THE SOLARISE PROJECT

CO_2

Low-Carbon technologies

Interreg

EUROPEAN UNION

2 Seas Mers Zeeën

SOLARISE

European Regional Development Fund

TOTAL PROJECT BUDGET:

4,18 M €

INCLUDING AN ERDF BUDGET OF:

2,51 M €

Content

The SOLARISE project

Solar electricity generation has been growing rapidly in recent years, in 2020 it accounted for 14% of the EU's renewable electricity (Eurostat), becoming the third largest contributor to electricity production from Renewable Energy (RE) sources in Europe.

Solar is the most abundant of all RE sources. It was perceived as expensive, although cost declines of 90 % over the past decade have made it significantly more affordable. However, aesthetic and business challenges still remain for solar to be deployed. Deployment of enabling technologies such as flexible loads and battery storage will permit solar photovoltaic installations to grow at pace.

The Interreg 2 Seas project, launched in 2018, is stimulating the adoption of solar energy in historic and public buildings and for low-income households, through feasibility study guidelines, city energy plan and solar roadmaps and, most of all, demonstrations on pilot sites in NL, BE, FR and UK.

UoP - Solar Living Lab University of Portsmouth

Budget

€ 83,000 of
total partner budget € 477,000.

Goal

To create a solar living laboratory at the University of Portsmouth

Description

Living labs are defined as user-centered, open innovation facilities integrating research and innovation processes in real-life settings. **A university-based living lab** gives the opportunity for staff and students to analyse the behaviour of real systems as they operate and provides access to live testbeds for innovative scientific research and training.

As part of the SOLARISE project, a solar living lab has been created consisting of **installations at two buildings** at the University of Portsmouth. The Port-Eco House is a research facility consisting of an instrumented 3-bedroom household for research in energy efficiency and building performance. The Port-Eco House has an electricity demand of about 10 kWh per day, which is typical for a 3-bedroom home in the UK. The Future Technology Centre is a four-story university building, opened in 2018 for project-based learning and innovation in engineering and product design.

The SOLARISE project has allowed these buildings to be equipped with **solar photovoltaic technology, smart battery storage, and energy monitoring systems**. The installations were completed during May 2021 and are complemented by additional laboratory equipment that has been acquired to facilitate student projects, such as individual solar panels, inverters, load simulators, maximum power point chargers, batteries, etc. The port Eco house received a 5 kW photovoltaic array and a 13.5 kWh battery storage system. The Future Technology Centre building received a 40.5 kWh smart battery storage system.

The **monitoring systems** at the living lab provide information about solar energy production at an array and individual module level, current and voltages associated with the modules and the solar array, power flows involving the solar array, battery and the grid connection, and the state of charge of the battery. All variables are sampled every 5 minutes and can be accessed remotely by means of web interfaces and mobile apps. These measurements are complemented by data from an existing weather station located on a nearby building, which provide useful variables including solar irradiance, air temperature, and wind speed.

Key figures

Location: Portsmouth, UK.
PV-size: 5 kWp / 25 kWp.
Energy storage:
13.5 kWh / 40.5 kWh.
Annual Energy production:
4,000 kWh / 25,000 kWh.
Energy use: On-site within the Living Lab and the campus.
Technology: Monocrystalline PV modules. Lithium-Ion battery storage system.

Attention points

- With the PV and battery, the Port-Eco House has become electrically self-sufficient, in the sense that any import of electrical energy from the distribution network over the year is offset by the electrical energy that is exported from the house.
- During the Spring and Summer months, it is a common occurrence that the Port-Eco House does not require to import any electricity over a 24 hour period.

Contact

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Useful links

https://www.port.ac.uk/
https://www.port.ac.uk/research/research-projects/solarise
https://www.port.ac.uk/about-us/our-facilities/lab-and-testing-facilities/port-eco-house
https://www.port.ac.uk/about-us/our-facilities/teaching-and-learning-spaces/future-technology-centre

UPJV - Solar Living Lab (SOLLAB)
Université de Picardie Jules Verne

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.

