

IEA SHC Solar cooling meeting

Cythelia: Overview & Solar cooling related activities



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21 March 2013



Cythelia

- PV projects: Feasibility study, Yield assessment, Terms or Reference, Construction follow-up, Plant hand-over
- Energy efficient buildings: Energy audit of buildings, Building conception assistance, NZEB
- Carbon Assessment and Life Cycle Analysis

- Consultancy in PV and Solar Energy
- R&D
- Training
- Publishing:
« La Lettre du Solaire »

ARCHELIOS PRO

www.archelios.com



www.abatia.fr



ENGINEERING



EXPERTISE



SOFTWARE

« PACairPV » project

☀ Project funded by the french National Research Agency (ANR)

➔ January 2009 - december 2012

☀ Partners



☀ Context:

➔ Reduction of energy consumption and GHG emissions in the building sector

➔ Towards NZEB

☀ Aims:

➔ Reduce the operating temperature of the PV modules

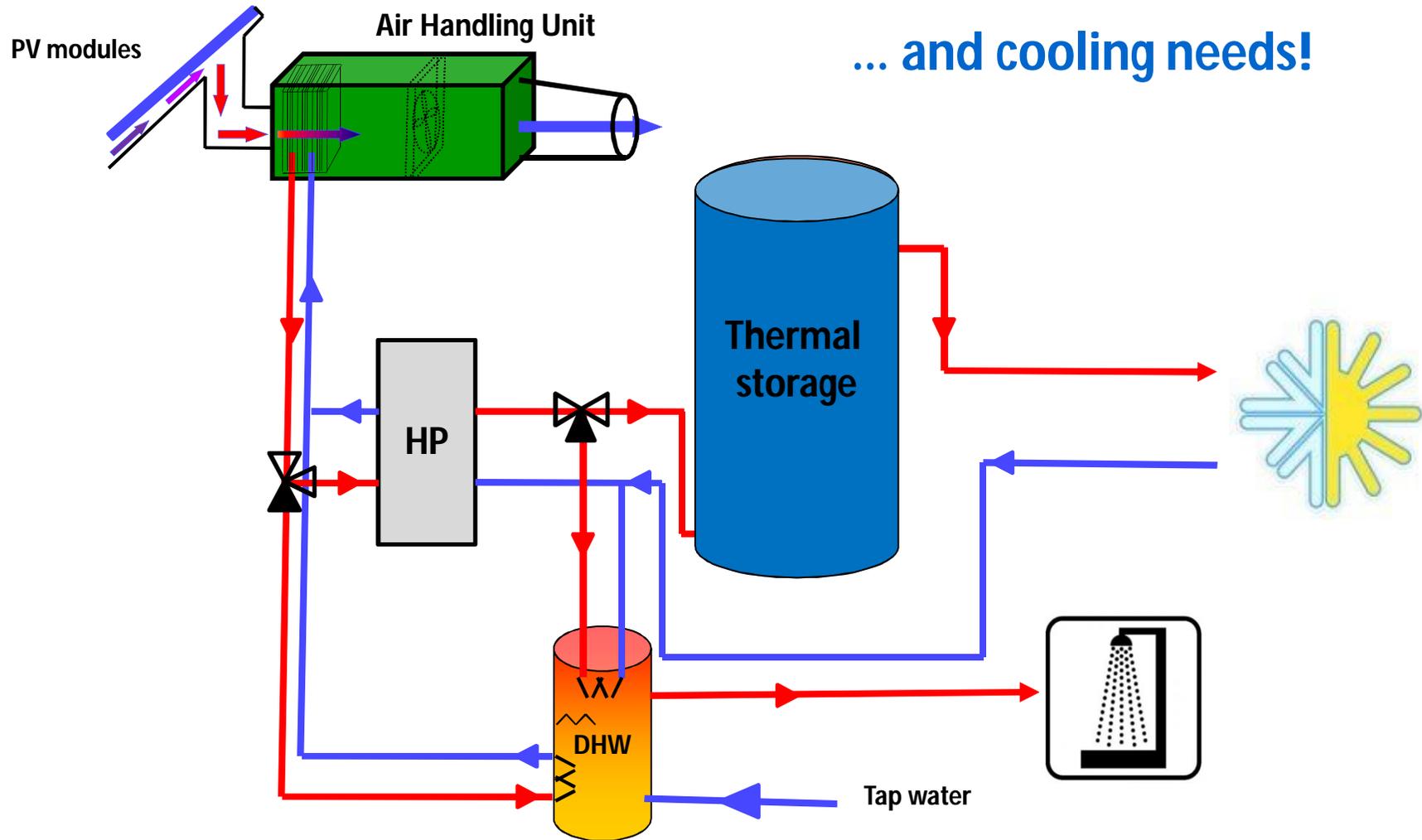
➤ Yield losses

➤ Ageing

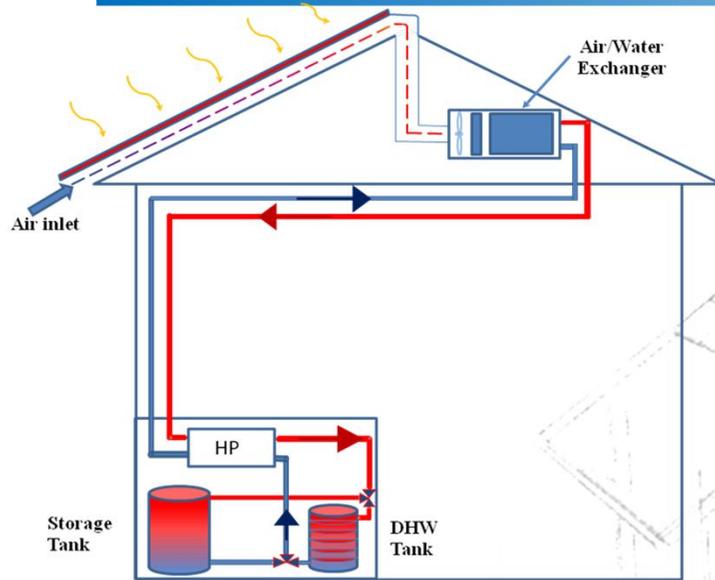
➔ Enhance the heat pump COP

☀ Approach: modelisation + prototype and monitoring

A single system for electricity, heating, domestic hot water...



The demo building : « La Petite Maison Z.E.N »



☀ Small office building (116 m²)

