INTEGRAL Project In Execution

Electricity Grid Projects Workshop

Brussels, 2 April 2009

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Partners

- Universities and R&D institutions:
  - Blekinge Institute of Technology (SE)
  - Centre de Recerca I Investigació de Catalunya (ES)
  - Energy Research Centre of the Netherlands (NL)
  - Institut Polytechnique de Grenoble (F)
  - Inventer la Distribution Electrique de l'Avenir (F)
  - National Technical University of Athens (GR)

- Private companies:
  - Enersearch AB (SE)
  - Gasunie Engineering and Technology (NL)
  - ICTAutomatisering (NL)
  - Wattpic (ES)

National Technical University of Athens

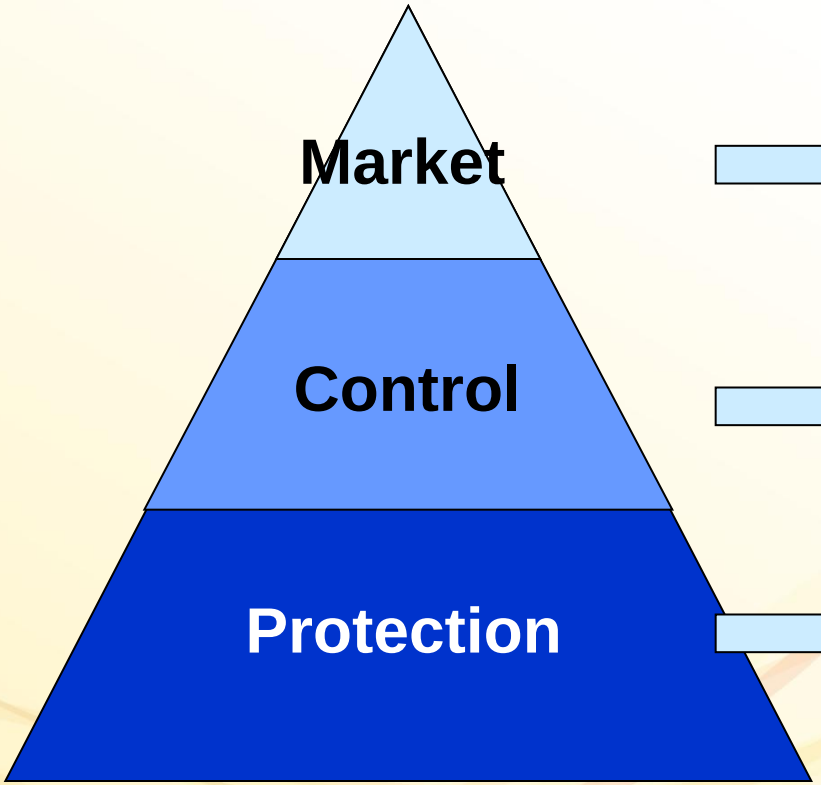
Objectives

To achieve an integrated ICT-platform based distributed control of decentralized energy resources (DER)

- Aim: to build and demonstrate an industry-quality reference solution, based on commonly available, multi-agent technology

- Demonstrate its practical validity via 3 field demonstrations:
  - Normal operation: Market
  - Critical operation: Control
  - Emergency operation: Protection

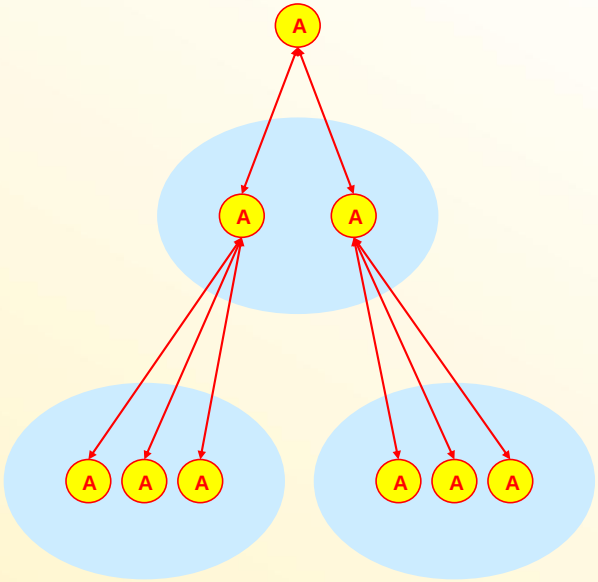
Three field demonstrations



		Response time
Market	Demo A	min-hours
Control	Demo B	sec-min
Protection	Demo C	msec-sec

