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HEAT4COOL

Sunamp
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ehpa
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heat pump association

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ENERGIAS RENOVABLES

HOCHSCHULE
LUZERN

Presentation of the demo site in Chorzów (Poland)
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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



Demo site in Poland – Historical building



Location	Chorzów, Poland
Surface – conditioned	1000 [m ²]
Year of construction	1902
Type	Residential
Users	60
Apartments	12
Commercial zones	3
Main heat and DHW sources	Gas boilers



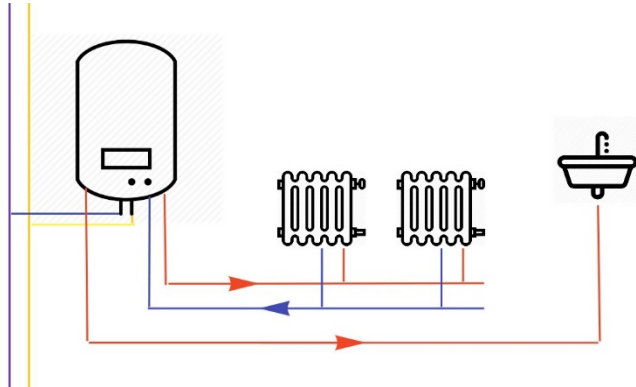


HVAC systems in the building



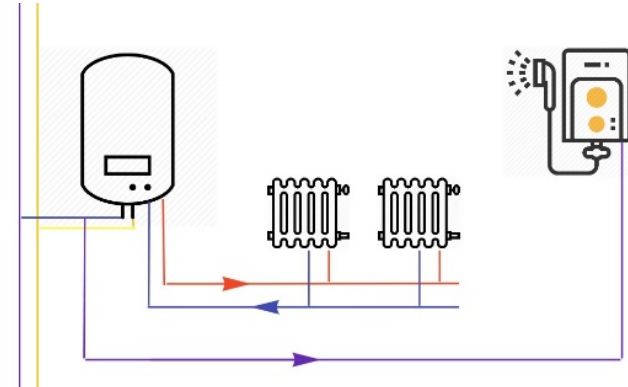
1

GAS SH + DHW



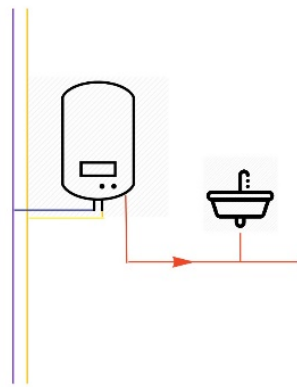
2

GAS SH + ELEC. DHW



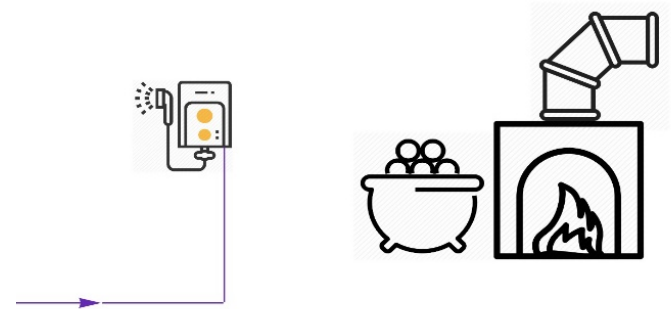
3

ELEC. SH + DHW



4

ELEC. DHW + COAL SH





Heat4Cool project implementation

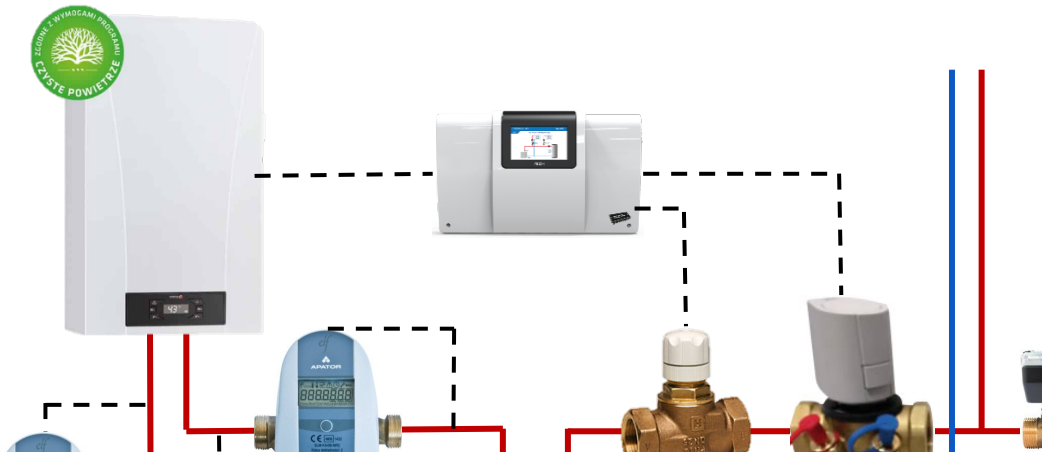


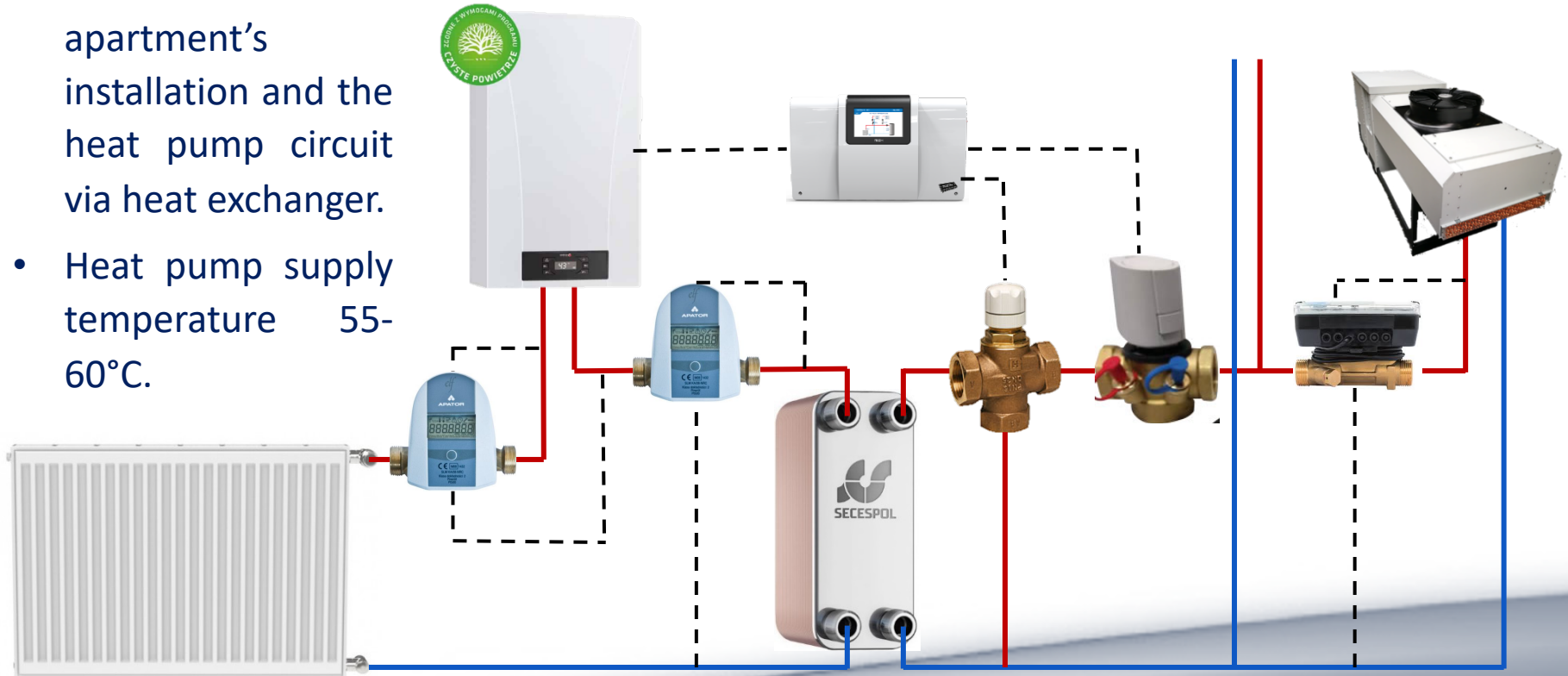
Implemented technologies:

- 30 kW air to water heat pump;
- 8 PCM heat batteries for hot water preparation – each of 12 kWh capacity, 96 kWh in total;
- PV system on the roof of the building – 43 LG 340N1K-V5 PV modules and 15 kW SolarEdge inverter.





