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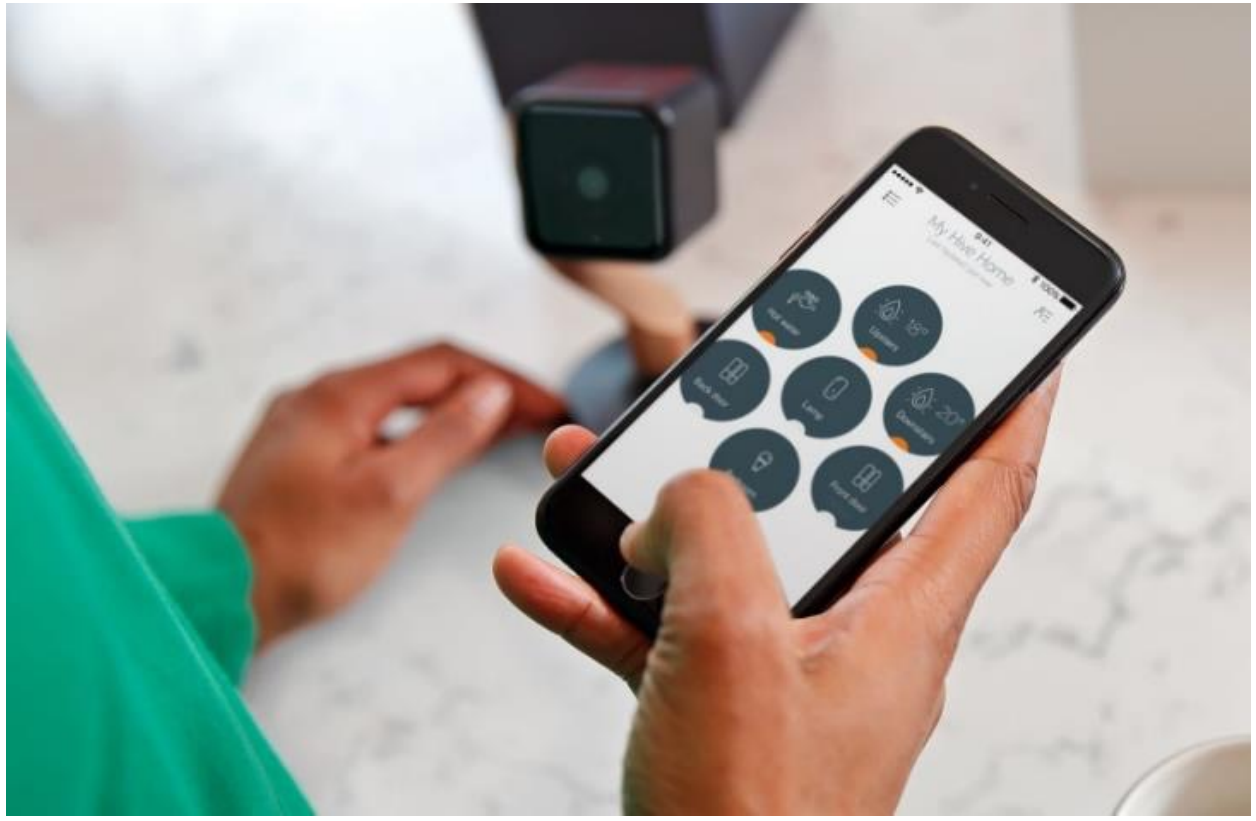

Empowering Prosumer Flexibility Through the Aggregators

Aleksei Mashlakov, PhD

25th April 2024

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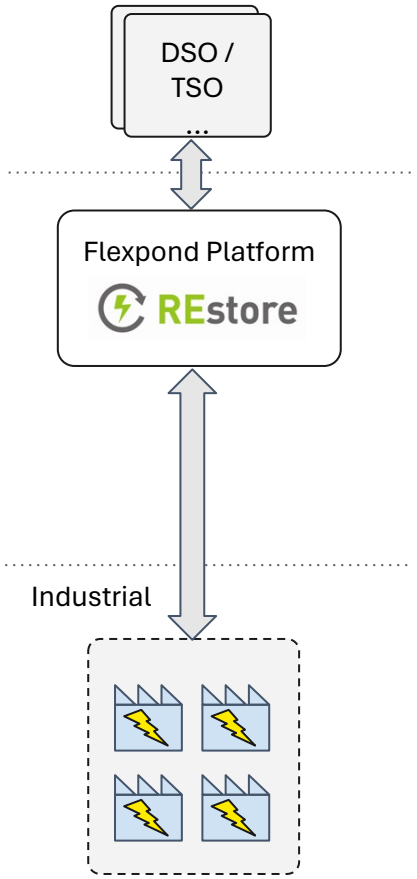
History of Centrica DSR

2010

REstore is founded

Delivers cloud-based Demand Side Management software and Demand Response Services

Now



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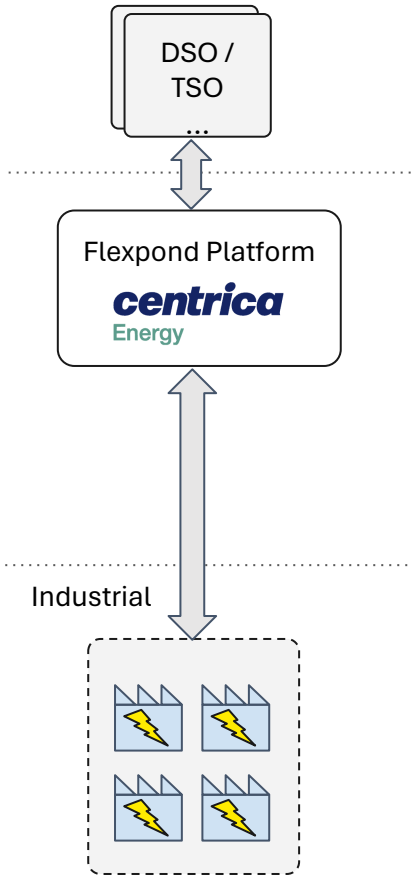