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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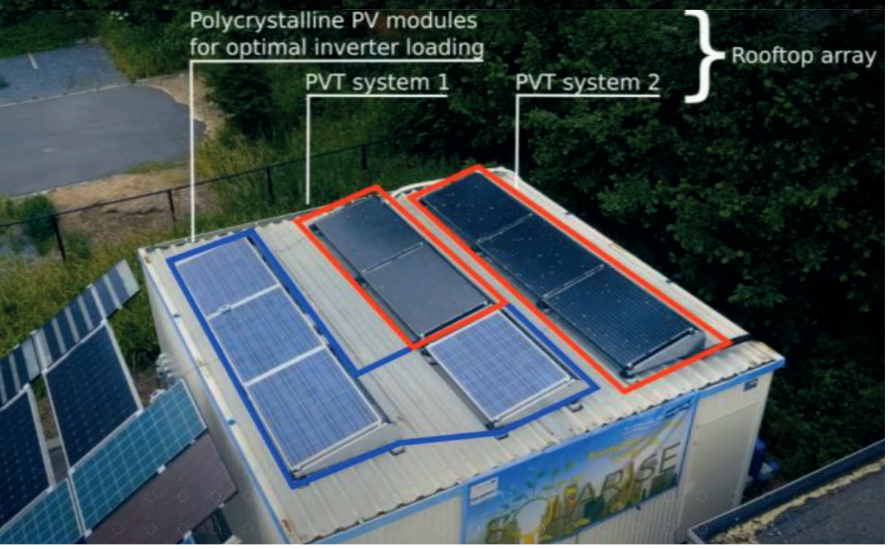
Useful links

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=Osnmk3WcOPZx-pRYAAio
UPJV Amiens – Living lab SOLLAB | Solarise (interregsolarise.eu)



KU Leuven Living lab Technology Campus Ghent

Budget

€ 63,000 of
total partner budget € 412,000.

Goal

The living laboratory at the Technology Campus Ghent of KU Leuven aims to demonstrate solar and enabling technologies that can be used in the residential, commercial and industrial sectors.

Description

The Living Lab demonstrates a range of solar and enabling technologies for visitors and students at the KU Leuven Technology Campus Ghent.

The eyecatcher of the Living Lab is the active awning in front of the Living Lab which hosts 10 PV modules, showing the **variety of PV modules** available on the market, and the evolution over the past decades. It includes bifacial PV modules (where sunlight is used by both the front and back of the module), or semi-transparent modules for use in agrivoltaic (=combination of PV and agriculture) applications, as well as coloured modules that provide aesthetic benefits. The roof of the Living Lab has two PVT (PV-thermal) systems, with their hot water storage tanks inside the lab.

The Living Lab has:

- An active awning with PV modules in front of the Living Lab **showcasing varieties of PV modules throughout the years**, connected to an educational switching matrix which permits users to connect the PV modules directly to the inverter, or via dedicated optimizers;
- Two PVT (**PV-thermal**) systems on the roof of the Living Lab with their hot water storage tanks inside the lab, connected with additional PV modules to an inverter, all PV and PVT modules using optimizers to reduce electrical mismatch
- A Lithium-ion (Iron phosphate, LFP) **battery** connected to a bidirectional inverter to manage PV variability;
- **A thermal "ice battery"**, consisting of a heat pump connected to an insulated water tank, capable of holding approximately 330 kWh of thermal energy;
- Various metered **electrical loads** in the living lab (lights, heater, controllable electrical load);
- Multiple PV, PVT and ambient temperature **measurements**, combined with irradiance measurements in the plane-of-the-array.

All of the measured data points are captured and saved at 15 second resolution in a local database for future analysis and use in the Living Lab.

Key figures

Location: KU Leuven Technology Campus Ghent (Belgium).
Size: 2.4 kWp (active awning) + 2.265 kWp (rooftop PVT and PV)
Annual Energy production: 3600 kWh.
Energy use: On-site within the Living Lab and by the Technology Campus.
Technology: Various mono- and polycrystalline silicon and PV+thermal modules, from 1999 to 2018.
Additional enabling technologies: 5.8 kWh Lithium-ion battery, 300 kWhthermal thermal storage in an "ice buffer" powered using an air-air heat pump.

Attention points

- PVT (PV+thermal) modules have a much higher complexity for installation compared to only PV. Their use is only recommended for space-constrained roofs.
- Regulations and experience around installing battery storage systems are still in their relative infancy. This can result in delays for new connection applications.

Contact

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Useful links

https://iiw.kuleuven.be/onderzoek/eena
https://solarise-kuleuven.one/
www.interregsolarise.eu
https://www.youtube.com/watch?v=cDiTuRV9Ex0

Brighton & Hove City Council
Solar energy in apartment buildings

Budget

€ 163,000 of
total partner budget € 534,000.

Goal

Accessible solar energy directly benefiting local residents in multi-tenant buildings to address energy poverty.

