Engaging households to avoid congestion works

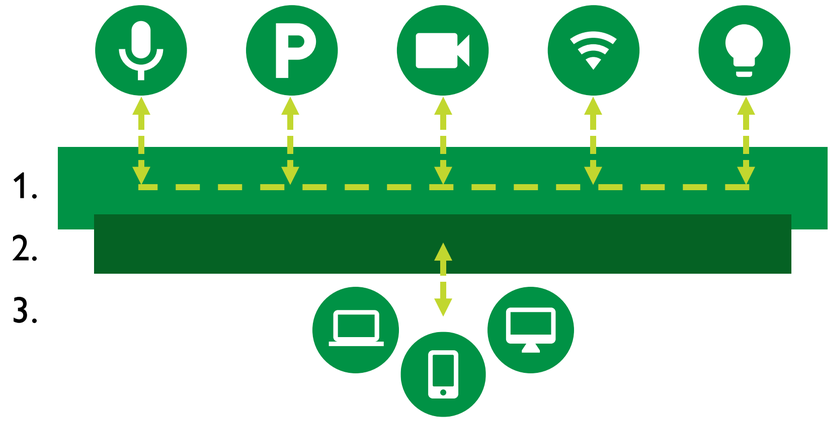
Pierre Kil, February 2025

OpenRemote, the 100% open source IoT platform

1. **We let systems talk to each other**
   Systems which do not know each other and don't speak the same language

2. **We add intelligence**
   By reading and writing to devices, we can automate behavior

3. **We focus on end-users**
   Our goal is to make life easier for your end-users, with everybody having his own application

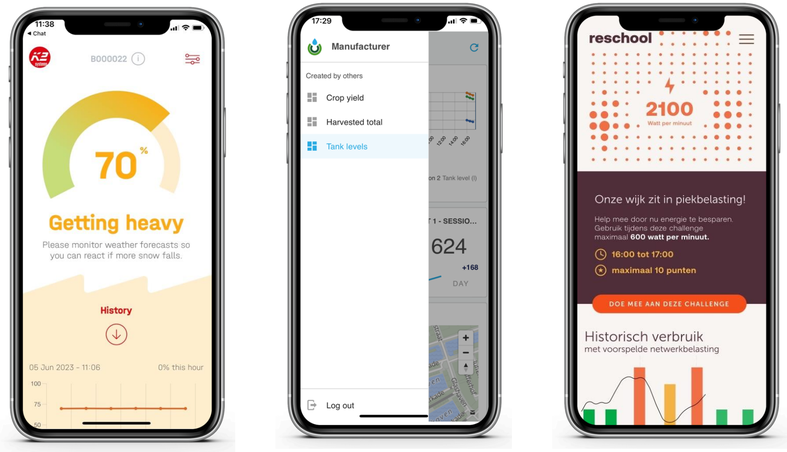


Our uniqueness

- **We do this 100% open source**
  No vendor lock-in, safe and transparent

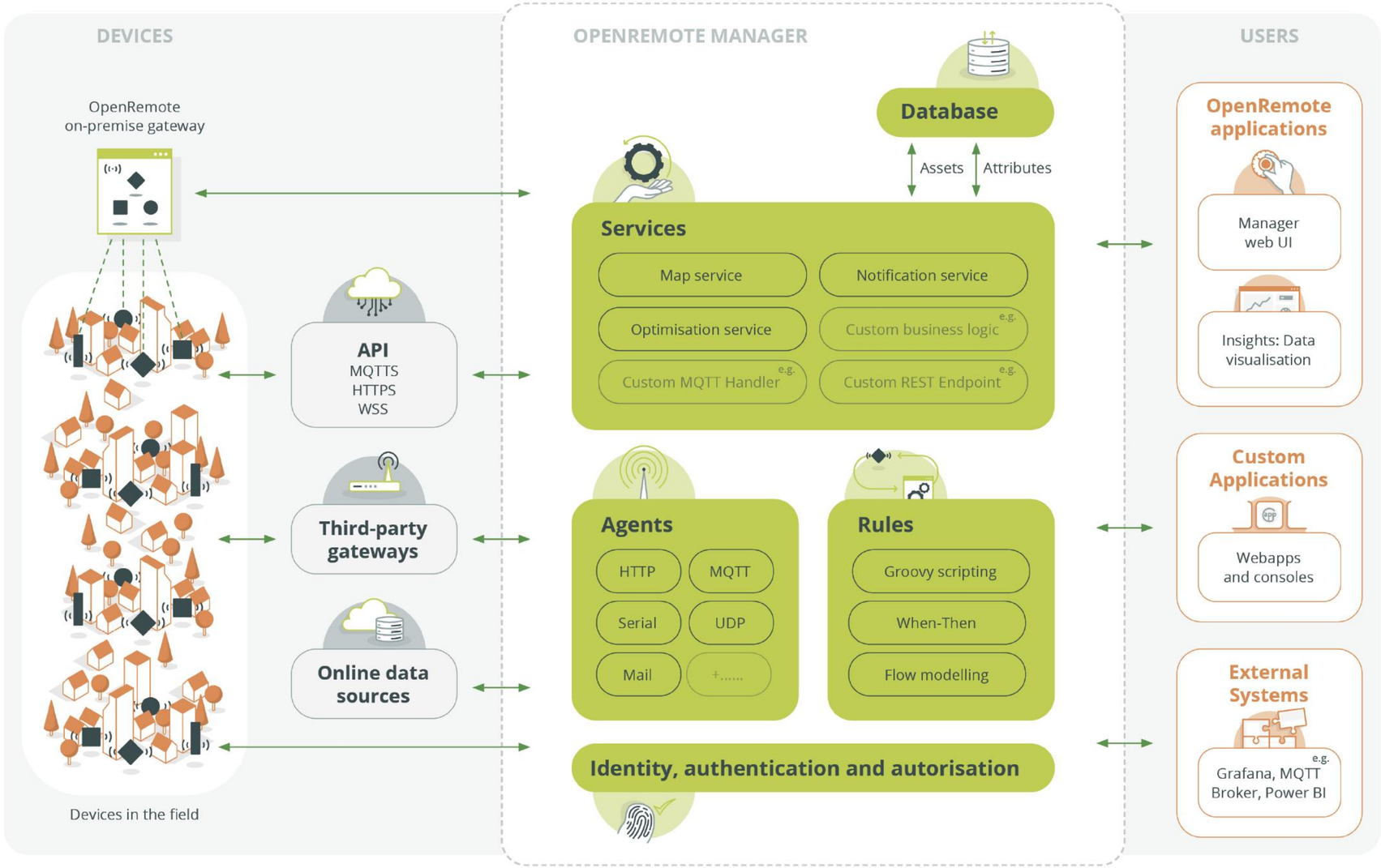
- **Intuitive and complete platform**
  Non-technical users can create automation, manage devices, and gain insights