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- Optimise Prime

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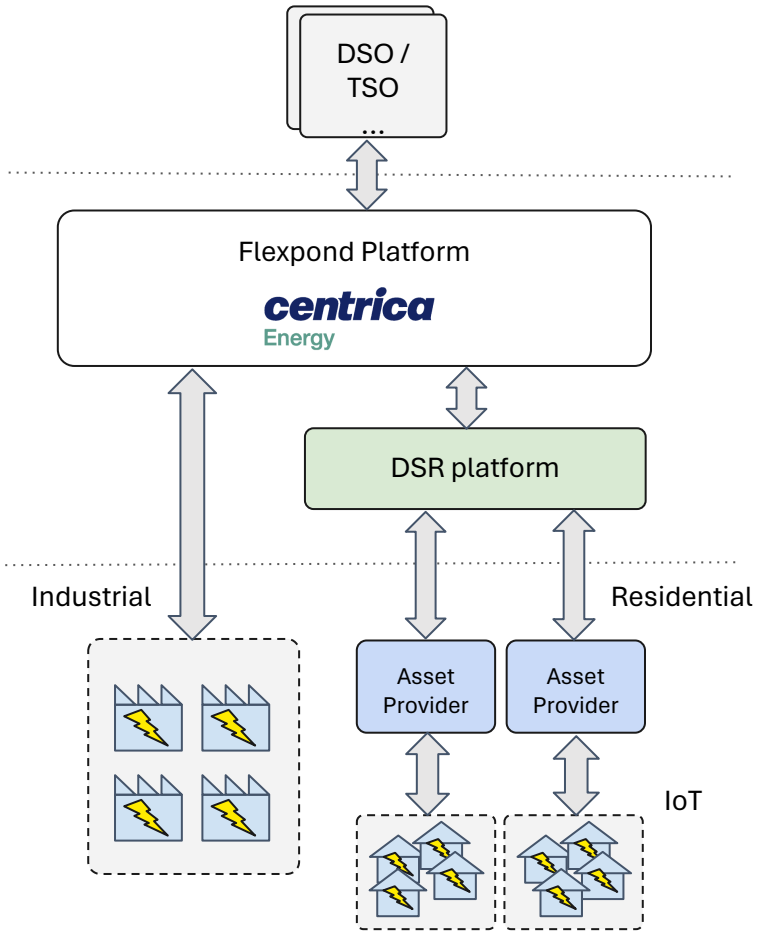

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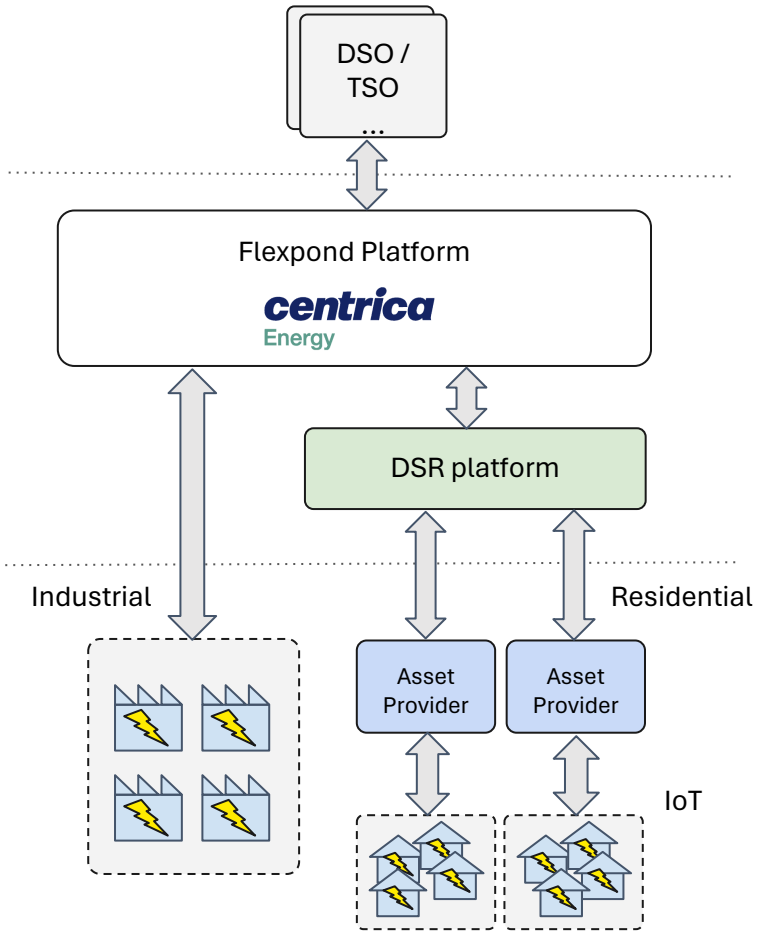
Scaling of DSR platform
Integration with Centrica ecosystem