Description

Brighton & Hove City Council's (BHCC) goal was to trial new ways of making solar energy more accessible to local residents on low incomes. The council ran pilots in council-owned housing, each one demonstrating a different way to maximise on-site consumption of the solar electricity and help keep residents' fuel bills low.

Pilot 1: Buckley Close

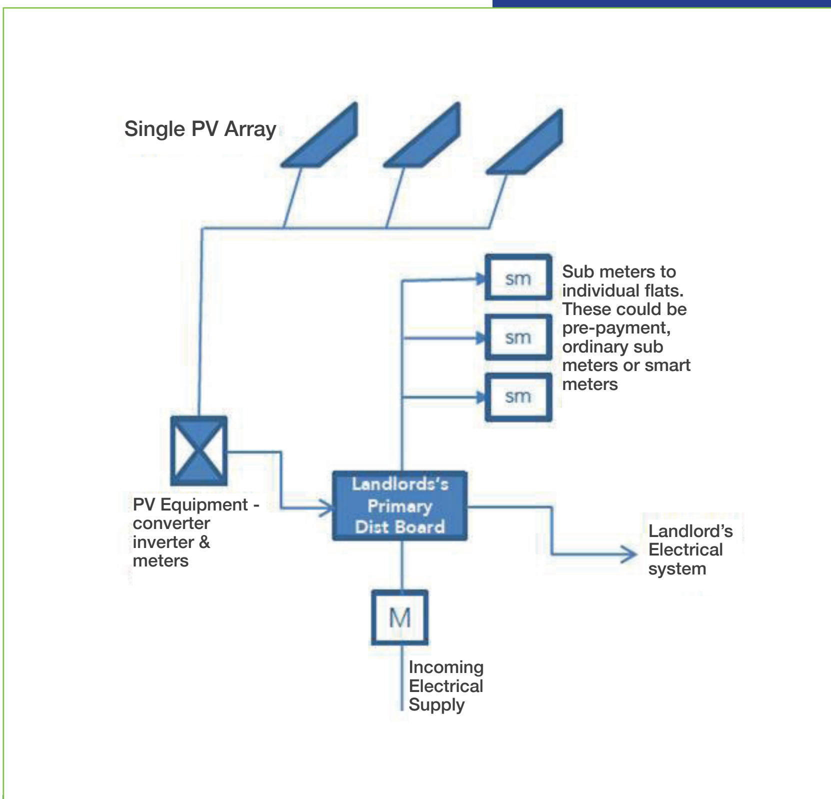
The goal at Buckley Close was to enable council tenants to maximise self-consumption of solar electricity in 3 housing blocks, via a common electricity meter and sub-metering tenants' consumption.

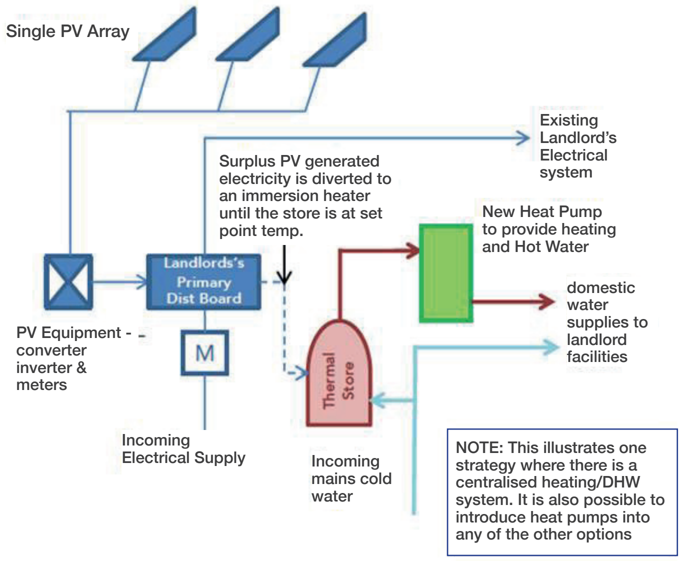
Buckley Close is a new development of 12 social housing flats within three blocks. Each block only has one MPAN (grid connection point), with tenants' supplies sub-metered by BHCC. This allows solar PV electricity to be consumed by tenants before exporting the remainder to the National Grid.

