HEAT4COOL

Project Overview

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Project Manager, Project Coordinator (Politecnico di Milano)

Heat4COOL project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 723925

Heat4Cool project

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Heat4Cool Consortium

- **3** manufacturing SMEs
- **6** engineering SMEs
- **3** academia/research
- **1** industry association

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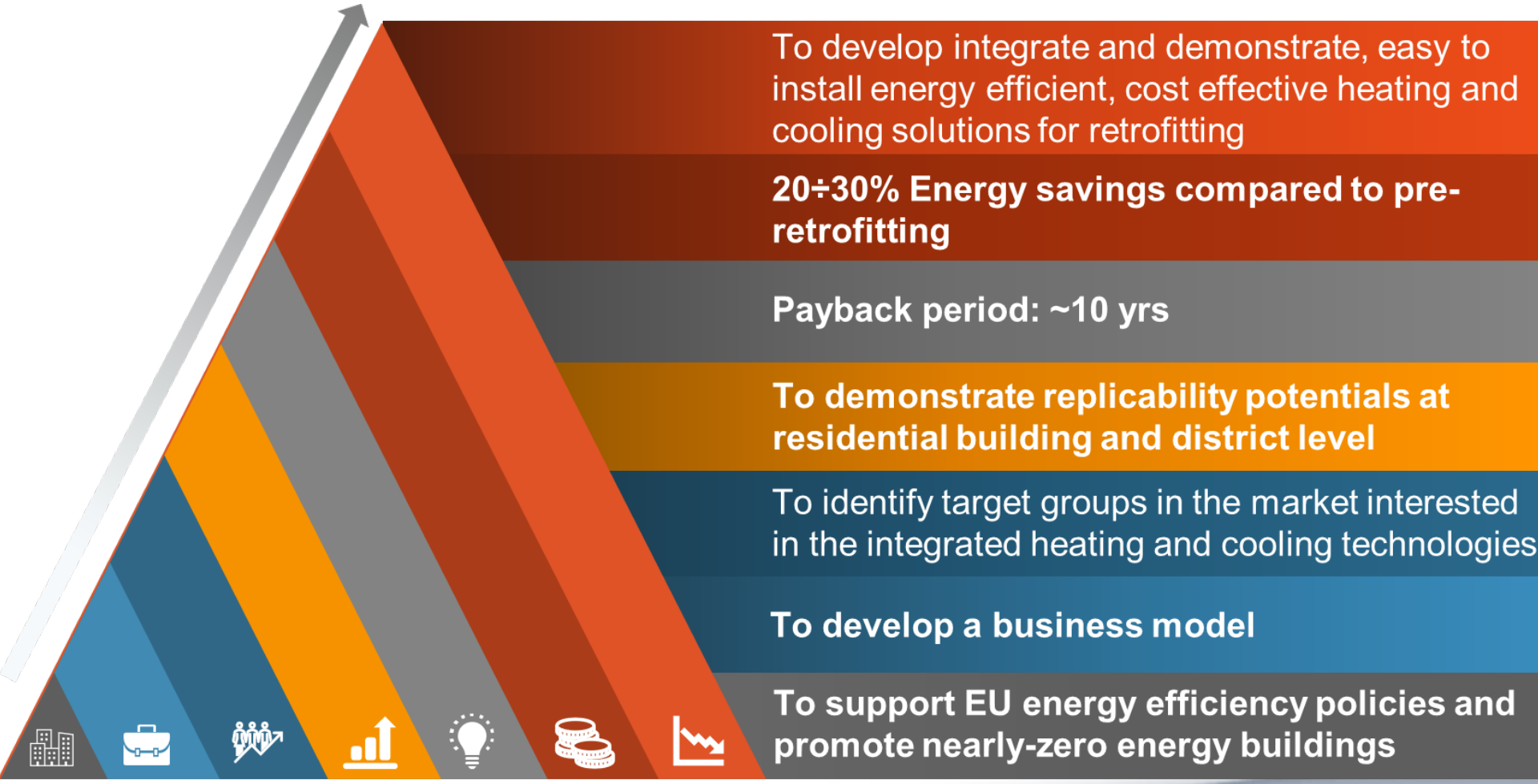
Heat4Cool objectives