Now



British Gas

Smart Tariffs

Sharing optimization revenues to gain customer value

HIVE

Customer Centric Value Propositions

Made simple to manage and engaging through the Hive app

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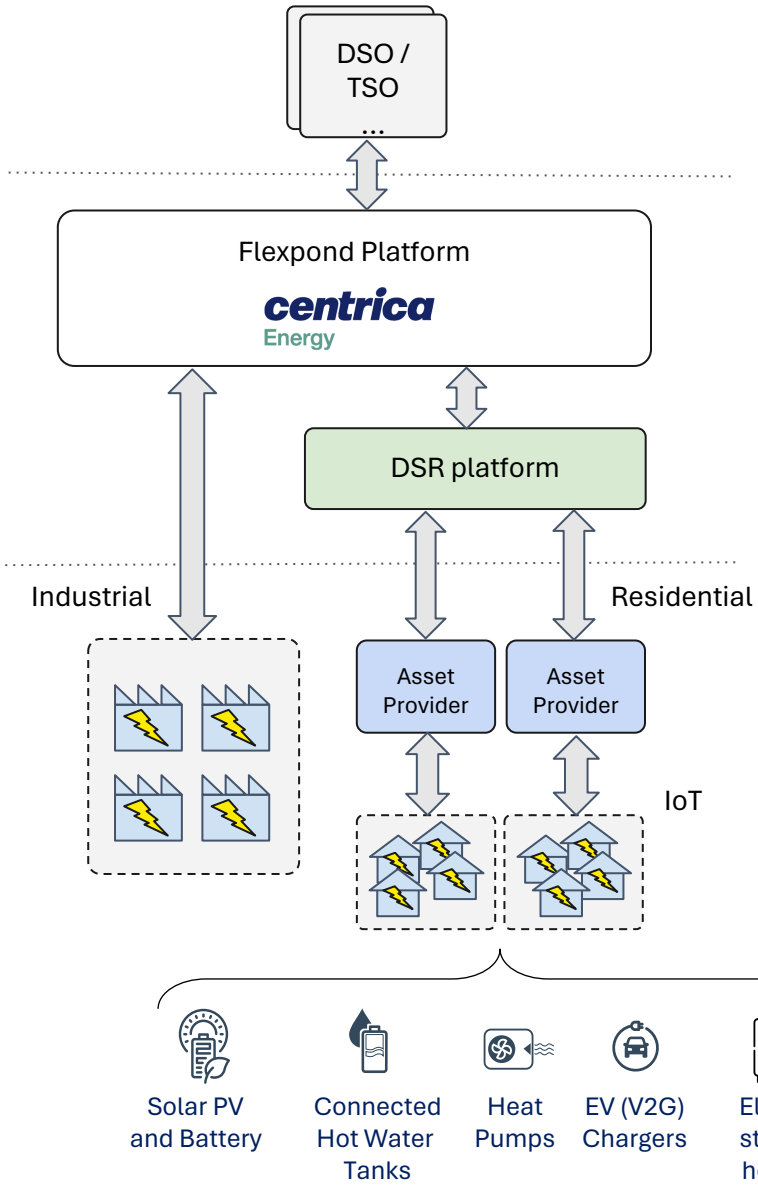
Now

iwell · eo · mixergy · Dimplex · ALFEN · SAMSUNG · pod POINT



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Why aggregation?

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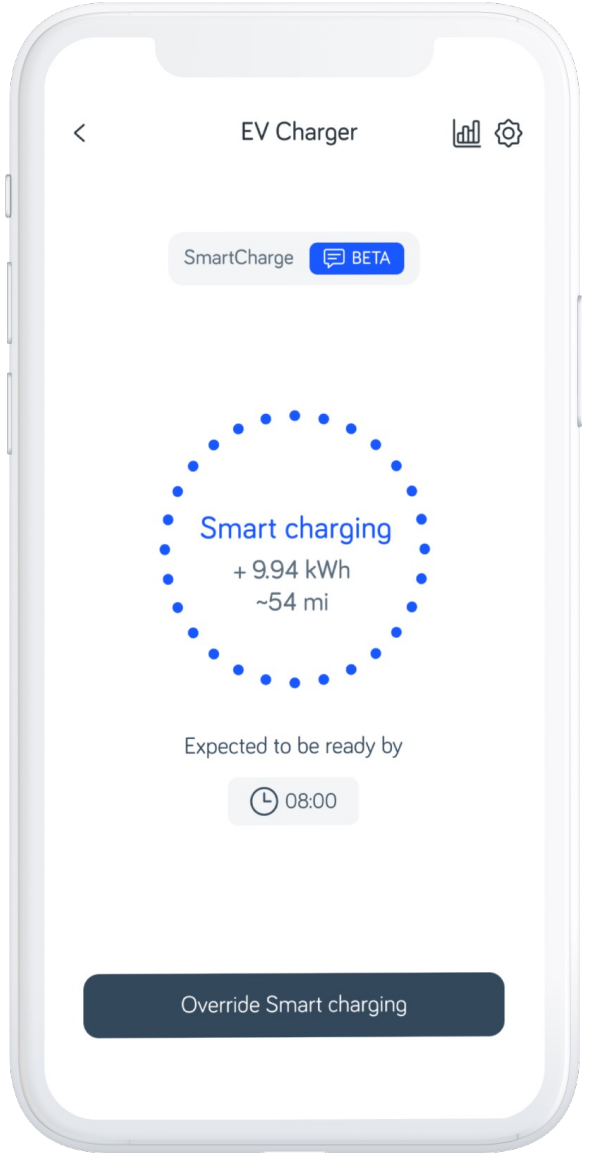
Residential Flexibility



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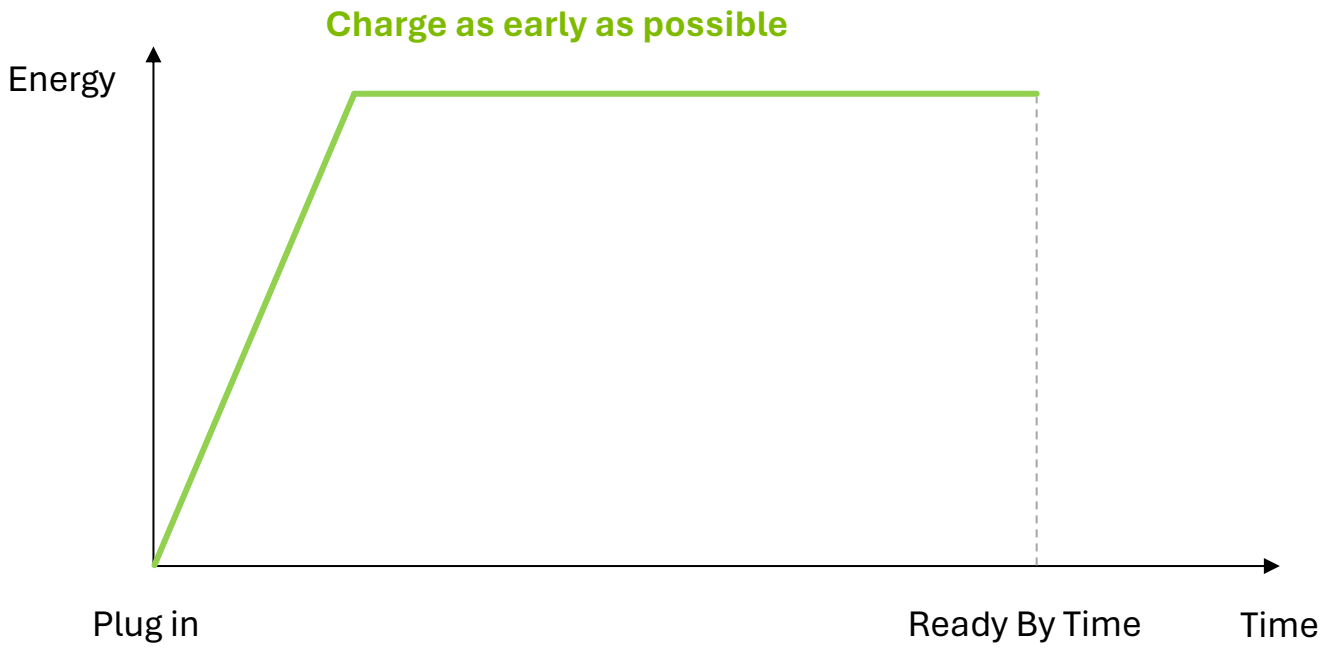