☀ NZEB

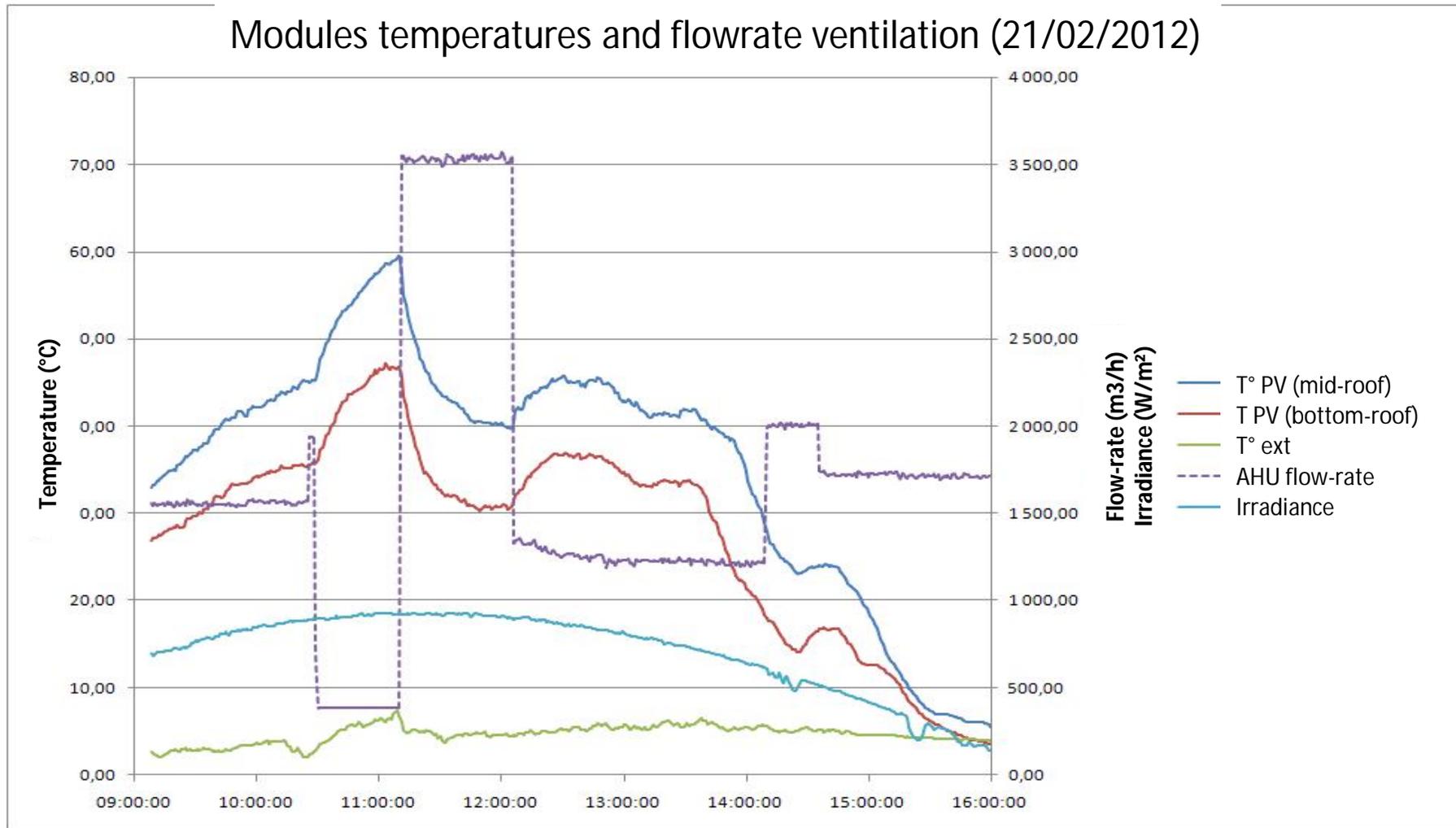
- ➔ Bioclimatic Design
- ➔ Wood-frame structure
- ➔ Wood wool insulation
- ➔ Triple and double glazing windows
- ➔ LED lighting
- ➔ High efficiency devices and HRV