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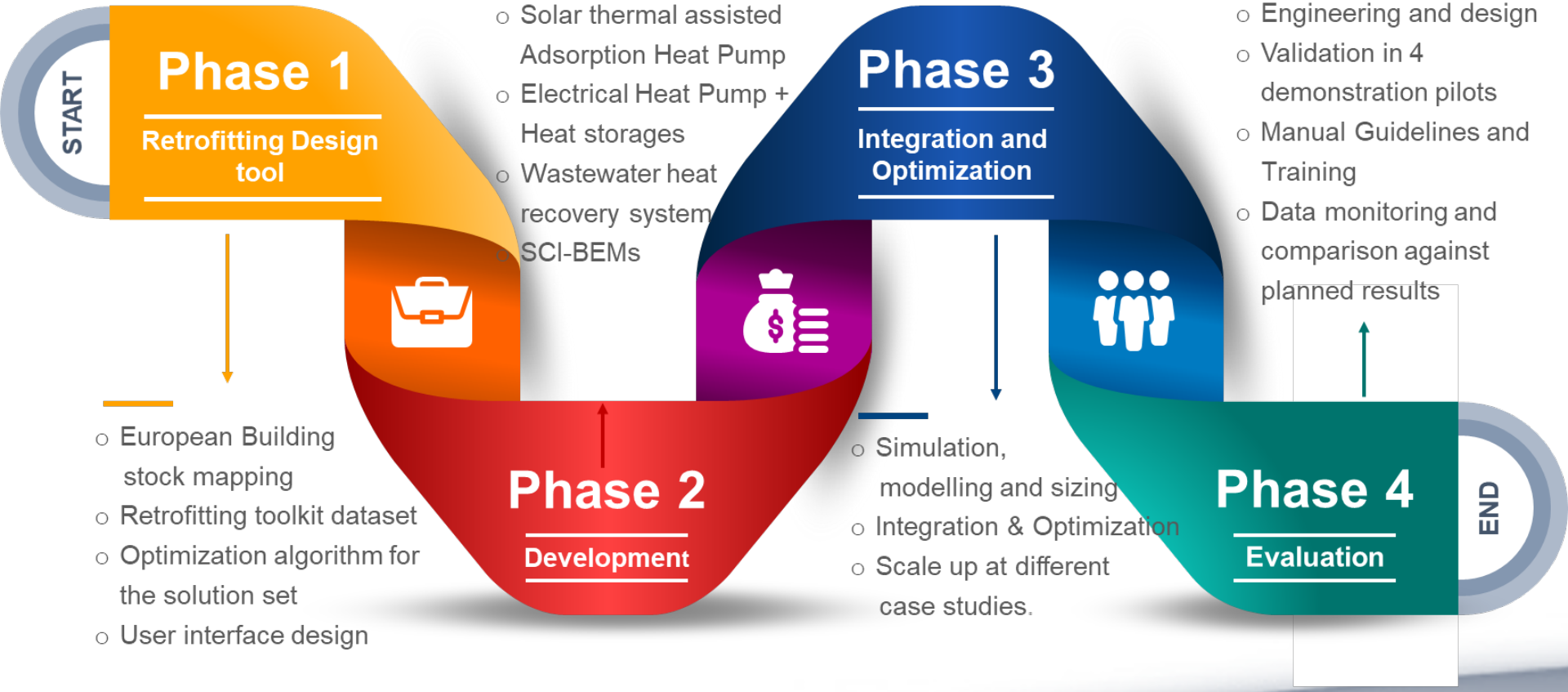
Heat4Cool project phases



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Heat4Cool technologies

- **Tools and integrated systems developed:**
  1. Building retrofitting **design planner tool**
  2. Solar Thermal + VC Heat Pump + **Adsorption Heat Pump**
  3. Photovoltaics + VC Heat Pump + **PCM storage**
  4. **Wastewater Heat Recovery system** + EHP (district level)
  5. Self-Correcting Intelligent Building Energy Management System (**SCI-BEMS**)

