

## Case Studies

<https://heatpumpingtechnologies.org/annex57/>

ANNEX

57

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

### Homes for flexibility, Sweden

Investigate possibilities for demand response of heating and domestic hot water production in homes with electrical heaters and heat pumps.

#### KEY FACTS

##### RD&D Status:

Ongoing demonstration and  
field measurement

##### Type of heat pump:

Decentralized heat pumps for  
single family buildings

##### Building description:

Swedish single-family buildings

##### Energy distribution system:

Hydronic system in the  
buildings

##### Power supply:

Electric grid

##### Energy Storage:

Building envelope

##### Control for the flexible heat pump operation:

Remotely control via the  
heat pump manufacturers  
API

##### Heat source:

Geothermal, air and exhaust  
air



#### 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.



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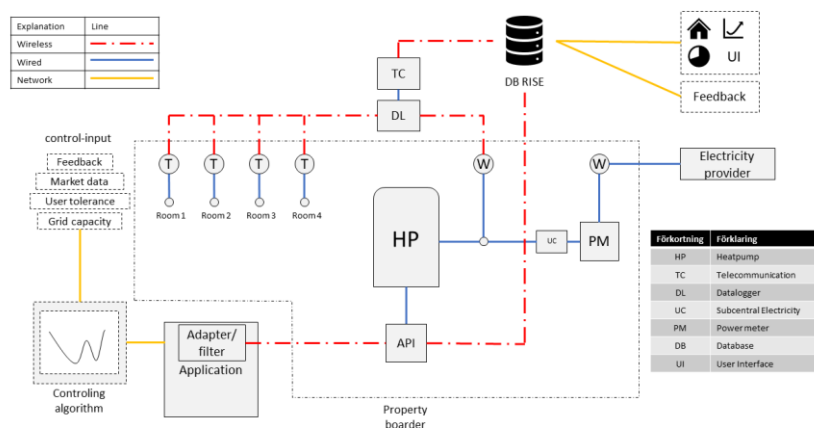
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### Expected results:

- 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.



*General description of one of the control layouts.*

### FACTS ABOUT THE PROJECT

#### Place:

Sweden/various locations

#### Time Frame:

2021-2023

#### Project owner/leader:

RISE Research Institutes of Sweden

#### Project participants:

Embriq Sweden AB Nibe AB  
Mitsubishi Electric Europe B.V.

### Published articles:

N/A

### Contact Information/Links

Morgan Willis, [morgan.willis@ri.se](mailto:morgan.willis@ri.se)



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