☀ BIPV

- ➔ Thin-Film CIGS: 6.2 kWp
- ➔ See-through modules veranda-roof



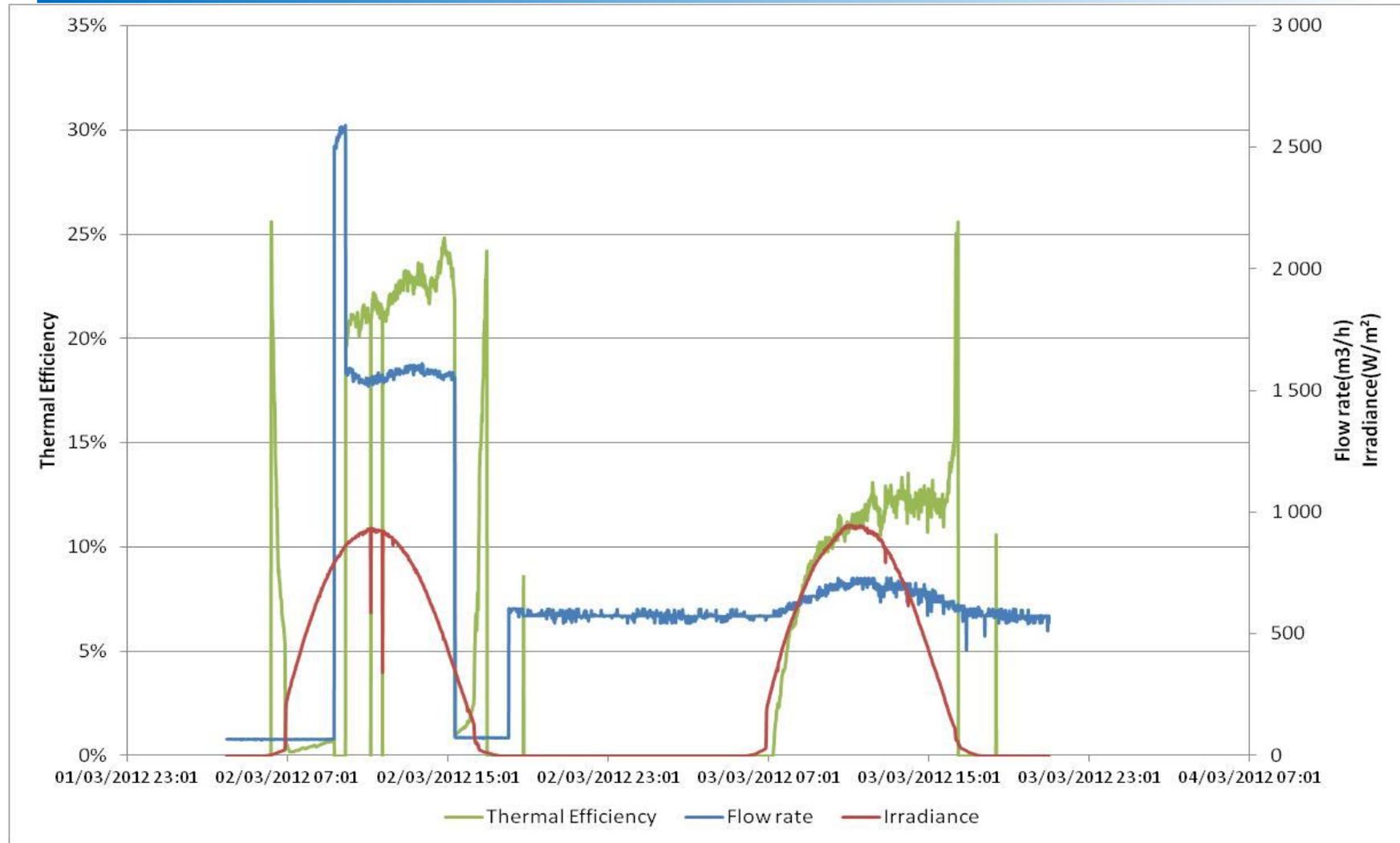
PV modules temperature reduction