- **Full service, proven with credible customers**
  Development, design, and project management. Together with the customer.



Reference applications manufacturers and system integrators

OpenRemote Architecture



Languages
Java
Typescript
Polymer Lit

Logic
EasyRules
Groovy
Flow
ML Tools
Timescale DB

Devops
GitHub
Docker
AWS

Engaging households to avoid congestion actually works

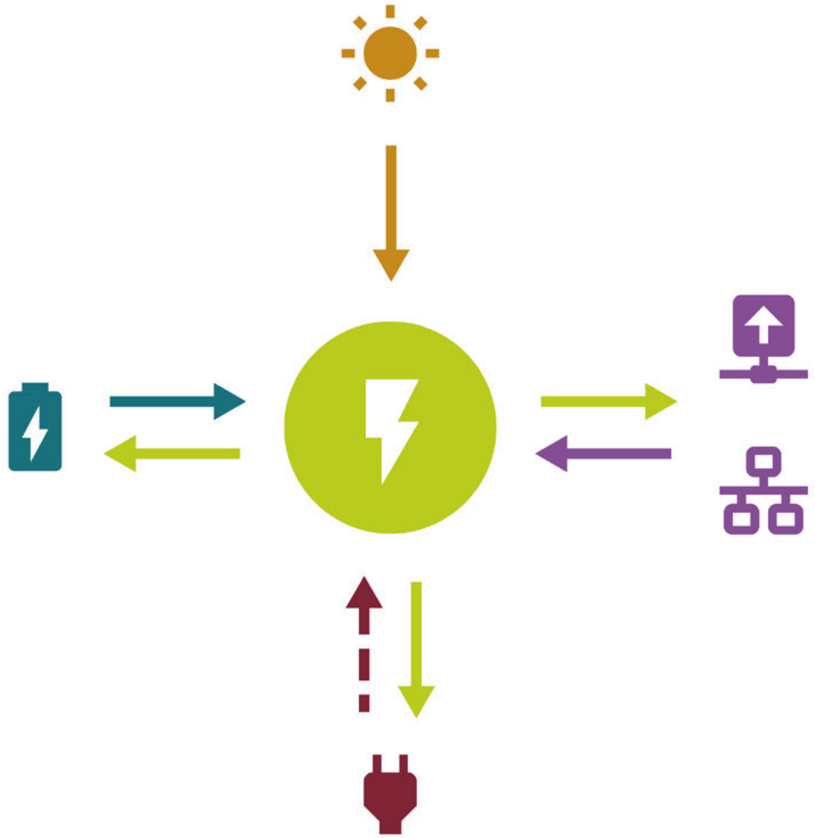
Background and recap: Energy optimisation in a district

Optimisation individual use
Align production and consumption through real-time insights:

The lowest bill €

Optimisation district
Maximise self consumption in your district, avoiding grid congestion:

Earn points and €



Background and recap: 2024 the first manual steps

Optimisation individual use

Align production and consumption through real-time insights:

The lowest bill €

Optimisation district

Maximise self consumption in your district, avoiding grid congestion:

