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Workshop long title

Date, 2023 - Madrid, Spain

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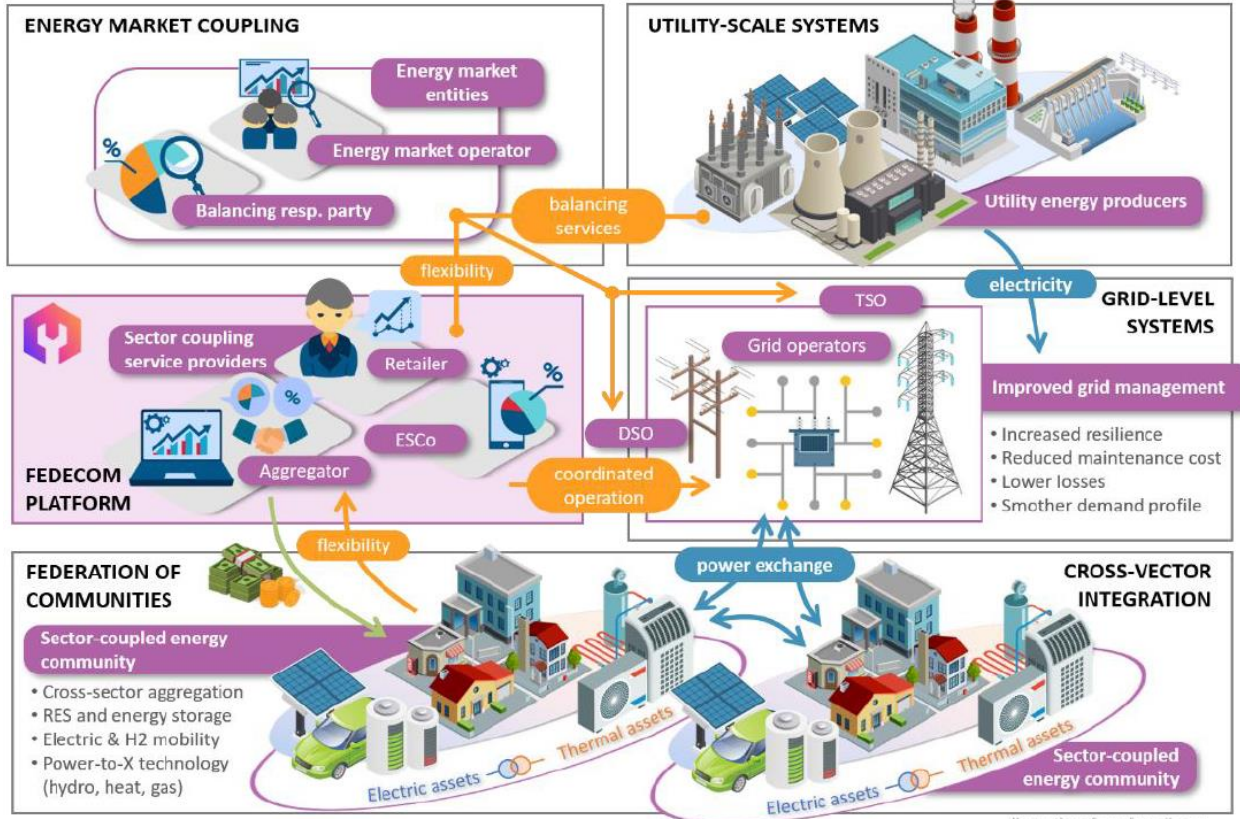
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# Agenda

- Presentation of FEDECOM high level project
- Communities in FEDECOM
- Augment RES production and flexibility
- Description of the 3 pilot sites
- E-mobility example

# FEDECOM project – High level description



## Energy Market coupling

- Day Ahead Market pricing
- Imbalance price
- Frequency stabilisation (FCR, aFRR, mFRR)

