# SOLARISE Project

PRIORITY AXIS

Low Carbon Technologies

SPECIFIC OBJECTIVE

Low Carbon Technologies

SOLARISE raises solar awareness and reduces carbon footprint in the 2 Seas.

SOLARISE will potentially provide 184.000 tCO2 reduction over 25 years.

# SOLARISE Consortium

- ❑12 partenaires
- ❑14 observers

Project budget
**4 302 023** €
ERDF amount
**2 581 214** €

ERDF rate **60**%

Start date: **08/02/2018**
End date: **30/06/2021**

# SOLARISE Partners

University of Picardie Jules Verne
**Lead partner**

- KU Leuven – Technology campus Gent
- Kamp C
- Flux 50
- Municipality Zoersel
- Fourmies City
- City of Heerhugowaard
- Brighton & Hove City Council
- Enercoop Nord-Pas de Calais - Picardie
- University of Portsmouth Higher Education Corporation
- City of Middelkerke
- Municipality Middelburg

# Observers

- Stad Brugge (BE)
- Beauvent cvba (BE)
- Création Dévelopment Eco-Entreprises (cd2e) (FR)
- Isle of Wight Council (UK)
- Business, Energy and Industrial Strategy Department, UK Government
- UK Power Networks (UK)
- Woonproject Saint-Antonius van Padua (BE)
- Organisatie Duurzame Energie (BE)
- Resourcefully (NL)
- Southern Water (UK)
- Avans Hogeschool (NL)
- Ville de Saint-Quentin (FR)
- Technische Universiteit Eindhoven (NL)
- Conseil Régional Hauts de France (FR)

# SOLARISE

The main objective of SOLARISE is to stimulate, broaden and accelerate solar energy adoption throughout the 2 Seas by :

- Identifying and overcoming barriers;
- Using smart grids, electricity/heat storage, internet of things and energy management systems;
- Proposing cost-effective and affordable solutions;
- Implementing innovative living-labs and a series of demonstrations in public buildings/infrastructure and in households with low income families;
- Delivering training tools and roadmaps.

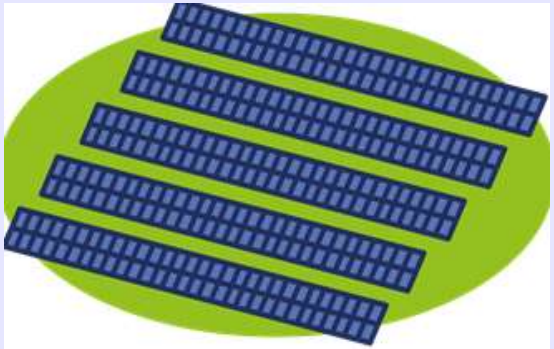
Support the EU to meet its target of 20% energy consumption from renewables by 2020.

# SOLARISE

## Main outputs

- Guide package on legislation, market and Innovative technologies (Legislation, regulation, Market analysis; Cost and investment models, Innovative technologies, benchmarks)
- Feasibility of Potential solar projects (schools, buildings, houses, cinema, swimming pool, solar farm, heritage mill, commercial centre…)
- Solar installations in historical/heritage buildings and public infrastructure. Implementation at housing sites. Living Labs & pilots
- Campaign to boost solar power adoption (Training & education, Web-platform...)
- Roadmap for Solar power

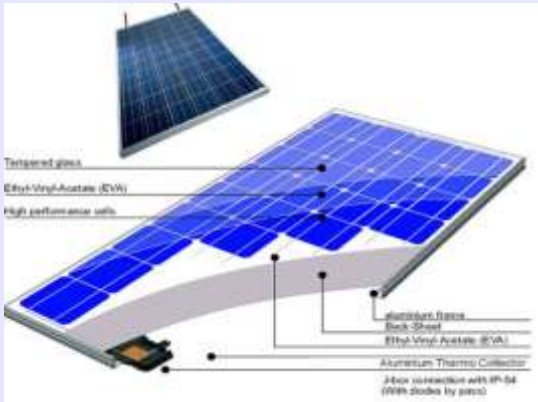
# SOLARISE VARIETY of COMPONENTS & TOPICS