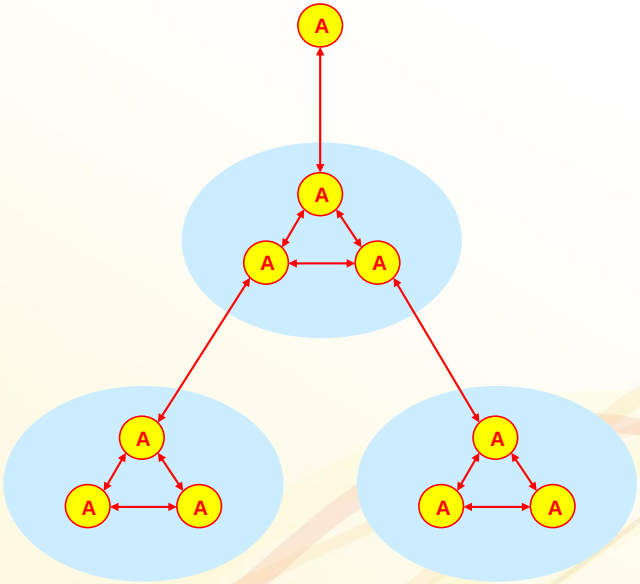
Common Control Concept

Market



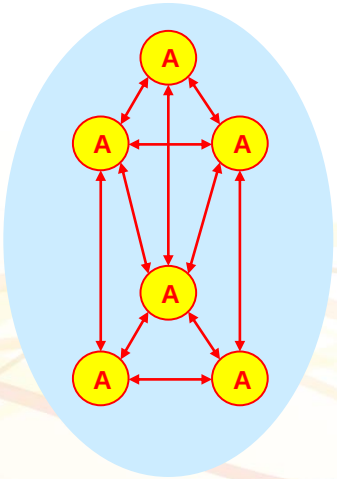
- Adopting theory of economics
- Agents competing with each other

Power Control



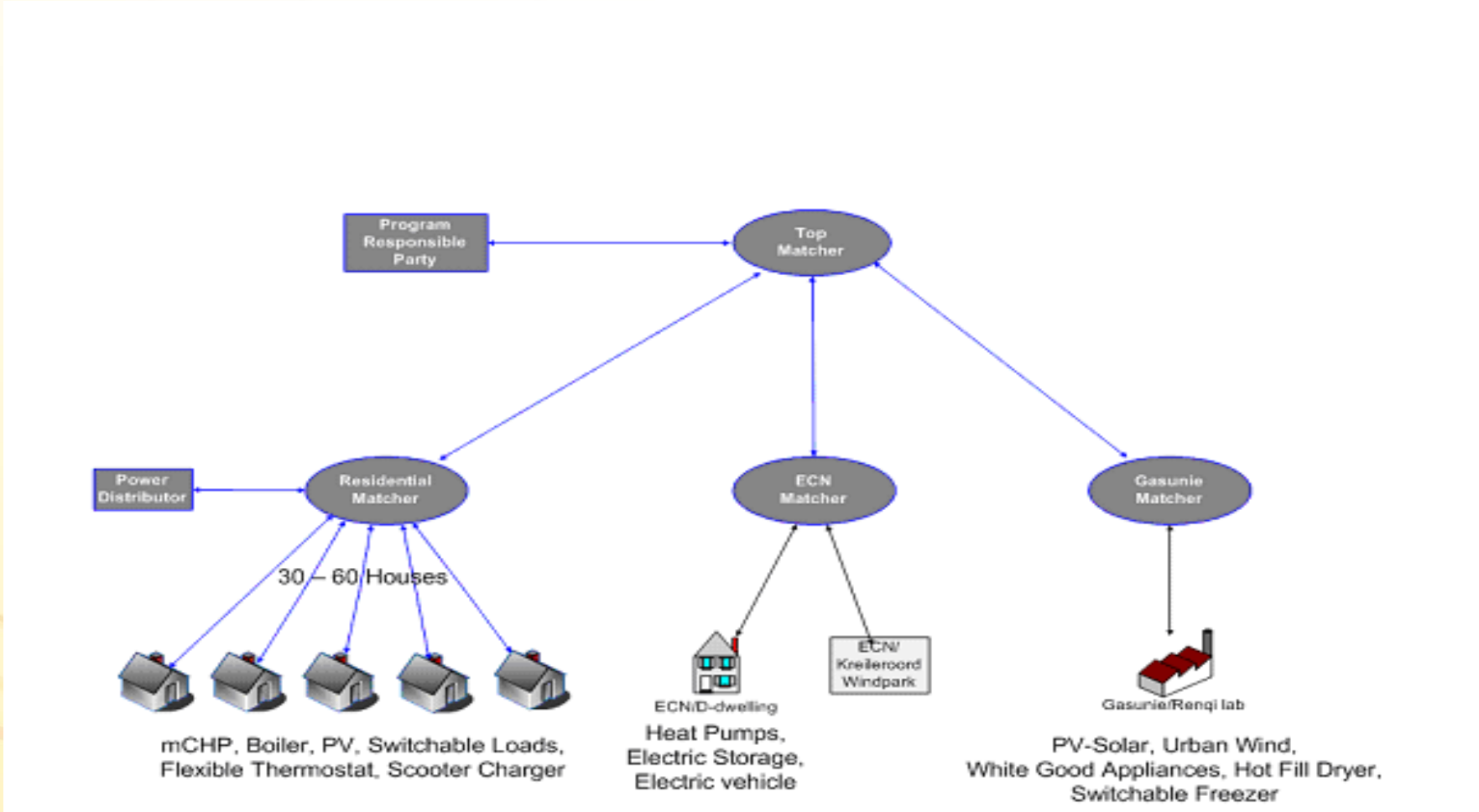
- System should handle local processes as well global
- Agents cooperating in order to achieve goal

