  - *engage end users and public authorities to deploying such systems.*
- **Interoperation** of these systems with **other ICT-based systems** (e.g. traffic management systems, Geographical Information Systems) that may be deployed in the area will be considered an asset..
- In addition to systems integration, proposals shall include a substantial validation phase. During this phase, projects shall record evidence of the benefits and total cost of operation, as well as the potential for scaling up solutions, for potential users.
- Consortia must be **compact** with partners each making substantial contributions.

# Expected Impacts

- Contribution to the opening of a market for **ICT-based district/community energy management systems**.
- Establishment of a collaboration framework between
  - *i) the ICT sector,*
  - *li) the buildings and construction sector,*
  - *lii) and the energy sector.*
- Quantifiable and significant reduction of **energy consumption** and **CO2 emissions** achieved through ICT.

# 2012 Cooperation theme 5: ENERGY

- **Activity 7 : Smart Energy Networks**
- Topic ENERGY.2012.7.1.2: Enhancing electricity networks through use of distributed intelligence : The project should provide recommendations as well as scalable and replicable solutions for the application of advanced distributed sensors, monitoring and control systems to increase the intelligence of electricity distribution networks. The solutions may cover :
  - the assessment and monitoring of the components of the electricity system (condition monitoring), as well as the
  - enhancement and optimization of the real-time operation of networks in real time at all voltage levels, with a special focus on the distribution network
- The R&D activities could include the integration of distributed, simple and cheap sensors supporting local intelligence, inter-sensor communications, and communication with a central supervision system.
- **Funding scheme:** Collaborative project.