

# SOLARISE project accelerating solar energy adoption




## Living Lab @KU Leuven

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Solarise Closing Event,  
Brighton & Hove  
May 2022

[www.interregsolarise.eu](http://www.interregsolarise.eu)



Low-carbon technologies

TOTAL PROJECT BUDGET:  
**4.35** M €

INCLUDING AN ERDF BUDGET OF:  
**2.61** M €

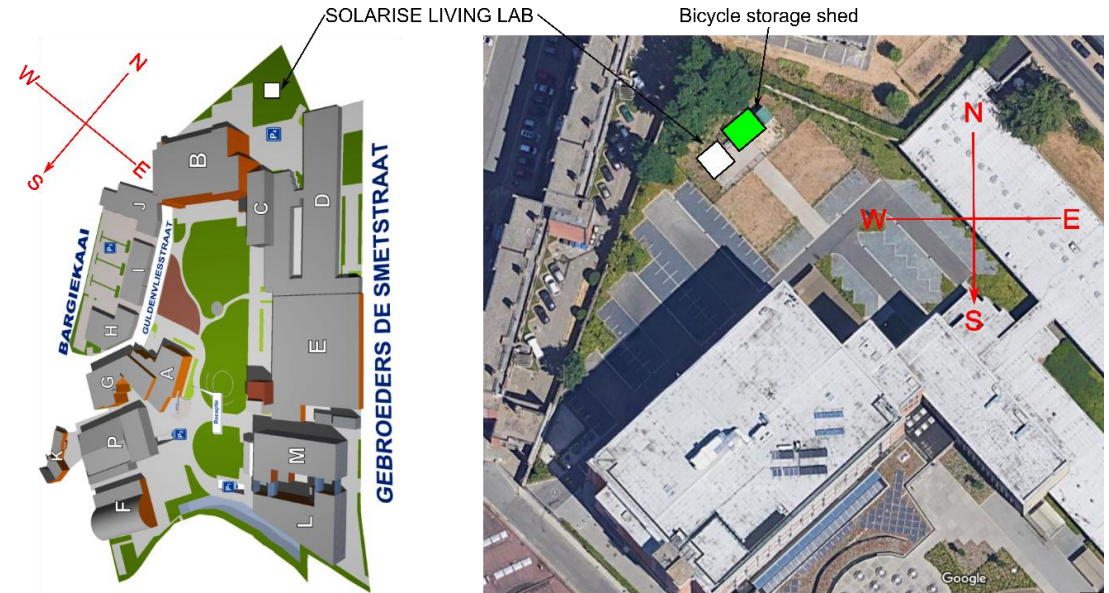
# LIVING LAB @KU Leuven Technology Campus Ghent

## Goals:

- Inspire curiosity in solar technologies
- Enable teaching activities
- Design considerations and challenges: PV, PVT & storage
- Demonstrate challenges of power and energy flows on a constrained connection.

# LIVING LAB @KU Leuven Technology Campus Ghent

- “B” building shading ↔ available space on campus
- Educational activities, visitors, meetings, ...



