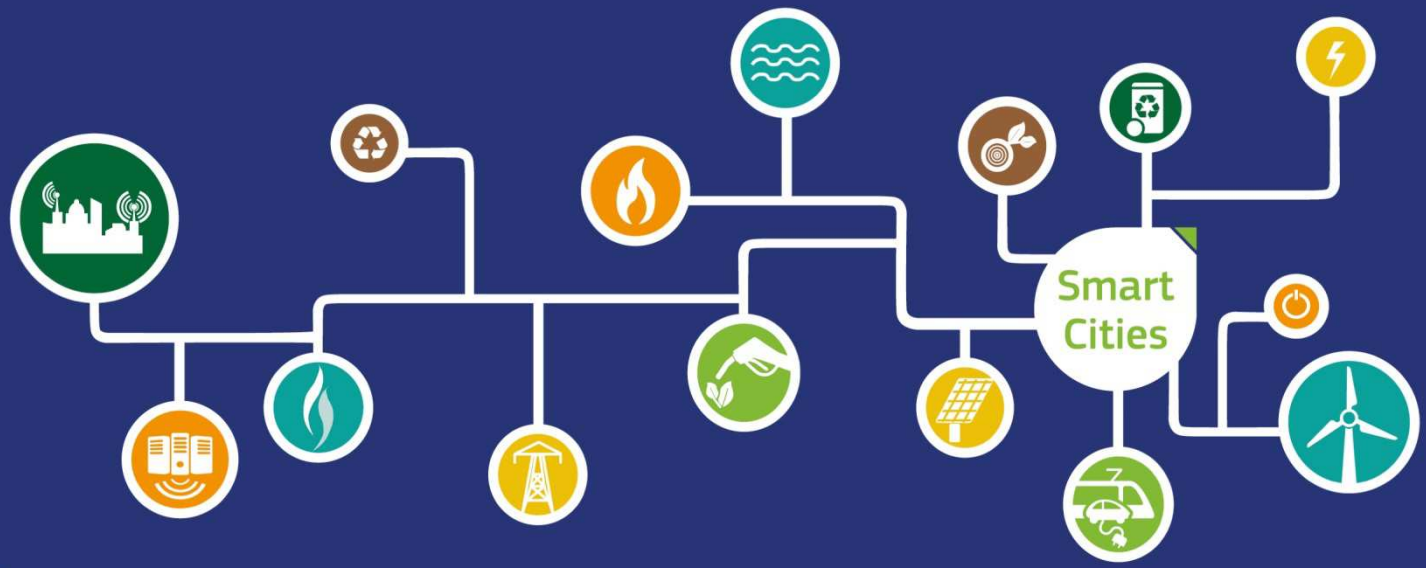
Empowering smart solutions for better cities

2 & 3 OCTOBER | BUDAPEST, HUNGARY

BUILDSMART: Integration of high performance technologies in residential buildings

Olga Macías - TECNALIA

olga.macias@tecnalia.com ; @tecnalia



#SS4C17
WWW.SCISCONFERENCE2017.EU

EU Smart Cities Information System

SCIS is funded by the European Union

In a nutshell

BUILDSMART

Main objective: Demonstrate the **cost-effective integration** of **high performance solutions** in **very low energy buildings** for different European climates.

PORTUGALETE RESIDENTIAL BUILDING

Social housing promoted by the Basque Government

Efficient design concept based on:

- Optimized thermal envelope – Integration of Active façades
- Airtight envelope and mechanical ventilation with heat recovery
- Centralized heating and DHW production plan with high performance technologies
- On site electricity production PV plant and CHP

Empowering smart solutions for better cities

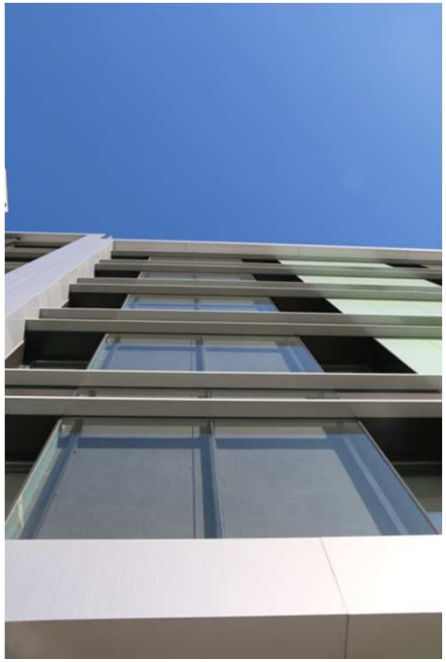
Value proposition

- INVOLVE PUBLIC DEVELOPERS towards low energy construction
- PLAN UNDER EFFICIENT DESIGN CONCEPT for social housing
- ADD INNOVATION: integration of innovative solutions in residential buildings to improve energy efficiency
- INVOLVE CITIZENS for energy efficiency