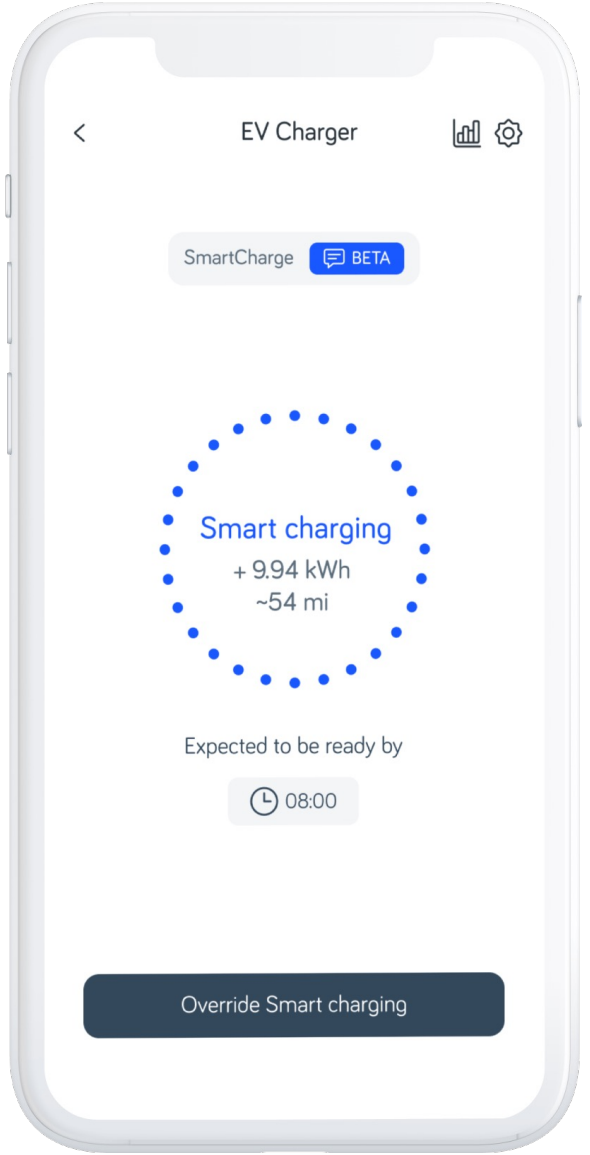

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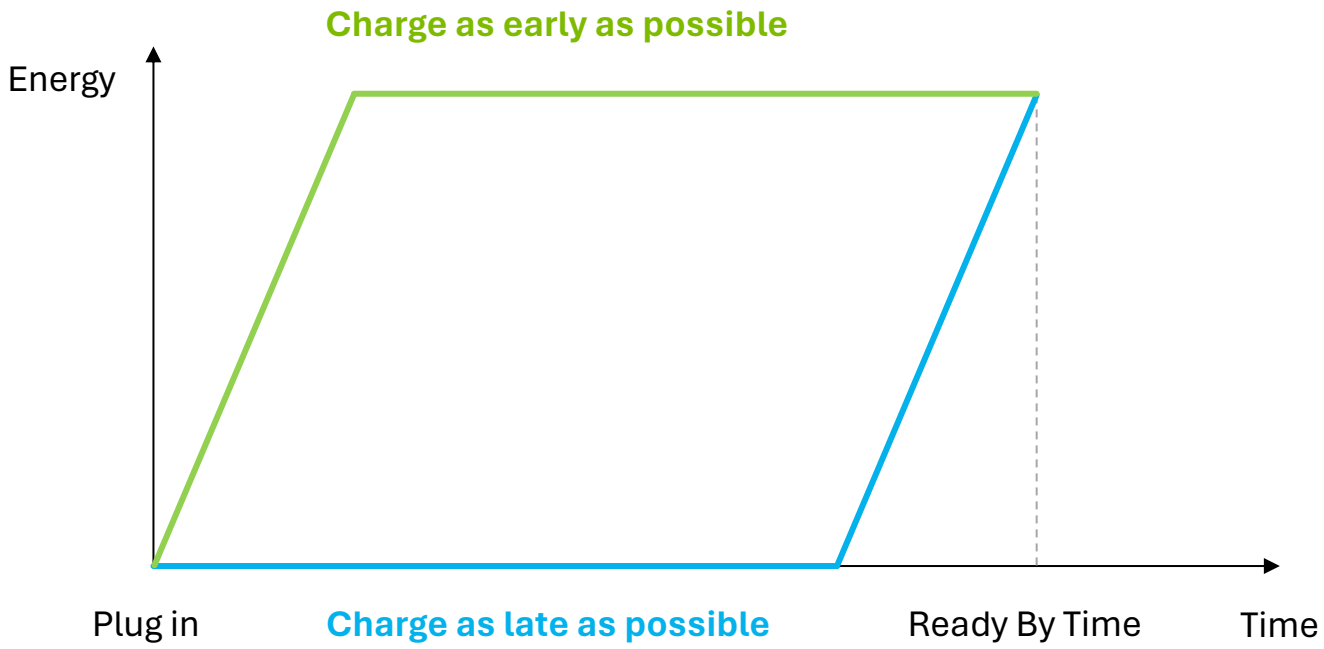