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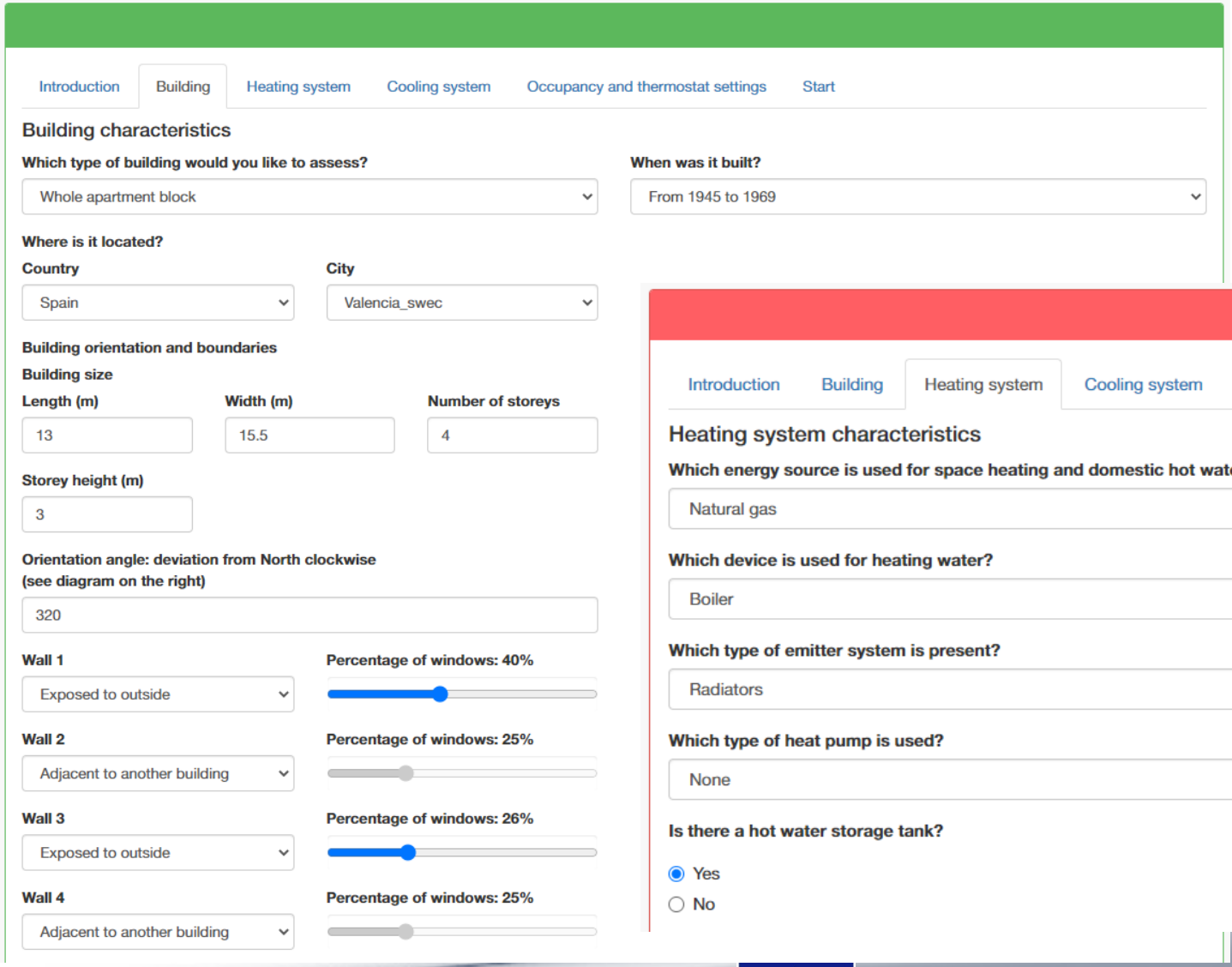
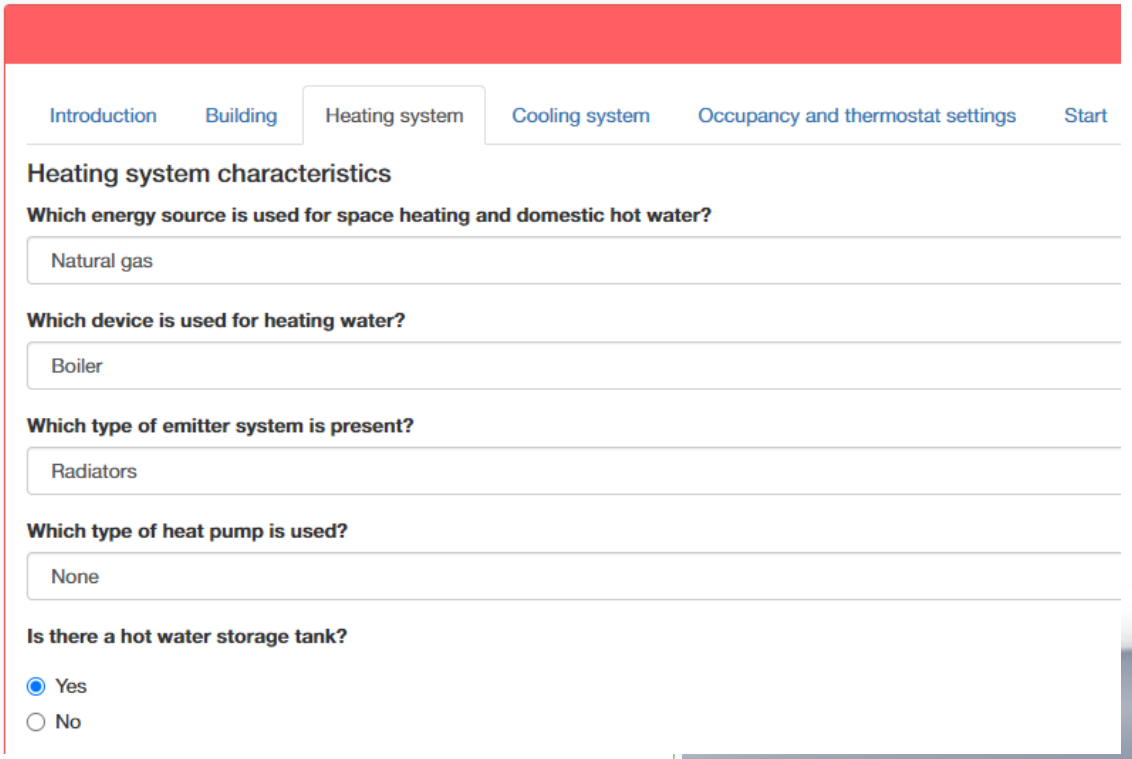
1. Building retrofitting design planner tool