Polycrystalline PV modules  
for optimal inverter loading

PVT system 1

PVT system 2

Rooftop array



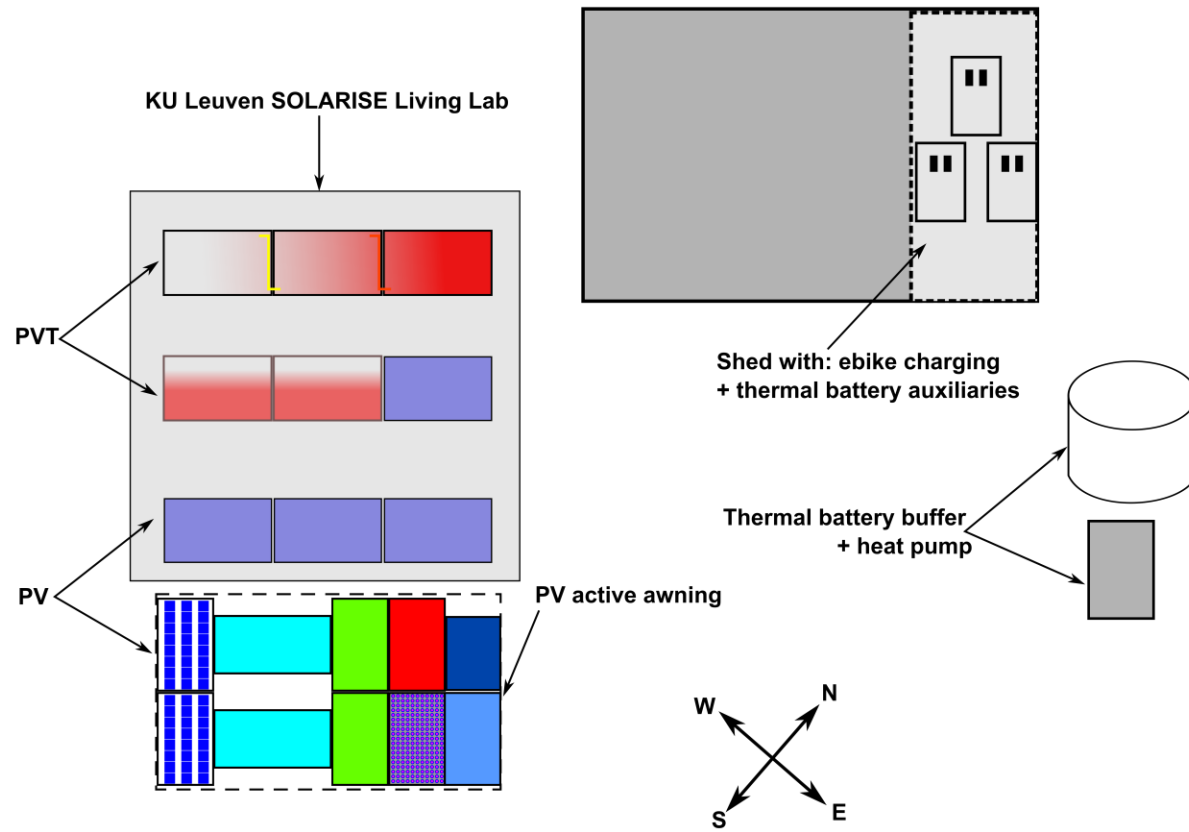
# Living lab

- Solarise living lab: example of grid issues (constrained connection, generation versus load mismatch)
- PV & PV/T systems: illustrate mismatch, solar technologies.
  - Ground-level view of PV module types  
⇒ inspire curiosity
  - Applications for workshops & education: Measurement, control & visualisation of key parameters
- PVT room heat control system: use heat from PVT storage (MSc thesis #1)
- Ice/thermal buffer: store excess electrical energy as heat, load-shifting (MSc thesis #2)