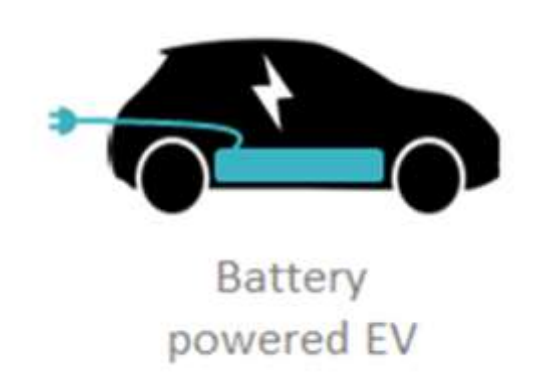
Near, city- connected Solar farm

Solar Building integration

Multiple, connected houses

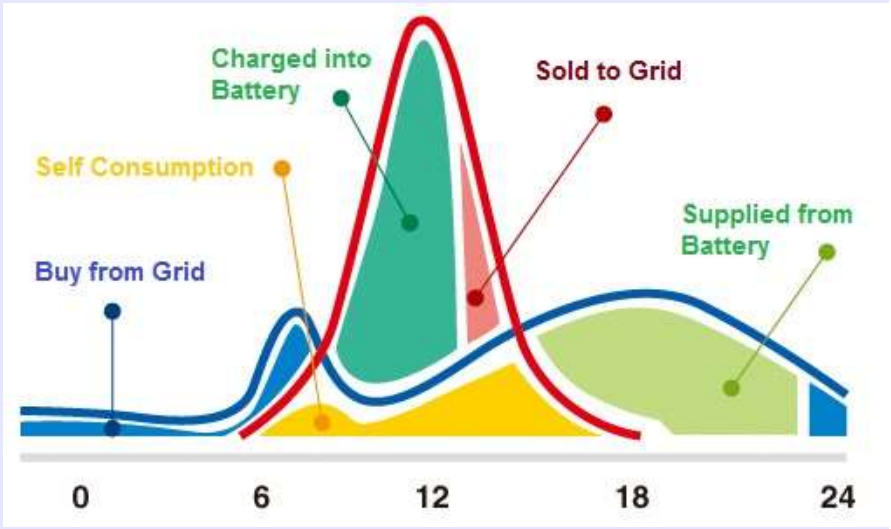



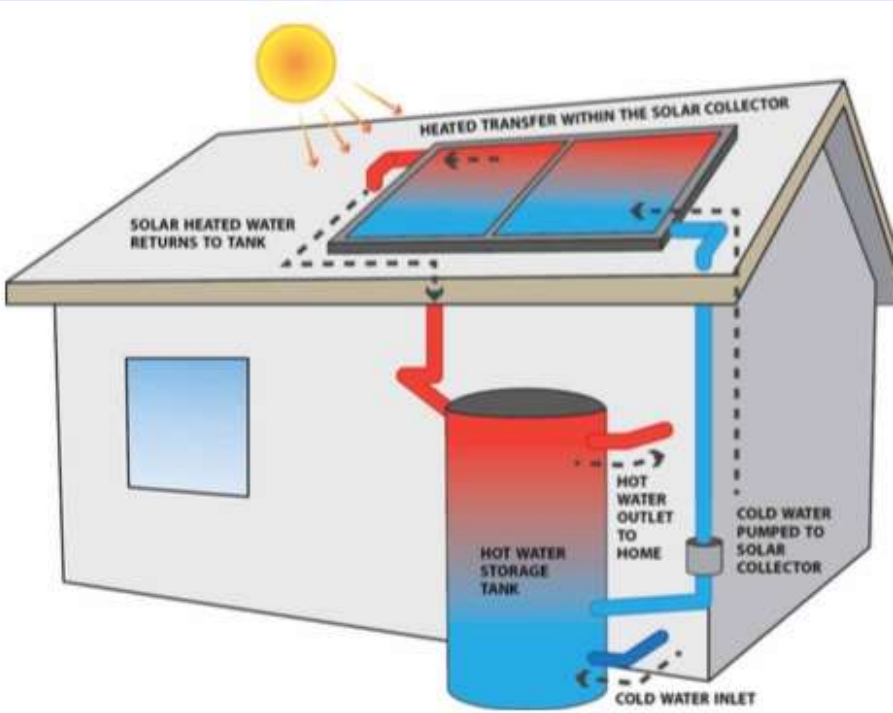
New panels Electricity & Heat




# BIPV: Building-integrated photovoltaics

# Energy Storage

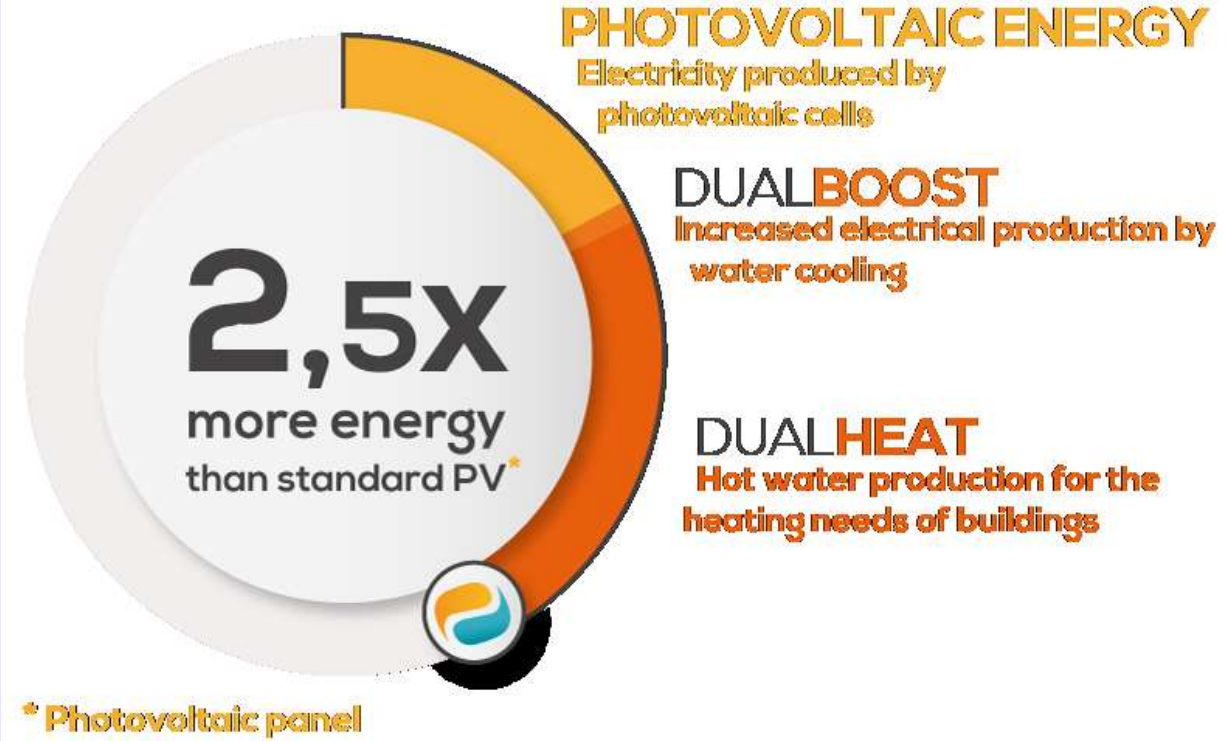


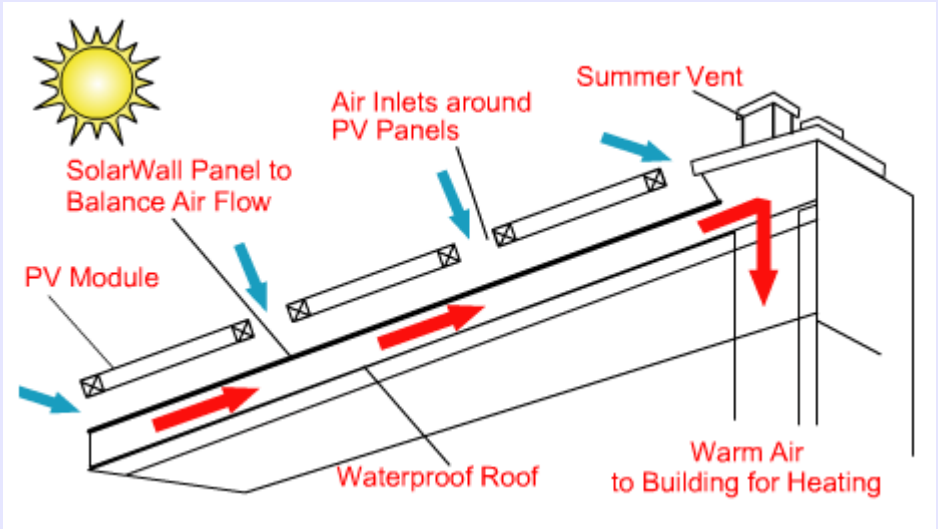





PV/T :

- Air
- Eau


PHOTOVOLTAIC ENERGY
Electricity produced by photovoltaic cells
DUALBOOST
Increased electrical production by water cooling
2,5X
more energy
than standard PV*
DUALHEAT
Hot water production for the heating needs of buildings
* Photovoltaic panel


Summer Vent
Air Inlets around PV Panels
SolarWall Panel to Balance Air Flow
PV Module
Waterproof Roof
Warm Air to Building for Heating


1
2
3
4
5

# PV/T


# LA RÉFÉRENCE DE L'AUTONOMIE ÉNERGÉTIQUE

SYSTÈME BREVETÉ

IDÉAL EN RÉNOVATION

## Effet recto-verso

Récupération innovante de l'air pour 4 fonctions en 1 seul système.