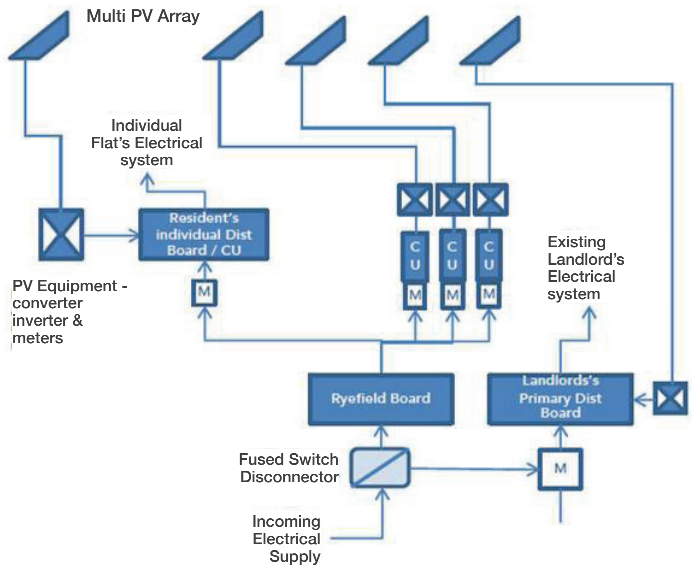
As a responsible landlord, the self-consumption achieved by putting tenant supplies behind the meter allows BHCC to charge tenants a reduced rate for electricity.

Key figures

Size: 14.91 kWp.
Energy production per year: 15,718 kWh.
Energy use: estimated 60-80 % self-consumption.
Technology: LG Monocrystalline 355 W PV panels, SolarEdge inverters.







Pilot 2: Elwyn Jones Court

The rooftop PV energy will be mainly targeted at running a ground source heat pump for the whole building.

Elwyn Jones Court is seniors' accommodation owned by BHCC, currently heated by night storage heaters run from the landlord supply. These storage heaters are due to be replaced with a Ground Source Heat Pump (outside scope of SOLARISE), which will significantly flatten the electricity demand curve at the site.

Two large solar arrays are installed to part-run these GSHPs, maximising the self-consumption of solar PV on-site and enabling a renewable heating solution to be driven by renewable electricity.
This accommodation is for older people and so it is important for the heating to be available throughout the year. Demand for hot water is also higher than usual. The cost of heating affects residents' service charges, so affordability is crucial. The solar-generated energy means that residents, most of whom are on fixed incomes, are partially protected from the steep rises in electricity prices seen in late 2021 onwards.

Key figures

Size: 55.6 kWp.
Energy production per year: 56,381 kWh.
Energy use: estimated 60% self-consumption.
Technology: 400 Wp panels, string inverters.

Pilot 3: Oxford Street

Here, the solution for rooftop PV on an apartment building is an array split into 8 separate systems, each connected to a single apartment.

Oxford Street is a renovation project, converting an old office building into new temporary accommodation apartments for people on the housing waiting list.
The 9.6 kWp rooftop array is split into 8 individual, 1.2 kWp arrays, each of which is wired directly into a consumer unit within each flat. This allows tenants to consume free electricity when their system is generating, without the need for complex metering equipment.

This will be an important contribution to cutting residents' fuel bills. Residents will be advised how to make best use of the solar electricity, for example running appliances during the daytime.

Key figures

Size: 9.6 kWp.
Energy production per year: 9,811 kWh.
Energy use: estimated 60-80 % self-consumption.
Technology: 400 W panels, string inverters.

Lessons learned

Initial monitoring and analysis of Buckley Close from Sept 20 to July 21 (includes use of modelled results for one meter per block from Sept to March):

- 3 solar systems totalling 28 kWp capacity
- Projected solar generation per year of 14,456 kWh, saving 4,263 kg CO_2/year
- All 12 residents have signed up as customers of scheme
- Very high solar productivity since March, with 52 % supplied to customers and only 48 % exported. Productivity will increase significantly in the winter.
- 42 % of customers' demand since March 2021 has been served by solar
- On current pricing, by comparison to the large electricity supply companies, customers are saving around 35% on their electricity unit costs and 27 % on standing charges.

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Useful links

The BHCC housing pilots are featured in this publication:
How Solar Energy Can Deliver for Climate and Communities
https://solarenergyuk.org/resource/how-solar-energy-can-deliver-for-climate-and-communities/

Fourmies
Solar energy on public buildings

Budget

€ 262,000 of
total partner budget € 419,000.

Goal

As part of the Third Industrial Revolution trend the City of Fourmies has installed nearly 1,000 m^2 of photovoltaic panels on public buildings (1 school and two sports centres). A crowd-lending operation co-financed the investment. The business model of collective self-consumption is tested in this project.