Earn points and €

Results: Amsterdam Sporenburg

71 active participants

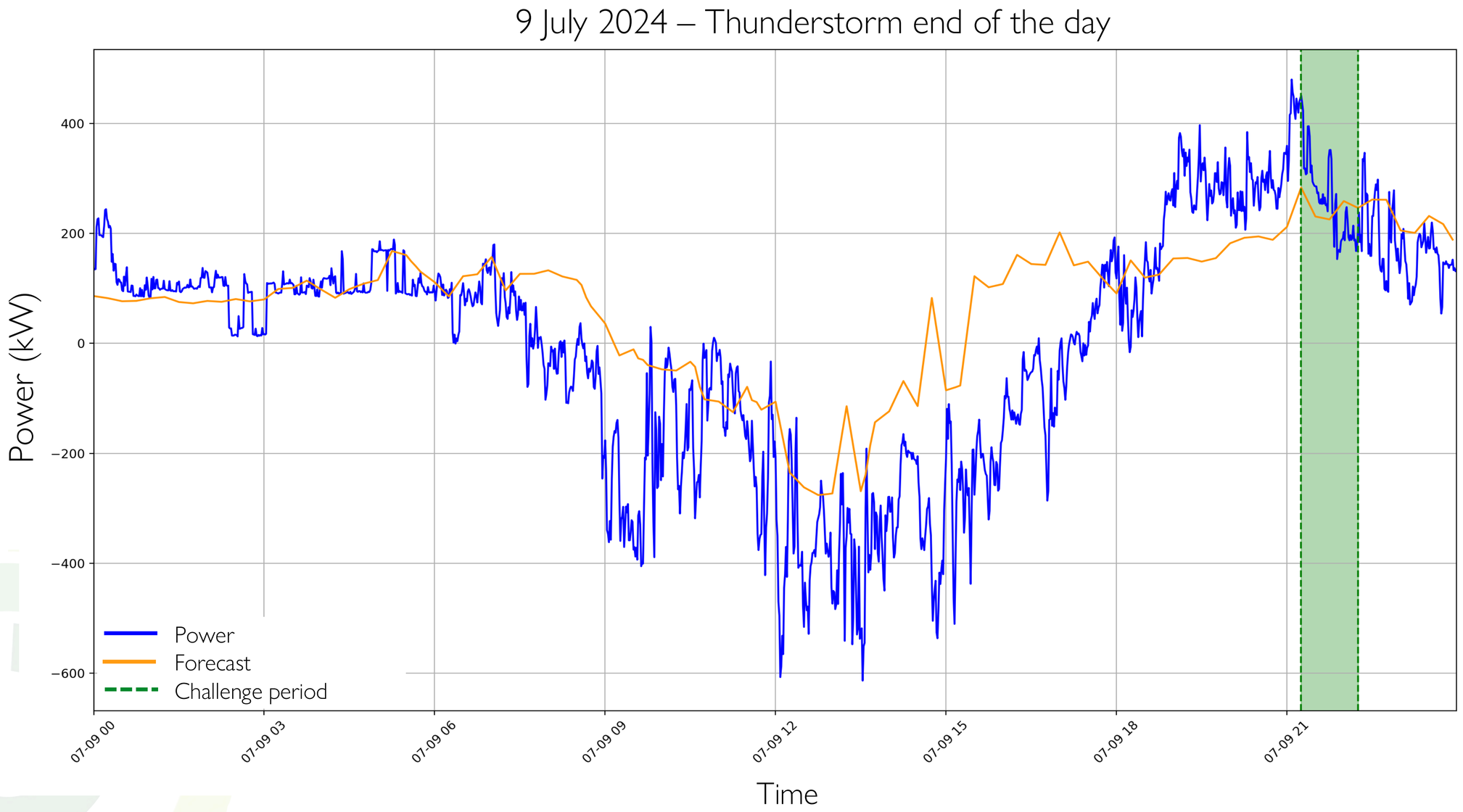
- 71 earned points
- 46 participated in challenges

How many points were earned in 2024

- Total number of challenges 48
- Participants per challenge 14,8
- Earned on average 35€
- Most active participant 146€

Meter	Points total
f99f5ced-d469-4d63-990d-b75…	586
3858a42e-4e37-41cf-bf1e-0c0…	549
33a16355-0ad8-468c-8315-2e…	538
694ea262-519e-4404-aba4-03…	532
429eed5c-4677-49db-9f11-5b9…	519
f9246dff-fb86-444d-8e69-d77b…	484
8c4c05b3-872d-46de-8189-5f0…	483
260ed58c-f5c3-408a-b7f5-5d6…	467
4d7d4ac8-7630-4a2c-9b1e-6d…	463
c424ff3a-ef2b-4a8e-8741-e5d…	448

Results: impact on the grid



Results: impact on the grid

Temporary reduction in power

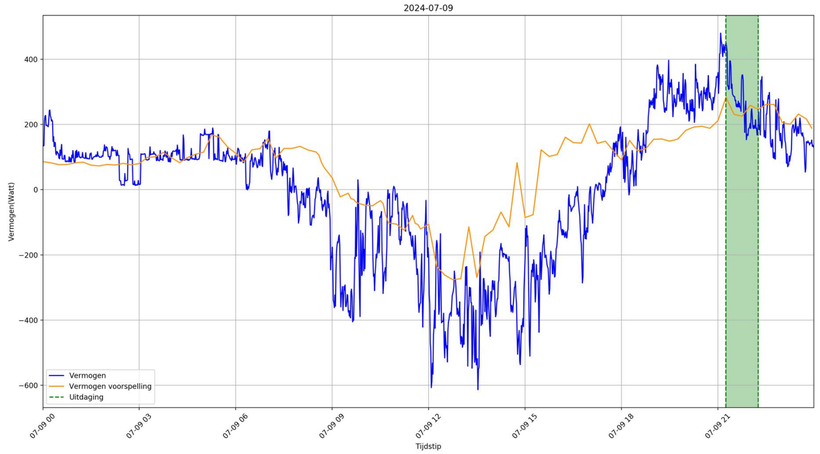
- Average reduction in peak **8,5kW**
- **Only with manual interventions**

