Overview of the project's goals achieved

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

Introduction

Packages	Where
1. Solar **H**eating **C**ooling system **SHC system**	*@ Valencia*
2. Waste **W**ater **H**eat **E**xchanger, **E**lectric **H**eat **P**ump for **D**istrict **H**eating and **C**ooling system **WW-HX + EHP for DHC system**	*@ Budapest*
3. Photo**V**oltaic system, **E**lectric **H**eat **P**ump and **P**hase **C**hange **M**aterial **H**eat **B**atteries **PV, EHP and PCM HB system**	*@ Chorzow and Sofia*

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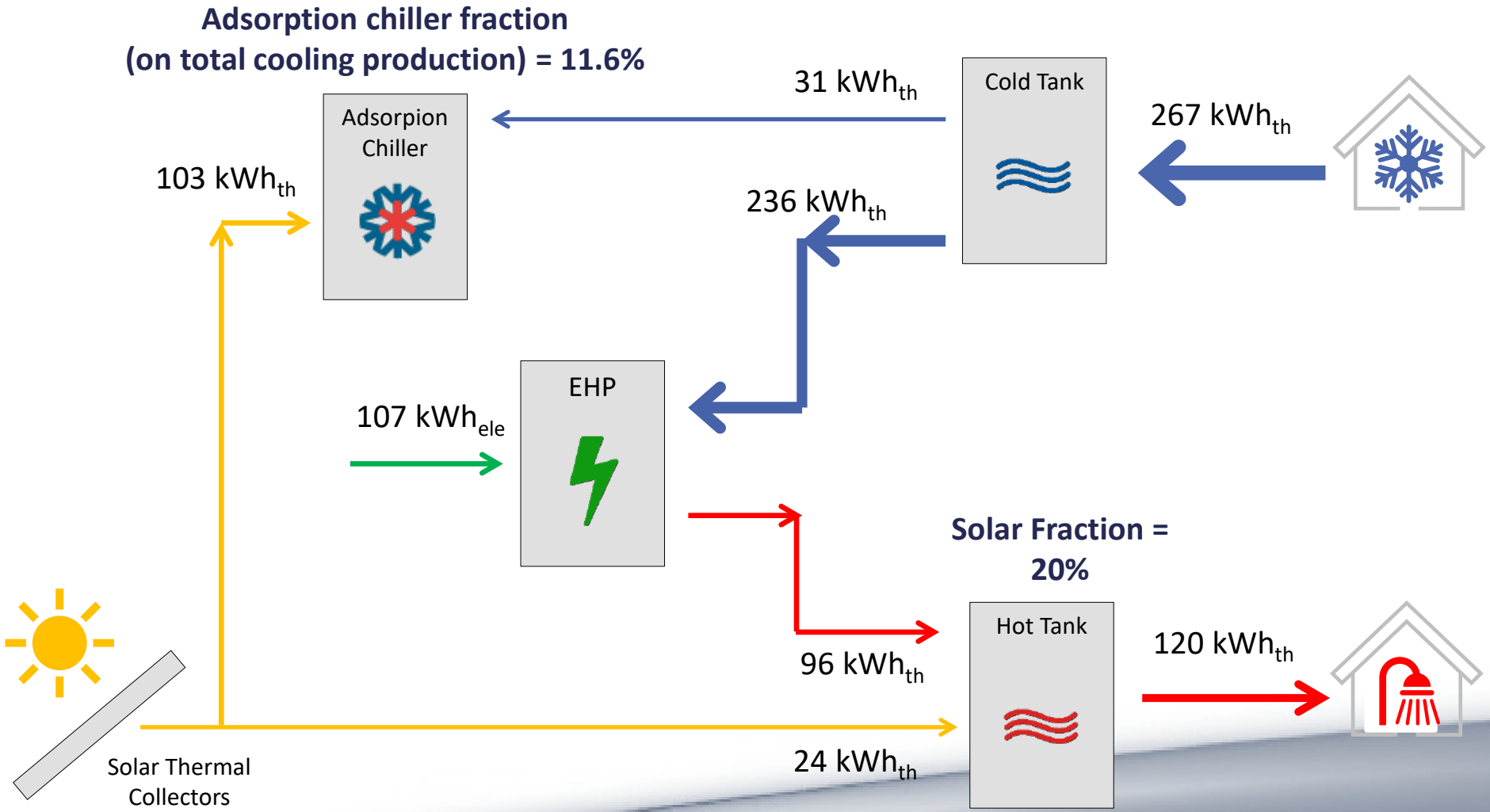
SHC system @Valencia

