

## Case Studies

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

ANNEX

57

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

## Electrification innovation platform Building sector (GO-E), the Netherlands

### Key Facts

**RD&D Status:** applied research on demonstration in living labs

**Type of heat pump:**  
Decentralized flexible heat pumps and communication protocols

**Building description:**  
Residential

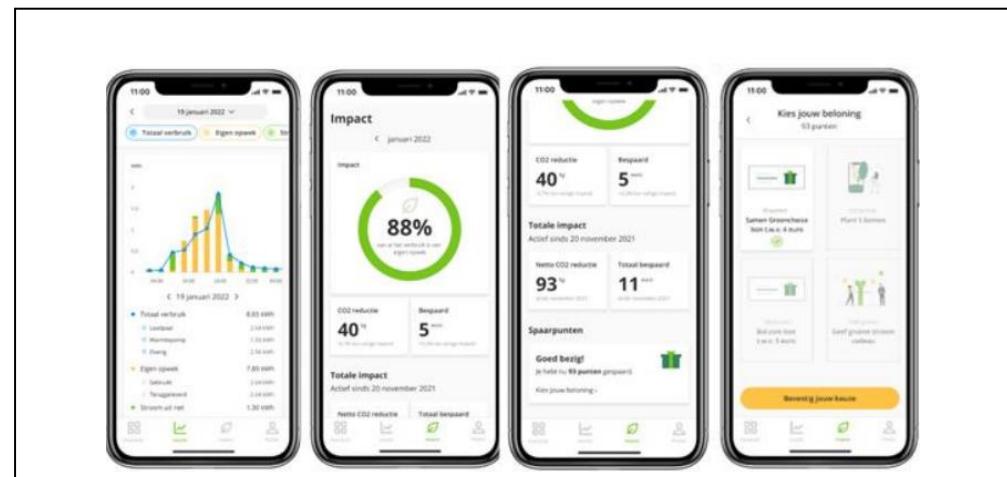
**Energy distribution System:**  
Electric infrastructure

**Energy Storage:**

**Control for the flexible heat pump operation:**  
Modbus, S2 protocol

**General description:**  
Scalable flex services

**Heat Source:**  
Electricity



### Summary of the project

Scalable flex services that contribute to a better use of local energy sources and contribute to reducing (the increase in) peak load of regional networks; (2) Standardization, interoperability and cybersecurity are integral parts of these services and products to make flexibility widely affordable and secure. (3) Regional network operators can make informed decisions as to whether, when, where and how flexibility should be used to avoid network congestion; (4) To this end, network operators and service providers have insight into the impact of electrification in the built environment and into the potential of solutions such as flex services; and (5) Consumers and business energy users are at the heart of the design of the flex services and products in GO-e by using the innovative 'participation by design'.

The entire flex chain is represented in the GO-e consortium. By working together with end users, this forms a strong consortium with a large scope and customer base. This collaboration results in integrated and coordinated system solutions:

- Flexible heat pump service with Modbus module tested in living lab Houten.
- S2 protocol implementation, connection between heat pump and home energy management system.



IEA Technology Collaboration Programme on  
Heat Pumping Technologies (HPT TCP)

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### Results

- Prototypes of scalable and supported flex services for consumers and business energy users.
- Protocols and architecture for open and scalable flexibility access.
- Supported strategy for successful roll-out of flexibility access.
- Assessment framework for the use of flexibility for congestion management in the built environment.
- Selection of flex call mechanisms for regional grid operation.
- Recommended practice for mitigating possible negative side effects of large-scale implementation of new optimization or control algorithms.
- Calculation model chain for analyses of the impact of electrification and future flexibility needs and potential on medium and low voltage grids.
- Practical application of calculation models to substantiate the investment agenda of grid operators.

### FACTS ABOUT THE PROJECT

**Place:** Houten, the Netherlands

**Time Frame:** 2021-2024

**Project partners:**

GO-E consortium

TNO, Greenchoice, Itho Daalderop, Alliander, Enexis, ElaadNL etc.

### Published articles:

[Digitale Aggregatie en Collectieve Sturing van Hybride Warmtepompen - Topsector Energie](#)

### Contact Information/Links

[Projectsite \(projectgo-e.nl\)](#)

[Built Environment Electrification Innovation Platform - Topsector Energie](#)



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