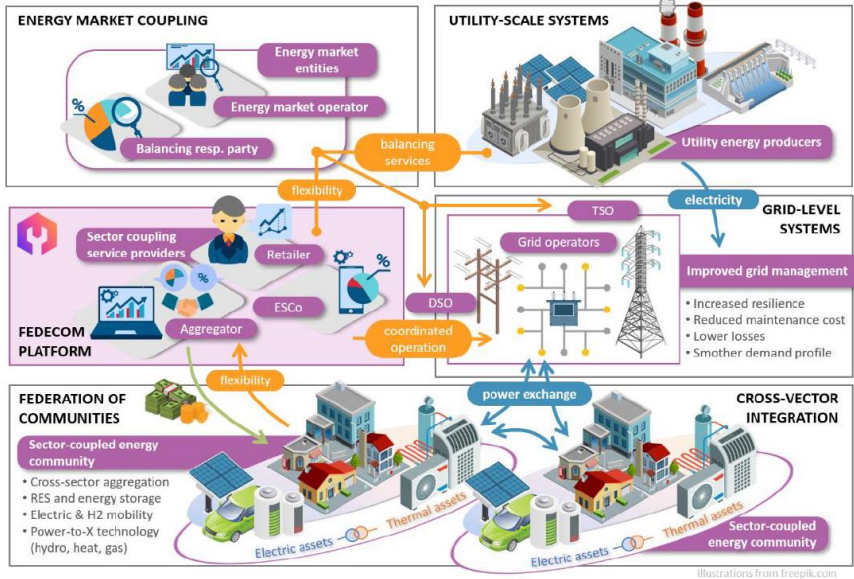
## Utility scale

- Energy storage / flexibility
- Promote RES production & consumption

## Grid

- TSO (various countries)
- DSO (various levels)

# FEDECOM project – High level description



## FEDECOM platform

- Communities consume energy and exchange surplus
- Augment range by Intra- and Inter-Community exchange
- Aggregate data to anticipate production / consumption
- Cloud based platform with predictive, modelling and optimisation capabilities
- Cost-optimisation and flexible energy systems
- Measure – Forecast – Optimise - Control

# Community – RES exchange and flexibility management

- Various communities are exchanging energy
- Push towards added Renewable production and consumption
  - More Renewable production (Solar, Hydro, Wind, ...)
  - Locally consumed by using inertial consumption (heatpumps, e-mobility, batteries, ...)
  - Power to X opportunities (P2Gas, P2Heat, P2Hydro)
  - Locally exchanged by sharing in a local community
  - Exchange inter-communities on a national level but also on a cross-border level
- Transaction and payment validated and secured on the Distributed Ledger