Energy Performance - Summer typical Day 1



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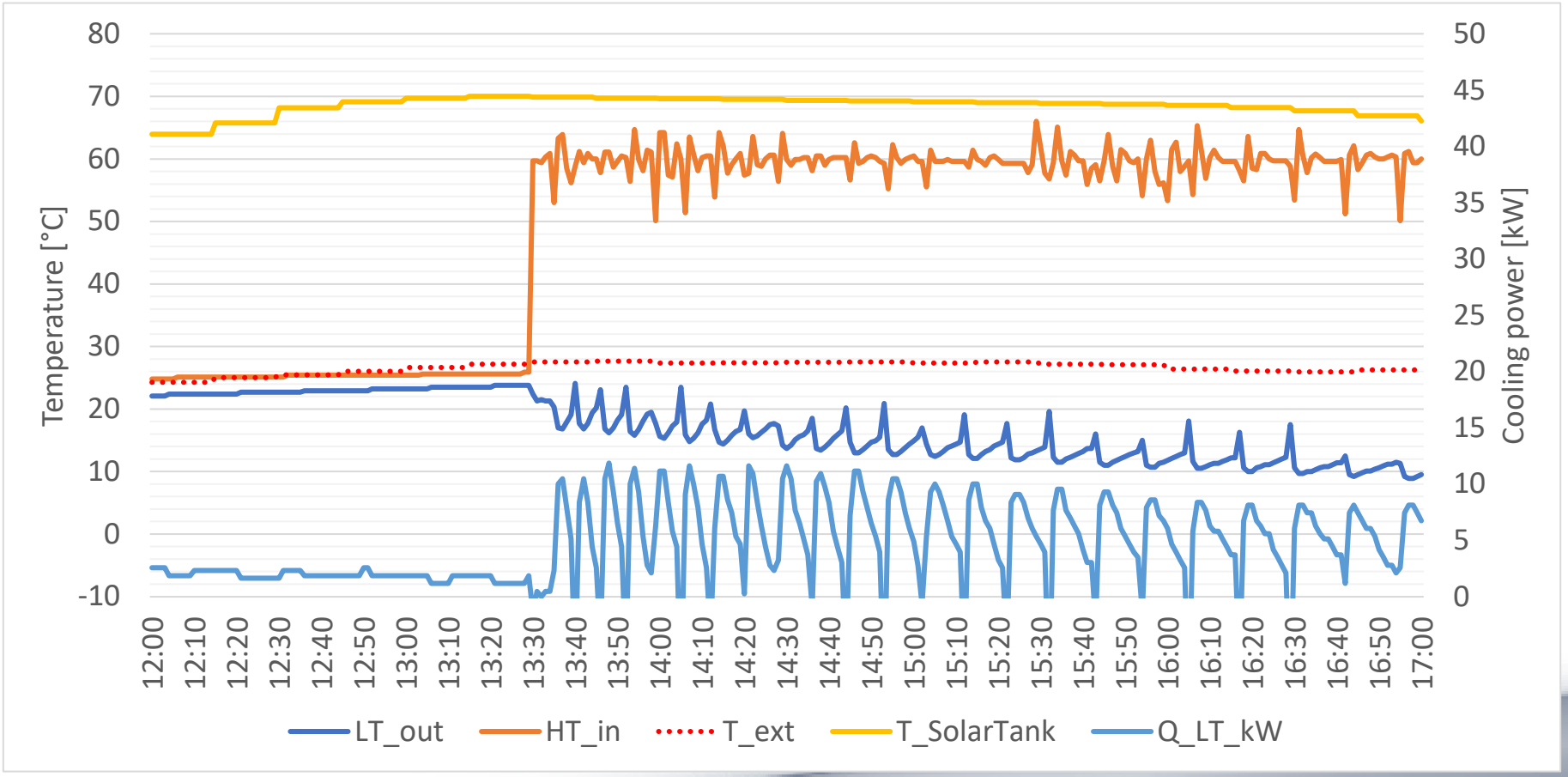
SHC system @Valencia