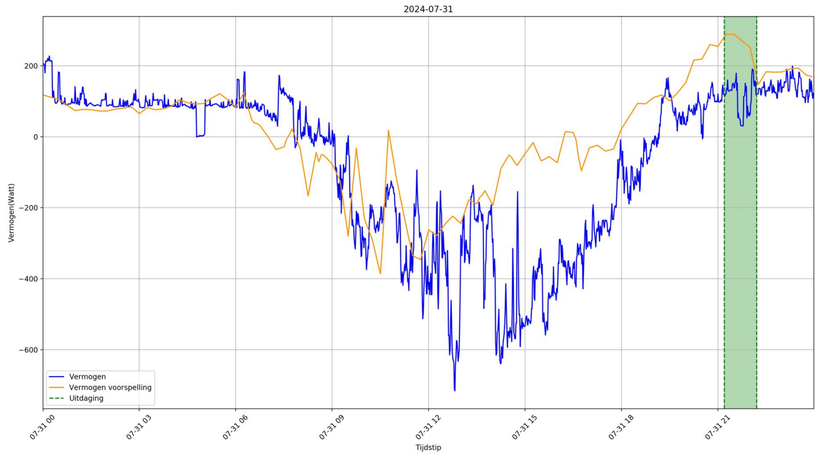
Improvements for residents

- Automatic control EV, heatpump, storage
- Use dynamic energy tariffs
- Energy sharing at attractive tariffs

Improvements for the DSO

- Improve forecasting and price elasticity

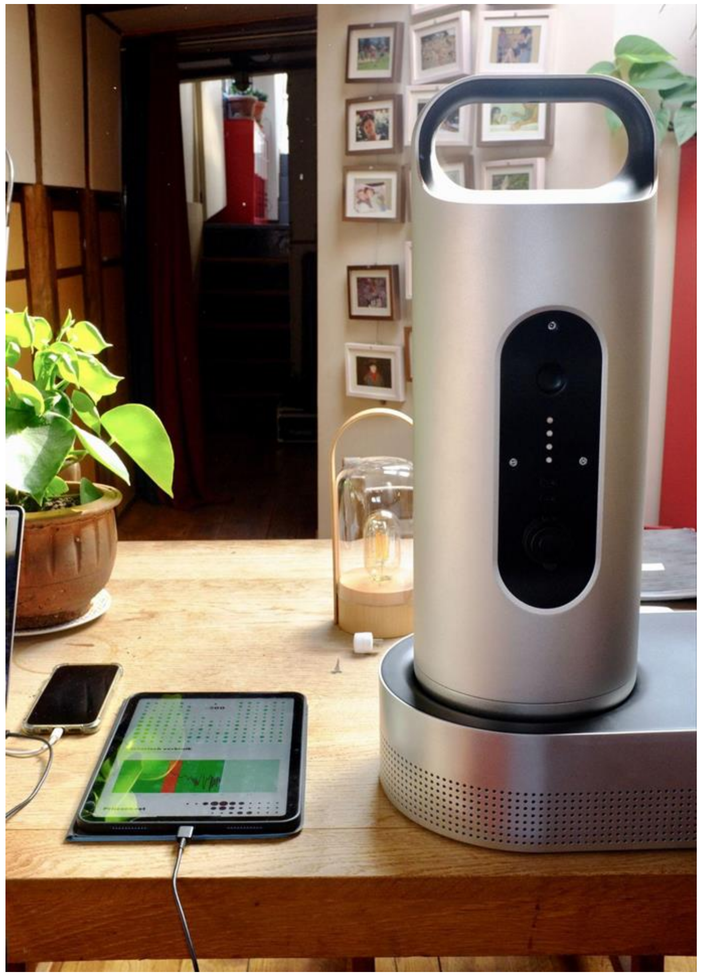




The next step: unlock more and automated flexibility

Automated and more control

- Increase participants to 30% by adding extra means and double incentive – **25kW**
- Link EV charging, heat pump or home battery to join challenges automatically
- Assume 20 home EV chargers and 13 public chargers in a district with 5 cars reducing their charge rate – **25kW**
- Assume heating via heat pumps, and 5 heat pumps are temporarily switched of for an hour – **25kW**
- Assume 50 batteries which are all discharging at 500W – **25kW**



