Key figures

PVT-air: 1.2 kWp PV, 2.4 kW Thermal; 4.8 kWh lead-acid battery.
PVT-water: 1.2 kWp PV, 2.4 kW Thermal, 1.5 kWh Li-ion battery, 421 L hot water tank.
Tilting PV: 300 Wp PV, 1.2 kWh lead-acid ba.

Attention points

- PVT collectors are more complex to monitor than separated PV and thermal panels.
- The collection of data is difficult and expensive if commercial interfaces are used. We have developed our own hardware and software interfaces.
- The installation of PVTs was not easy because these type of panels are still quite unknown and 2 profiles are needed: 1 electrical and 1 with plumbing knowledge.
- There are a lot of administrative and legislative barriers for solar installations.

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Useful links

University of Picardie Jules Verne Amiens – Living lab SOLLAB - YouTube
https://www.youtube.com/watch?v=LZefhI0f9JU
https://elab.u-picardie.fr/ui/#!/0?socketid=Osnmk3W-cOPZx-pRYAAio
UPJV Amiens – Living lab SOLLAB | Solarise (interregsolarise.eu)

Interreg 2 Seas Mers Zeeën SOLARISE
European Regional Development Fund
Brighton & Hove City Council · Université de Picardie Jules Verne · KU Leuven Technologiecampus Gent · Flux50 · Zoersel · Middelburg · Middelkerke · Fourmies · Enercoop · University of Portsmouth · Kamp C · Heerhugowaard Stad van kansen

Interreg 2 Seas Mers Zeeën
SOLARISE

European Union
European Regional Development Fund

UPJV - Solar Living Lab Université de Picardie Jules Verne

CO_2
Low-Carbon technologies

www.interregsolarise.eu

TOTAL PROJECT BUDGET:
4,18 M €
INCLUDING AN ERDF BUDGET OF:
2,51 M €

Budget

€ 101,000 of total partner budget € 595,000.

Goal

SOLLAB is viewed as an open platform for education, research and development on innovative solar energy technologies.

Description

SOLLAB covers the main components of the solar harvesting chain: Collection; Conversion; Storage; Intelligent and connected sensors; Metering; Communication; Stand-alone operation or injection into the Grid or Micro-Grid; Use of energy in electrical form in storage, injection or self-consumption; Use of energy in thermal form in storage, for domestic hot water (DHW) or for heating / cooling; Graphical User Interface; Supervision and optimal management of the installation; locally or in secure remote access via the web.

The SOLLAB illustrates a variety of solar enabling components. To cover a wide range of technologies, we chose PV/T hybrid panels that provide heated air/ water in addition to electricity. Figure 1 shows the experimental setup at SOLLAB roof to be monitored where the three blocks (PV/T-air and PV/T-water hybrid panels, tilting PV panels) are installed with different configurations and equipped with IoT modules.

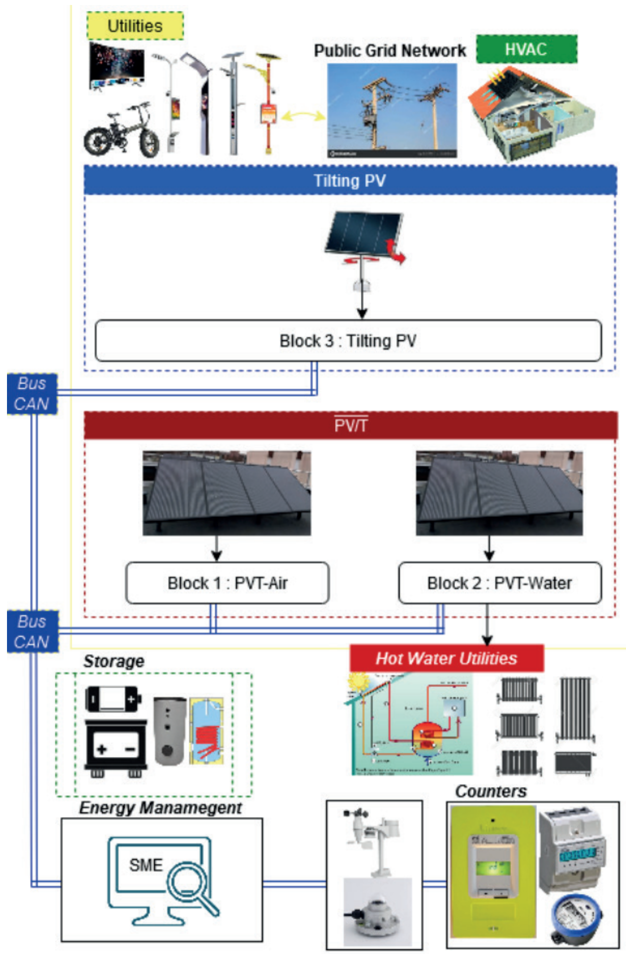
- **PVT-air system**: Four PV/T-air hybrid panels are connected with two maximum power point tracker (MPPT), batteries and one DC/AC inverter to supply different AC loads. Heat is used for air heating.
- **PVT-water system**: Two parallel groups of PV/T-water hybrid panels mounted in series are connected to two MPPT devices, which are connected to two parallel batteries and one DC/AC inverter to supply different AC loads. Heat is used for hot water.
- **Tilting PV system**: One 2 axis tilting PV panel is connected to an MPPT device that connects one battery and one DC/AC inverter to supply different AC loads.

The system is completed by a Weather station; Motorized camera; Automatic panel cleaning system; Shading simulator; Albedo effect simulator

Monitoring

The supervision tool of the SOLLAB uses a visual flow programming, flexible, scalable, and secure SCADA web-platform. The web monitoring interface, based-on Node-Red, receives measured data by subscribing to a secure MQTT server and sends the control values by publishing them.

The ESP32_based board ensures the communication between the physical and cyber layers by collecting sensors information, controlling actuators and communicating with secure MQTT server.



PV/T blocks with different communication technologies