



# MatchIT

## Efficient demand and supply matching by incentivizing end-users in buildings

*” MatchIT integrates research on physical, social and technological aspects of the grid to optimize the current energy infrastructure.*

An electricity grid that integrates renewable energies and enables flexible consumer and production technologies requires a reliable, efficient and socially acceptable energy infrastructure, in which households, commercial buildings and industrial buildings are connected. MatchIT proposes an interdisciplinary framework that integrates research on physical (e.g., generators), social (e.g., acceptability) and technological (e.g., ICT) aspects of the grid, which could improve current electricity infrastructures reliability, efficiency and acceptability.

We integrate cross-sectorial expertise on power distribution, control systems, building automation, computer science, and social and behavioral science to propose an interdisciplinary framework that uses innovative distributed control algorithms and an ICT platform coupled with intelligent automated techniques to improve demand-supply matching in a financially and psychologically way that is attractive and acceptable to end-users. Notably, we study interactions and interdependencies between key physical, psychological and technological layers. This significantly moves forward the state-of-the art where these issues are typically studied in isolation, with the risk of flawed or even inaccurate views.

### Project Duration

01.04.2017 - 31.03.2020

### Project Budget

Total Budget: € 1,424,704.-

Funding: € 1,134,078.-

### Project Coordinator

University of Groningen – Environmental Psychology (NL)

### Project Partners

- University of Groningen – Environmental Psychology (NL)
- University of Groningen – Distributed Systems (NL)
- University of Groningen – Engineering and Technology Institute Groningen (NL)
- KTH Royal Institute of Technology – Automatic Control (SE)
- Ellevio (SE)
- Metry (SE)

### Project Website

[www.matchit.info](http://www.matchit.info)

### Contact

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## Main Objectives

The overarching goal of the MatchIT project is to increase the efficiency and reliability of the electricity grid by optimally and intelligently encouraging demand-supply matching of different sources of energy that are acceptable to end-users. We rely on an interdisciplinary study of the physical, social and technological properties of the grid, for which we identified four key objectives.

**Objective 1a.** Develop user proof control and technical solutions for energy management that are acceptable to users and empower them to actively participate in the energy market.

**Objective 1b.** In addition, we test which incentives are effective in motivating users to match their energy demands with the variable supply of decentralized renewables.

**Objective 2.** Deliver technical solutions to users in the form of an ICT platform coupled with automation for energy management in buildings. We aim for a scalable platform that interfaces building users with the electricity grid and implements intelligent automated techniques to facilitate the matching of demand and supply by considering congestion, control signals, prices, user needs and building context information.

**Objective 3.** Deliver distributed control algorithms that will balance supply and demand while managing the complexity and restraints of the grid, and deliver different incentives. Based on physical, social behavioural, and technological data from the grid, MatchITs algorithms result in automated control designs for innovative integrated future demand-supply management.

**Objective 4.** Test the developed control methods in real life and scale existing living labs in the Netherlands and Sweden to bring the most recent scientific solutions to the market.

## Main Results

In 2017, the MatchIT project was funded by NWO (final approval in March) and SWEA (final approval in July) under the ERA-Net Smart Grids Plus programme. Since September 2017, 4 postdoctoral researchers are working on the project.

Because the project consists of an interdisciplinary framework, the first phase of the project mainly focused on knowledge transfer between partners. Moreover, we have attended and presented, and will attend and present in the near future, our work at the following events:

- ERA-Net SG+ Annual project event, May 2017
- International Conference on Environmental Psychology (ICEP), August, 2017
- European Utility Week, October 2017
- International Energy Agency, Experts' Group on R&D Priority Setting and Evaluation, October 2017

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This project is part of the 2<sup>nd</sup> Joint Call for transnational RDD projects of the ERA-Net Smart Grids Plus initiative. EUR 13 million of funding have been made available to 9 projects from 8 regions/countries.

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