


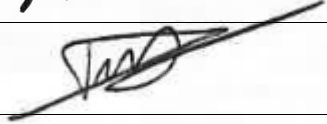


H2020 - EEB - 2017 - 766464 – SCORES

Self-Consumption Of Renewable Energy by hybrid Storage systems



Report on the required number of prototypes for the project

	Name	Signature and date
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2 Background

This deliverable (3.3) presents the EHP and AHPP prototypes that have been realized for the SCORES project

This document was compiled by CAM and has been reviewed by the partners within the SCORES program before publication.

3 References

3.1 Applicable Documents

	Document	Reference	Issue

3.2 Reference Documents

	Document	Reference	
RD-01	DoA: EeB-06-2017 - SCORES - Part B		
RD-02	D7.2 Requirements and specification of the SCORES system A and C	TNO-SCORES-RP-094	1

1 Commissioning of EHPs on Agen demosite

1.1 Objectives

Describe the commissioning conditions of EHP on demo site B and present the results after the SCORES team has left the demosite

1.2 Achievements

1.2.1 Appliances preparation, shipping and delivery

Appliances ready for delivery at CAMPA factory on 10/2/20



Delivery to Agen by a dedicated transporter that helped to install them physically in the apartment 6.



A few bumps were reported on the appliances due to transport, only aesthetical impacts.



1.2.2 Team

Commissioning realized in presence of:

- Romain JOST – Heliopac
- Pierrick MANDROU – EDF
- Ronald – Siemens Netherlands
- Alexandre LEBLANC – CAMPA

1.2.3 Building – Demo site B - Agen





1.2.4 Apartment 6

1.2.4.1 Living room



Electrical installation: as the wall socket wasn't supplied with voltage, a temporary installation was set up using a classical removable wall plug. Information should be reported by Mr JOST to the building electrician that will act to do a proper installation.

EHP serial number: SETS0022

IP address for BEMS communication: 192.168.252.82

Ethernet Wiring:

- Wall plug number: 3
- Appartment / BEMS cabinet cable number at electric cabinet: 1

EHP/BEMS Gateway firmware version: vM0.004_Agen.ino

1.2.4.2 Bedroom 1 – small bedroom



Electrical installation : Wago connection of phase, neutral and earth



EHP serial number: SETS0024

IP address for BEMS communication: 192.168.252.84

Ethernet Wiring:

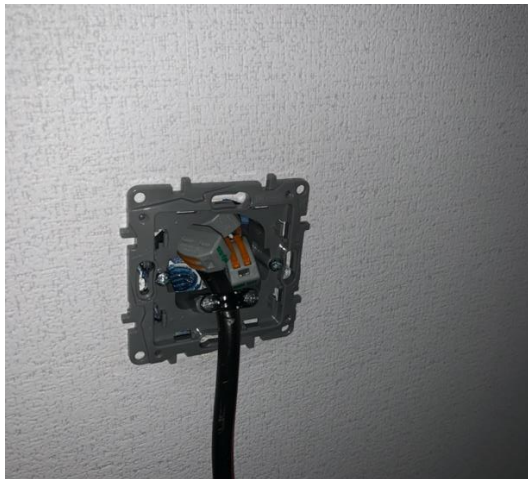
- Wall plug number: 6
- Apartment / BEMS cabinet cable number at electric cabinet: 4

EHP/BEMS Gateway firmware version: vM0.004_Agen.ino

1.2.4.3 Bedroom 2 – big bedroom



Electrical installation: Wago connection of phase, neutral and earth



EHP serial number: SETS0023

IP address for BEMS communication: 192.168.252.83

Ethernet Wiring:

- Wall plug number: 8
- Apartment / BEMS cabinet cable number at electric cabinet: 2

EHP/BEMS Gateway firmware version: vM0.004_Agen.ino

1.2.4.4 Electric cabinet

- Ethernet cables wiring inside the apartment and towards the BEMS cabinet technical room
- Linky meter
- Linky TIC Gateway toward BEMS
- EHP breaker of big and small room (24 inscription on it)
- No identification of breaker for EHP in the living room as it was not operating.



1.2.4.5 BEMS Cabinet



Actions done :

- Wiring of ethernet cables and RJ45 connectors crimping – troubles with wire gauge too high.
- Integration of cables for clean installation in the BEMS

1.2.4.6 ISHS

ISHS activation / deactivation was set up on a relay controlled by the BEMS.

Operation is according to the following.

BEMS reads Modbus Boolean value called “system online” from the 3 EHPs. If at least one of those 3 booleans is set to 0, BEMS reactivates the ISHS back on to assure comfort in the apartment.

1.3 Contact in case of assistance

Contact information for CAMPA -Alexandre LEBLANC, was left in the electric panel of the apartment and given to the technical maintainer of the building.