Innovative technologies

Building thermal envelope – Active façades

Trombe wall



Outside

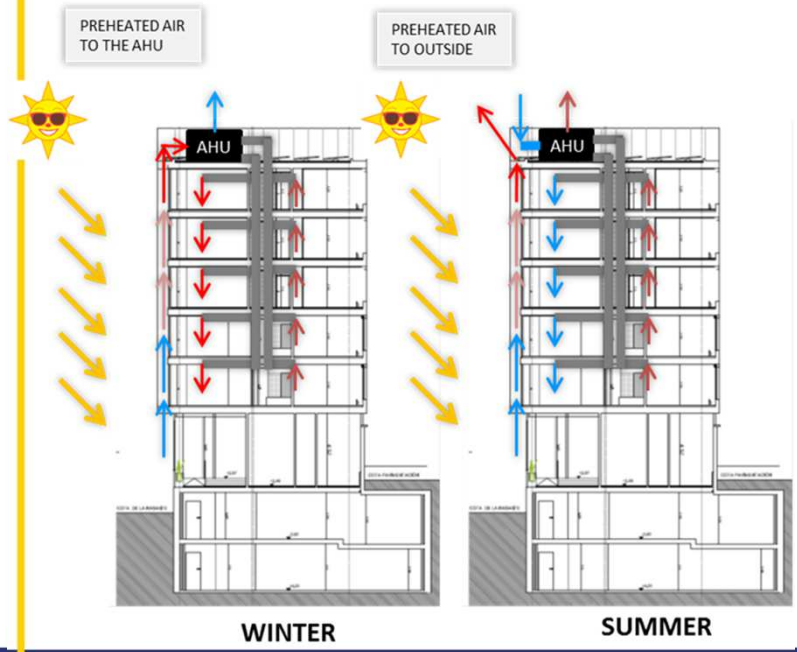
- Glass
- Air cavity
- Mineral wool (6cm)
- Ytong block (10cm)
- Mineral wool (4cm)
- Plasterboard

