Energy Efficient Ventilated Façades for Optimal Adaptability and Heat Exchange enabling low energy architectural concepts for the refurbishment of existing buildings.

E2VENT

E2VENT WORKSHOP

„Think green, think Smart Façade“

LHTES: Latent Heat Thermal Energy Storage System

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Nobatek

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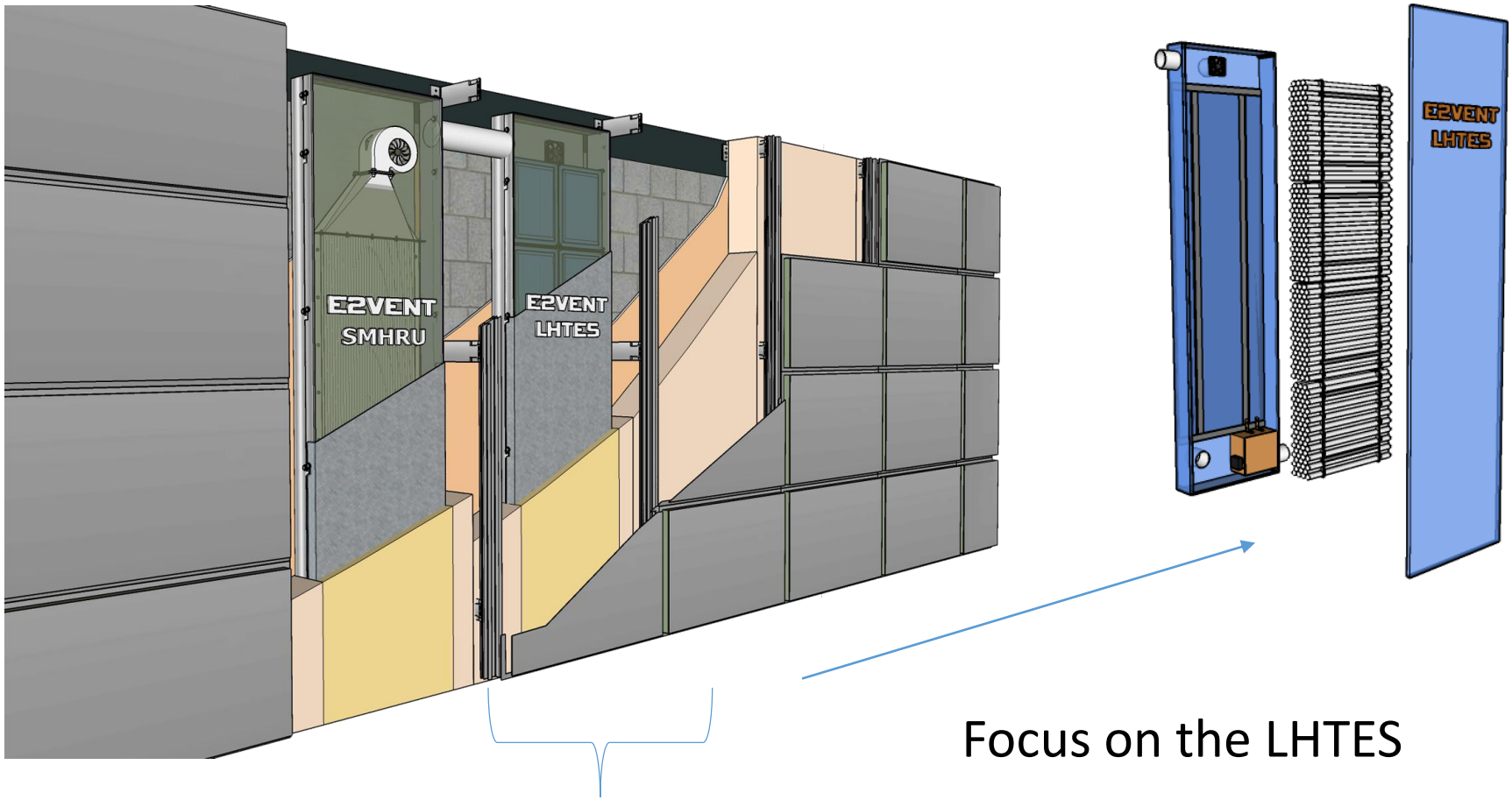
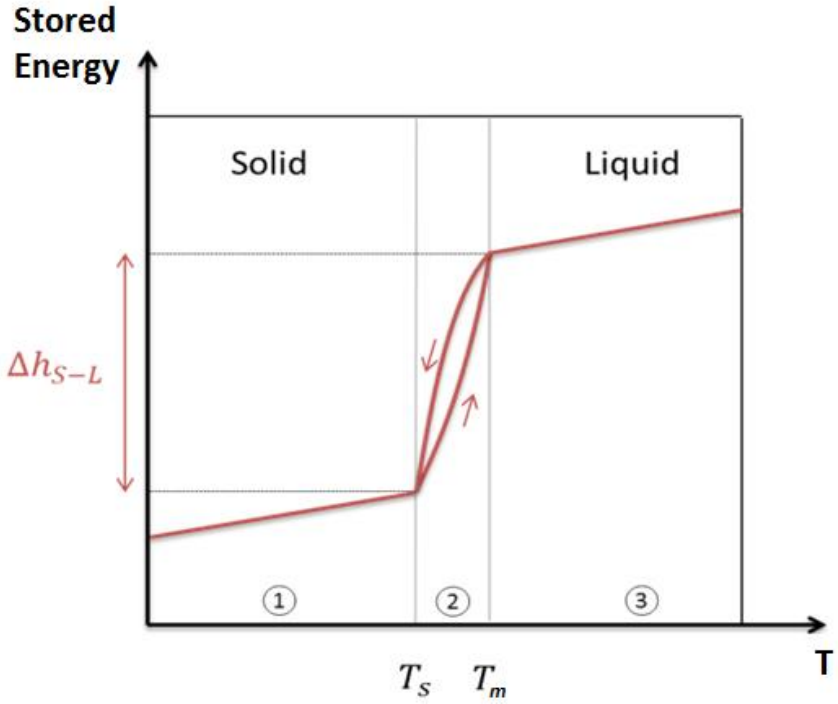
Focus on the LHTES