- Produire votre électricité
- Mieux chauffer votre maison
- Rafraîchissement nocturne en été
- Assainissement de l'air intérieur

## 900 W *(250 Wc + 650 W)*

Le panneau solaire le plus performant au monde.
Economies d'énergie garanties.

*Certifié Solar Keymark*

Conception et Fabrication Française

R-VOLT 3

# Route solaire


# SOLARISE WPs

WP 5: Project Management

WP1: Contextual Framework

WP2: Feasibility case studies

1.Living Labs
2. Domestic, Historical & Public Building
3. Solar farms

WP4: SOLARISE installations

WP3: Accelerating solar uptake

WP 6: Communication

Start:08/02 ----------End:09/21

# SOLARISE WPs

| WP | Responsible | Title | Budget |
|---|---|---|---|
| 1 | PP2 - KU Leuven | Contextual framework | 434,514.90 |
| 2 | PP7 -UoP | Feasibility studies of solar projects | 568,573.20 |
| 3 | PP3 – BHCC | Accelerating solar uptake | 582,357.25 |
| 4 | PP11 -Middelburg | Installations | 1,733,468.71<br>**27% of the total** |
| 5 | LP1 – UPJV | Project management | 560,704.55 |
| 6 | PP6 - Flux 50 | Communication | 421,281.90 |


https://interregsolarise.eu/

**SOLARISE will produce:**
**16 outputs,**
**more than 160 deliverables,**
**22 solar case studies,**
**8 installations.**

UNIVERSITY OF PORTSMOUTH

## ECO House

The Port-eco house is a research facility consisting of an instrumented 3 bedroom household for research in energy efficiency and building performance.  It will be equipped with solar technologies as part of one of the SOLARISE project's living labs.

## Future Technologies Centre

£12m facility opened in 2018 for project based learning and innovation in engineering and product design
The building is equipped with solar panels and will be provided with an energy storage system through SOLARISE

# Enercoop

## 100 % renewable & cooperative Electricity Provider

Created in 2005 by :

biocoop

HESPUL

WWF

laNef
société coopérative
de finances solidaires

CLER

Les Amis
de la Terre

GREENPEACE

**Vision** : to allow citizen to act concretely

**ENERCOOP HAUTS DE FRANCE was created in 2011**

*Contact : Pierre Gouëllo*

# Enercoop Hauts de France Solar projects


2,5MWp Solar Plant
2,8MWp Solar Plant

3MWp Self used on buildings
250MWp Self used on a building
600MWp Self used on a university

# Community Middelkerke

Community on the coast of Flanders

- Location project:
  - Groenhagestraat Leffinge
- Protected village view

# Contribution to the project

- Technical feasibility study for innovative solar techniques including a small smart grid and storage capacity
- Investments in
  - Make the roof fit for solar panels
  - Innovative solar panels
  - Storage capacity through home batteries
  - Public lighting + lighting with sensors
  - Possibility of charging points

- Centre for **sustainability and innovation in the construction sector** for the province of Antwerp.

- Target groups:
  - Inhabitants of province of Antwerp
  - Local governments
  - Schools
  - Building professionals.

- Partner in several European projects on
  - Renovation
  - 3D-printing
  - Circular building.

**Contact persons:** Kelly Penen
Sarah Verbeeck

- Offer workshops and tour guides in our exhibition and give advice on sustainable building.

# Link with solar energy

- Different solar energy installations on their site in Westerlo e.g. solar boilers and pv panels.
- Their advisors give neutral and independent advice to inhabitants on sustainable energy (subsidies, type of installations, simulations,…). They have a global view on the (legal) situation in Flandres.
- Kamp C takes part in different European projects on renewable energy e.g. cVPP (Interreg NWE),…
- Local governments and schools can request independent advice on renewable energy for building projects and legal matters

## WHAT ARE THE ACTIVITIES OF FLUX50?

FLANDERS INNOVATION & ENTREPRENEURSHIP

flux50

Clusters for Growth

Flux50 **orchestrates** and **facilitates** the realisation of a **smart energy region**, aiming to create **economical value** for Flemish **companies**.