Protection

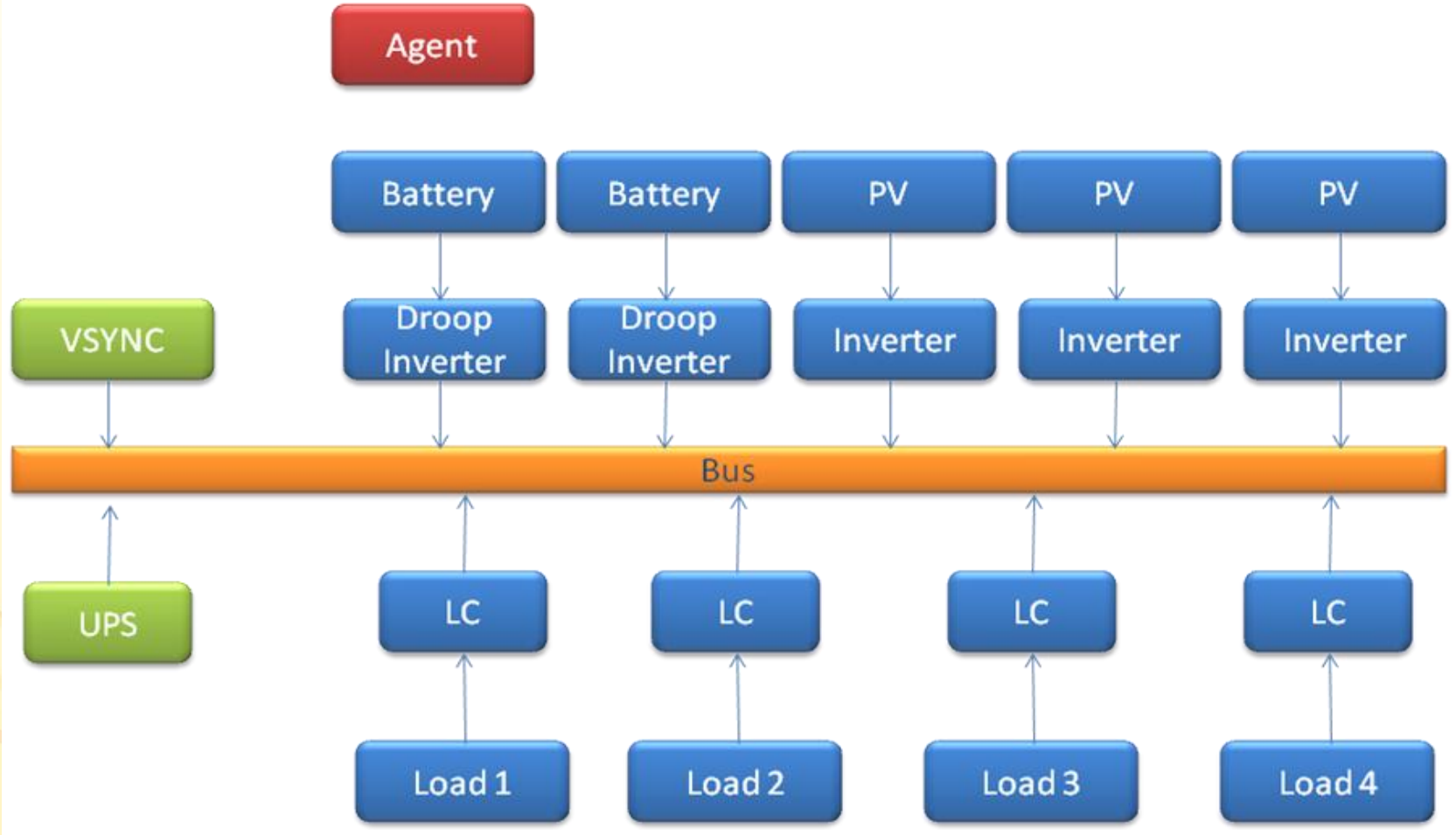


- Solution should be fast
- Sub-optimal solution allowed
- Agents cooperating to prepare grid parts to be switched off