PCM (Phase Change Materials) to store heat

1. Phase change for temperatures close to T_{int}
2. To store great amount of energy in a define volume
3. The building's inertia is increased

- Different types of PCM materials :



	Rubitherm RT21	Rubitherm RT25	Rubitherm RT28
Latent heat (J/kg)	180000	218000	235000
Liquid density (kg/m3)	770	770	770
Thermal capacity (J/kg/K)	2000	2000	2000
Conductivity (W/m/K)	0.6	0.2	0.2
Melting temperature range (°C)	19-23	22-25	26.5-28.5

LHTES system: concept for cooling

- Two circuits EXT – EXT and INT – INT

LHTES: design

- Use of PCM encapsulated in tubes made of aluminum

- Selection of actuators:
  - Fan
  - Dampers
  - Sensors

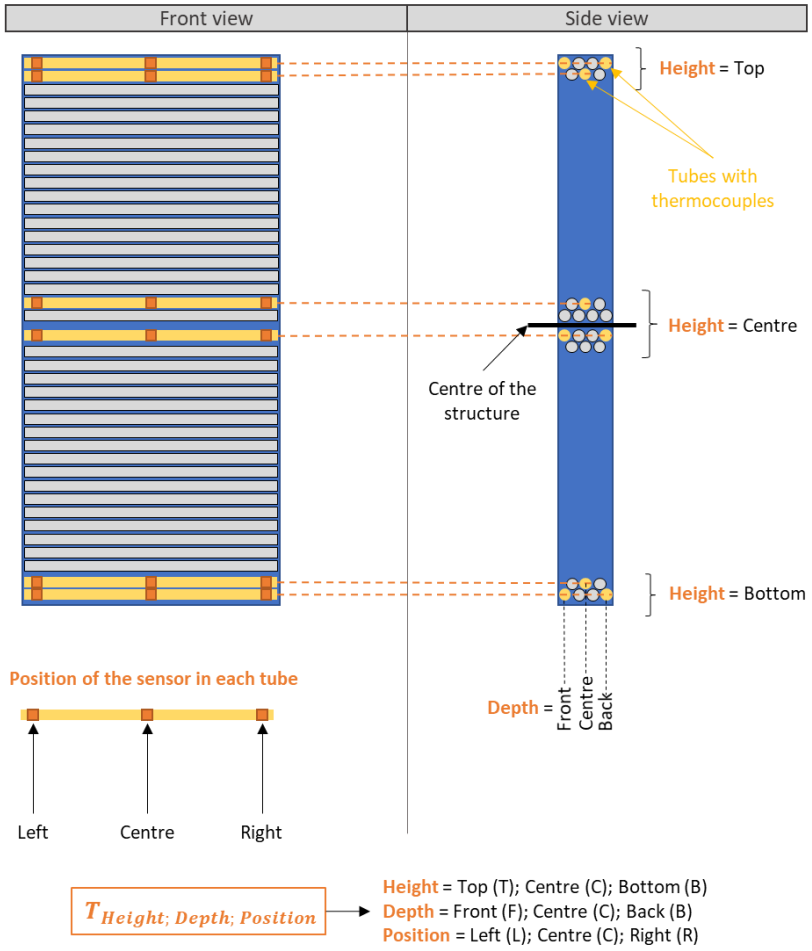
- Connection to the Building Energy Management system