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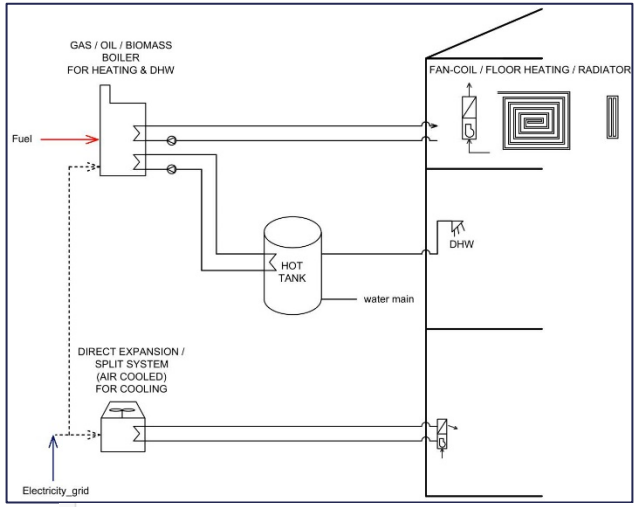
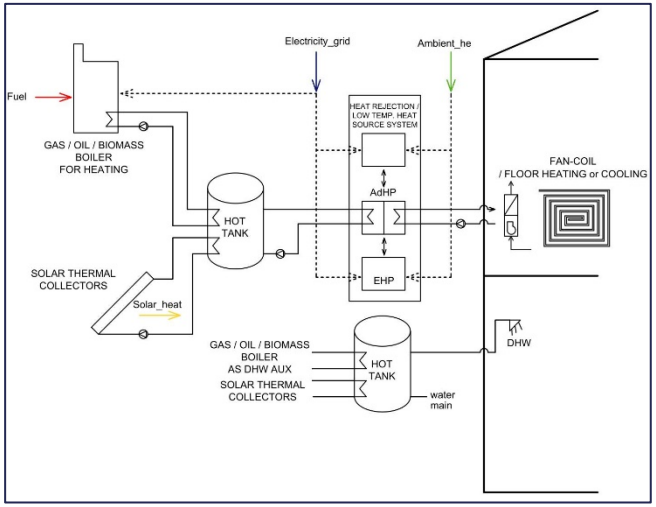
1. Building retrofitting design planner tool