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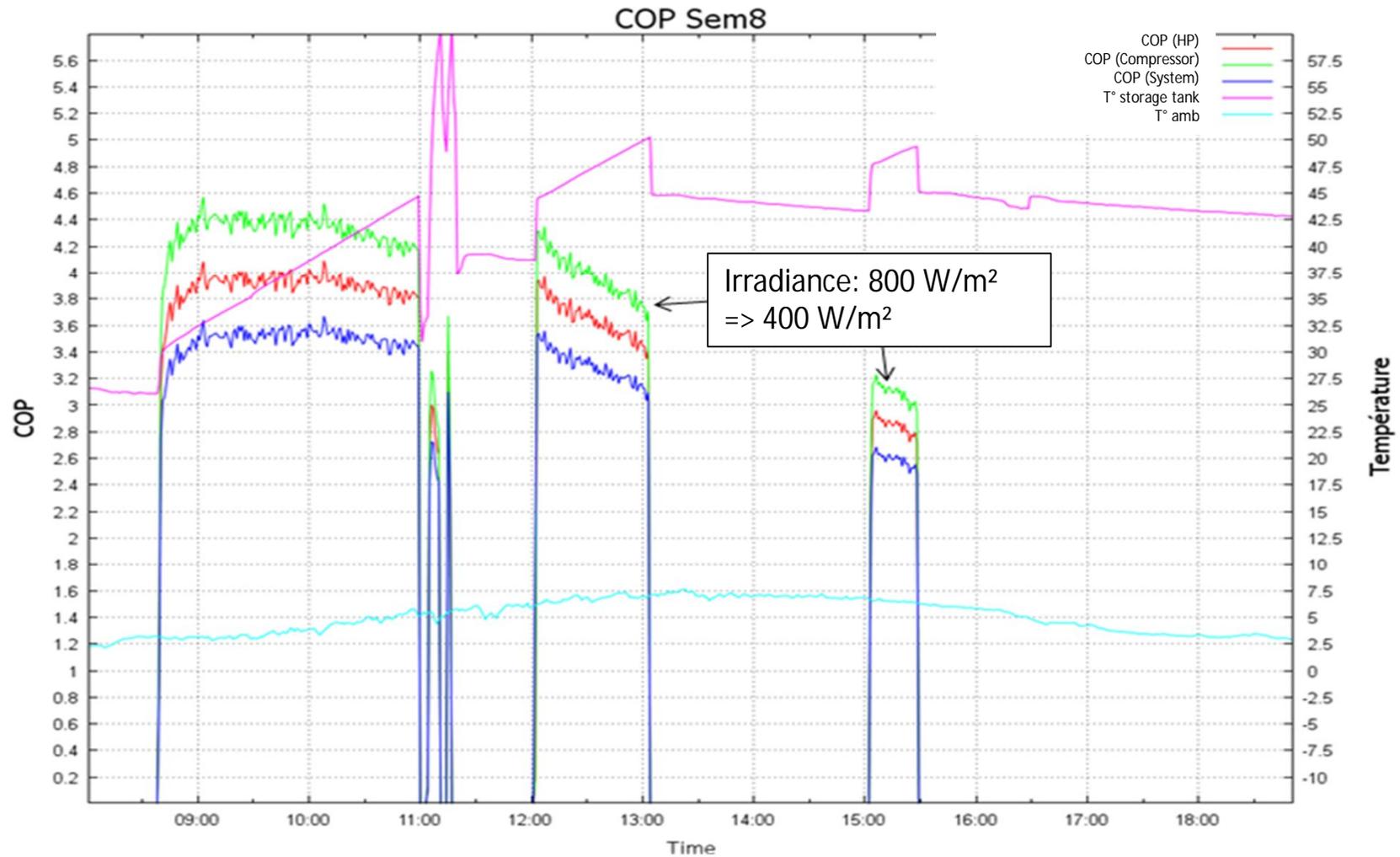
Thermal efficiency of the hybrid PV roof