Adsorption chiller – Summer typical Day 2

- Cooling energy production = 31.5 kWh
- Thermal COP = 0.49



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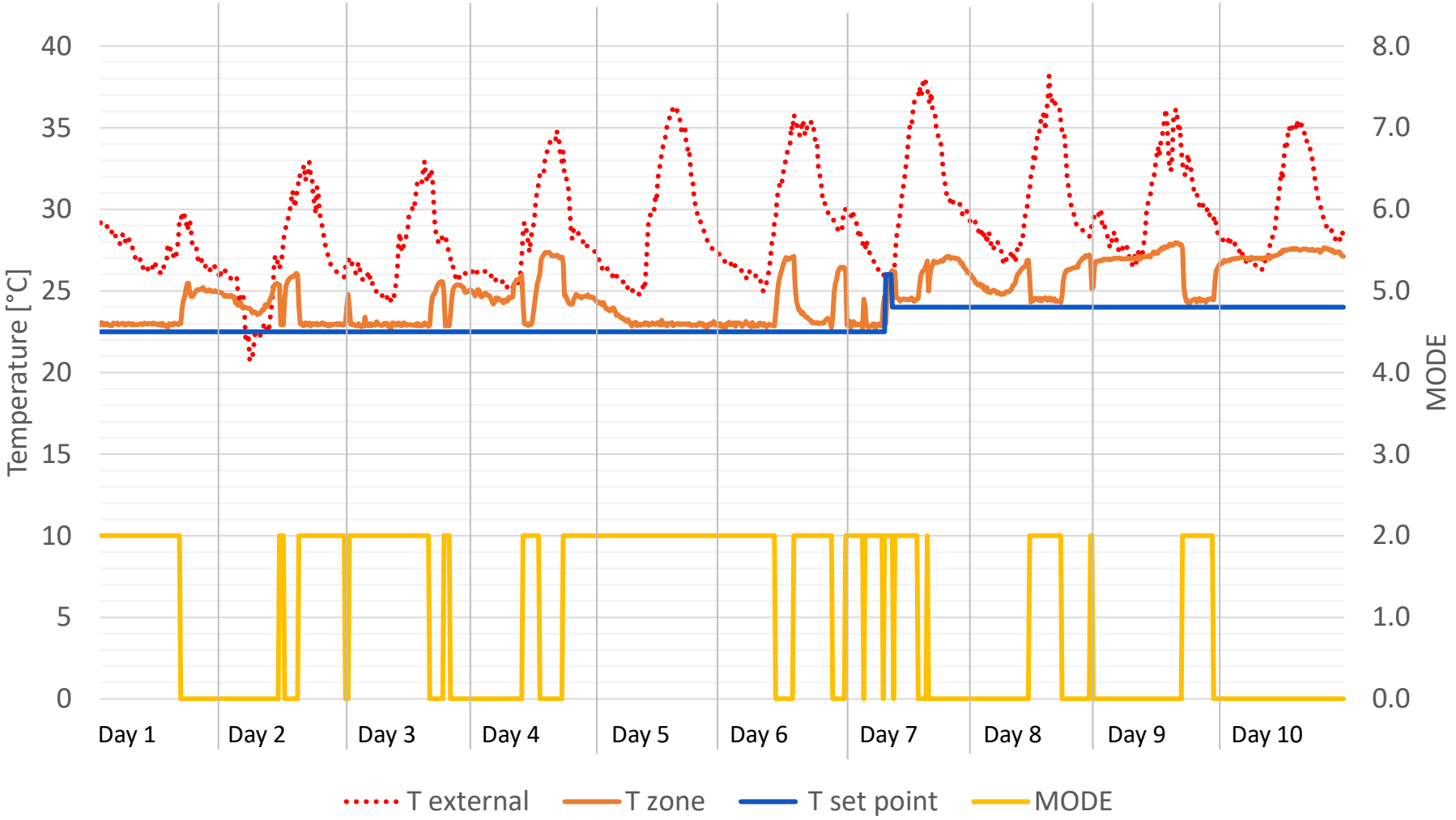
SHC system @Valencia