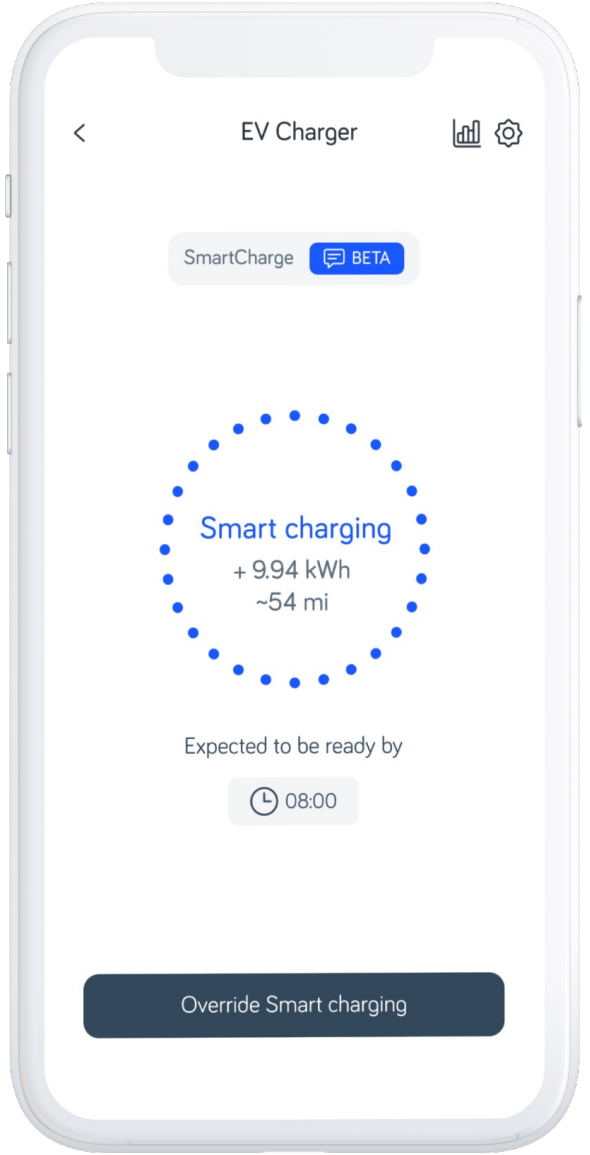

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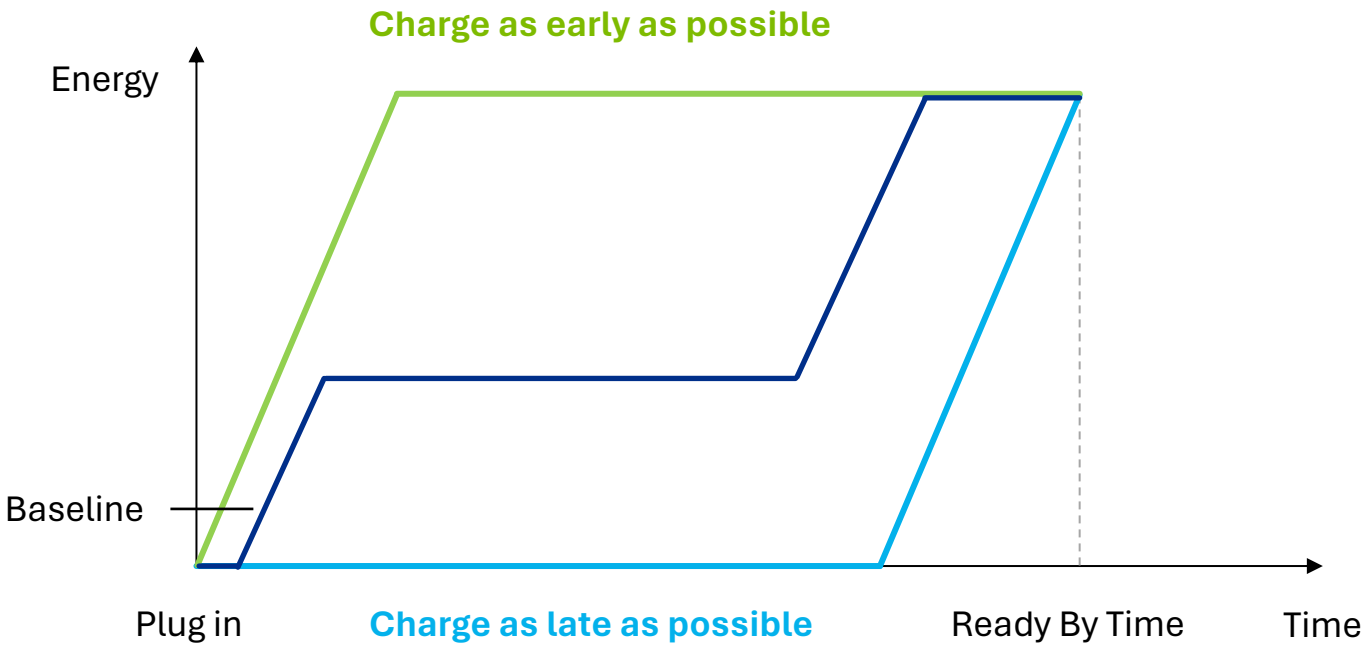