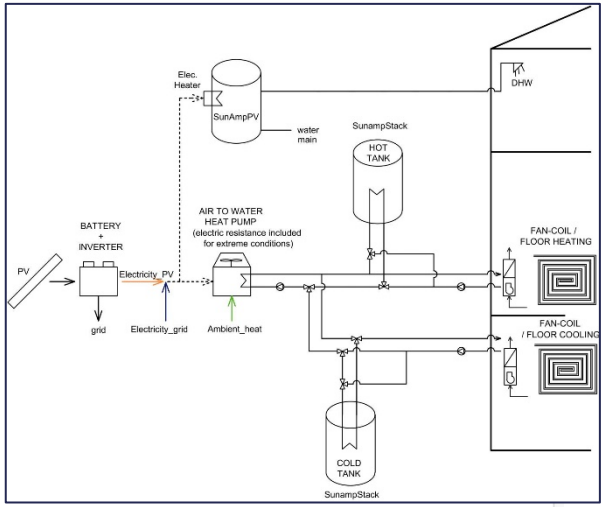
Current



AdHP + SC



EHP + PV + PCM



Simulation name	Layout	Ranking	Non-renewable primary energy (kWh/m2/y)	Renewable energy contribution	Greenhouse gas emissions (kgCO2eq/m2/y)	Electricity fed to the grid (kWh/y)	Average Comfort devation (°C)	Techincal and regulatory information	NZEB compliance according to EU 2016/1318
+AdHP+SC	4	1	26.5	92%	4.3	0.00	-0.81	show	No
+AdHP+SC+BEMS	4	2	28.2	92%	4.7	0.00	-0.81	show	No
Current	2	3	64.1	0%	13.0	0.00	-1.07		
+BEMS	2	4	63.8	0%	13.0	0.00	-1.07	show	No
+EHP+PV+PCM+BEMS	5	5	82.5	83%	13.5	10357.76	-0.86	show	No