- The main source of the heating power – gas boilers.
 - 3-way valves with actuators before the heat exchangers
 - Independent work of the circulation pumps and the boilers in apartments.
 - Connection of the apartment's installation and the heat pump circuit via heat exchanger.
 - Heat pump supply temperature 55-60°C.
- 
- The diagram illustrates a heating system configuration. On the left is a white gas boiler with a green circular logo that reads 'SCHEME 2 WYMOGAM PRZEWIDUJE KLASĘ POWIĘKZE' and 'WAT 24'. To its right is a grey control unit with a small screen. Below the boiler is a blue circulation pump with a digital display showing '888888'. To the right of the pump is a brass 3-way valve with a white actuator. Dashed lines represent the control and signal paths between the boiler, control unit, and pump. Solid red and blue lines represent the heating circuit pipes, showing the connection between the boiler, pump, and valve. A vertical blue and red pipe is visible on the far right.



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Space heating system



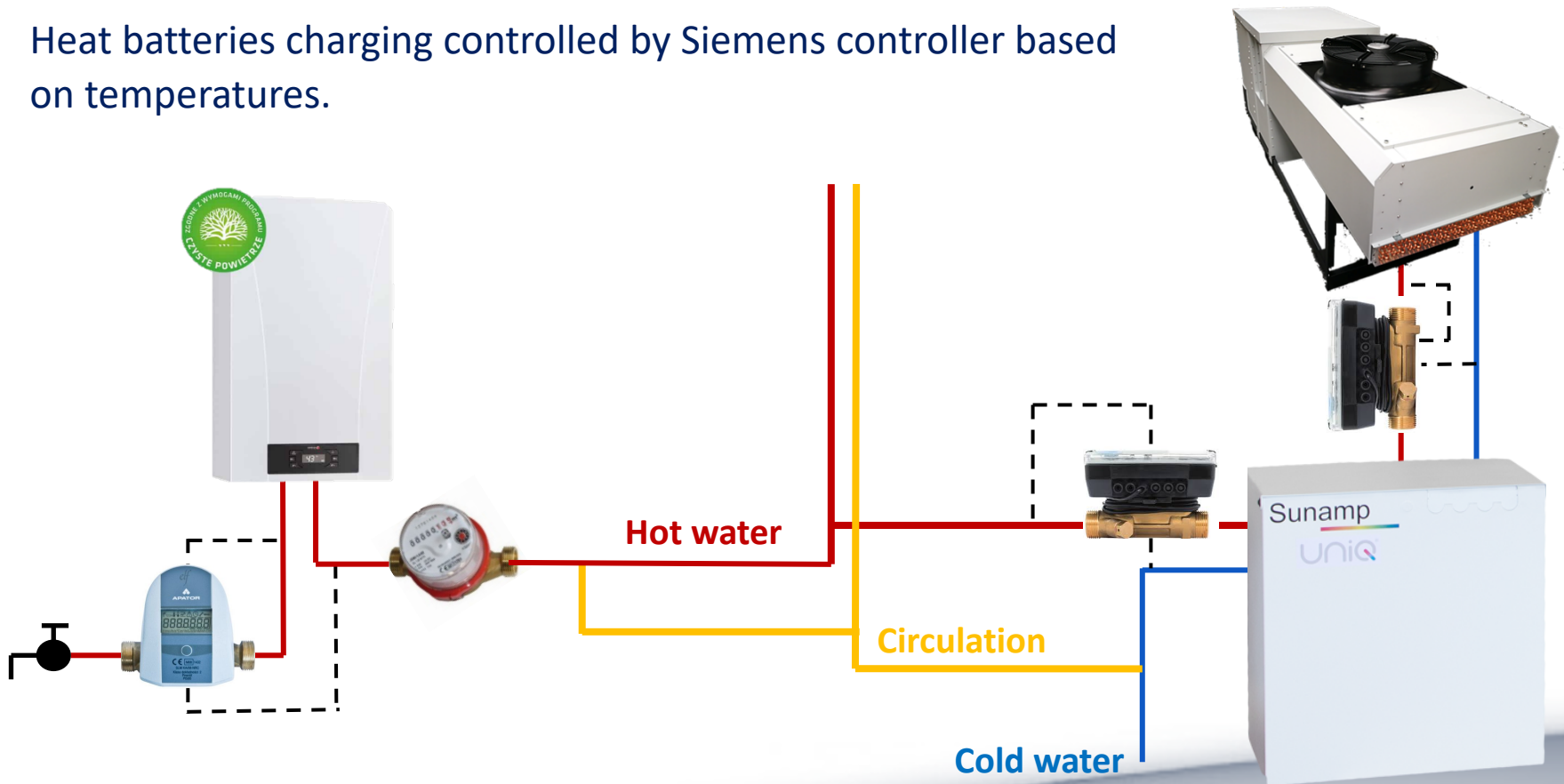
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Hot water preheating system