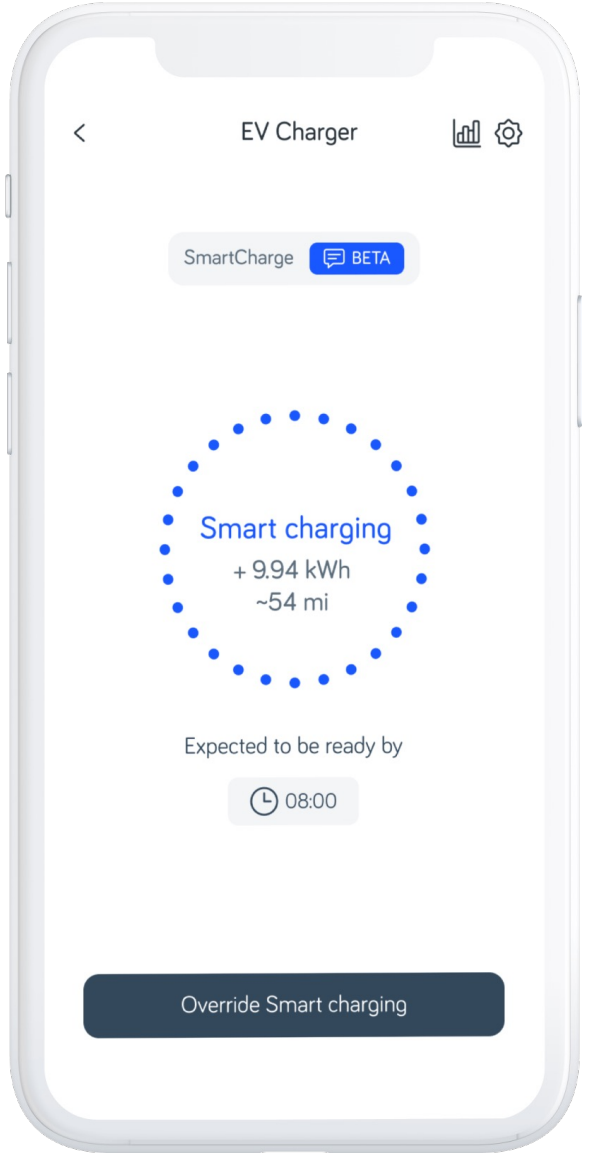

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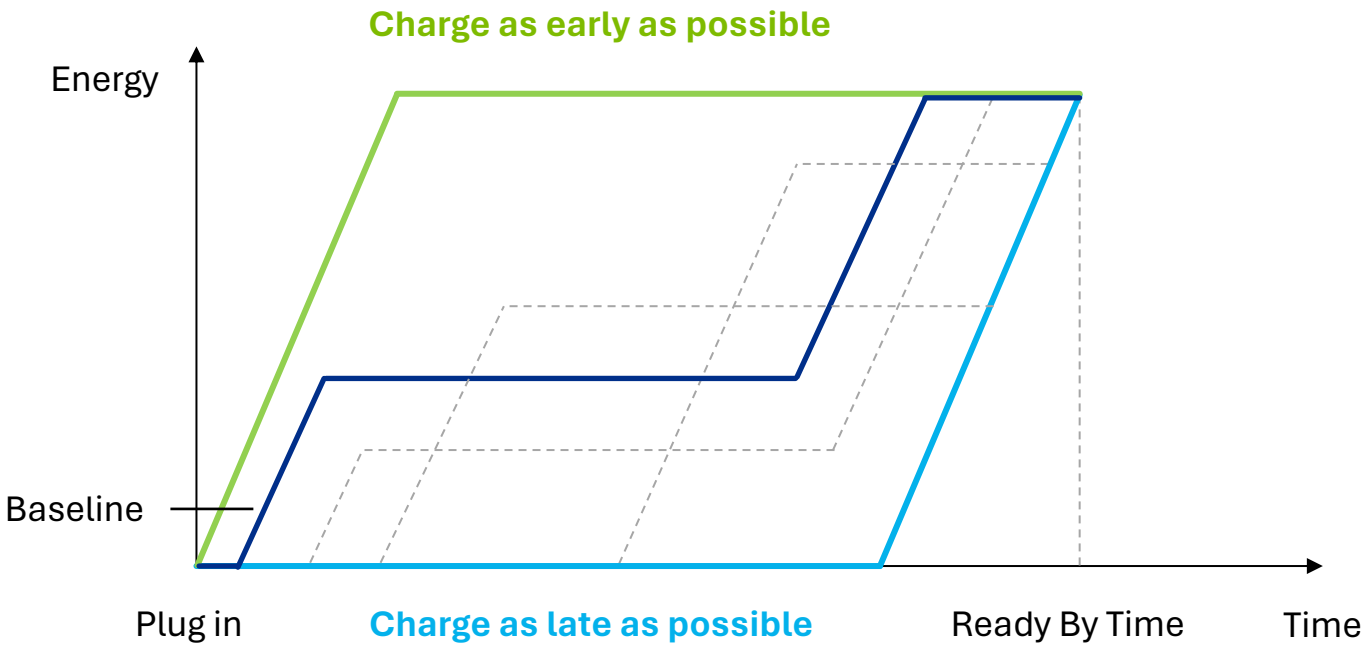