Occupant profile – 10 days operation



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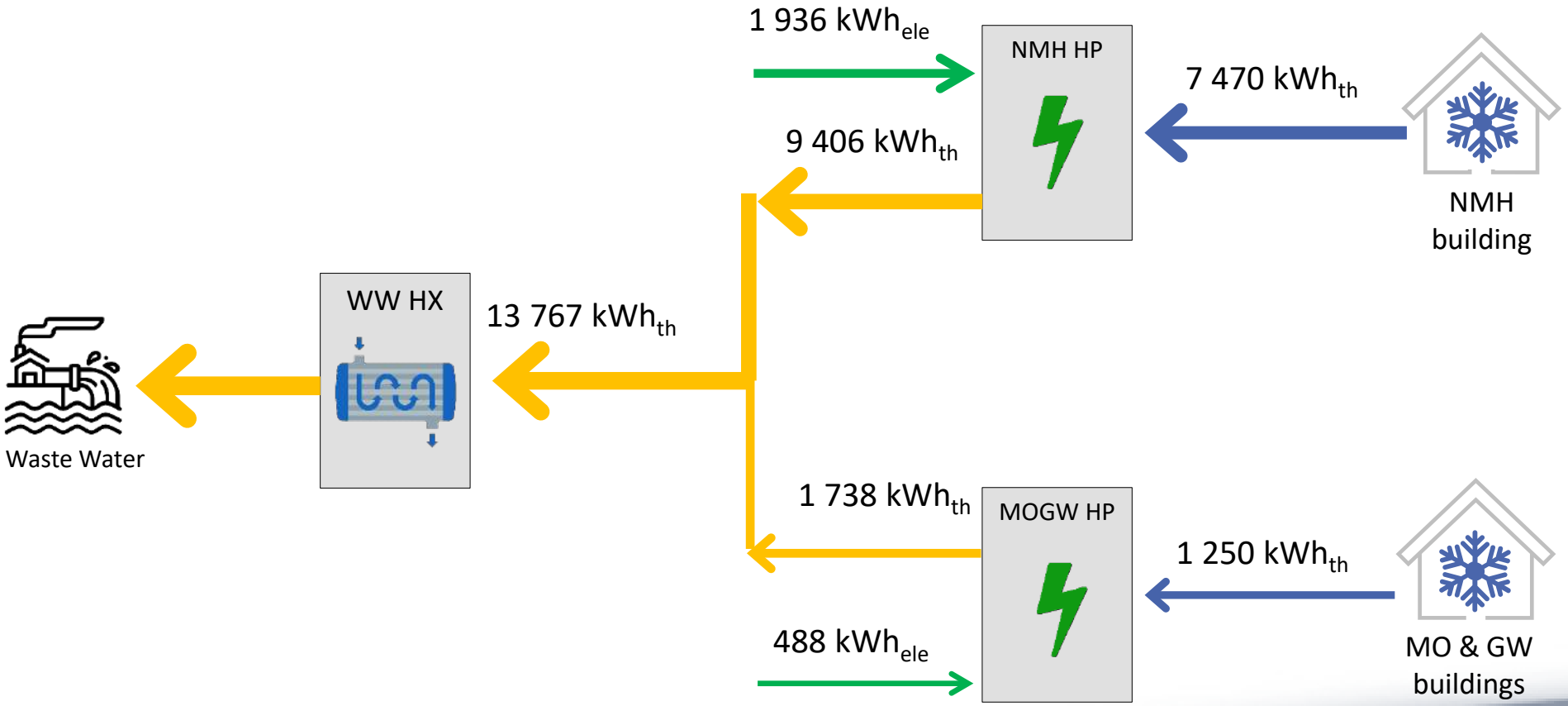
WW-HX, EHP for DHC system @Budapest

Energy Performance - Summer typical Day 1



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WW-HX, EHP for DHC system @Budapest

