Introducing the MAS²TERING project

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MAS$^2$TERING?

MAS$^2$tering is

Multi-Agent Systems and Secured coupling of Telecom and Energy GRIIds for Next Generation smart grid services

A collaborative R&D project (FP7) developing an innovative ICT platform for the monitoring and optimal management of low-voltage distribution grids

Project co-funded by the European Commission within the 7th Framework Program (Grant Agreement No. 619682)
MAS²TERING Goals

- What do we need to build a smart grid?
- Information and Communication Technologies to optimize the global management of the production, the distribution, the consumption and the storage of energy
- Better coordination of all the meshes of the electric network from producer to final consumer
- Improvement of the global efficiency by minimizing grid losses and by balancing production and consumption in real-time
- Reduction of the use of the most expensive energies, during peak times, by using storage equipment and flexibility methods to shave peaks
- Develop innovative cross-domain business models
MAS2TERING solution

- Market studies, Data Analysis
- Use Case Business Modeling

MAS2TERING solution

**Optimization:**
Home and DM (balance, peak shaving, quality, cost)

**Self-healing:**
Replaning (receding horizon control), grid stability, power quality

**Monitoring:**
Peak demand profiles, production, tension, communications

**Device interfacing:**
with physical agents and DSO smart meter (naming service)

**Forecasting:**
Flexibility availability, DER production, planning

**Security:**
Anonymization, encryption, IDS, authentication

**Mas2tering's District Energy Management Platform (mDEM)**
Mixed expertise and background

- Communication
- Energy
- Cybersecurity
- Artificial Intelligence
- Market
- Business assessment
- Industry validation
- Proof of concept
- Research

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Secure and effective connection of commercial home energy boxes with public DSO smart meters and consumer profile optimization

Research focuses
- Customer-side flexibility
- Interoperability
- Data privacy

Expected outcomes
- Energy savings at domestic level (10%)
- Effective connection between DSO smart meter and smart home gateway
- Data privacy guaranteed
- HAN side energy consumption data collection
- Scheduling of domestic loads
USE CASE 2 (district-level)

Decentralized energy management in a local area with Multi-Agents

Research focuses

- Multi-agent optimization to demonstrate the potential benefits of such a local energy management to DSO.
- Data access control & security
- Analyse on test field the level of adaptation of coordinated small local areas to contribute to DSO objectives

Expected outcomes

- Peak load reduction & energy savings (up to 12-15%)
- Effective data integrity assurance techniques
- Effective sabotage prevention techniques
- Results of the physical test campaign

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USE CASE 3 (grid balancing)

Enhancing grid reliability, performance and resilience

Local or district-level energy management, combined with effective grid monitoring and enhanced DSO / ESCO connections can significantly improve the flexibility and global balancing of the grid.

Research focuses

- Grid monitoring & balancing strategies
- Effective connection between DSOs and such district-level energy managers

Expected outcomes

- Grid losses reduction (5-7%)
- Renewable grid hosting capacity (12-15%)
- Reduced switch off time per year