Energy optimisation: smart home meets smart district

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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.
OpenRemote open source community

Global Community in US, Europe and South East Asia
Google Stats 30,000 Page views in September 2023
Applications by Manufacturers

1. Ooma (US)
   Home security

2. K2 Systems (DE)
   Solar system guard

3. Smart PSA (DE)
   Smart clothing for firefighters

4. VDL Energy Systems (NL)
   Energy storage and balancing
Applications by Manufacturers

5. Lyckegard (SE)
Sustainable agriculture

6. Digita (FI)
Power grid monitoring

7. IBIS Power (NL)
Energy management Urban Power

8. Mierlo Engineering (NL)
Legionella protection
Applications by System Integrators

1. Nottingham City (UK)
   Smart charging city vehicle fleet

2. VolkerWessels (NL)
   City Data and lighting platform

3. Military Police (NL)
   Schiphol airport border control

4. Kersten Techniek (NL)
   Retail & residential Energy Management
OpenRemote Architecture

Languages
- Java
- Typescript
- Polymer Lit

Logic
- EasyRules
- Groovy
- Flow
- ML Tools
- Timescale DB

DevOps
- GitHub
- Docker
- AWS
Energy optimisation: smart home meets smart district
**Background:** Sustainability and network congestion

### Smart Home: self-consumption behind the meter

- **Forecast** production based on weather
  - consumption based on historical data (WEA)
  - agile energy tariffs for import and feed-in
- **Optimise** flexible loads, targeting minimum costs or carbon exhaust
  - include levelized costs of storage of flexible loads

### Smart District: self-consumption behind transformer

- **Forecast** production for the district, extrapolating real-time household data
  - consumption for the district based on historical data (WEA)
  - net power district and risk of congestion
- **Optimise** flexible loads, targeting minimum costs or carbon exhaust
  - adding ad hoc dynamic network tariff for all households
  - send personalised challenges to households to change behaviour
  - adjust power profiles for shared flexible loads
Nottingham EMS

1. As energy manager control battery and vehicle charging (V2G), saving €.

2. As fleet manager set energy schedules for the vehicle categories.

3. The EMS prevents surpassing site limit.
Smart District: Amsterdam

Community Mobile App

1. You manage individual energy consumption with real-time insights, saving €.

2. As a neighbourhood you manage peak consumption to respect the grid, earning €.

3. The EMS prevents surpassing peaks by automatic control of large consumers.
My power consumption right now

The neighbourhood is doing well

My power consumption today

How the neighbourhood is doing today

Smart District: Amsterdam
The neighbourhood is reaching its limit
Smart District: Amsterdam

Receive a challenge

Participate in the challenge

Onze wijk zit in piekbelasting!
Help mee door nu energie te besparen. Gebruik tijdens deze challenge maximaal 600 watt per minuut.

- 16:00 tot 17:00
- Maximaal 10 punten

Doe mee aan uitdaging
You joined and reached the target.

Earning points during this hour.

Tips to reduce power consumption.
Reduce the temperature in your room for an hour

Postpone your cooking or doing your laundry

Charge your car later or less

Reduce the temperature in your room for an hour
Challenge completed!
You earned 4 points

Smart District: Amsterdam
An overview of your trophies

Points earned with challenges

Points earned by avoiding neighbourhood peaks
Smart District: Amsterdam