New heat exchangers - Summer typical Day 2

- Waste Water Cooled

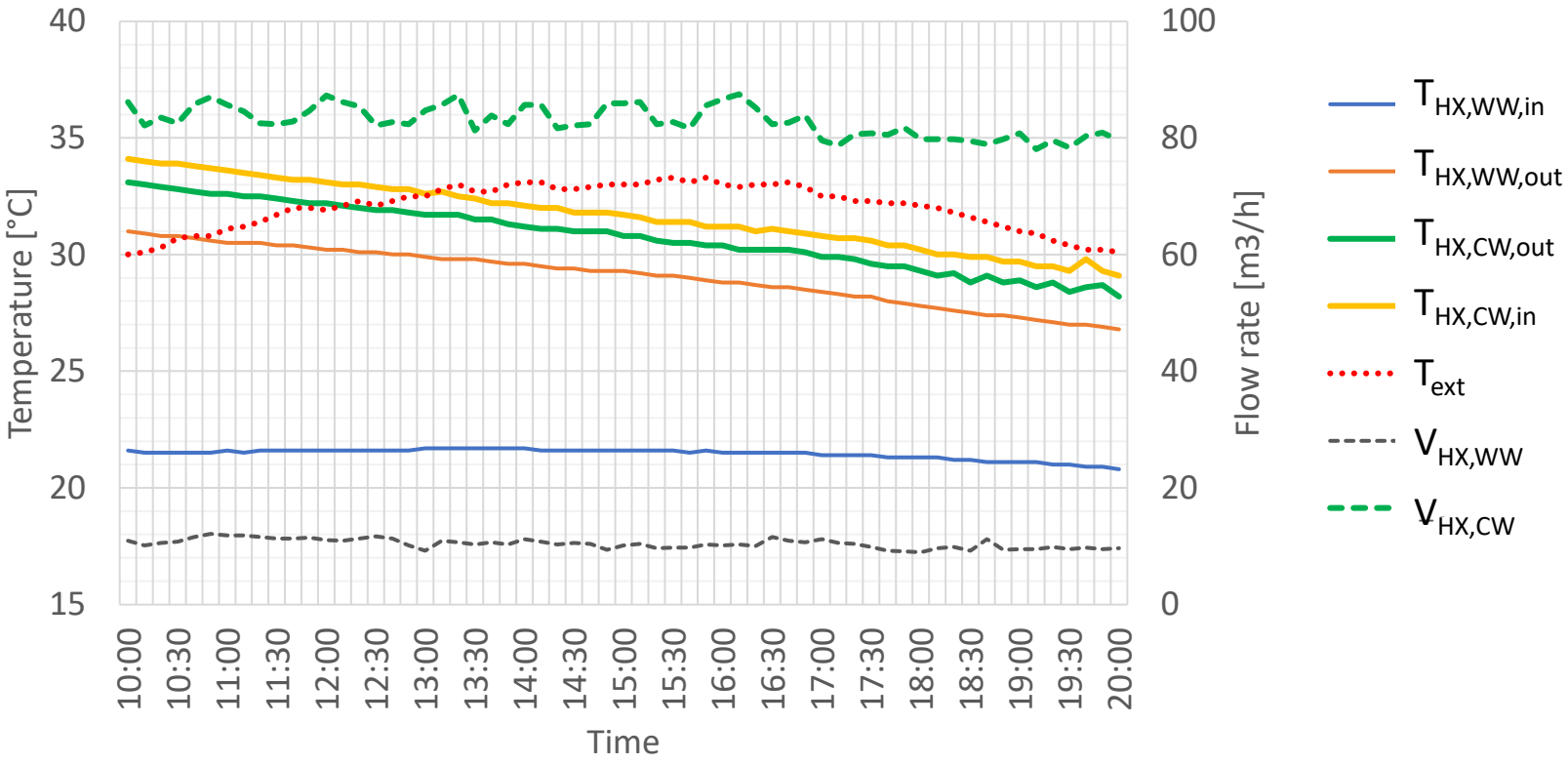
  EER = 5.71

  (refrigerant temperature = 31°C)