√ = augment RES production in energy mix,

√ Energy savings,

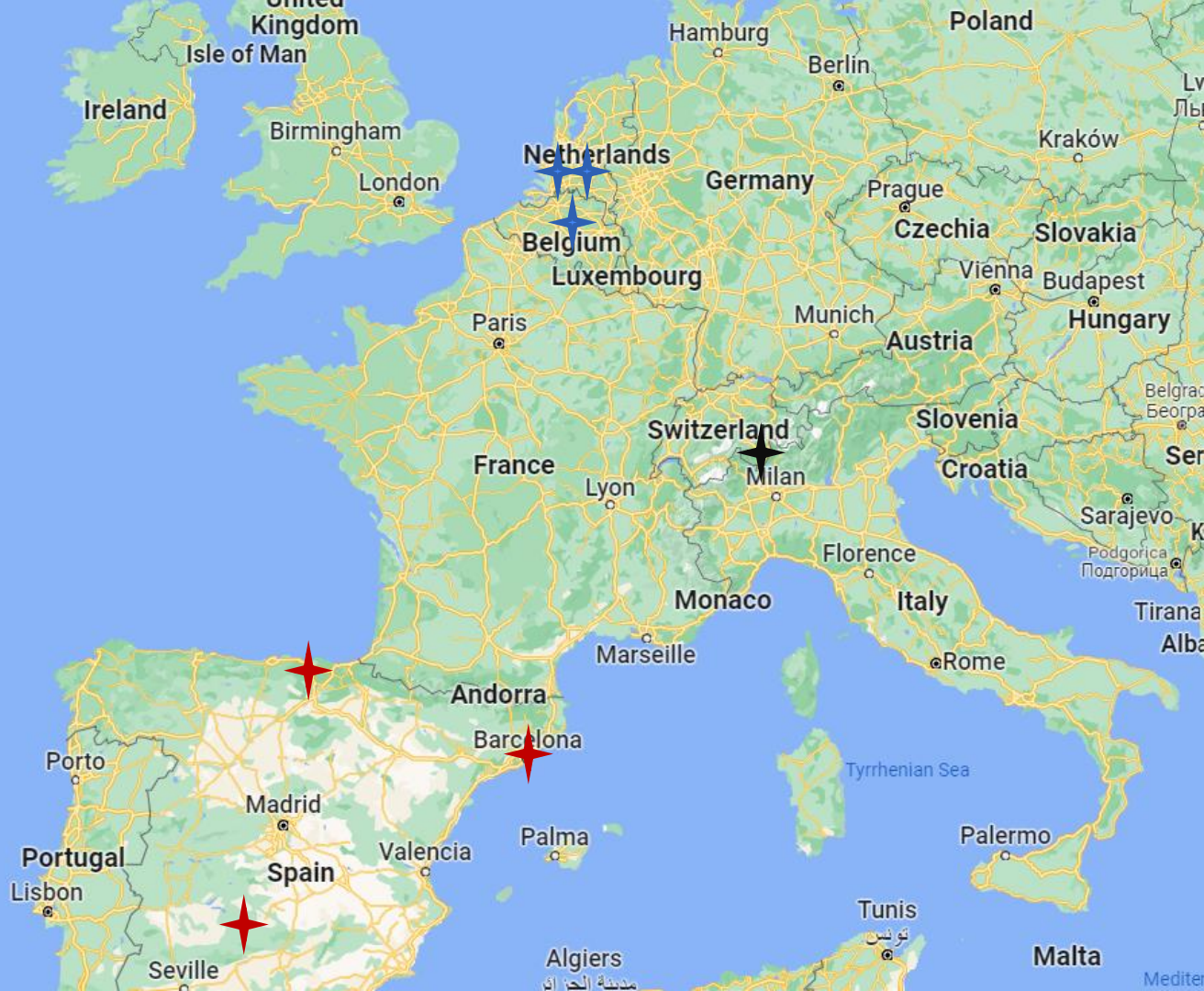
√ reduction GHG emissions

√ € reduction to consumers



## 3 pilot sites

- Spain
  - Virtual Green H2 Federation
- Switzerland
  - Swiss Residential Hydropower Federation
- Belgium and The Netherlands
  - BeNe Cross-country e-mobility Federation