Alexandre LEBLANC
leblanca@campa.fr
03.26.48.01.76

1.4 Remaining actions

- Gitlab software archive
- Encoder problem reported – to be fixed by software patch
- Current weather display problem – to be fixed on the CAMPA server
- PCM capacity available – wrong format for BEMS – to be fixed by EHP software update
- EHP fault cases to define to send information to the BEMS – to be fixed by EHP software update
- Ship user manual to building maintainer
- Give insurance information
- Provide data collection authorization and system presentation for future inhabitants.

2 AHPP prototype manufacturing and testing

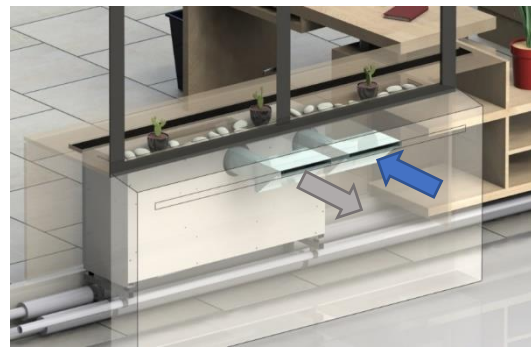
2.1 Introduction

AHPP: Air to air Heat Pump with Phase change material

- It is a single and autonomous unit located in the room to heat
- It uses energy in outside air to heat the room: approximately 1 kwh of electrical consumed allows to heat 3kwh. Therefore, it needs 2 holes between the outside and the AHPP prototype.



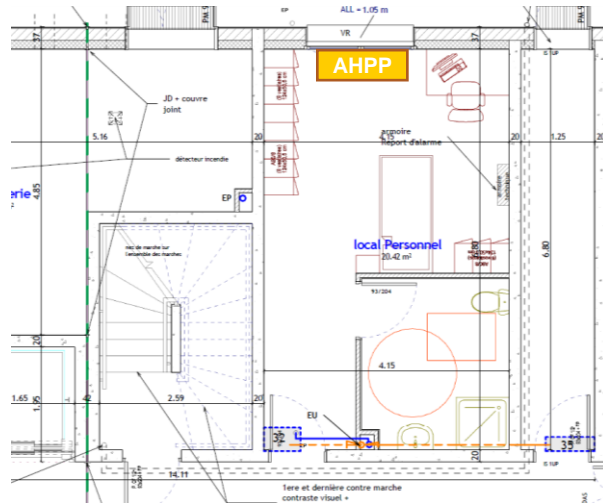
Schematic view from inside the room : the AHPP is installed against the wall close to the window



Schematic view the from outside: 2 holes, one allows sucking the air and the other one exits the air.

AHPP initially planned to be installed at AGEN. Unfortunately the building manager didn't accept works in the room (meeting with the building Manager, Mrs Peraldo, the 31/07/2019).

As foreseen in the DoA, there was a risk of non-acceptance of the AHPP prototype due to the building modifications (holes in the wall). The alternative noticed in the DoA was to test the prototype in the Laboratory of France Energie.



2.2 Tests of the AHPP in the France Energie Laboratory

The France Energie laboratory is equipped with 2 test rooms to test the AHPP:

- 1 for the internal climate $+10^{\circ}\text{C} < T_{int} < +40^{\circ}\text{C}$
- 1 for the external climate $-15^{\circ}\text{C} < T_{ext} < +50^{\circ}\text{C}$
- with a “technical opening” between the 2 test rooms



France Energie laboratory with 2 test rooms.

The positive point to test in a laboratory is to be able to monitor the complete functioning of the AHPP: 57 probes : temperature / humidity / airflow / pressure / electrical power.



The AHPP has been installed inside the Internal Climate test room which simulates the ambient conditions of a room in a building



The External Climate test room simulates the outside air conditions

2.3 Test conditions

3 phases of tests have been planned:

The first campaign of tests consists of measuring the performances of the AHPP without using the storage capacity. The tests conditions have been defined in collaboration with AEE and they fit with the standard. AEE will use the results for the simulation.

Internal temperature	Internal Humidity	External Temperature	External humidity
20°C	55%HR	12°C	88% RH
		7°C	84% RH
		2°C	80% RH
		-7°C	75% RH
		-15°C	60% RH

The AHPP is an inverter type heat pump that means it delivers the heating capacity according to the needs: the difference between the internal air temperature and the setpoint defined by the user. The controller of the AHPP set the speed of the compressor according this ΔT .

The second phase of the tests will allow to know the storage capacity and the storage and heat release profiles as a function of the time.

And the last campaign of tests will simulate a full day of functioning with storage and heat release phases.