Inside

Innovative technologies

Building thermal envelope – Active façades

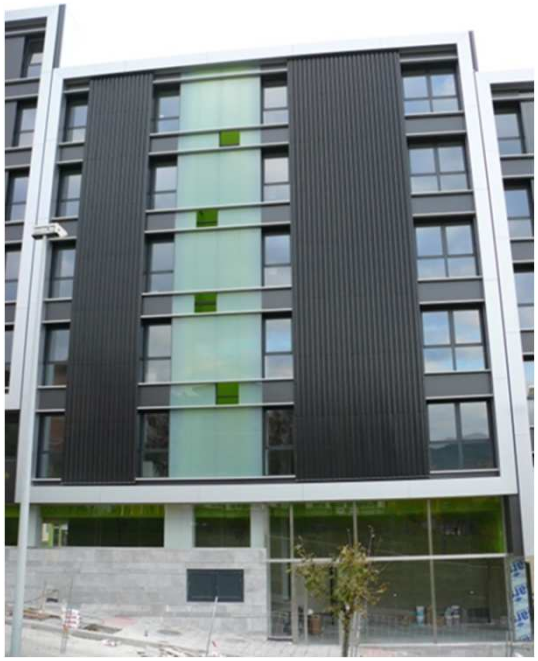
Trombe wall

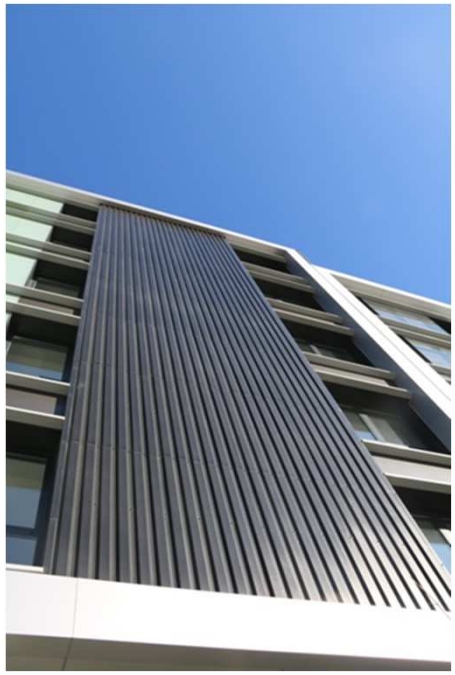


Innovative technologies

Building thermal envelope – Active façades

Solar wall





Outside

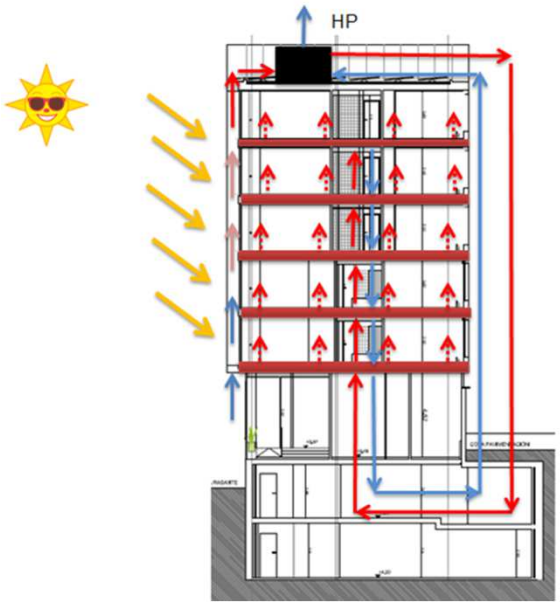
- Black perforated metal sheet
- Air cavity
- Mineral wool (6cm)
- Ytong block (10cm)
- Mineral wool (4cm)
- Plasterboard