# Pilot 1 – Bilbao - Spain

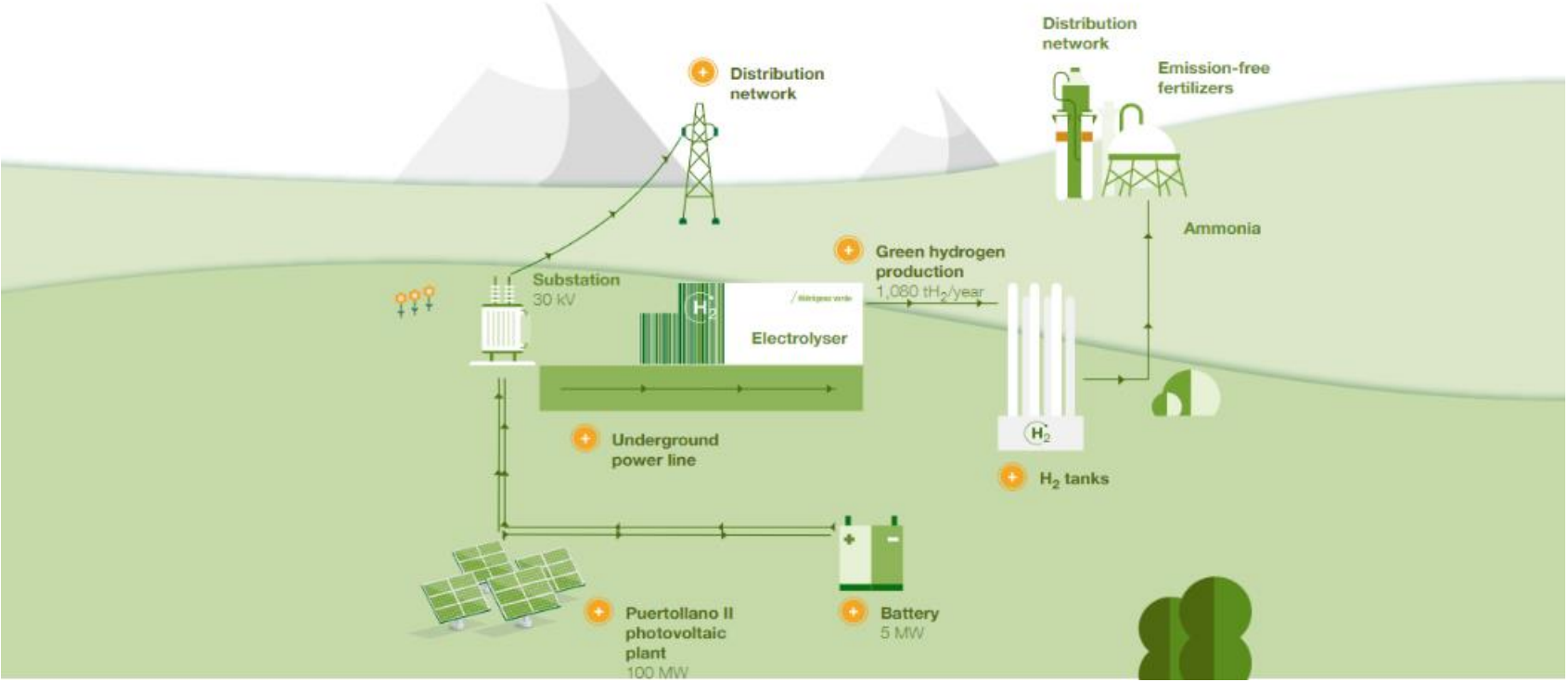




# Pilot 1 – Ur Beroa - Spain



# Pilot 1 – Puertollano - Spain



# Pilot 1 – Barcelona Hydrogen plant - Spain

Green Hydrogen mobility project in Barcelona. A reality in 2022

The only production and refueling facility in Spain capable of producing green H2 to fleets

## On site production:

- **Location:** Barcelona's Harbour free-zone
- HRS to supply **green H2** to TBM (Transporte Metropolitano de Barcelona)



There are already **3 mobility clients** . **With spare capacity to supply to other fleets**

