European Research Infrastructure supporting Smart Grid Systems Technology Development, Validation and Roll Out

TRANSNATIONAL ACCESS PROVISION

RESEARCH INFRASTRUCTURE DESCRIPTION AND
TRANSNATIONAL ACCESS CONDITIONS

Oulu Smart Grid Laboratory
VTT Technical Research Centre of Finland

Grant Agreement No:	**654113**
Funding Instrument:	**Research and Innovation Actions (RIA) – Integrating Activity (IA)**
Funded under:	**INFRAIA-1-2014/2015: Integrating and opening existing national and regional research infrastructures of European interest**
Starting date of project:	**01.11.2015**
Project Duration:	**54 month**

Project co-funded by the European Commission within the H2020 Programme (2014-2020)

1 Research Infrastructure

Name of Infrastructure/Installation	**Oulu Smart Grid Laboratory (*SG-Oulu*)**
Location	VTT – Oulu, Finland
Web Site	*www.vtt.fi*

2 Description of the Research Infrastructure-Installation

Oulu Smart Grid laboratory (*SG-Oulu*)

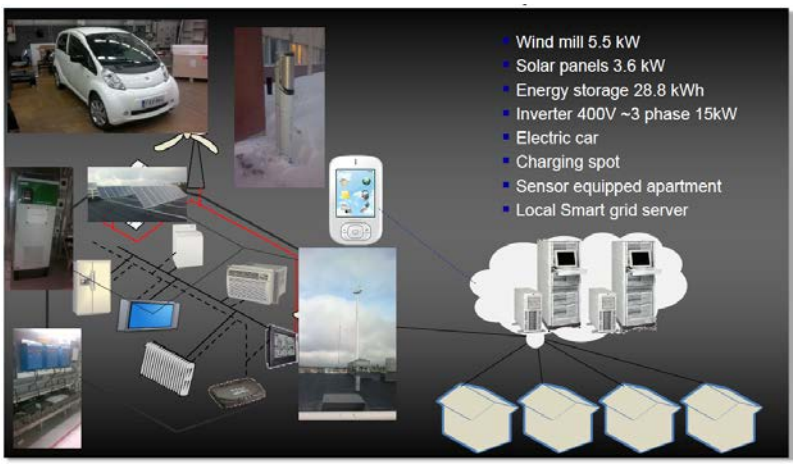
VTT has new Smart Grid laboratory for customer-level research. This facility consists of PV panels and inverter equipment, wind power unit, storages and EV with charging post. At the same, the laboratory is built as a home environment where household devices can be monitored and controlled intelligently.

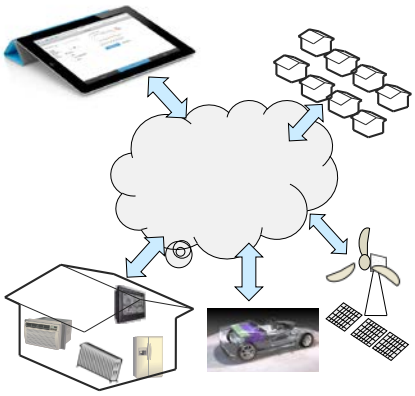
Key technical features include:

- Wind mill 5,5 kW installed on top of roof.
- Solar energy 7.2 kW
- Mini inverter and two rotating solar panels (250 W, 240)
- Inverter 400V ~3 phase 15kW
- Energy storage 58 kWh
- EV (Peugeot ION) and charging posts (2) with remote contol
- Controllable domestic loads

The laboratory has flexible controllability possibilities:

- Network and consumption control
- HTML5 & CSS3 based control interface
- Programmable user interface for monitoring, control and decision making
- System details from power source, consumption, energy storage etc.
- Decision making tools for selling/buying energy and managing energy consumption
- Dual power network (24V/240V) for internal use (specially for illumination with LED technology)





3 Services offered by the Research Infrastructure-Installation

Smart Grid lab offers development and testing possibilities for local micro grid systems, load control and use of energy storages. The operation platform enables development of new control systems but also user interfaces. Typical possibilities include:

- Control of EV charging post and V2G integration
- Decision making and intelligence at customer level – optimization on different basis
- Active load control and demand response systems
- Development of PV, wind and storage related control strategies

