



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

TRANSNATIONAL ACCESS PROVISION

RESEARCH INFRASTRUCTURE DESCRIPTION AND TRANSNATIONAL ACCESS CONDITIONS

Institut National de l'Energie Solaire



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1 Research Infrastructure

Name of Infrastructure/Installation	PRISMES Hardware-in-the-loop simulator and multi microgrid test platform
Location	CEA Ines, Le Bourget-du-Lac, France
Web Site	www.ines-solaire.org

2 Description of the Research Infrastructure

The heart of the infrastructure is the hardware in the loop simulator which allows the simulation of any complex grid situation and which transforms a specific grid points into reality with the use of 45kVA three phase power stages. This can be used to test specific components and the different control and management strategies. The hardware in the loop simulator is integrated in the multi microgrid platform PRISMES, which covers the complete campus of INES. Single phase and triple phase grids are available at the platform, which are completely independent allowing running different projects in parallel.



PRISMES consists of a low voltage micro-grid, including several generators with different technologies (renewable and conventional), controllable loads, electrical vehicles and storage systems. PRISMES can provide electricity to the main grid and is supervised.

For the activities in ERIGrid, the necessary components will be selected and connected to the hardware in the loop simulator using the PRISMES platform.

It is previewed to link this infrastructure to the PREDIS platform of G2ELAB which is a one hour drive away from INES

Available devices which can be connected to this PRISMES platform are among others:

- About 160 kW photovoltaic modules which are divided into more than ten freely configurable different PV systems with single phase and triple phase inverters



- 45 kVA conventional fuel generator
- Several electrochemical storage systems like a Redox flow battery (10kW/100kWh), high-temperature NaNiCl₂ storage (140 kWh / 90 kW), li-ion storage (25kWh/25kW)



- Solar Mobility charging station with 20kW PV generator and more than 18 Twelve electric vehicle charging terminals, two of them with an associated stationary storage system electric load simulator (125kW)



3 Services offered by the Research Infrastructure

The hardware in the loop simulator together with the multi microgrid platform provides a complete range of Rapid Control Prototyping (RCP) solutions to quickly develop, iterate and test control strategies for:

- PV and storage power plant connected to grid
- Storages (batteries, flywheel, etc.) connected to grid
- Ancillary services (voltage control, frequency control, stability control ...)
- Microgrid operation, control and protection

This infrastructure was already accessible in the contest of the EU FP7 DERri and SOPHIA project program. Moreover, all user projects will be realized according to the procedures developed in NA5.

4 Brief description of the organization managing the Research Infrastructure

INES is the reference center in France, and one of the first in Europe, dedicated to research, innovation and training on solar energy. Set up with the support of the Savoie Departmental Council and Rhône-Alpes Regional Council, it hosts teams from the CEA and the University of Savoie, and is supported by the CNRS and the CSTB. INES currently employs 300 staff, a figure that will rise to 500 engineers and scientists, on a 22,000-m² site equipped with state-of-the-art facilities.

KEY FIGURES:

- 22,000-m² of laboratories, offices and training rooms
- 800 professionals trained each year
- 400 researchers and technicians
- 200 industrial partners
- 85 patents pending per year
- 15 laboratories

5 Transnational Access conditions offered by CEA-Ines

All the offered experimental systems included in the PRISMSE platform are in the CEA-Ines centre in Le Bourget-du-lac, near Chambery, France.

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 CEA-Ines. For **the rest of applications** and after ad-hoc training, the user group will be granted access to the related facilities for the duration of the stay (with the support of CEA-Ines 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, canteen, etc.) and the support and advice on accommodation and transportation to PRISMES infrastructure, the access being offered includes supervision and help of CEA-Ines staff:

- As a complement to the pre-access contacts between the user group and CEA-Ines, the stay will start with an introductory meeting with a senior researcher for confirming the stay conditions (confidentiality, safety indications), scheduling the activities, explaining the on-site procedures, clarifying the logistics and technical details.
- Preparatory work: a laboratory technician 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.
- CEA-Ines researchers will support the realisation and follow-up of the experiments.
- CEA-Ines researchers will support the results interpretation, data processing and analysis, and test report preparation
- Assurance covering the visiting period may be demanded by the local administrators.

In principle, a typical stay of 1 month 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.

As CEA platform is an access restriction area, the user group need to foresee at least **2 months** for administrative procedures before the stay.

Reimbursement of expenses:

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

For the user projects taking place in PRISMES, ERIGrid will refund the stay expenses when the stay is finished: the user must declare the incurred expenses and present the invoices/receipts to CEA-Ines in order to get the refund.

Logical expenses must be made by the user: travels will be made in economy class and conventional hotels (not luxury) or equivalent accommodation will be used. As an indication (it is not a daily allowance), a maximum subsistence fee of

- **72€/ night for hotel**

- 17.50€/ lunch
 - 22€/ dinner
- must be considered per day.

6 Contact details for Research Infrastructure

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