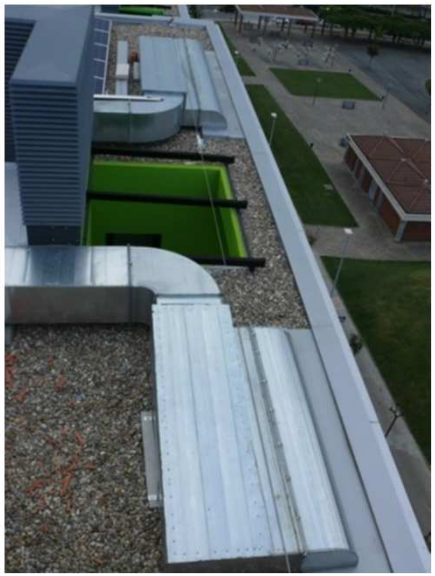
Inside

Innovative technologies

Building thermal envelope – Active façades

Solar wall





Innovative technologies

Building heating and DHW production plant

Heat pump

Model: CAHV-P500YA-HPB
Power: 45 kW
Consumption: 12,5 kW
COP: 3,49

CHP

Model: DACHS 5.5
Electricity power: 5,5 kW
Thermal power: 14,8 kW

Condensing boiler

Model: BIOS PLUS 110F
Nominal heat: 102 kW
Efficiency: 95%

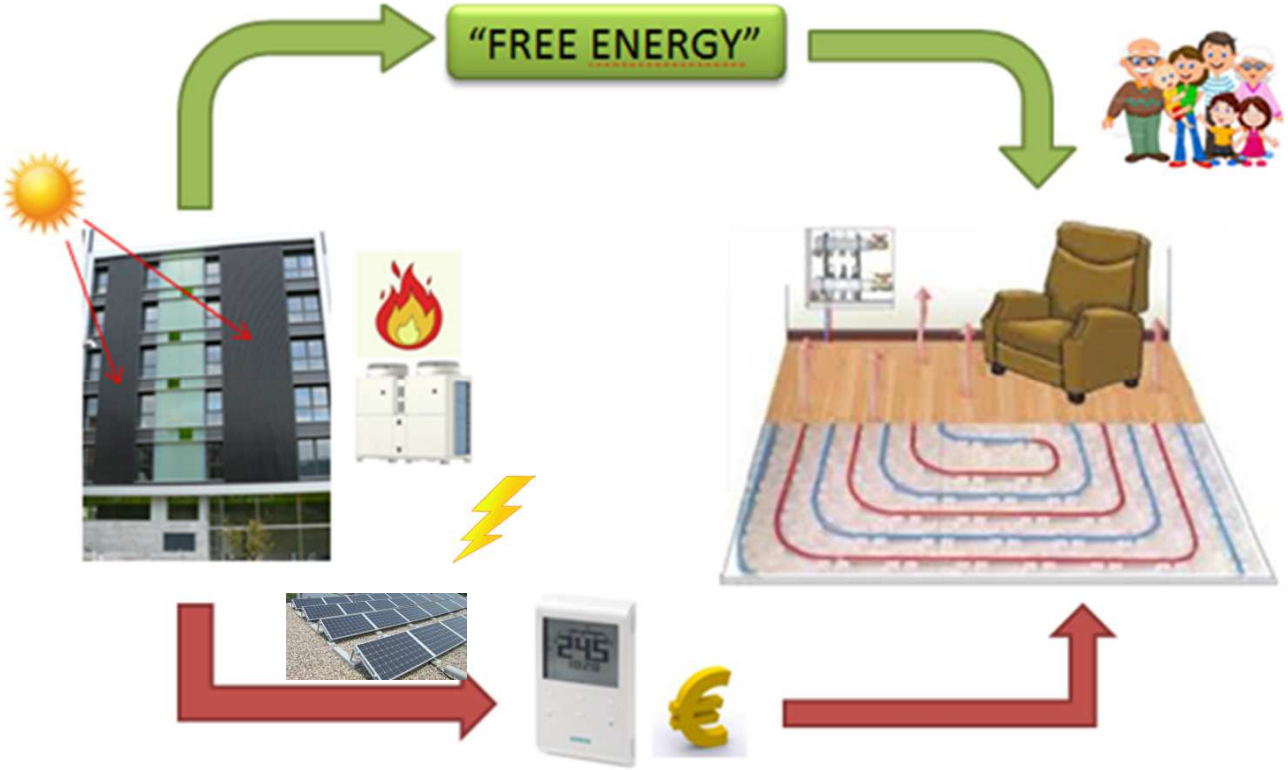
Innovative technologies

On site electricity production

Fotovoltaic system

FV modules: ELIFRANCE EL60255
Maximum power (Pmax): 255 Wp
Panel efficiency: 15,42%
FV field: 88 modules
FV field power: 22,4 kW

Social value – Free energy concept



Empowering smart solutions for better cities

Citizens involvement

Training required for tenants

- Efficient use of the building
- Energy visualization and prepaid system

- Promote an energy efficient behaviour of building occupants
- Thermal comfort conditions visualization
- Heating and DHW consumption visualization
- Electric consumption visualization
- Access to building level total consumption and production values

Lessons learned

- Required a continuous follow up of the process to avoid standard administrative problems and ensure communication between stakeholders
- Architects are important in the decision-making process regarding energy saving techniques
- Flexibility required to integrate Innovative solutions
  - Lack of guarantee → Integrate another solution : Intelliglas changed by solar wall
  - Lack of regulations and standards→ Special effort required to ensure the success of the solutions and perform certification
  - Limited number of manufactures
- Changes in the regulations about RES in Spain → Modifications in the heating and DHW project

Replication

The project demonstrate that solutions and technically viable and the conditions to be applicable to other buildings

To replicate:

- Required to share obtained results to relevant stakeholders
- Required to follow up
  - Contractors:
    - Demonstrate that this class of buildings is affordable and can be executed with already available technologies
    - Savings due to learning lessons in the Buildsmart pilot buildings.
  - Building owners and promoters
    - Acceptance by the end users
    - Accurate and reliable data about energy savings

Q&A and Discussion

- Challenges when integrating innovative solutions
  Technical issues, legal framework, guarantees, responsibilities, users behavior,…
- Role of public promoters for enhancing innovative construction with social purposes
- Legal barriers for smart solutions

BUILDSMART

Energy efficient solutions ready for market

www.buildsmart-energy.eu

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no ENER/FP7/285091/BUILDSMART