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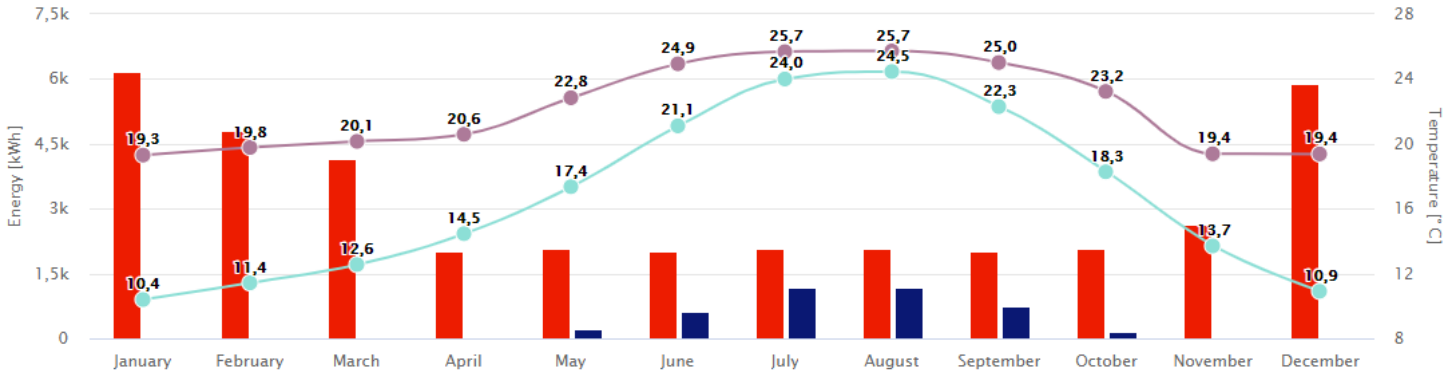
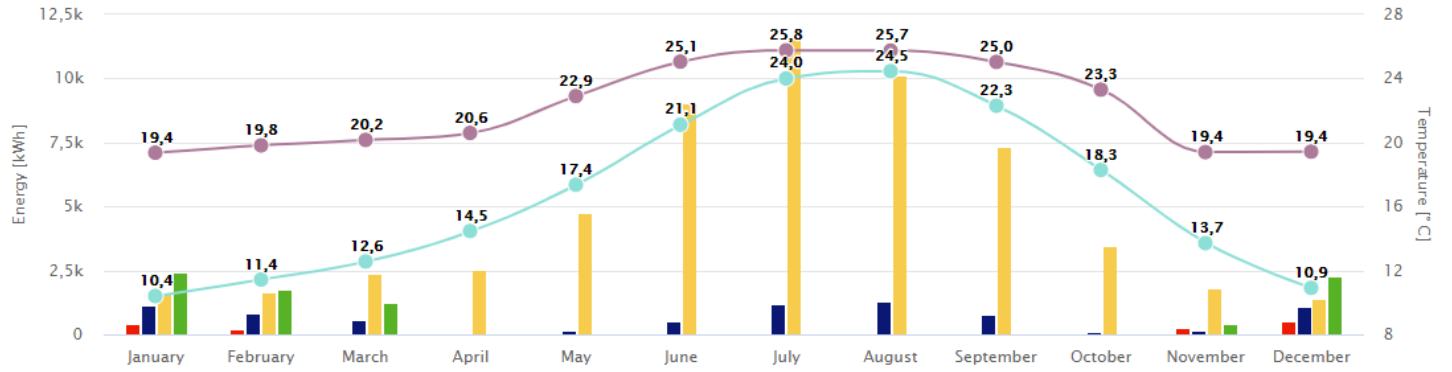
1. Building retrofitting design planner tool