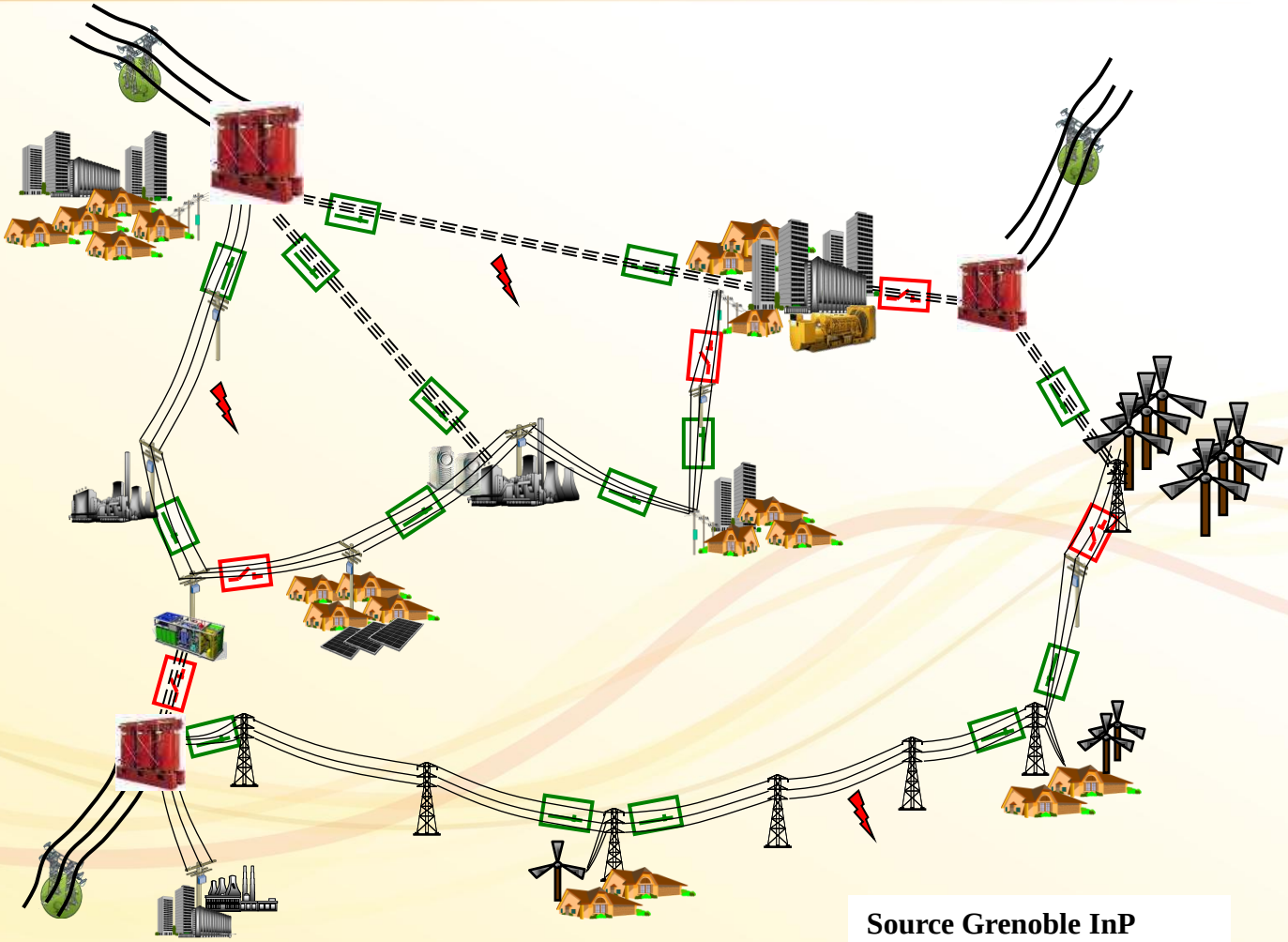
Demo A (Market)



Demo B Control



Demo C Protection



Source Grenoble InP

Status (19-3-09)

- Common control concept ready
- Demo A
  - On track, integration testing started
  - Wide range of DER/RES devices included ranging from PV-solar, Wind, Heat-Pumps to m-CHP and Fuel Cells
- Demo B
  - Test site in operation; desired infrastructure for 80% completed
  - The different modules are connected with ZigBee wireless technology – 20% completed
  - MV connection simulated and reproduced by SMA inverter.
  - End of May: initiation of test cases on critical situations
  - Cooperation with VSYNC project in preparation

Status (continued)

- Demo C
  - “INTEGRAL like” telecommunication system in progress
  - “DSO like” SCADA control system expected July ‘09
  - “INTEGRAL like” control system with agent based self healing functions expected July ‘09
  - Assembling electrical infrastructure ready Oct ‘09