LHTES: 1st prototype

- From the manufacturing site to the lab for testings

LHTES system: Lab scale testings

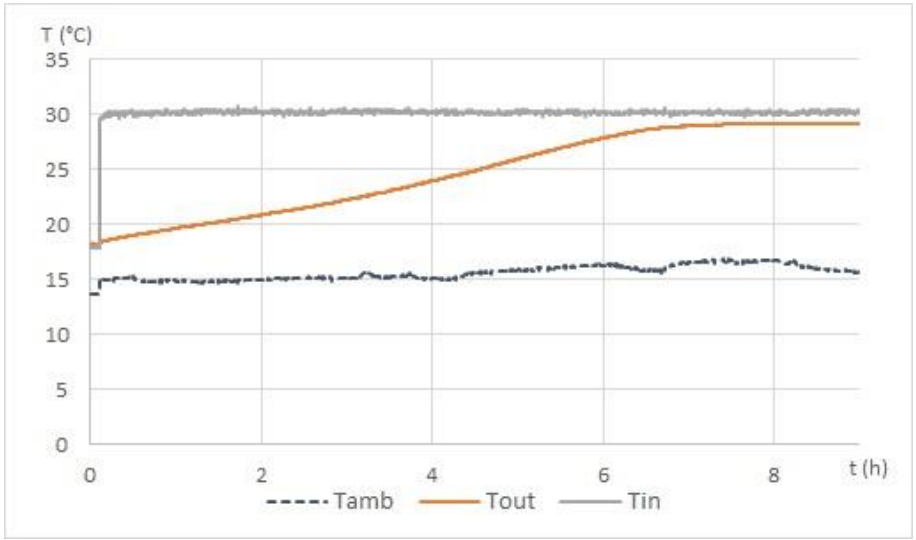
View of the LHTES system with tubes



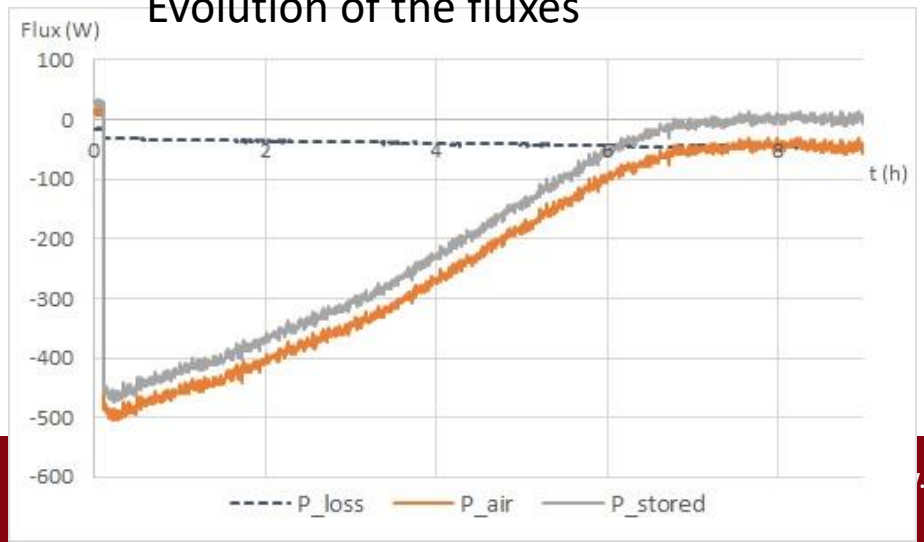
Location of the sensors

Laboratory testings

Evolution of the temperatures



Evolution of the fluxes



Conclusion:

- 7 hour cycle
- 500 W max (fan = 25 W)
- 2,0 kWh of energy stored while mode gives 2,1 kWh
- COP = 9

Overall:

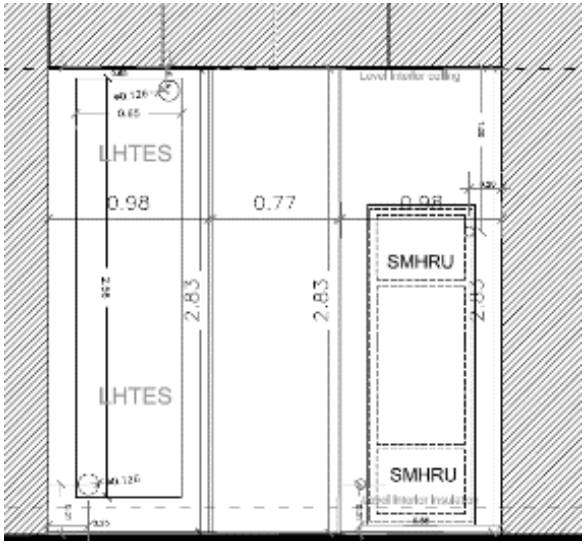
- In laboratory, quite conclusive

… But what about on real site ?

Real scale testings on a test bench

- For the prototype validation. Use of test bench in Anglet, France

Real scale testings on a test bench



- Installation with all partners involved

→ feedback for installation

Conclusion:

- Simillar measurements

Pilot site in Burgos

- Installation in Burgos of 2 LHTES.

Pilot site in Burgos

- Waiting for summer for analysis of measurements.

Thank you for your attention.

Contact

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