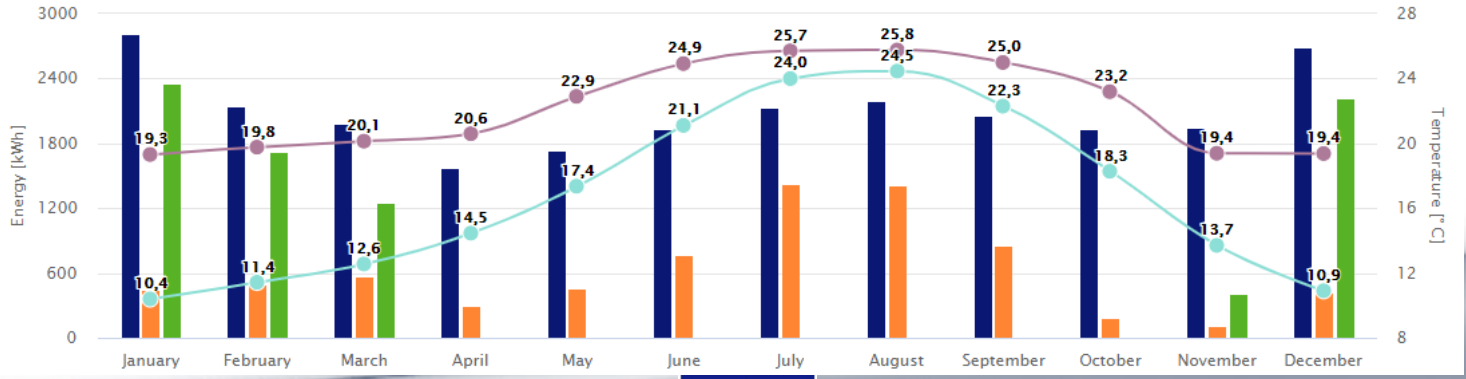
Current



AdHP + SC



EHP + PV + PCM



Fuel
Electricity_grid
Electricity_PV
Solar_heat
Ambient_heat
T_Room
T_Ext

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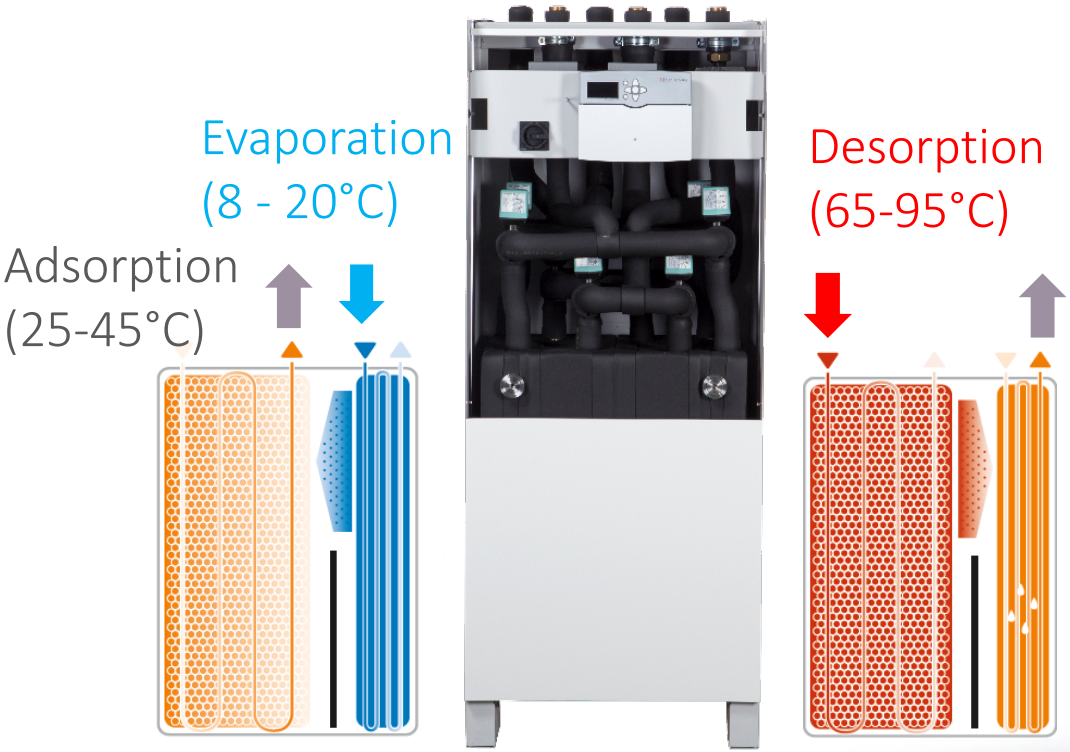
2. Thermally driven adsorption heat pump

FAHRENHEIT

- Zeolite and silica gel coating
- Solar cooling
- Use of water as refrigerant



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3. PCM storage

Sunamp
Heat Batteries™

- Compact heat and cold storage system
- 9 kWh module eq. to 210 l cylinder
- 56% reduction in volume
- 40% reduction in heat loss
- Modular and scalable
- Dual ported heat exchanger: simultaneous charge and discharge