## DISSEMINATION

## Contact :

- Frederik Loeckx

- Nick Deknudt

**Concentrated Solar Power**

**Insights on three installations**

**Harbour area- antwerp**
- 140°C Process Heat – day night operation
**Industrial AREA – Proviron (Ostend)**
- 260°C Process Heat – day night operation
**Research Area – Thor Park (Genk)**

**> 3000m² combined installations**
**1260 – 1390 MWh/year**

# City of Fourmies


12.600 inhabitants

22km², 50% of forest

«**Third industrial revolution** » pilot City, working on digital experiments (3d printing…), rural mobility innovations and renewable energies, involving citizens and economic stakeholders

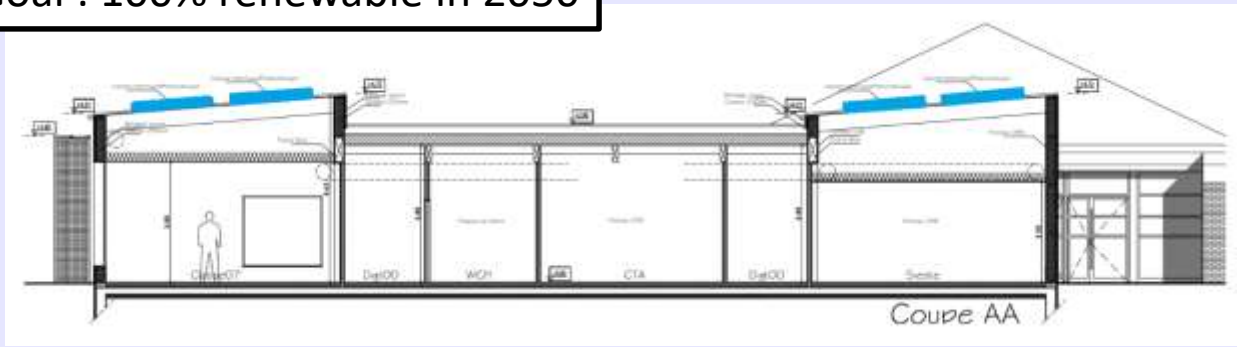


7/11/2017 : J. Rifkin aplauds Fourmies

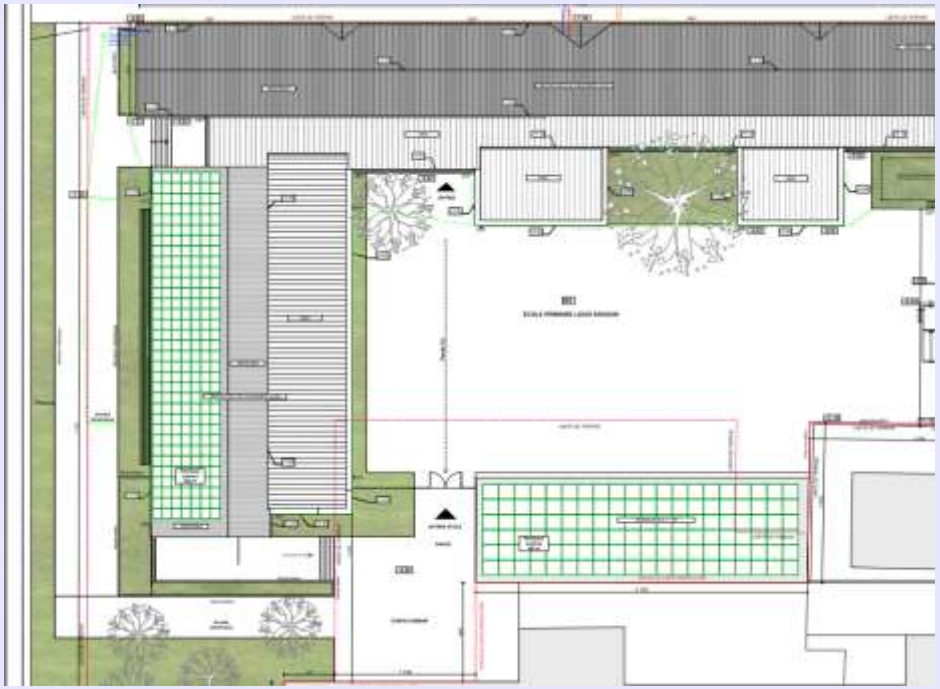
Contact Solarise : Mathias LOUIS-HONORE
mlouis-honore@mairie-fourmies.fr

Goal : 100% renewable in 2050

**« Pierre Perret School » extension**
Works end in october 2018
16 kWp installed




**« Louis Aragon School » renovation**
Writing the tender specifications
95 kWp expected, powered in sept 2019



… and feasibility studies on 10 city buildings, exploring electricity and heat generation, storage options in city vehicules', « collective self consumption » in neighbourhood.