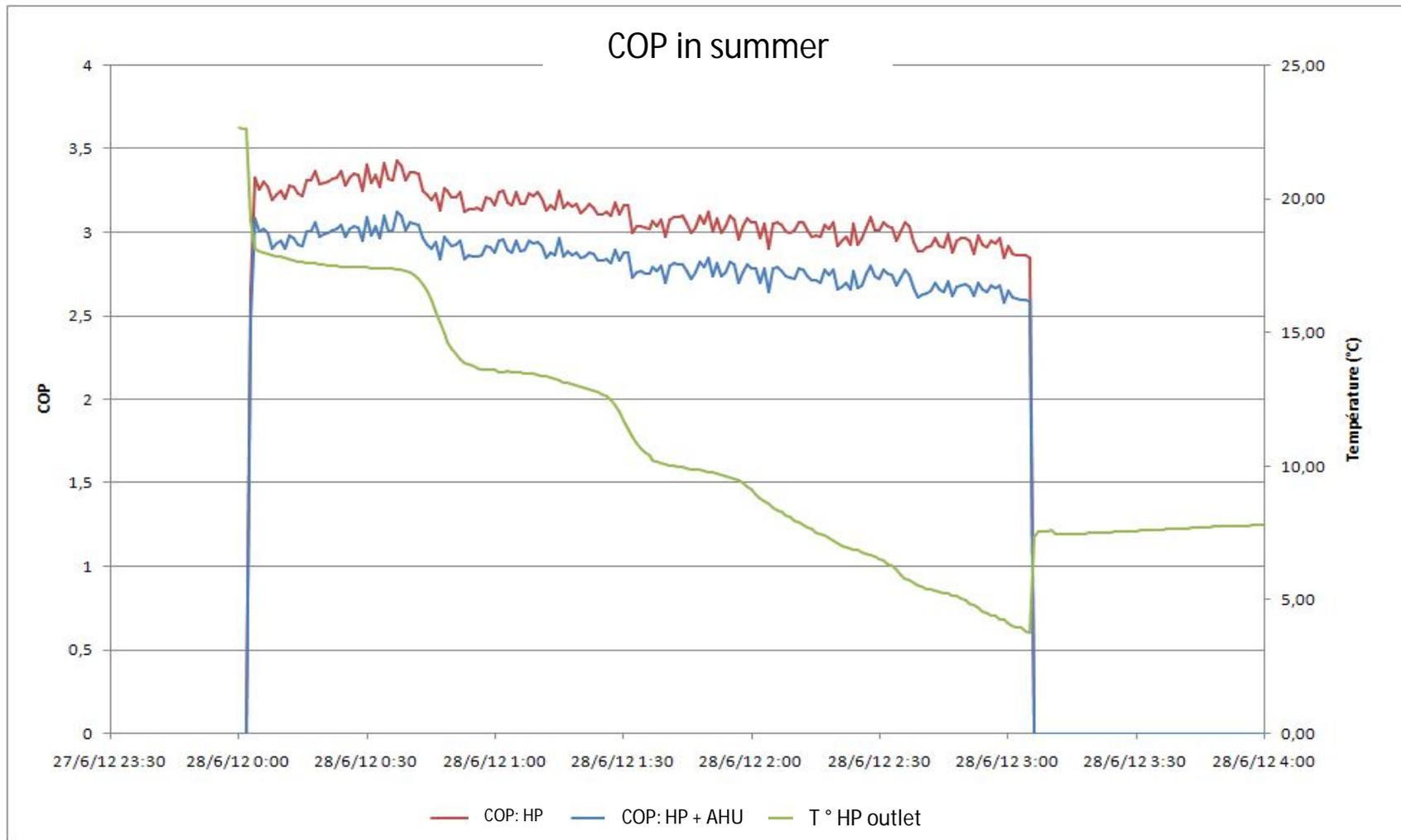
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Heating



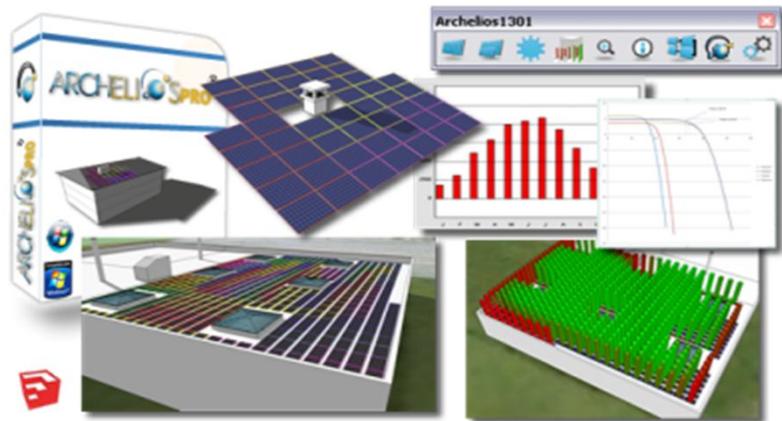
Cooling



Inputs

☀ Subtask B: "Control, Simulation and Design"

- ➔ B2 – B3: Economic (LCO of Energy, new business-models,...) and LCA aspects
- ➔ B6: Design tool Sizing and simulation tool, coupling the existing ARCHELIOS® and ABATIA® software



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Inputs and expectations

☀ Subtask C: "Testing and Demonstration projects"

- ➔ C2: "System selection for field test and demo project"
Evolution of the current demonstrator or new prototype in NZEB?
 - Electrochemical storage for cooling mode?
 - PCM, ice storage
 - Weather prediction

☀ Expectations

- ➔ Joint work VS task division
- ➔ User-centered approach, decision-making tools