Case Studies

https://heatpumpingtechnologies.org/annex57/

ANNEX 57

Flexibility by implementation of heat pumps in multi-vector energy systems and thermal networks

Demo No.: D-003	**Location/City:** Borås, Markaryd, Hässleholm, Stockholm	**Country: Sweden**
Project name (short and full title): Homes for flexibility		
Quotation: “investigate possibilities for demand response of heating and domestic hot water production in homes with electrical heaters and heat pumps”		
Schedule of the demo project (research study): 2021 - 2023		**Year of realisation:**
Leader organisation (owner, constructor, solution developer, research inst., etc.): RISE Research Institutes of Sweden		
Participating organisations – demonstration project part (involved other organisations): Embriq Sweden AB, Nibe AB, Mitsubishi Electric Europe B.V.		
Budget of the demo (invest/monitoring etc.): Approx. 170 000 EUR		
Summary of the project: In the field measuring part of the project approx. 10, heat pump heated, small family houses are equipped with measuring equipment, developed using of the shell parts. Temperature, humidity, electricity use as well as several heat pump parameters are monitored. The heat pumps are then remotely controlled using the manufacturers application programming interface (API). Different controlling strategies are tested with the aim of providing beneficial load shedding for the local electricity grid. The actual grid benefits, heat pump behaviour as well as comfort and interest from occupants are analysed.		
Expected results • Better understanding of the flexibility potential as well as identifying complexities and practical issues • Finding the practical potential of flexibility from an aggregated cluster of small family houses • Better understanding of the practical possible benefits from grid owners compared to the cost and challenges of aggregating flexibility from small family houses		
Published articles (paper, article etc.):		
Contact information: Morgan Willis, RISE, morgan.willis@ri.se		
Country: Sweden	**Participating Organisation:** RISE Research Institutes of Sweden	**Contact/name:** Morgan Willis

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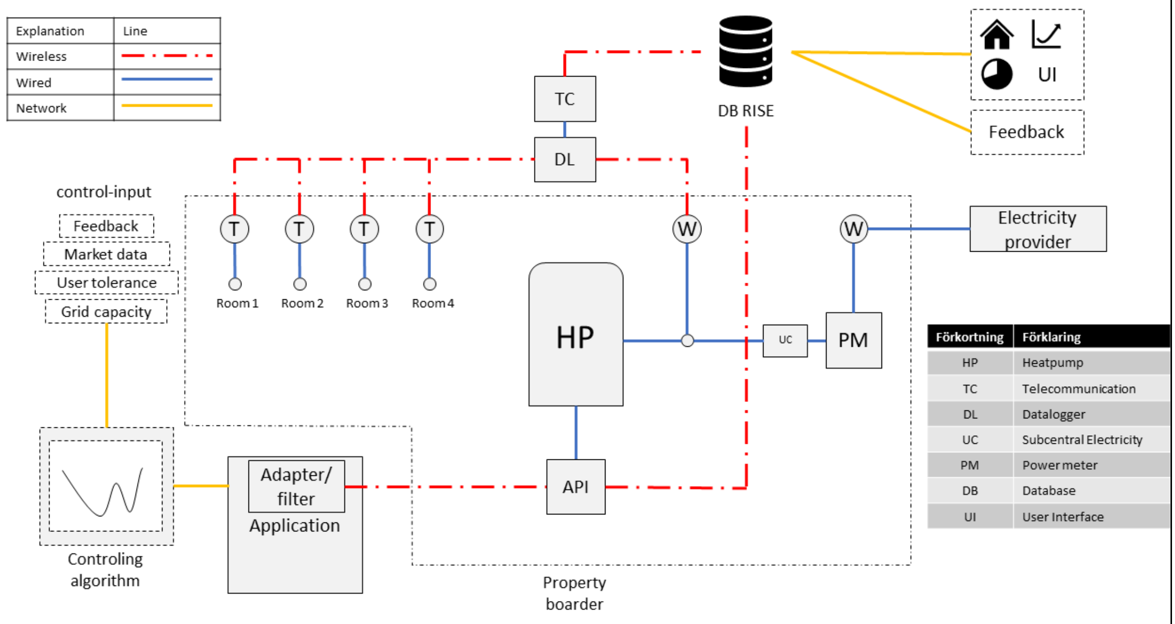

Figure 1 General description of one of the control layouts

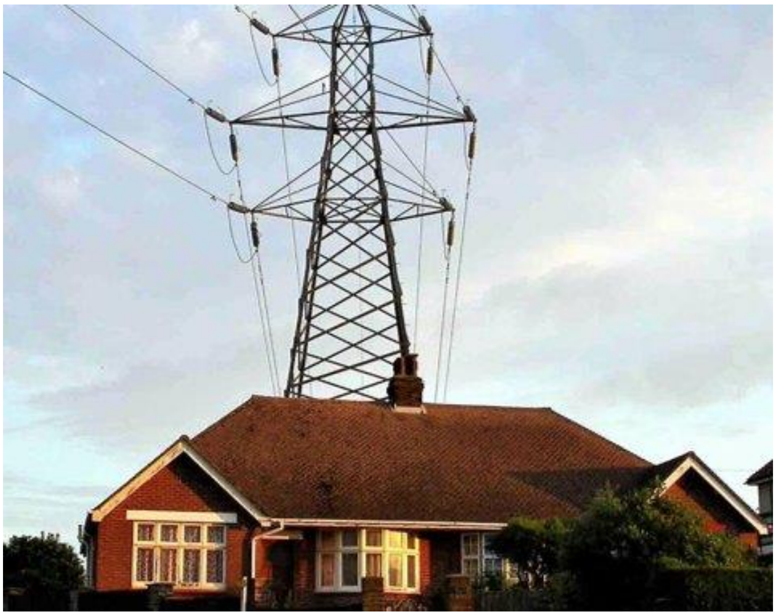

Figure 2 Eye catcher

Homepage address: https://www.ri.se/en/what-we-do/projects/homes-for-flexibility

IEA Technology Collaboration Programme on

Heat Pumping Technologies (HPT TCP)

Delivered by:

Team Sweden

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Project classes:

RD&D status

Large-scale demonstration	Small-scale demonstration	Lab scale (results based on measurements)	Design study (results based on simulation)
☐	☒	☐	☒

Type of heat pump

Decentralized HP (cold district heating)	Centralized HP with a district heating system
☐	☐
Heating	Cooling
☒	☐

Heat source of HP: Ambient air, exhaust air, geothermal

Power supply for HP (electricity grid, PV, wind turbine etc.): electricity grid and PV (not part of project)

Buildings

New buildings	Existing buildings	Mix of new and existing buildings
☐	☒	☒
Residential	Non-residential	Mixed use
☒	☐	☐

Energy storage

Battery storage		Thermal energy storage	
Centralized	Decentralized	Centralized	Decentralized
☐	☐	☒	☐