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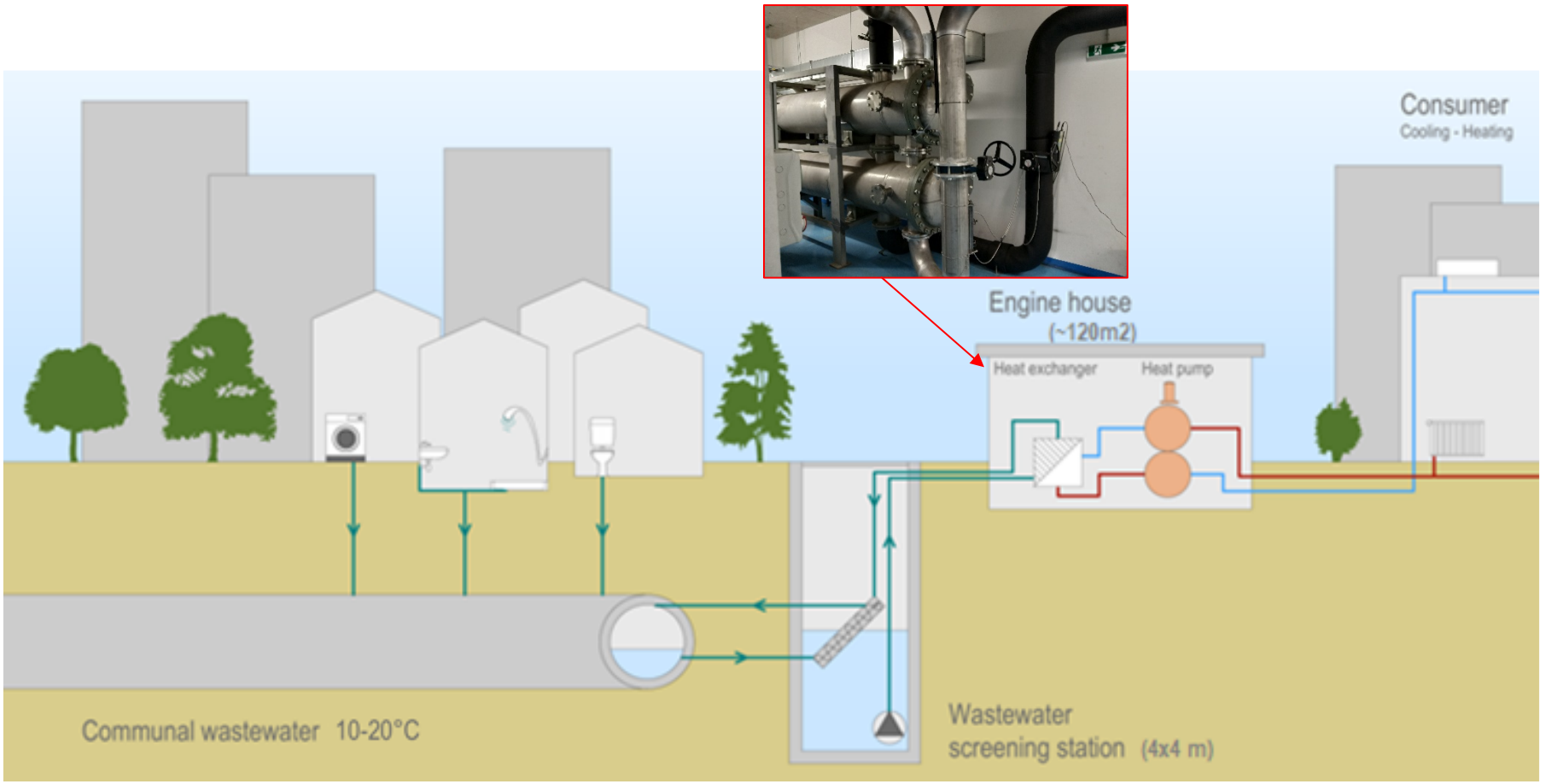
4. Wastewater heat recovery



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5. SCI-BEMS

Gateway

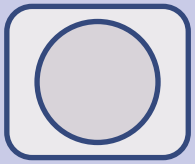
- **Data and Control**
- **Home Agent**

SCI-BEMS Cloud Services

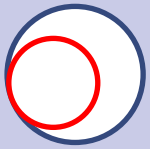
- **Information Management**
- **Comfort Profiling**
- **Automation of Control**

Middleware

METER



ROOM SENSOR



RADIATOR HEAD

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Heat4Cool pilot sites

1. Sofia (BG)

3 floors
4 apartments
350 m^2

2. Valencia (ES)

4 floors
12 apartments
588 m^2

3. Chorzow (PL)

4 floors
12 apartments
1330 m^2

4. Budapest (HU)

3 Buildings
1330 m^2 ,1900 m^2,
8000 m^2

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HEATHCOOL

THANK YOU!

HOCHSCHULE
LUZERN

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