- 8 PCM heat batteries installed in the basement for hot water needs.
- Average DHW temperature around 41°C.
- Heat batteries charging controlled by Siemens controller based on temperatures.





Heat pump installation



- The 30 kW heat pump is one unit device for outdoor use.
- Concrete foundation with gravel filling and perforated pipe.
- Connection to the building with pre-insulated PEX pipes in the ground.





PV system



- 43 LG 340N1K-V5 modules are installed with angle of 36.6° .
- Total generation power of the installation is 14.62 kWp.
- 15 kW SolarEdge inverter is installed and connected to the Internet and the monitoring platform.
- 2-way electricity meter is installed by the energy supplier.





SCI-BEMS

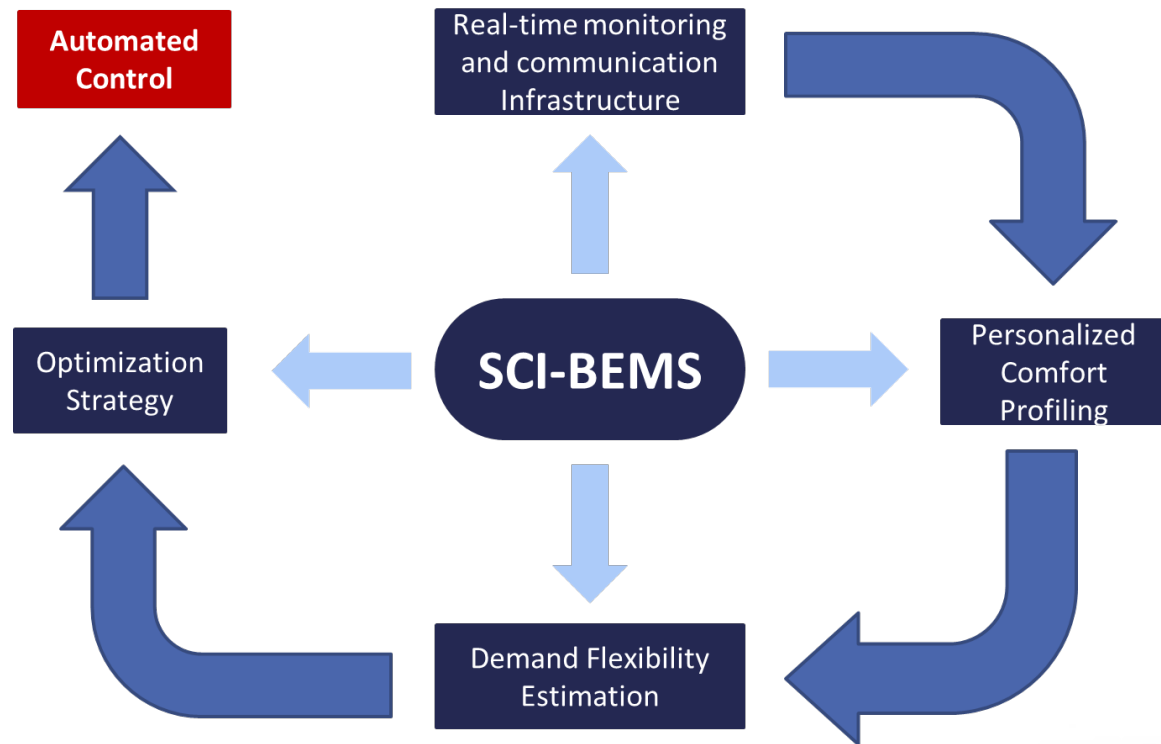


The system is monitored and controlled by BMS created for the building. It collects data from meters and send it to the data base.