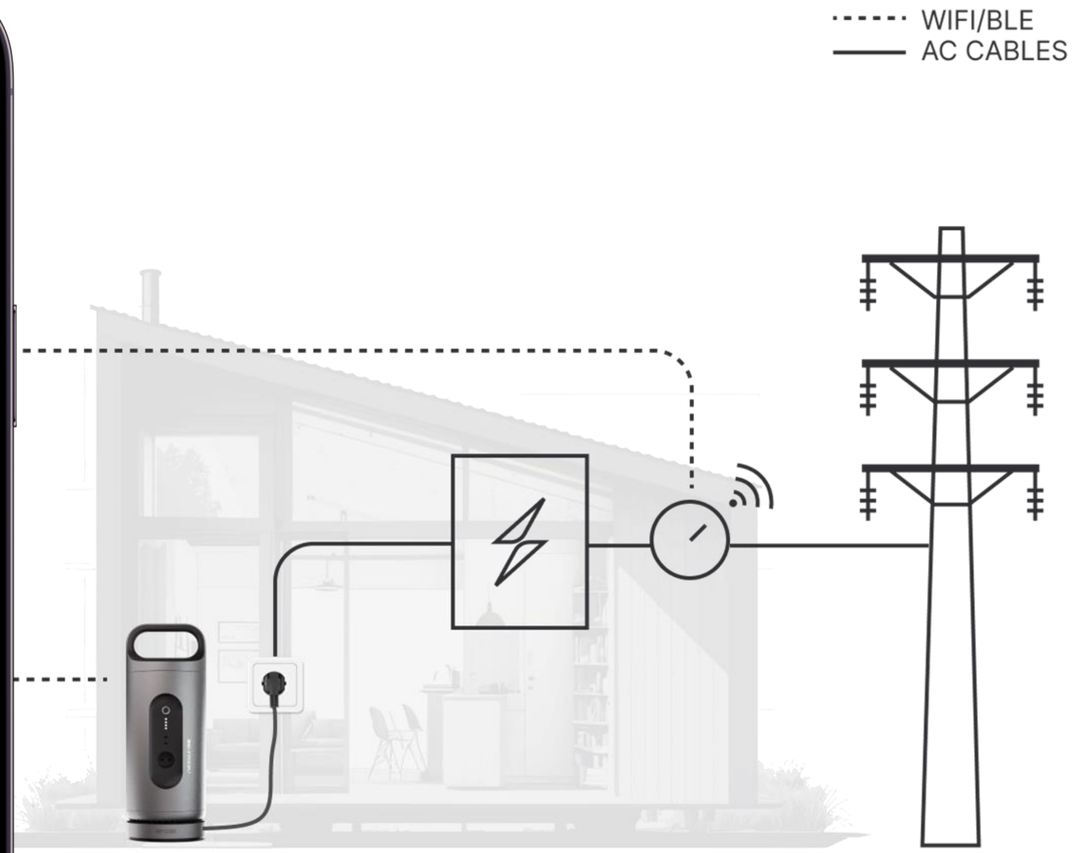
The next steps: automatic control – Amsterdam, The Hague, Arnhem

Your real-time power consumptions

There are no grid congestion issues in your district

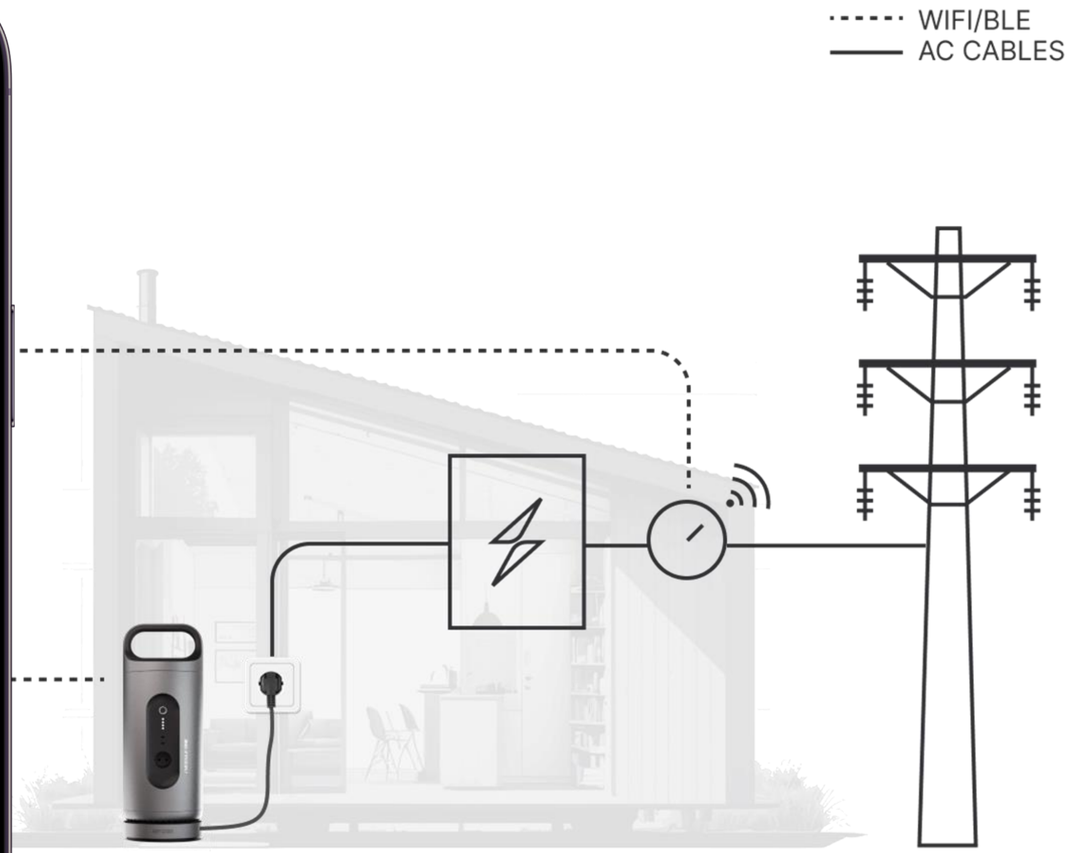
Your power consumption the past few days