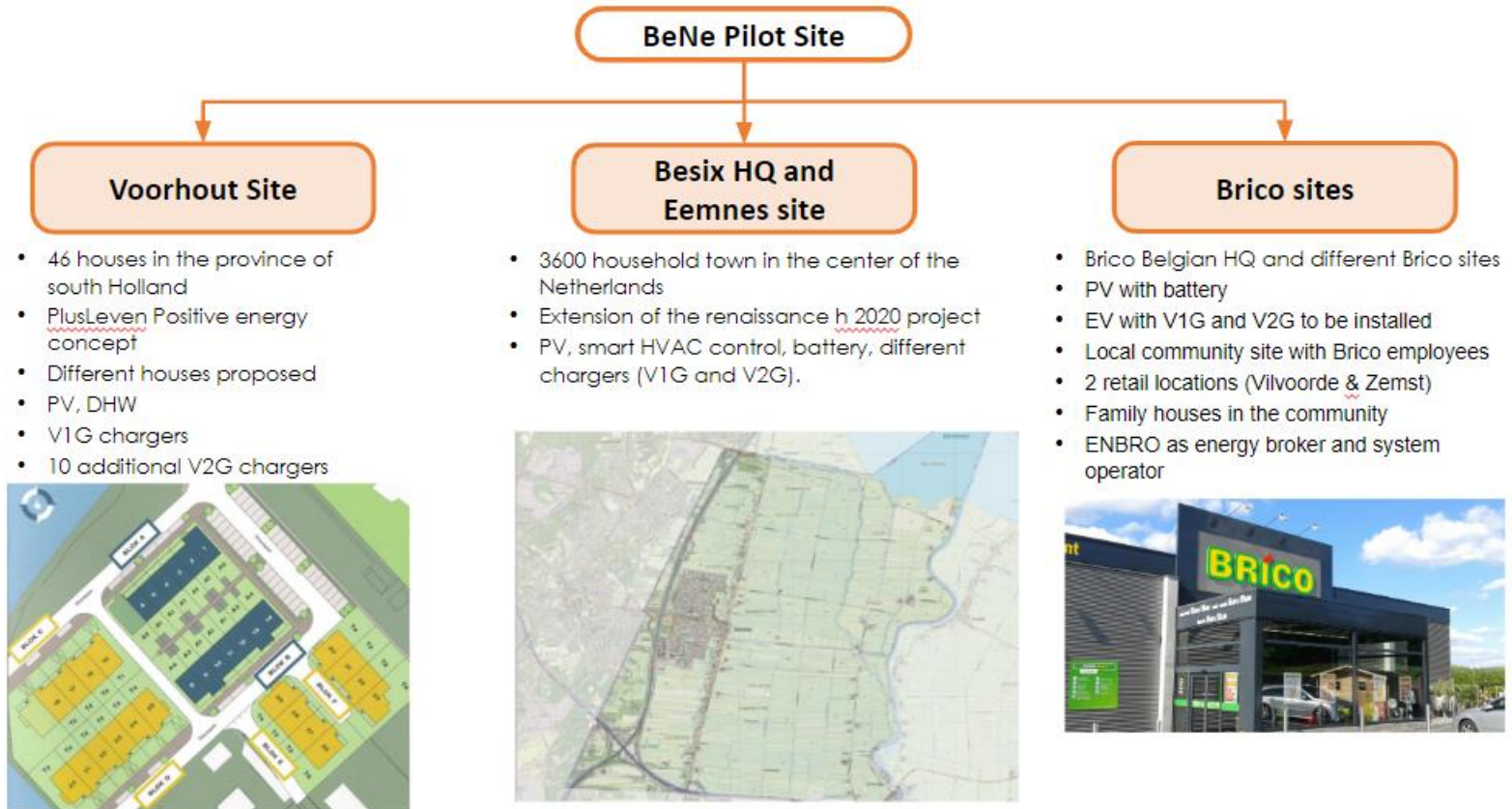


# Pilot 2 - Switzerland





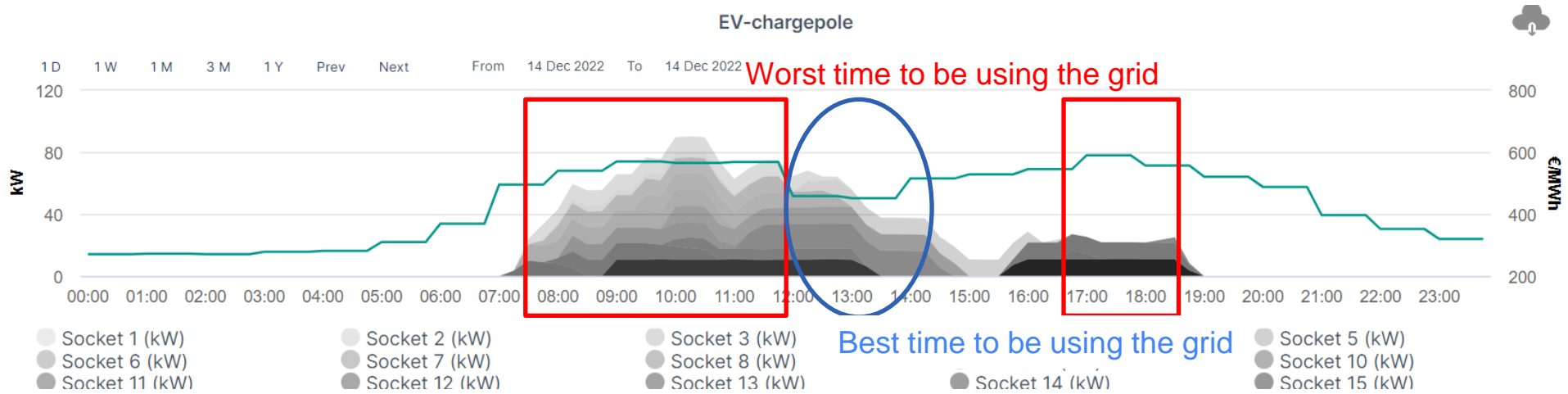
# Pilot 3 - BeNe



# E-Mobility

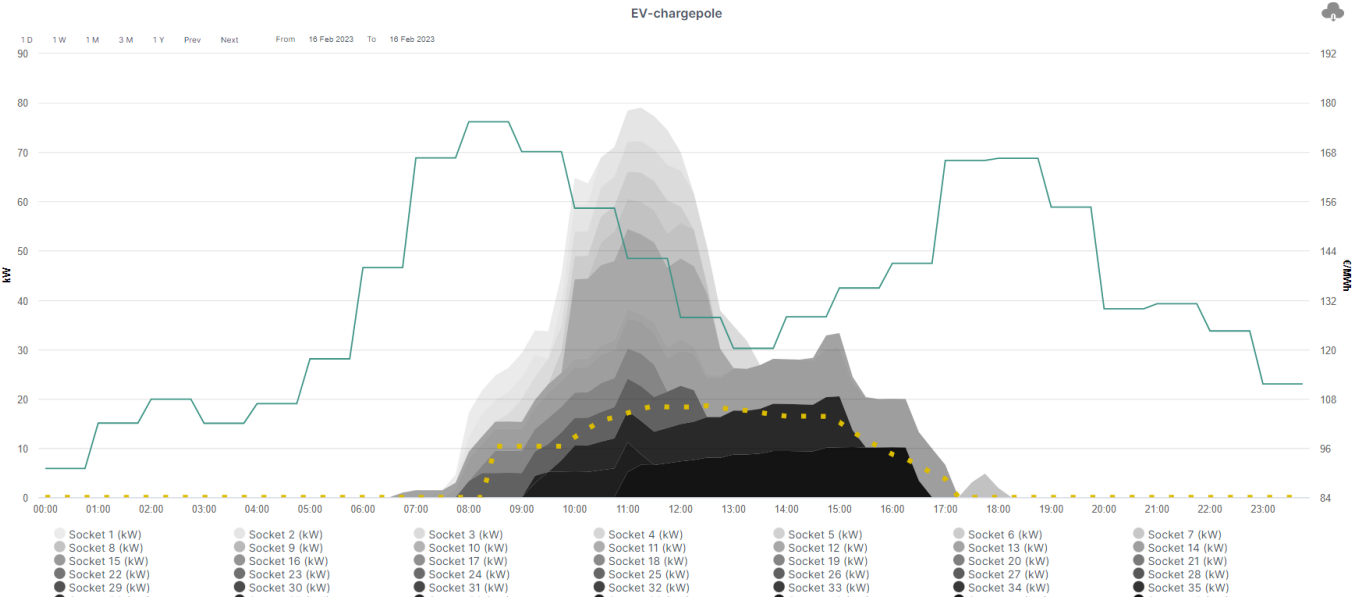
- Focus on renewable production and store the excess production first locally
- Be able to retrieve power when needed (outside of production times)
- Share excess energy production cross border to other sites (sites that are producing more than consumption to sites that consume more than production)
- Shift recharge of car batteries during production times
- Use car batteries as storage but also on production (V2G) to deliver shifted production