- Air Cooled (reference case)

  EER = 4.87

  (refrigerant temperature = 38°C)



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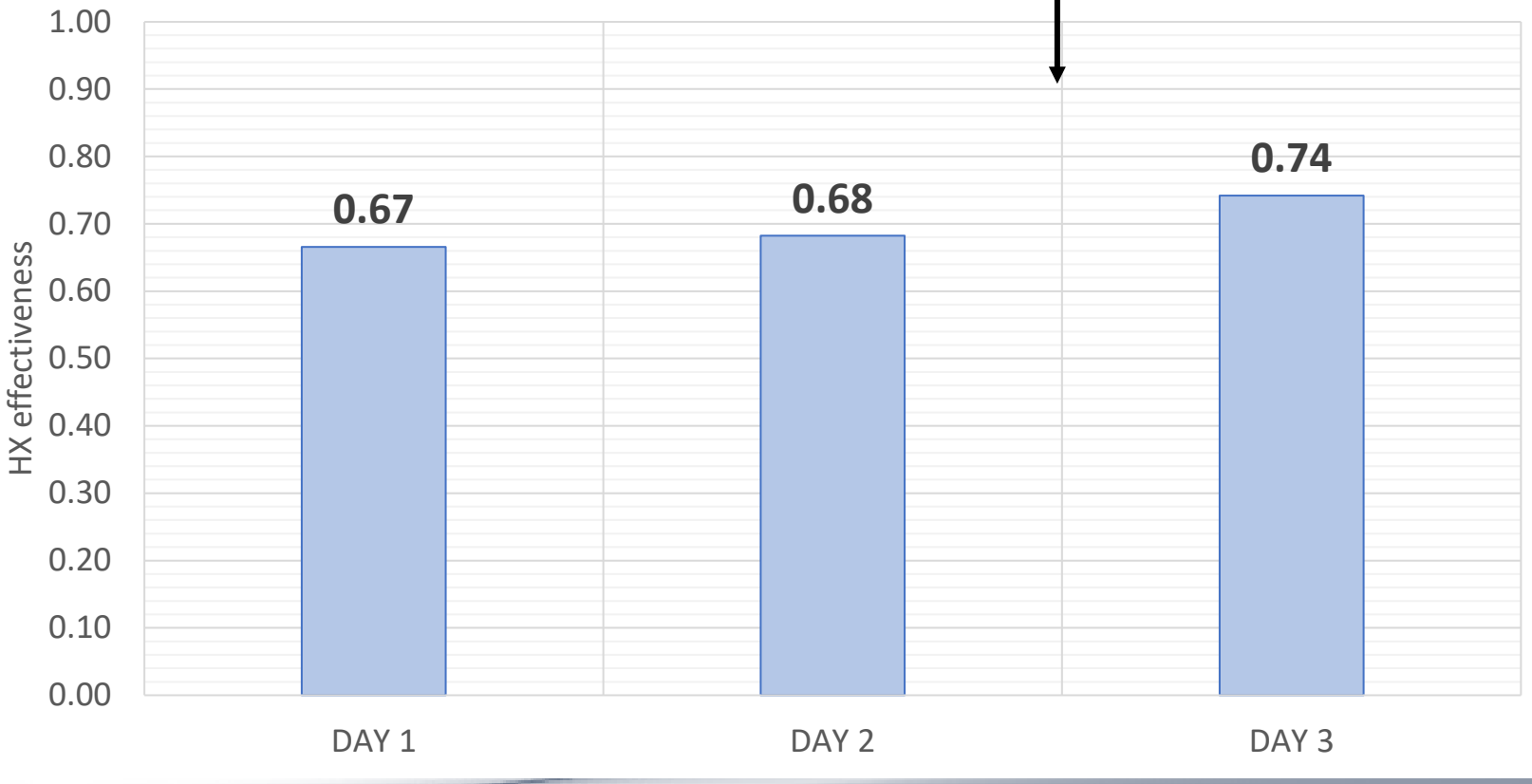
WW-HX, EHP for DHC system @Budapest