Description

Collective self-consumption: the concept

The collective self-consumption allows one or more producers and or one or more consumers to organise collectively the consumption of generated energy. All actors need to be geographically close, meaning that that the grid connection points for offtake and injection need to be downstream of the same distribution substation. The self-consumption system needs a legal person, which is the City of Fourmies in this pilot project.

Citizens' investment: crowd-lending

Next to the European subsidy of 60 %, Fourmies has chosen to finance the other part via a crowd-lending scheme, so its citizens can contribute to the financing of its energy transition and enjoy the economic and environmental benefits of these installations. This operation is structured as a four-year loan, consistent with the overall financing scheme for the installation (grants + loan). The town of Fourmies will reimbursing the lenders, with a yearly interest of 1.87 %.
The residents were honored by voting for the names of the future facilities of the pilot projects during the construction phase.

Pilot 1: ARAGON & Mendès France Schools

This pilot is installed on the roofs of two schools refurbished for this purpose. The energy production from the 98 kWp system is injected directly into the electrical distribution network and sold to an electricity supplier.

Pilot 2 and 3: The Sports Complexes: Léo Lagrange Gymnasium and Marie-José Pérec Gymnasium

The production of the two systems, together 103 kWp, is shared with eight municipal buildings, in a scheme called collective self-consumption.

Useful links

Fourmies has created a video to show you the 3 PV pilot sites and describe the system of collective self-consumption and the crowdlending approach.
https://www.youtube.com/watch?v=ODKoUW3oDww

Key figures

Location: Fourmies, France.
Size: 98 kWp / 36 kWp / 67 kWp.
Annual energy production: 92 MWh / 30 MWh / 62 MWh.
Energy use: direct injection / collective self-consumption.
Technology: Monocrystalline PV modules; central inverter / micro inverters.

Attention points

The involvement of citizens from the beginning on created confidence and awareness in the community about the potential of renewable energy.
The result of the votes (hundreds of participants) were:

- Aragon and Mendes schools: "Aurore sur la ville",
- Gymnasium Léo Lagrange "Léo Solis",
- Gynmasium Marie-josé Pérec "Sport & Sun".

This resulted also in 2 successful crowd-lending campaigns with enthusiastic participation by 150 citizens.

Via the pilot project the community, private actors and social landlords now recognise there is a big solar potential if we think about collective and individual roofs.

Fourmies has also shared its experience with other cities of Haut-de-France through a conference dedicate to collective self-consumption.

Contact

City of Fourmies, France
MICHAEL Hiraux, mayor of Fourmies
Marie HENNERON, experienced manager and passionate about the environment
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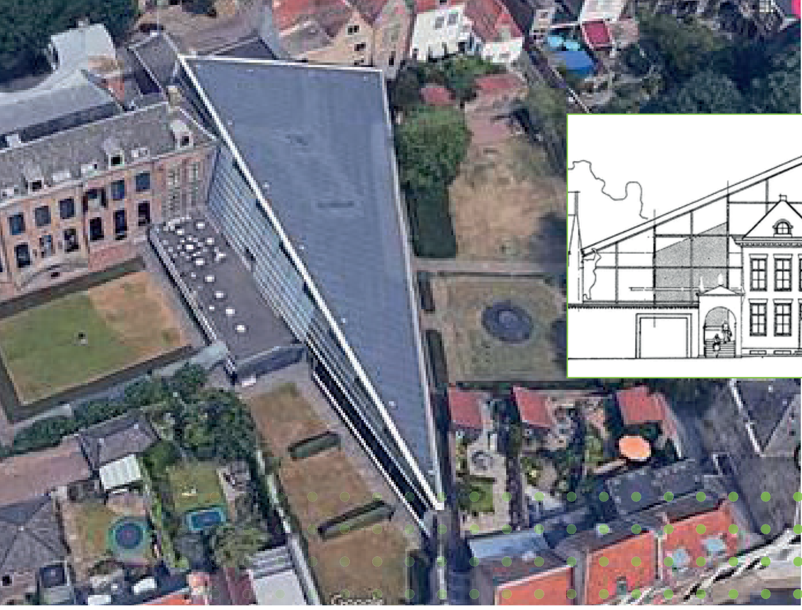