4 Brief description of the organization managing the Research Infrastructure

VTT Technical Research Centre of Finland is a non-profit government organisation established by law and operating under the auspices of the Finnish Ministry of Employment and the Economy. VTT is a multitechnological research organisation providing high-end technology solutions and innovation services. VTT has a staff of 2600. Through its international scientific and technology networks, VTT can produce information, upgrade technology knowledge, and create business intelligence and value added for its stakeholders. VTT's activities are focused on three areas: Knowledge intensive products and services, Smart industry and energy systems and Solutions for natural resources and environment. VTT has 70 years of experience in addressing the needs of industry and the knowledge-based society. In the past 20 years, VTT has participated in more than 1000 European R&D Framework Programme projects, within various thematic programmes. VTT has been granted ISO 9001:2000 certificate and ISO 14001 environmental certificate.

Research area "Smart Energy and System Integration" conducts wide research on future energy systems and their integration. We apply a holistic view on different energy carriers and integrate strongly ICT and communication aspect with power system research. VTT is closely involved in international co-operation networks (for instance EERA, DERlab, IEA ISGAN) as well as European research projects (for instance ELECTRA, SmartNet, STORY). VTT also participates in multiple national research programs on the area of smart grids.

5 Transnational Access conditions offered by VTT

The experimental system described is located at Oulu, Finland.

For **safety reasons**, for **critical applications**, the users are not expected to operate the systems by themselves; even when safety instructions will be provided, tests will be carried out by staff of VTT. For **the rest of applications** and after ad-hoc training, the user group will have access to the related facilities for the duration of the stay (with the support of VTT's researchers and laboratory technicians when necessary). The **scheduling of the experiments** will be agreed and booked prior to the stay according to the availability of the involved staff and equipment. Administrative documentation for the access (contract, non-disclosure agreement, etc.) will comply with ERIGrid common indications.

In addition to the general corporate services (Internet connection, working space, etc.) and the support and advice on accommodation and transportation to VTT's infrastructure, the access being offered includes supervision and help of VTT's staff:

- As a complement to the pre-access contacts between the user group and VTT, the stay will start with an introductory meeting for confirming the stay conditions (confidentiality, safety indications), scheduling the activities, explaining the on-site procedures, clarifying the logistics and technical details.
- Preparatory work: VTT's staff will assist the users for the installation of the devices, electrical connections, use of the specific instrumentation, preparation of a test procedure (if necessary) on the basis of the users requests, and programming of the experimental conditions.
- VTT's researchers will support the realisation and follow-up of the experiments.
- VTT's researchers will support the results interpretation and data processing and analysis

In principle, a typical stay of 2-4 weeks is foreseen for a single user group but this period could be extended depending on the concrete user project. The user group can use the infrastructure for the defined time.

Access to VTT premises requires a personal security clearance procedure, conducted before arrival by local authorities. Without the clearance the users are not allowed to move alone at VTT's premises nor given any access rights.

Reimbursement of expenses:

User expenses for the Transnational Access are paid by ERIGrid (EU H2020 Programme). This includes travels to Oulu by plane, accommodation, daily subsistence, and daily transportation during the stay.

For the user projects, VTT will refund the stay expenses when the stay is finished: the user must declare the incurred expenses and present the invoices/receipts to VTT in order to get the refund.

Logical expenses must be made by the user: travels will be made in economy class and conventional hotels or equivalent accommodation will be used. These costs (travel, accommodation) will be covered and additionally a daily allowance of 40€/day can be reimbursed, following the Finnish practices.

<u>All reimbursement practices must be checked and agreed on between the user and VTT prior to making any reservations for travelling.</u>

VTT will primarily reimburse the costs to organization (company, university, etc.). Please note that reimbursement of daily allowances to individual person can lead to taxation depending on practices.

6 Contact details for Research Infrastructure

<table>
<tr><td colspan="4">VTT Technical Research Centre of Finland
Address: Vuorimiehentie 3, 02150 Espoo, Finland
Website: www.vtt.fi</td></tr>
<tr><td colspan="2">For Management/Organization Issues:</td><td colspan="2">For Technical issues:</td></tr>
<tr><td>Kari Mäki

Tel.: +358 40 142 9785
E-mail: kari.maki@vtt.fi</td><td>  </td><td>Riku Pasonen

Tel.: + 358 40 574 8105
E-mail: riku.pasonen@vtt.fi</td><td>  </td></tr>
</table>