How is your district doing



The next steps: automatic control – Amsterdam, The Hague, Arnhem

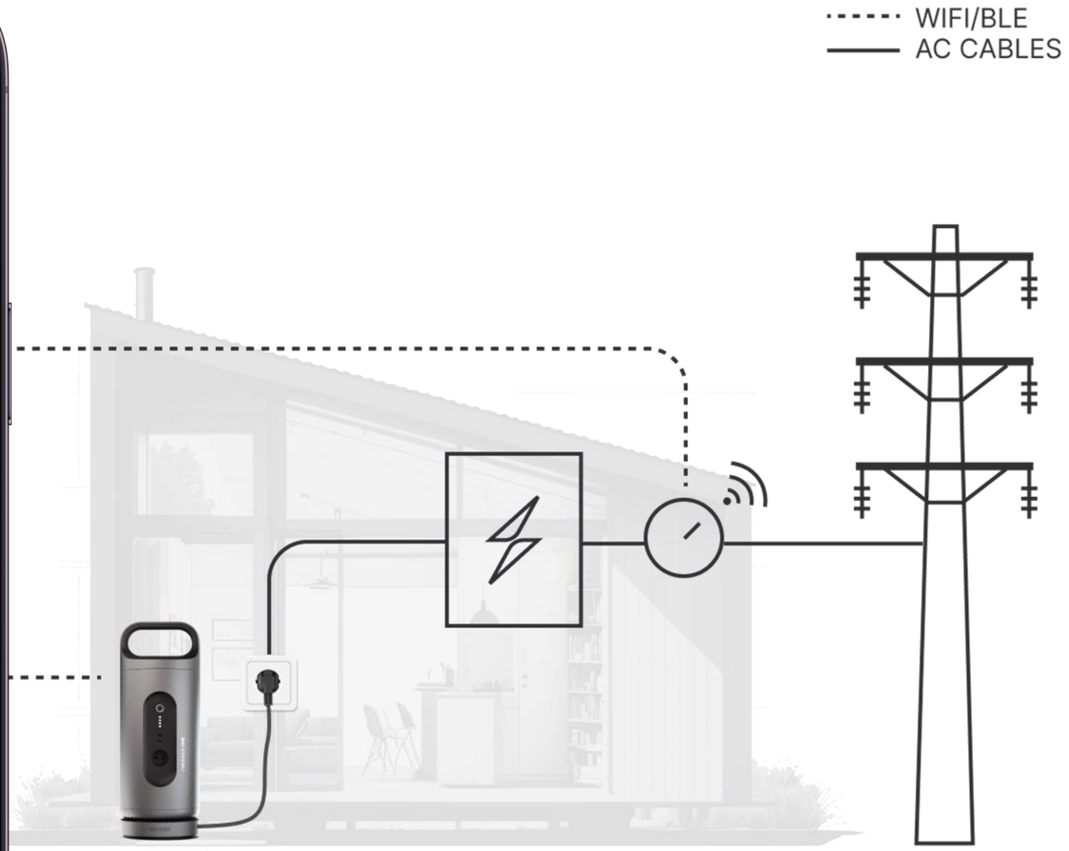
Your district is expecting grid congestion issues