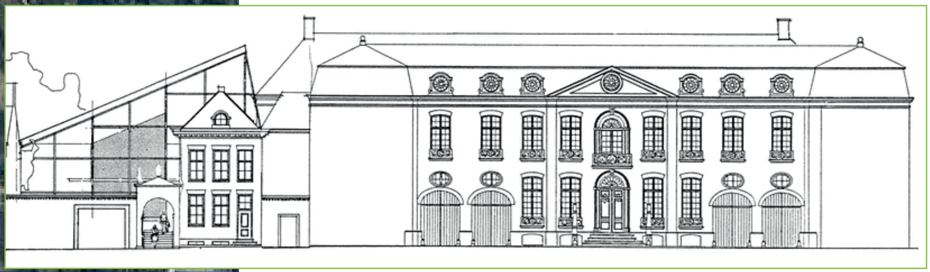

Middelburg - Solar on historic buildings: Zeeland Archives

Budget

€ 181,000 of
total partner budget € 599,000.

Goal

The City of Middelburg aims to be energy-neutral by 2050. The use of roofs for the utilisation of solar energy has the highest priority in historic Middelburg. This is challenging due to the large number of monumental buildings in the town centre and the protected townscape, which is subject to strict regulations.

Description

The" Zeeland Archives" is the regional historical centre of Zeeland. It administers and stores archives and collections from Zeeland's public authorities, private individuals and businesses. These 34 kilometres of archives can be consulted by anyone and are stored in three depots that reach 13 metres below ground. Maintaining optimum climatic conditions costs a lot of energy. The "Zeeland Archives" is housed in the historic inner city of Middelburg and consists of a monumental section (old city palace from 1765) and a modern new building (2000).

When choosing between various alternatives, sustainability is an important consideration. Various sustainability measures have already been realised, such as: the central heating sytem has been replaced by low-energy boilers, conventional lighting has been converted to LED lighting and the monumental glass has been fitted with sunscreens.

One of the main wishes was to install solar panels on the roof.
This was preceded by a long preparation process. There were many challenges, such as fire safety, the appearance of a roof with solar panels in the historic city centre, the connection to the existing electricity network and, of course, the costs.

There are now 781 solar panels on the roof. The entire roof, no less than 725 m^2, is fully utilised. The guaranteed minimum yield is 87,000 kWh per year. The expected yield is about 95,000 kWh per year because of the extra hours of sunshine in Zeeland.
At the entrance to the building there is a real-time display showing how much solar energy has been generated and how much this will save in euros.

Key figures

Location: Middelburg.
Size: 116 kWP.
Annual energy production:
87,000 kWh.
Energy-use: On site within the buildings and archives.
Technology: 781 (776 + 5) custom made solar panels München Solar 150 Wp 28 cells (All Black).

Attention points

- When installing solar panels in the historic city centre, it is highly recommended that cooperation be sought with the various stakeholders at an early stage. In this way, possible objections can be avoided in advance and support can be created.
- Seek cooperation with various partners. Not only the cooperation between those directly involved, such as the municipality and the Zeeland Archives and the State Property Agency, but also the cooperation with numerous experts in special building constructions.
- It is valuable to share the results of a project like this with colleagues and visitors, to inspire them.

Contact

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Useful links

www.zeeuwsarchief.nl/zonnepanelen-zeeuws-archief-in-gebruik-genomen/
www.middelburg.nl/solarise

Middelburg - Solar on historic buildings: Zeeland Concert Hall

Budget

€ 93,000 of
total partner budget € 599,000.

Goal

The City of Middelburg aims to be energy-neutral by 2050. This goal can be achieved by saving energy and by generating energy from sustainable sources such as solar energy.

The use of roofs for the utilisation of solar energy has the highest priority in historic Middelburg. Despite all efforts, it is difficult to use enough roofs. This is due to the large number of monumental buildings in the town centre and the protected townscape, which is subject to strict regulations.

Description

The Zeeland Concert Hall in Middelburg is housed in an old 18th-century warehouse and has been a very important link in Zeeland's musical life for over a century. Numerous concerts and other activities are organised there.

Over the years, the building has not only served as a concert hall, but during the First World War it was used as a reception centre for Belgian refugees. Later, it even served as a shelter for military personnel and as a warehouse.

68 solar panels are installed on the roof of Zeeland Concert Hall. Energy is mainly used in the evening hours and in the autumn and winter season when the sun is not shining. A battery for storage is provided here and the monitoring takes place in close cooperation with KU Leuven technology campus in Ghent.