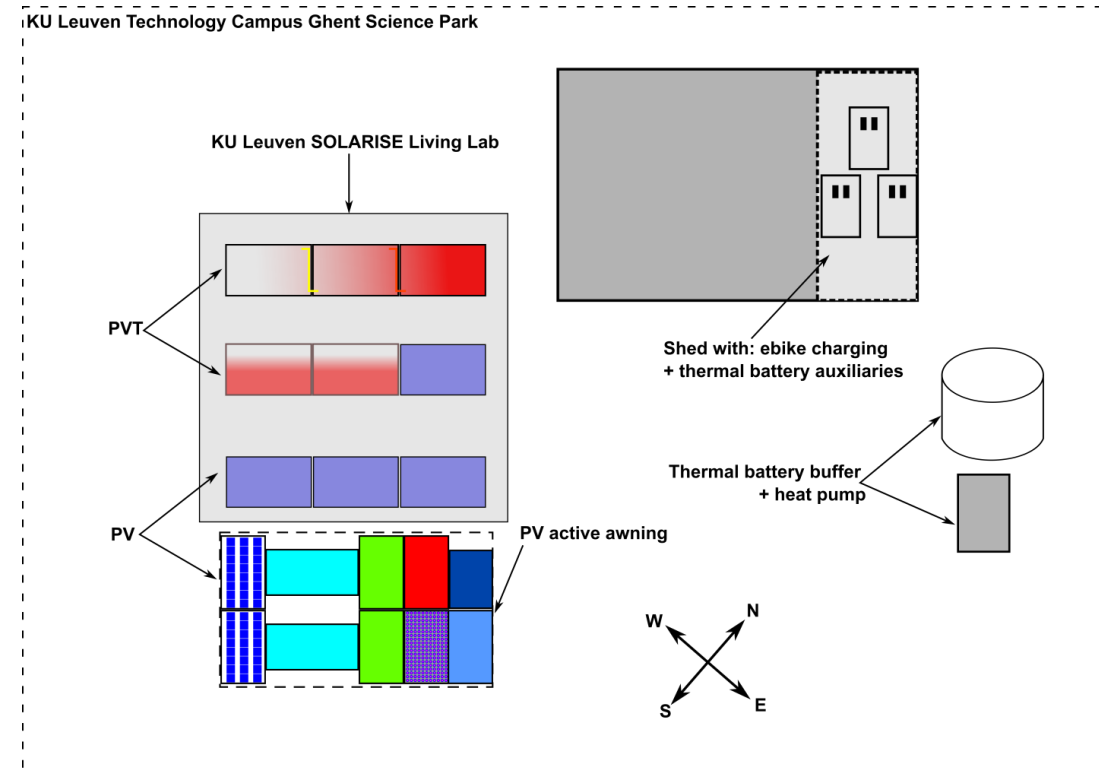
# Lay-out & design

KU Leuven Technology Campus Ghent Science Park

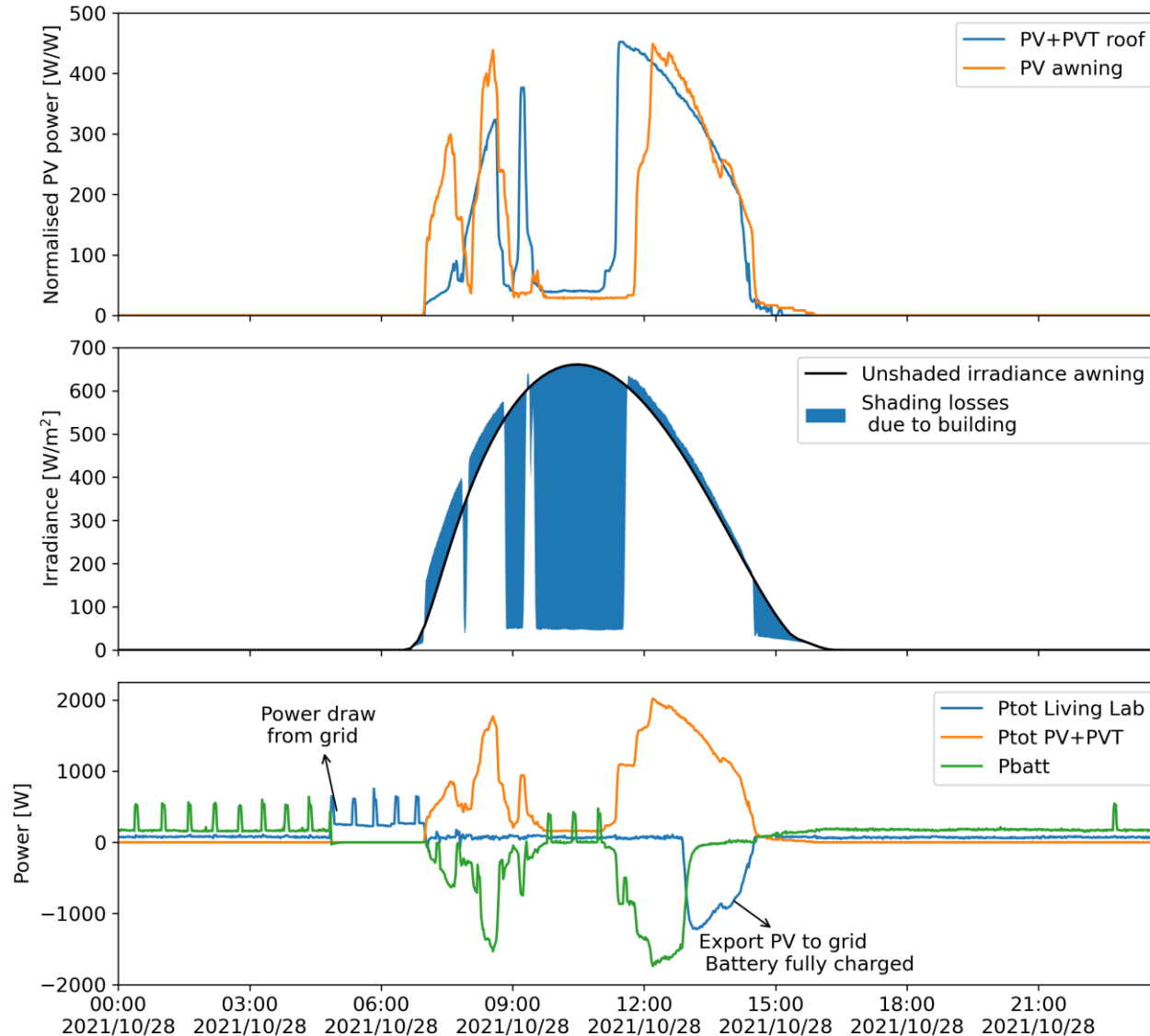


# System overview

- PV + PVT: 4.7 kW
- Li-ion battery: 5.7 kWh
- Thermal “ice” buffer: up to 300 kWh<sub>thermal</sub> energy storage
  - E.g. for farmer: milk cooling
- 3 ebike chargers (controllable)
- All weather & power data measured  
 ⇒ <https://solarise-kuleuven.one/>
- Expected CO<sub>2</sub> savings: ~11 tCO<sub>2</sub> over 25y



# Operations



- Shading!
  - Shade reaches awning and roof at different time of day
- Match between:
  - Battery capacity
  - PV generation
  - Load
- PV daily self-sufficiency & self-consumption challenging



# Events, my dear boy, events – Harold Macmillan

- Coronavirus
  - Staff & student quarantines
  - Lockdowns: installation work delayed
  - Supply chain issues: costs & delays
- Cold snap Jan-Feb 2021
- New neighbours: KU Leuven CBCI Living Lab (Interreg 2 Seas) – Circular Bio-based Construction Industry