# Brighton & Hove City Council

- Local Authority serving 270 000 residents
- Responsible for over 10 000 staff (including schools)
- Social housing landlord for 12 000 homes (mostly flats)
- Geographically constrained by the South Downs and the Channel


# Current solar technologies

- 300 domestic solar PV arrays (total 1MWp) give free electricity to tenants
- Very modest PV on corporate buildings (circa 50kWp)
- Occasional solar thermal systems
- Recently approved framework for installers (including community groups) to install on schools

28

BRIGHTON ENERGY COOPERATIVE

Community-Owned Solar for Brighton and Hove Schools

# Middelburg

- Capitol of the Province Zeeland
- 48.000 residents
- Historic town: 1300 listed buildings

Contact:

-Ronald de Bruijn

-Annet Hannewijk

-Tiny Maenhout

**Goals:**

**Solar energy to be promoted in difficult contexts like heritage buildings;**

**Solar energy to be used efficiently, avoiding peaks and an unbalanced grid.**

# Role in different WPs

WP1: we share know-how, challenges and opportunities related to the use of solar energy;

WP2: feasibility studies concerning historical buildings, public buildings, and housing;

WP3: we will develop Energy Plans.

## WP4: responsible partner)

New energy wall (ca. 500 m2) will produce an average of 60.000 kWh/ year for 120 studenthouseholds.

250 m2 of (flexible) solarpanels in the inner historical city (produce max 25000 kWh/year).

Implementing reversible integrated systems on the sloping roofs (ca. 330m2) of historical buildings  incl. smartgrids with peak level.

Charging points for cars, bikes, phones, computers in the public area.

# THE CITY OF HEERHUGOWAARD

- 56.000 residents, 40 km2, 40 km. north of Amsterdam.
- 1,59 km2 water
- Early forerunner in energy transition.
- EU FP5 Suncity project: ‘Stad van de Zon’, *first emission-neutral residential district in the world.*
- Multiple sustainable projects in the city:
  - solar park.
  - ‘Waerdse Energie Circuit’: distribution system for residual heat between companies, including warmth collection in asphalt pavement.
  - sustainable housing.
  - world premiere: application of flexible solar cells in road guardrail.
  - smart energy grid, improving balance supply /demand (solar) energy.
  - development sustainable multimodal traffic node in railway station area.


***Contact officer***

***Henk Jan Jansen***

***h.j.jansen@heerhugowaard.nl***


Heerhugowaard
Stad van kansen

# Developments in Heerhugowaard

***Stad van de Zon (2001-2008)***

+3,000 homes.
25,000 PV panels.
3.75 MW, reduction CO2 vs. normal: 2,500 tonnes p/yr.
3 wind turbines (2,3 MW).

***Smart energy net***

Cooperation with several partners

- Energy Ring': distribution system for residual heat (EU/EFRO project)
- warmth collection in asphalt pavement near De Vaandel (1,500 m2)

***Solar fields (to be ready Sep/Oct. 2018)***

35,000 PV panels.
9.6 MW (+/- 3,000 households).

***Sustainable housing ('0' on the energy meter; 2015)***

Experiment with 55 social houses social housing corporation

- 'second layer' over walls and roofs.
- gas connection removal.
- PV on roof front and back side.

contract: energy in = out (5.984 KWh per year).
90% tenants reached goals in 2015, project overall success!