Malmö stad

SKANSKA

ROTH

ivl

WSP

EUSKO JAURLARITZA GOBIERNO VASCO

tecnalia Inspiring Business

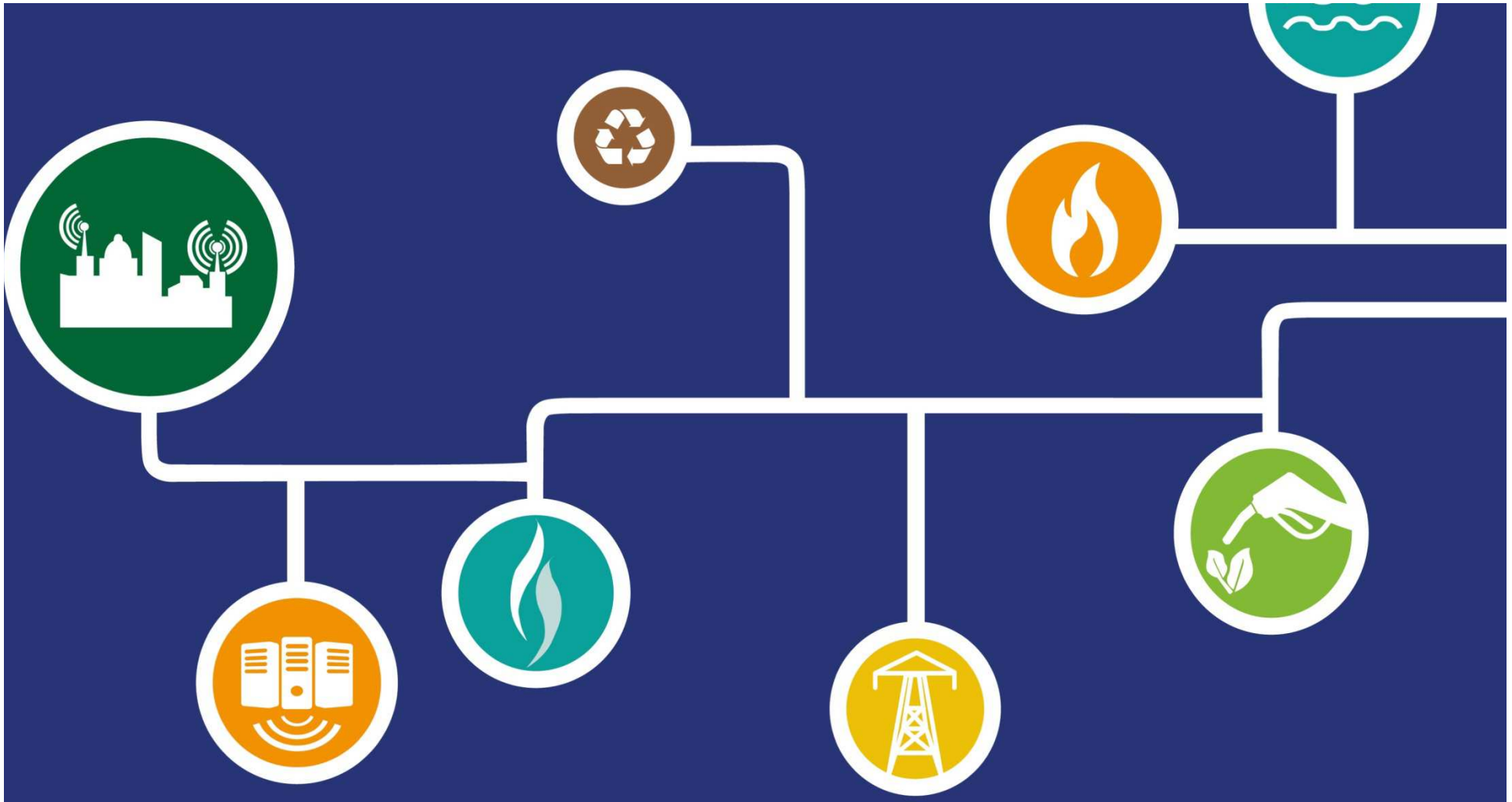
FCC

codema Dublin's Energy Agency

Empowering smart solutions for better cities

EU Smart Cities Information System

SCIS is funded by the European Union



Olga Macías - TECNALIA

olga.macias@tecnalia.com; @tecnalia

THANK YOU !

EU Smart Cities Information System

SCIS is funded by the European Union