Useful links

www.middelburg.nl/solarise

Key figures

Location: Middelburg.
Size: 23 kWp.
Annual energy production:
System total peak power of 23,460 watt. With this installation we have an production of approximus 21,000 kWp.
Energy use: On site within the concerthal, practice rooms, foyer and artist foyer.
Technology: 68 PV panels type Jinko solar 345 Wp 28 cells (All Black).
Battery: Alpha ESS model T 30 energy storage system.
The battery provides 35 kW energy.

Attention points

- It is important to seek collaboration at an early stage with experts in the field of old building structures and energy calculations so that an estimate can be made of costs, benefits and payback times and the extra comfort you gain.
- Take into account in an early stage in the process the consequences for example for (fire) safety and insurance issues.
- Application of PV at important locations in the historic city center serve as an example for other organizations and private owners.
- Tip. Check in an early stage whether a combination of techniques is possible.

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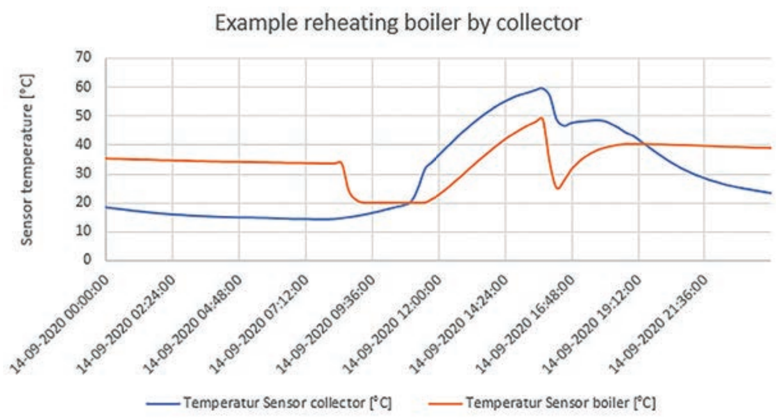

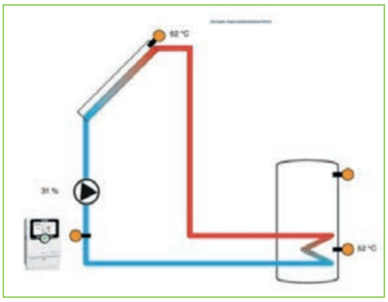

Middelburg - Solar on historic buildings: De Helm Middelburg

Budget

€ 35,348 of
total partner budget € 599,000.

Goal

Harvest thermal solar energy without affecting the esthetical appearance in a historical city.

Description

The City of Middelburg aims to be energy-neutral by 2050. The use of roofs for the utilisation of solar energy has the highest priority in historic Middelburg. This is challenging due to the large number of monumental buildings in the town centre and the protected townscape, which is subject to strict regulations.
In the heart of the historic center of Middelburg we have implemented an innovative technology to harvest heat in an invisible way.

Q-Roof is a system consisting of tubes that are placed in a circuit right under the roof. The heat from rooftiles, or slates in this case, heated by the sun, is transferred through metal sheets connected to the tubing system. The tubes contain an anti freeze liquid, which transfers the heat into a boiler that contains water. A small electric pump ensures that the water circulates.

This system is implemented under the roof of an outbuilding of the monumental city hall of Middelburg called “De Helm”. The building hosts the Middelburg Observatory (Volkssterrenwacht).

The Q-roof system has already been used under roof tiles. In this case the roof of De Helm is covered with slates, where even a higher efficiency was expected. Slates are very dense and can therefore heat op quickly.

The Q-Roof system at this monument is in place since June 2020 and the boiler is installed in August 2020. Since end of August 2020 the control technology for monitoring has been activated. The performance is online available

Key figures

Location: Middelburg.
Size: thermal power 3,400 W (170 Watt per m^2).
Annual energy production: 2,780 kWh (= 10 GJ/year).
Energy-use: domestic hot water.
Technology: Q-roof – invisible sunheat/energy.

Attention points

- Implementing sustainable measures in monumental buildings or in a historical area is usually quite a challenge. The regulations aimed at preserving historical character often limit the possibilities to make them more sustainable.
- The Performance of a solar energy collector system depends on the consumption of the heated water in the building. Within this project, it has been decided to use 2 “shower” moments as a hot water consumption profile.