Heerhugowaard
Stad van kansen

# E&A – research group

***Mission:*** Support the energy and automation industry by applied research and hands-on education

### *Team*

6 staff members industrial projects

3 PhD students

1 postdoc

2 project managers

3 professors

### *Research topics*

stand-alone power systems,

industrial datacom and security,

**sustainable energy production**

**energy flow modelling and monitoring**

light electric mobility

electric drives and robotics

### *Energy Infrastructure*

Electric bicycle test equipment

Energy-efficient gensets (hybrid + variable speed)

Scaled Medium Voltage Distribution Network

Home chargers for EV

Programmable 5kVA power electronic platform

**State-of-the-art outdoor PV energy yield measurement set-up**

Energy measurements (wired and wireless)

### *Automation Infrastructure*

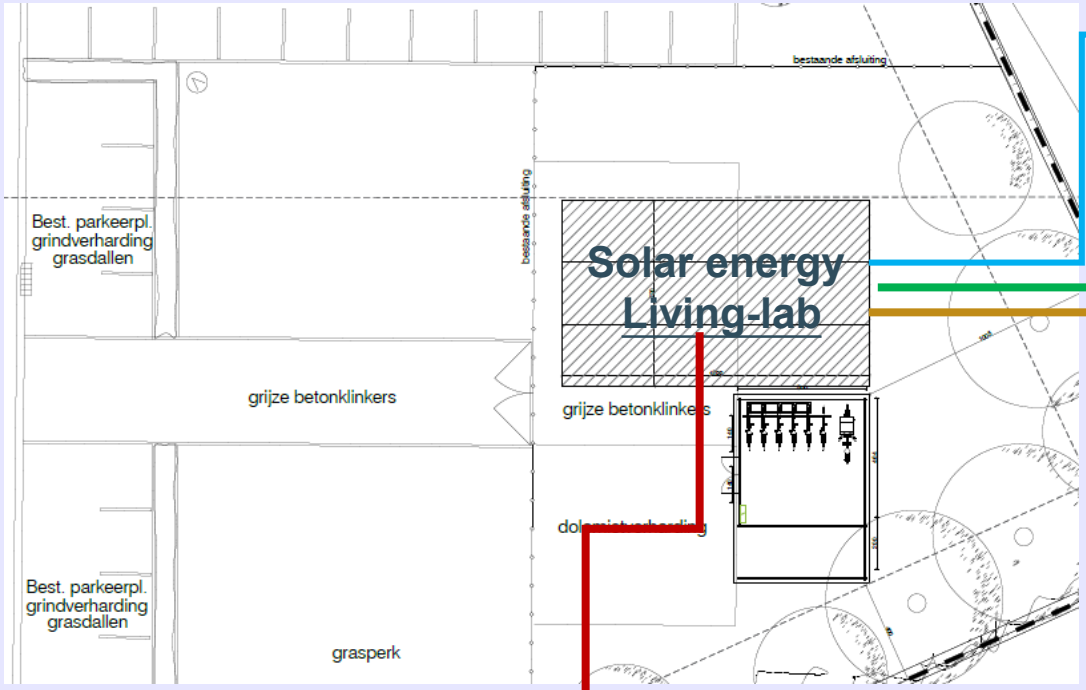
Monitoring and analysis tools for Profibus, Profinet, Ethernet based networks

State of the art network controllers, devices and components

**Contact person:** **Prof.dr.ir. Emilia Motoasca**

# Participation to SOLARISE project

- **Leader WP1**: insight solar energy market, legal, technical issues, future potential
- Provide **knowledge/support** for dimensioning, choice and monitoring of SOLARISE-installations (**measuring/monitoring and data analysis tools**)
- Realization of a **'Solar energy - Living Lab'** at TC Ghent:



