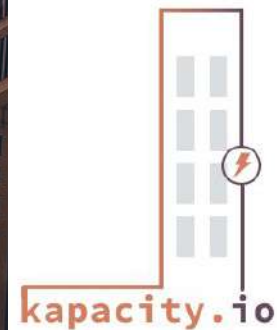


# kapacity.io

Distributed Flexibility Resources for the Grid  
(DFR4Grid)

31.1.2022

*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824330*

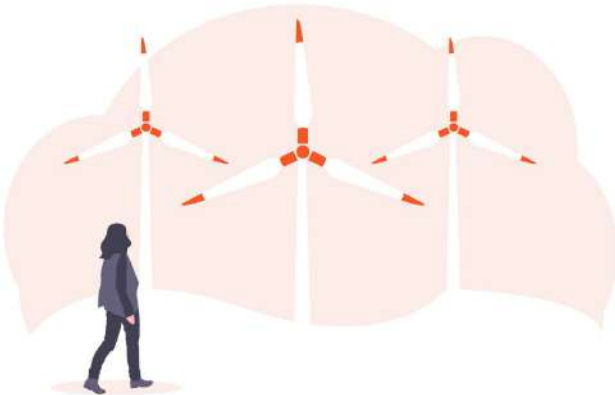


# Vision

Use of energy in buildings covers 30% of all CO<sub>2</sub> emissions: 10 Gt of CO<sub>2</sub>-eq.

Heating, cooling and ventilation covers approximately 40-50% of building energy consumption.

Heat pumps in buildings can be used to decarbonise heating and cooling while providing flexibility for the grid.



# Aim

The aim of the project is to demonstrate how Flexibility Service Providers, like Capacity.io, can with the use of digital data control and communication platforms unlock the flexibility of its customers for multiple markets run by TSOs and DSOs.

# Economic benefits from participation

An average consumer with **4000 kWh of annual consumption** pays approximately **710 EUR** for electricity annually (H1/2021 prices).

The earnings potential from participation in mFRR could **reduce the electricity bill of the consumer by 36%** based on earnings potential analysis.

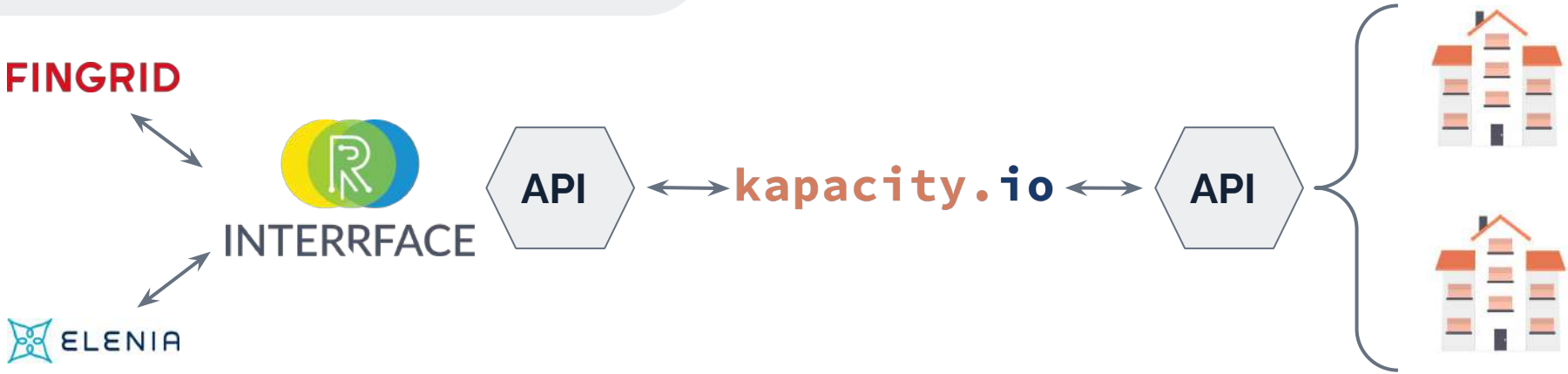
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# Objectives



1. **Perform qualification of flexible resources** with the TSOs and DSOs.
2. **Test and demonstrate exchange of data** for metering, submission of offers and activation of bids.
3. **Settle and balance bids** in accordance with market rules and regulations.
4. **Identify main requirements and bottlenecks** to guide the development of the IEGSA platform in the future.
5. **Analyse and disseminate the results** of the project to relevant stakeholders in the industry, academia and wider public.

# Technical solution architecture



TSOs and DSOs procure regional flexibility via the IEGSA platform

Kapacity.io processes bids and activations from the IEGSA platform

Kapacity.io controls energy demand of heat pump pools via its own API.

# Example sites in the pool: Finnish residential apartments



- Capacity.io controls in total nine Y-säätiö residential buildings with heat pumps as a single pool.
- Building size between 1000-5000m<sup>2</sup>
- Four different heat pump models, each controlled with Kapacity.io edge devices.



# Example scenarios

*“Planned maintenance is causing a short-term need for the use of backup connection, which is congested. DSO procures upregulation (load reduction) from the flexibility market to solve the congestion.”*

Markets covered in the demonstration phase:

- mFRR (manual Frequency Restoration Reserve)
- Intraday
- Local DSO-procured flexibility



# Project execution



## Development phase

Data exchange established and tested. Scenarios agreed and planned upon.

## Demonstration phase

Demonstration phase with activations involving use of real buildings.

## Analysis

Analysis of the results from the active demonstration phase and development of recommendations.

## Dissemination

Project results published and disseminated in relevant forums across Europe.

# capacity.io

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