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Useful links

Thermal solar technology: https://www.q-roof.nl/
Gemeente Middelburg : www.middelburg.nl/solarise
Boiler and control technology: https://www.croonwolterendros.nl
Project website: https://www.interregsolarise.eu/,
Specialised roofing contractor: https://www.jobsebv.nl/

Middelkerke - Pilot on Heritage building

Budget

€ 70,000 of
total partner budget € 179,000.

Goal

Use solar energy on a historic site.

Description

28 PV panels on the shed of the 'Groenhage' heritage mill in Leffinge (Middelkerke) produce enough renewable energy to cover the needs of the site itself. The miller's house was renovated and became a community centre for small social and/or cultural events and gatherings. This centre can now use the sustainable energy from the adjacent stable.

If not all the renewable energy produced is consumed, it can be used for charging points for electric vehicles or bicycles or even street lighting. For the latter, the municipality is in negotiations with Fluvius, the electric distribution system organisation, who is also responsible for public lighting.

An initial monitoring report shows that connecting public lighting is not going to be easy. The project is too small-scale for this and the costs of opening the street's pavement do not outweigh the potential benefit. Providing a charging station is possible, but then only one third of the charging station will work on renewable energy.

The municipality of Middelkerke is now looking at the option to start up a system with battery charging. With this, the municipality wishes to provide the lifeguard station with electricity in the summer and to provide the public broadcasting system with power. The public broadcasting system or lifeguard stations are no longer feasible within the time period of the solarise project.

Useful links

www.middelkerke.be/solarise

Key figures

Location: Middelkerke (Belgium).
Size: 8.68 kWp solar PV and 6 kWh battery.
Annual energy production: 8,000 kWh.
Energy use – building next door and maybe charging points, public lighting or other possibilities.
Technology: 28 PV-panels, 2 converters and 2 batteries.

Attention points

- In March 2021, the installation started to be monitored in order to measure its effectiveness, in close collaboration with KU Leuven.
- It is not easy in Flanders to get permission from The Real Estate Heritage authority to realize something on historically important buildings. The solar panels were eventually placed on an adjacent roof that is not visible from the street. The site is protected as heritage and "protected village view'.
- A charging station for cars in a residential area has little added value. People can charge in their own driveway and will not use the public charging station.

Contact

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Zoersel - Solar heat on a historic building

Budget

€ 256,000 (excluding costs for building renovation and new hall) of total partner budget € 443,000.

Goal

The municipality of Zoersel is building a new village hall in one of its suburbs. This new village hall borders a historic public building: 'The Pastorium'. Due to the integration of this historic building into the construction of the new village hall and the simultaneous renovation of this historic building, Zoersel wants to create a sustainable complex, by combining a heat pump with an ice buffer, solar collectors and solar roof tiles.

Description

The intention of Zoersel is to reduce energy consumption/CO_2 -emissions from this historic building. Today however, with the techniques currently available, it is not easy to collect solar power on a historically valuable building without visual impact, affecting it's heritage value. Together with the other partners and extra funds Zoersel hopes to complete this project by using innovative solar thermic roof tiles, to be a source of inspiration for other municipalities (cross-border) and to contribute to the further development of solar energy use. The pastorium will be equipped with solar roof tiles, to collect solar heat. The solar collectors on the new village hall also collect solar heat. The combination of both solar collectors and an ice water buffer system will serve as source for a water-to-water heat pump. The control system of the heat pump will automatically choose the optimum source for hot water production to supply low temperature heat release.

Key figures

Location: Halle Zoersel, Belgium.
Heat pump: 2 units of 17.4 kW each.
Thermal solar collectors
- 20 panels SLK-F 3.0 x 1.0
- 5 panels: absorption surface: 53 m².
Ice buffer vessels:
capacity 6 x 10,000 L.
Buffer tank hot water: 750 L.

Attention points

- (sub) Contractors are clearly not familiar with new / more specialized techniques, so a good cooperation with the supplier is necessary.
- There are not (yet) many suppliers of these techniques (like an ice buffer system coupled with a heat pump). This lack of competition has an influence on the price.
- The solar collectors are a standard product, so limited adjusting option are available. Panels also have a large delivery time.
- Ice buffer vessels take up more surface area than originally thought.
- The works started in July 2021 and 12 months of works are foreseen. At the moment the provisional delivery is foreseen in September 2022. So there will be still some time for monitoring the installation (project Solarise finishes in March 2023).

Contact

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Useful links

https://www.zoersel.be/wonen-en-omgeving/werken/bouwprojecten/bouwprojecten-uitvoering/nieuwe-dorpszaal-halle

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PROJECT PARTNERS

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