ZWave sensors in apartments (radiators' FIBARO thermostats and humidity-temperature-motion AEOTEC MULTISENSOR) are a part of **Self-Correcting Intelligent Building Energy Management System (SCI-BEMS)**.

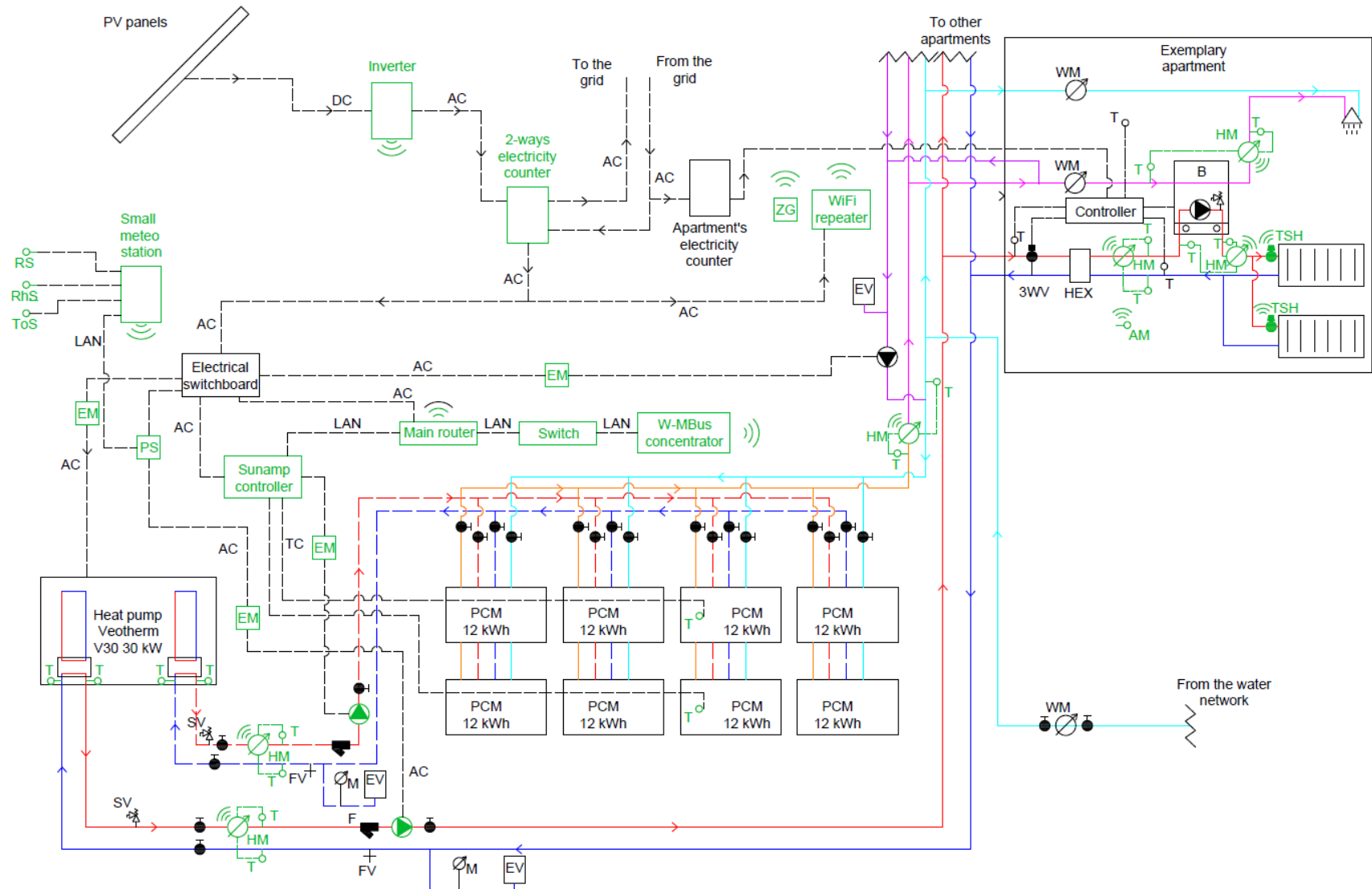
Tenants' availability of control:

- Thermostats in apartments,
- Boilers.





Complete system in Chorzów



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Thank you.

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