  - + More PV energy generation & data
  - More shading on modules



# Lessons learned

- PVT systems: very limited use: cheaper or easier to install separate PV and solar thermal systems  
⇒ installers must have expertise with PV **and** thermal/hydraulic systems
- PV & battery storage: regulations not yet unambiguous  
⇒ delays, extra costs
- Battery inverters: must meet national (**Belgian**) regulations  
⇒ Few available, as not all manufacturers wish to pay for tests
- Flexibility, tolerance, patience **and** planning go a long way

Thank you

Data available: <https://solarise-kuleuven.one/>

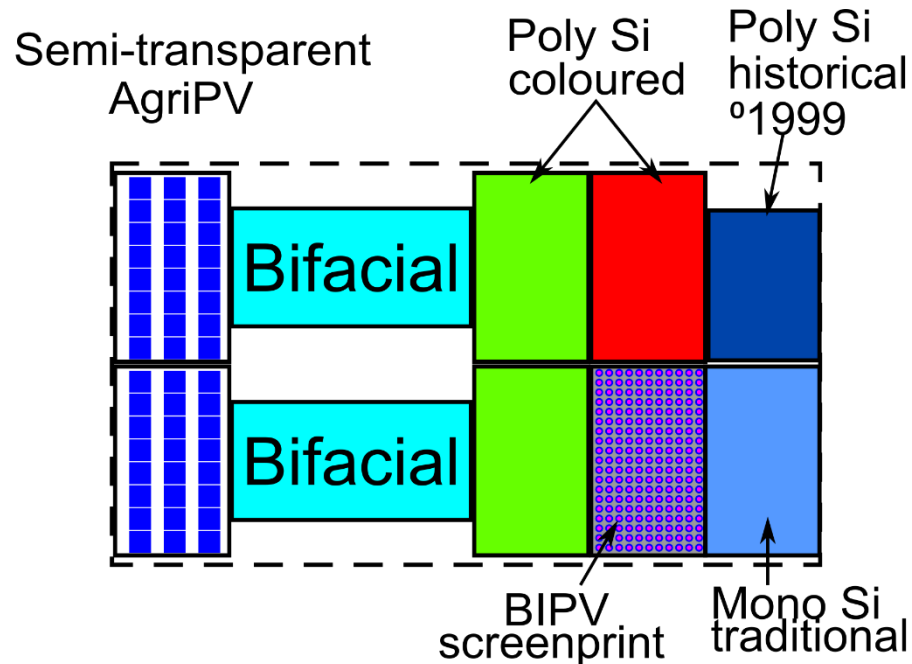
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# PV & PV/T systems

PV: 2.390 kWp – 2.5 kVA (SMA + 10x DC/DC )

PV/T: 2.265 kWp – 2.2 kVA (SolarEdge + 9 DC/DC)  
 3 PV/T in series – tank #1, 2 PV/T in series – tank #2



$P_{STC}$ top	185	395	255	255	120 (100)
$P_{STC}$ bottom	185	395	255	175	190

# Electrical & thermal