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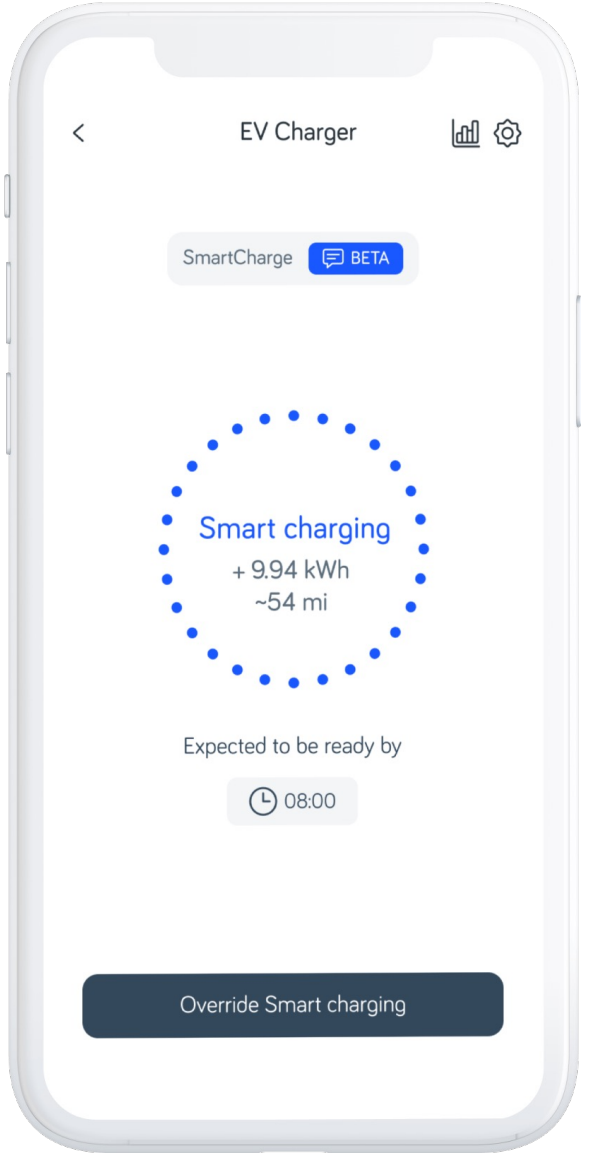

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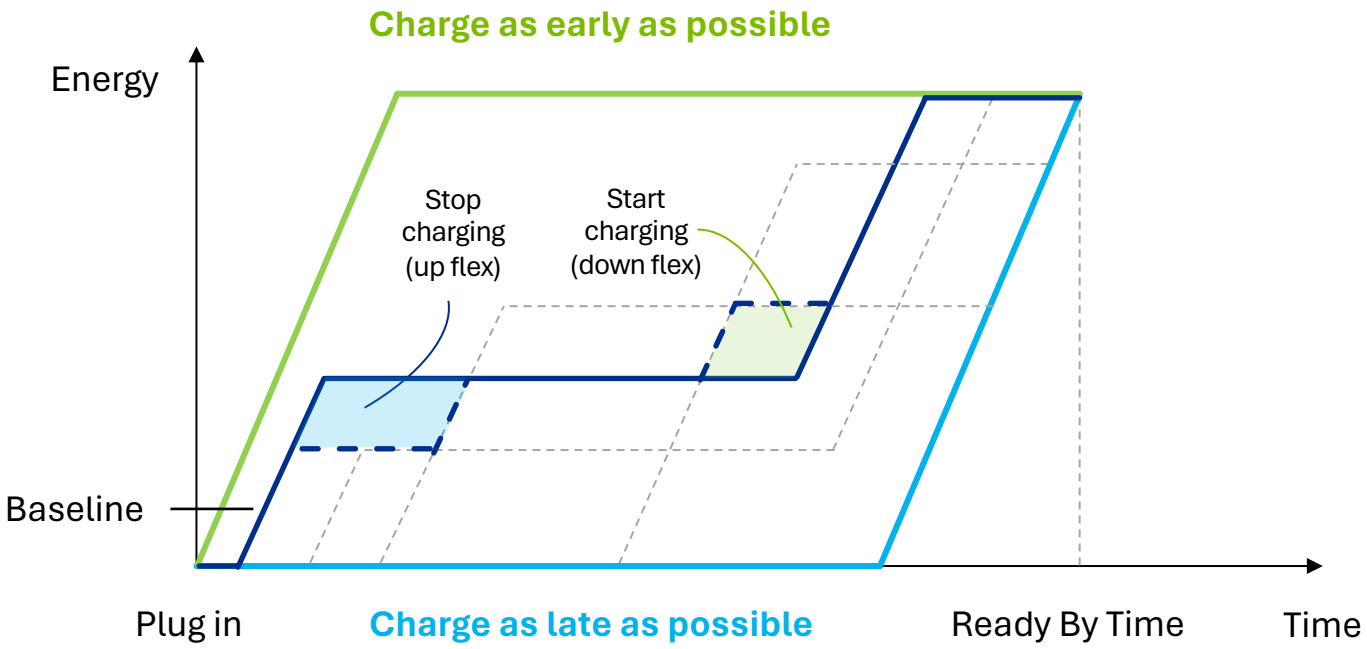