The next steps: automatic control – Amsterdam, The Hague, Arnhem

Receive a challenge with a personal target

Join a challenge

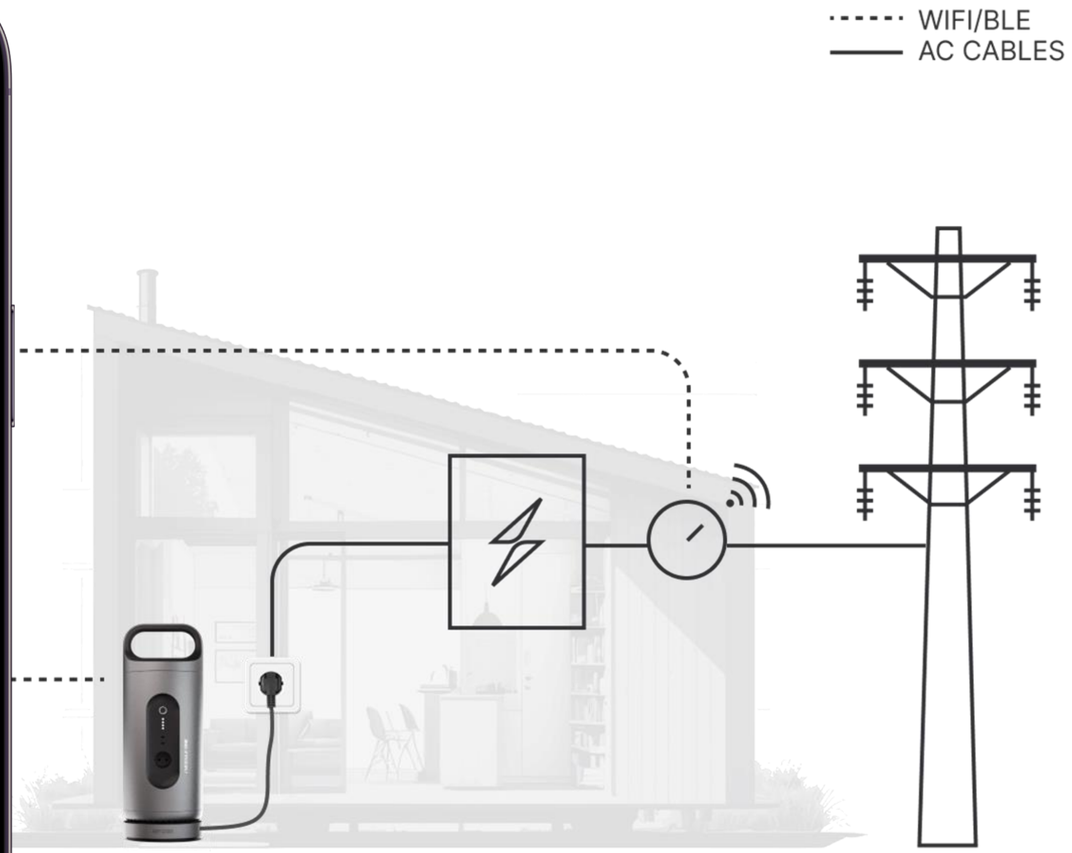


The next steps: automatic control – Amsterdam, The Hague, Arnhem

You are joining and meeting your target

You can earn points for an hour

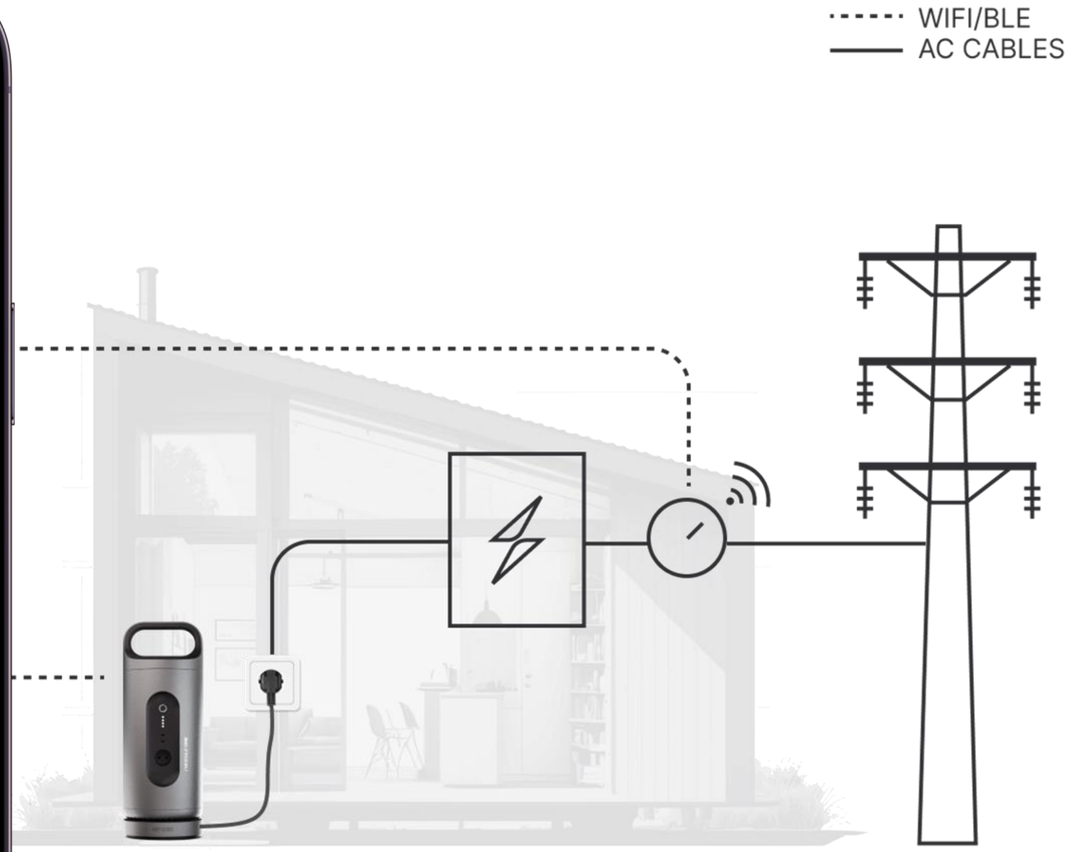
Tips and actions to reduce consumption



The next steps: automatic control – Amsterdam, The Hague, Arnhem

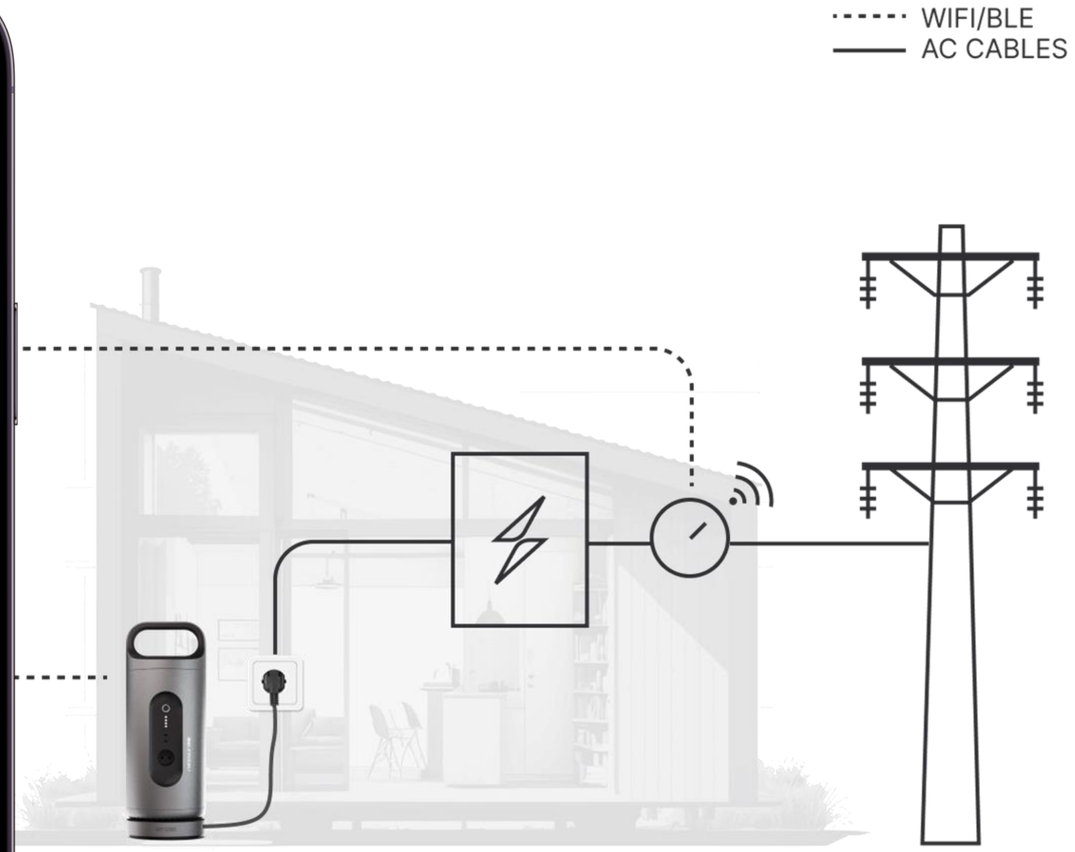
We discharge your battery

Reduce or postpone car charging



The next steps: automatic control – Amsterdam, The Hague, Arnhem

Challenge succeeded, you earned 4 points

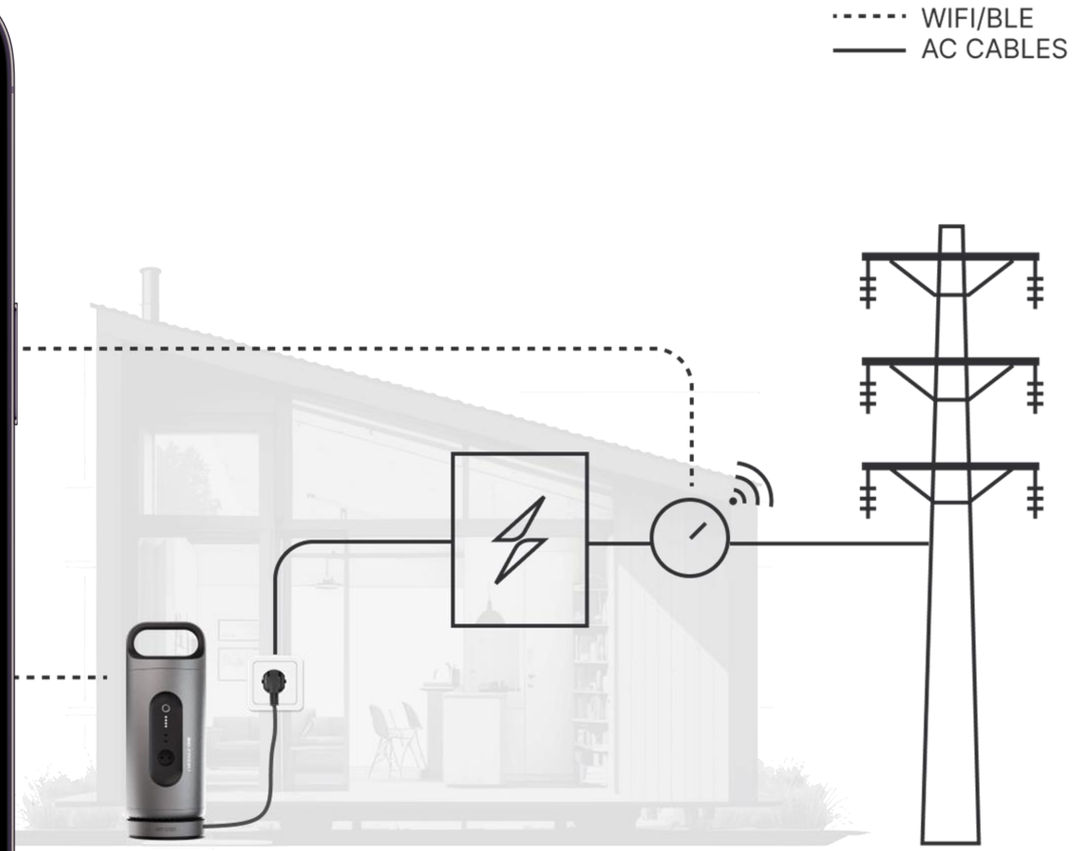


The next steps: automatic control – Amsterdam, The Hague, Arnhem

An overview of your trophies

Points earned through challenges

Points earned by avoiding congestion periods



The next steps: maximising self consumption

Grid congestion

- Join challenges and earn points

Dynamic energy tariffs

- Plan charging your battery and vehicle and adjust heating based on dynamic tariffs

Energy sharing in your district

- Maximise self consumption as a community

Maximise personal self consumption

- Plan charging your battery and vehicle and adjust heating to maximise self consumption

Energy sharing across seasons

- High temperature storage

Gemeente Amsterdam

Den Haag

Gemeente Arnhem

alliander

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