# Challenge with EV charging (V1G)



- Shift charging moment during « cheap » electricity prices but also during typical solar production

# Challenge with EV charging (V1G)



Focus charging outside of peak moments BUT keep cars usable

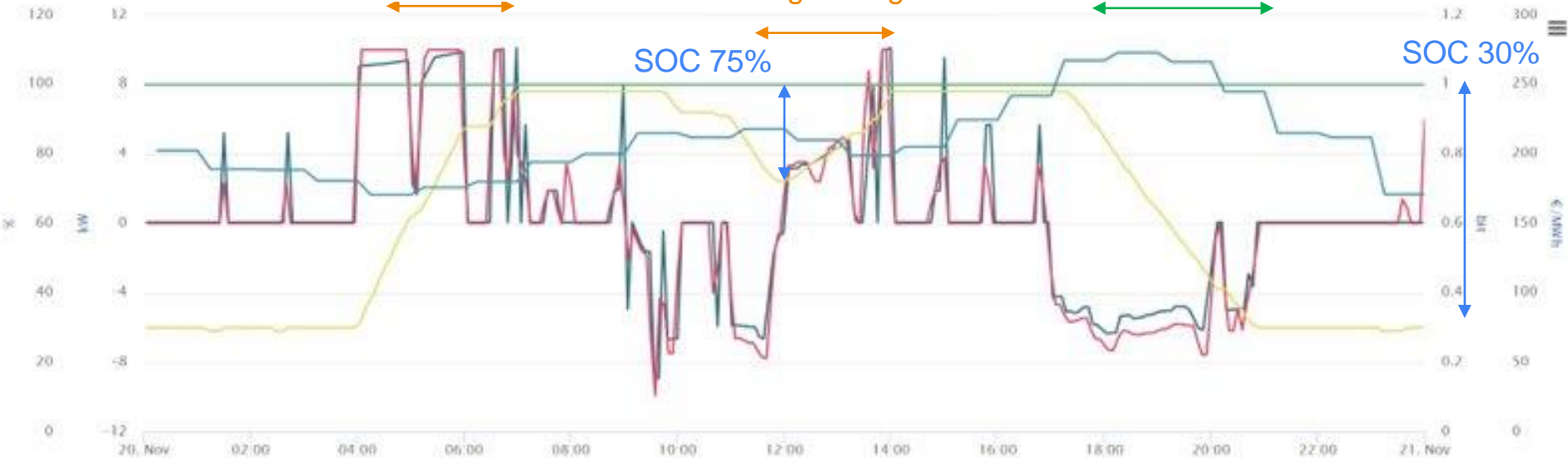


# V2G example in function of electrical prices

Charge using cheap prices

Charge using solar

Discharge selling high price energy



— Gemeente Bonheiden : CP3\_DC\_Socket1.power Sun, 20 Nov 2022 – Mon, 21 Nov 2022 Max: 10.11 kW Average: 0.29 kW

— Gemeente Bonheiden : CP3\_DC\_Socket1.control.active\_power Sun, 20 Nov 2022 – Mon, 21 Nov 2022 Max: 10.00 kW Average: 0.15 kW

— Gemeente Bonheiden : CP3\_DC\_Socket1.session\_status Sun, 20 Nov 2022 – Mon, 21 Nov 2022 Max: 1.00 bit Average: 1.00 bit

— Gemeente Bonheiden : CP3\_DC\_Socket1.SoC Sun, 20 Nov 2022 – Mon, 21 Nov 2022 Max: 98.00 % Average: 66.66 %

— Gemeente Bonheiden : ElectricityDayAheadPrice\_BE Sun, 20 Nov 2022 – Mon, 21 Nov 2022 Max: 273.00 €/MWh Average: 210.71 €/MWh

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