New heat exchangers - heat exchange effectiveness

→ Heat Exchanger cleaning



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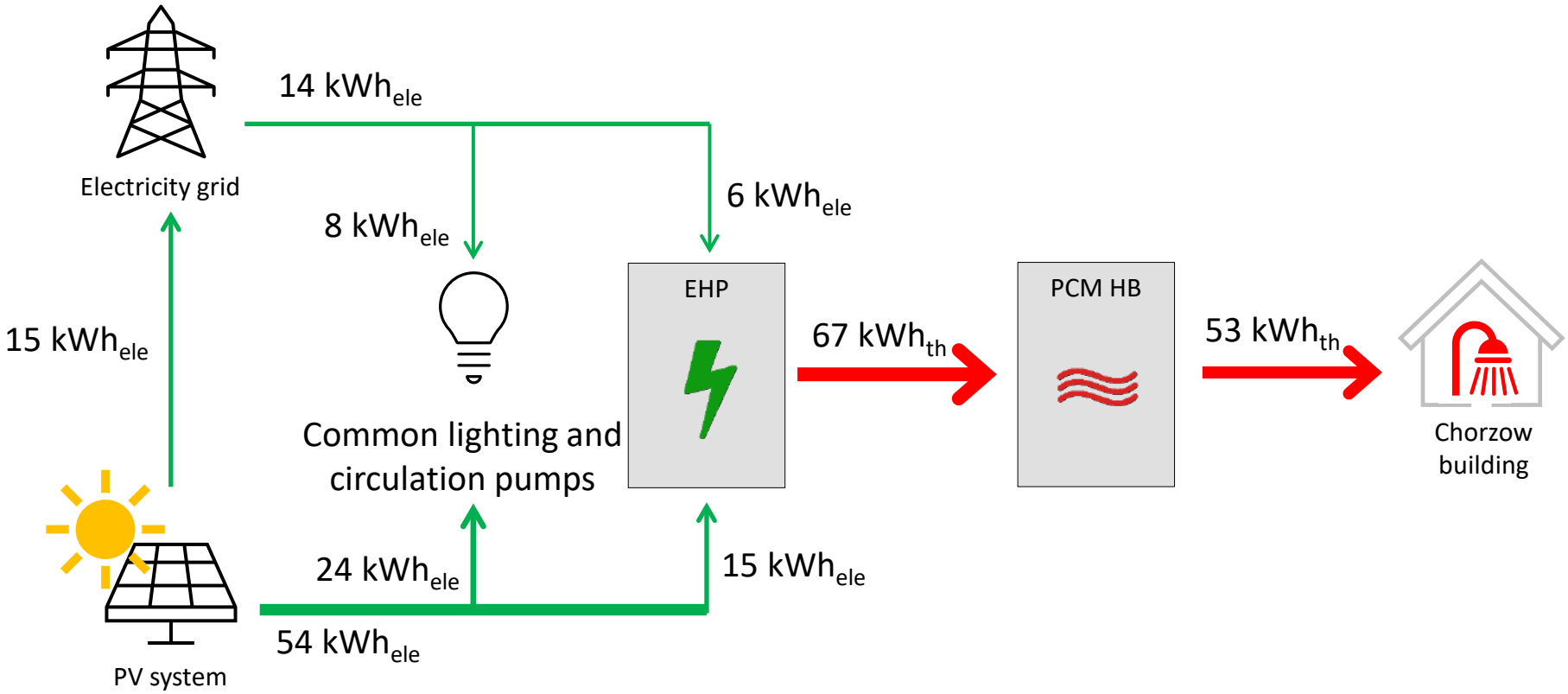
PV, EHP and PCM HB system @Chorzow

Energy Performance - Summer typical Day 1



- Self-consumption (on PV system production) = 73%
- Import (on total consumption) = 26%