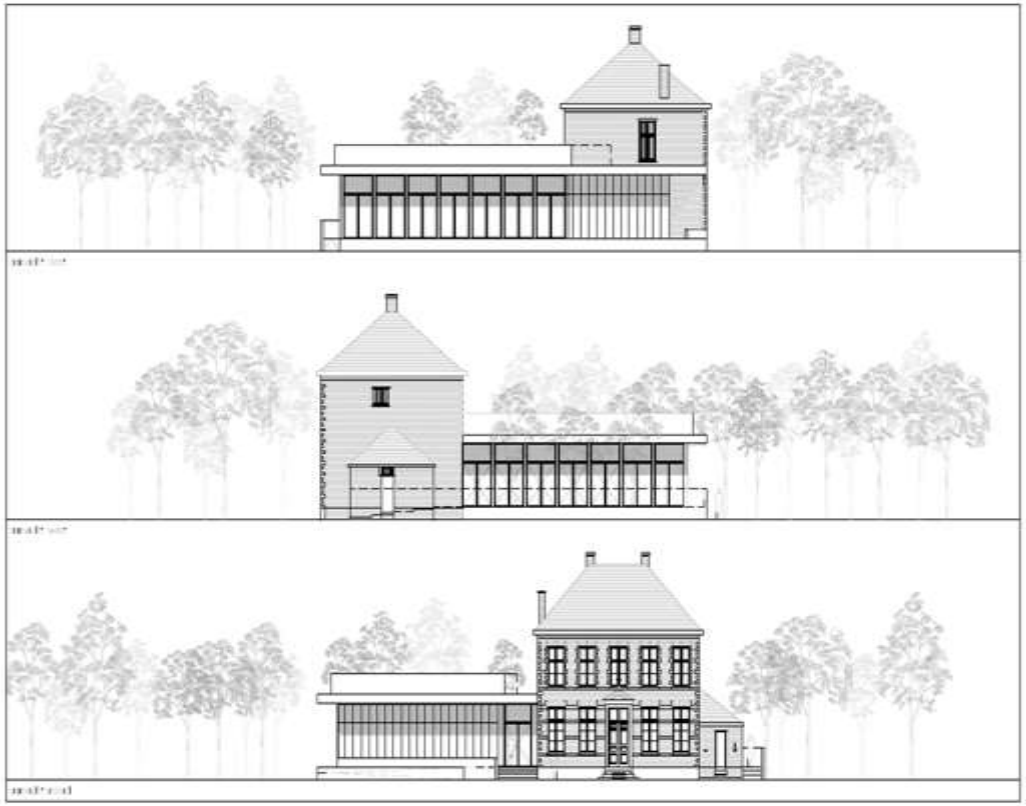

**5 kW** installation (PV, PV/T, various types of solar energy harvesters)

**hands-on and virtual learning tools**

**combination with CHP, heat pump, battery pack, rain-water install…**

**Applied research on PV/T and thermoelectric materials (heat to electricity conversion)**
application on solar energy harvesting

Municipality Zoersel.
BELGIUM



the ambition of the municipality to reduce CO2 by 2030 and to share its
experiences with his residents and other local and regional governments

Contribution to WPs 1, 2, 3 & 6

WP4 Investment : Sustainable renovation of a historic public building in
'The Pastorium'.

WP4 Investment : Sustainable renovation of a historic public building in
'The Pastorium'.

Close collaboration and support : Kamp C

Inne Clinkers. Jurist. Policy Adviser
inne.clinckers@zoersel.be

# Université de Picardie Jules Verne

***Ahmed RACHID***

**Tricycle électrique pendulaire avec toit solaire amovible/ extensible**

https://solarise2018.sciencesconf.org/


## solarise2018 : Energie Solaire et Smart Grid

*18 oct. 2018 Amiens (France)*

| Programme | |
|---|---|
| 09h00 | **Ouverture de la journée**<br>**Présentation du projet Interreg SOLARISE.**<br>*Ahmed RACHID. Professeur Université de Picardie Jules Verne - LTI* |
| 09h15 | ***Optimisation de l'extraction de la puissance électrique sur les systèmes solaires photovoltaïques.***<br>*Jean Paul GALIBERT, Professeur Université de Poitiers. ENSIP LIAS* |
| 09h45 | **Photovoltaic-thermal (PV/T) hybrid systems: state-of-the-art technology, challenges and opportunities**<br>*Emilia MOTOASCA (Prof.dr.ir.), Clément de la Fontaine (PhD Student), Baptist Vermeulen (Ing.)*<br>KU Leuven. Dept of Electrical Engineering. Research Group Energy & Automation (E&A) |
| 10h15 | **Smart Grids: key concepts and challenges with the integration of solar energy**<br>*Victor BECERRA. Professor of Power Systems Engineering.School of Energy and Electronic Engineering. University of Portsmouth* |
| 10h45 | Pause |
| 11h | **Centrale solaire 2.5MWc des Hauts de France. Législation française, administration et marché de l'électricité**<br>*Pierre Gouëllo. Responsable énergie. ENERCOOP* |
| 11h30 | **Stratégie énergétique de la Ville de Fourmies**<br>*Mathias LOUIS HONORE. Chargé de mission Energie – Mobilité. Service Troisième Révolution Industrielle. Mairie de Fourmies* |
| 12h00 | **L'autoconsommation collective d'électricité solaire**<br>*François Xavier CALLENS. CO2E. Responsable du Pôle des ENR. Animateur de la Plateforme Technologique Lumiwatt* |
| 12h30 | **Présentation du projet VERTPOM**<br>*Humberto HENAO. Professeur Université de Picardie Jules Verne - LTI* |
| 12h45 | **Clôture** |

***Thank you for your attention***