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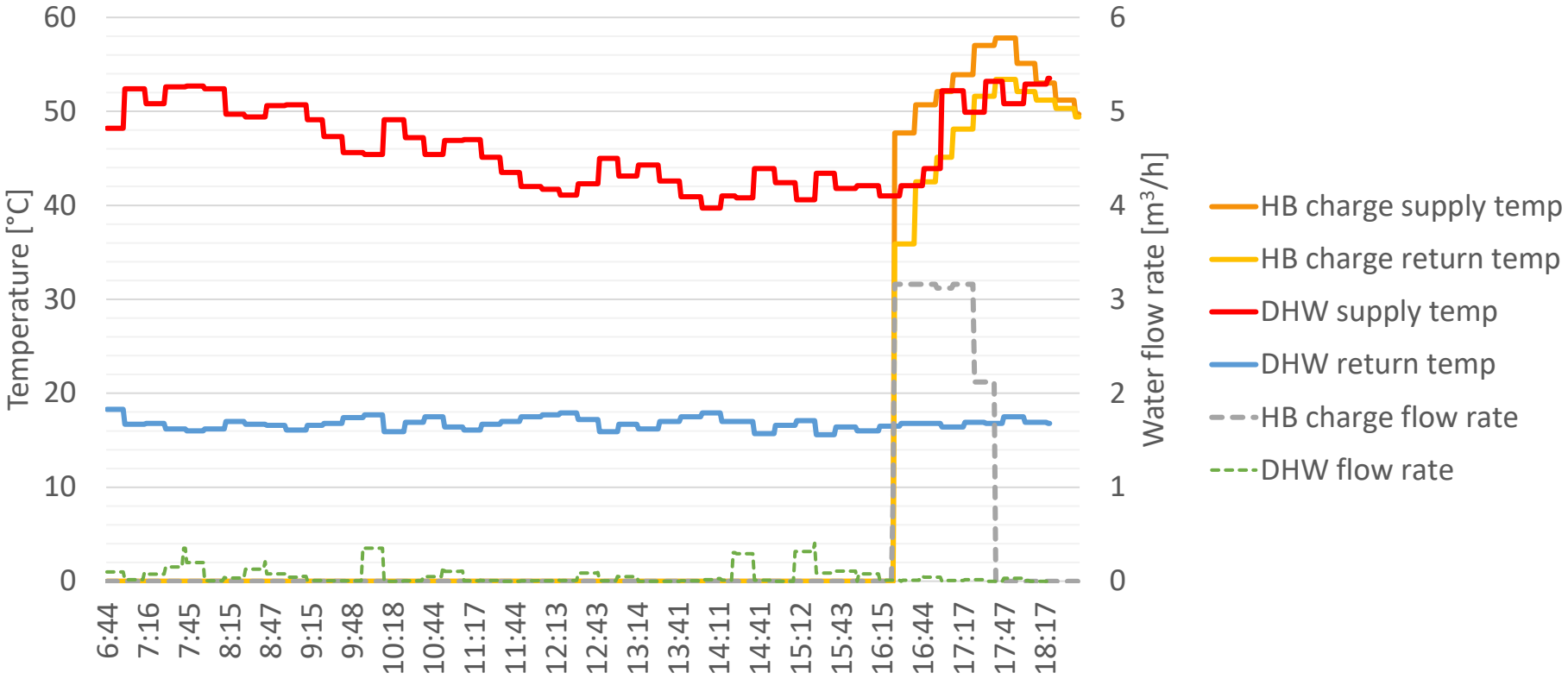
PV, EHP and PCM HB system @Chorzow

PCM heat batteries - Summer typical Day 2

- Charging energy provided = 67 kWh
- DHW energy provided = 55 kWh



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Conclusions

SHC system - Valencia

- Solar driven adsorption cooling and solar thermal hot water production in accordance to simulations;
- Possible optimization of the adsorption chiller high inlet temperature control.

WW-HX, EHP for DHC system - Budapest

- Proven technical feasibility of a district heating and cooling system based on waste water heat exchangers;
- Application of a new heat exchanger cleaning method which demonstrated the improvement of the heat exchange effectiveness;
- Better cooling/heating energy efficiency performance thanks to the use of the waste water as energy sink/source (in comparison to air).

PV, EHP and PCM HB system – Chorzow and Sofia

- Modular PCM heat batteries provide high flexibility with less space occupation compared to water storage;
- On site PV production of which 73% self-consumed thanks to the PCM HB;
- Only 26% of electricity imported from the grid.

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Thank you

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