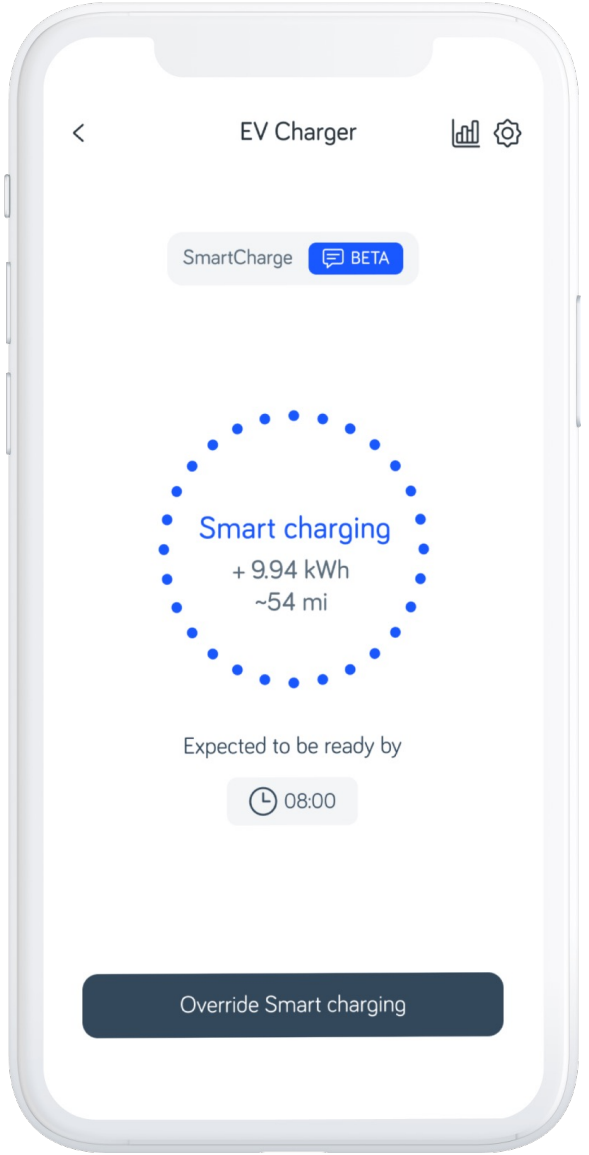

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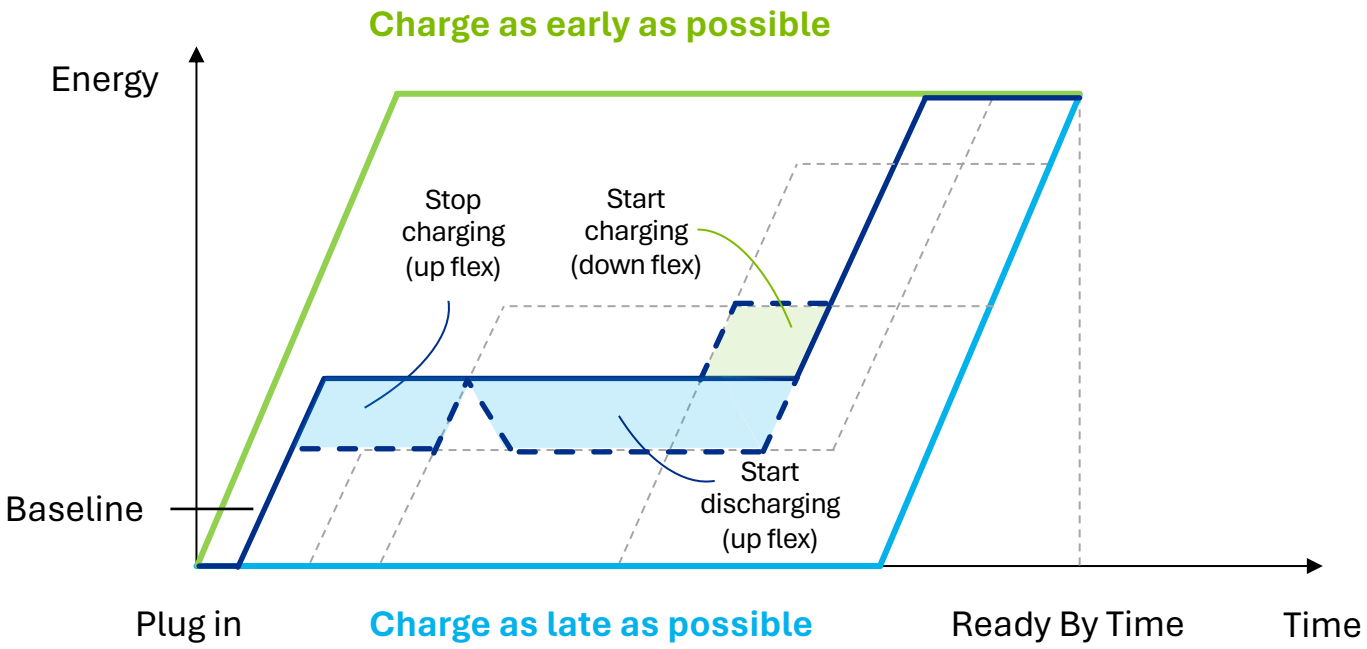

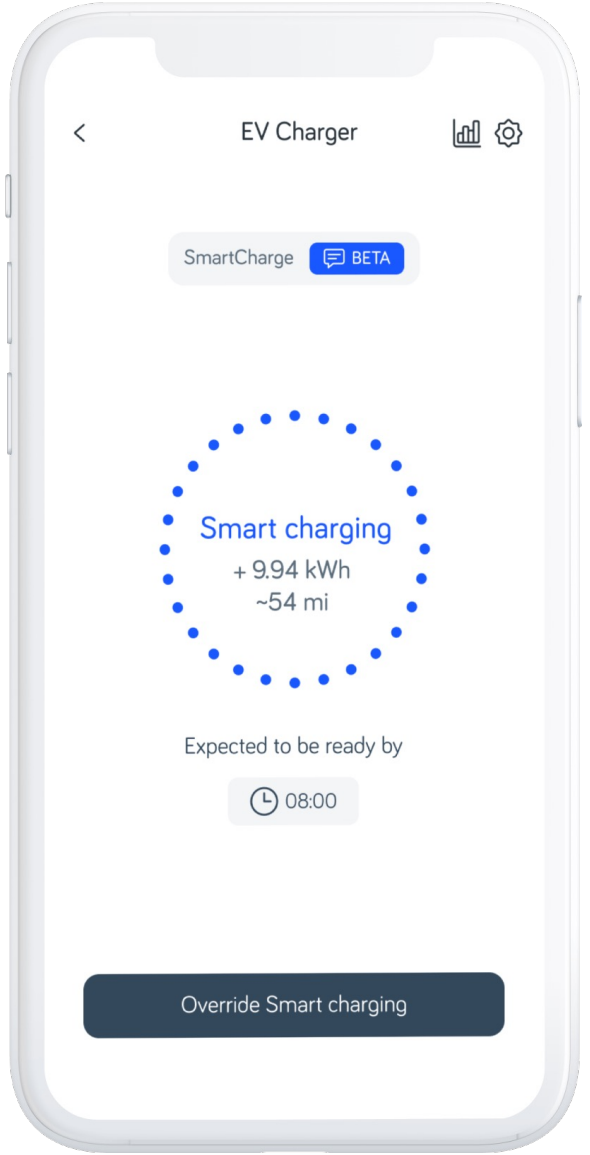

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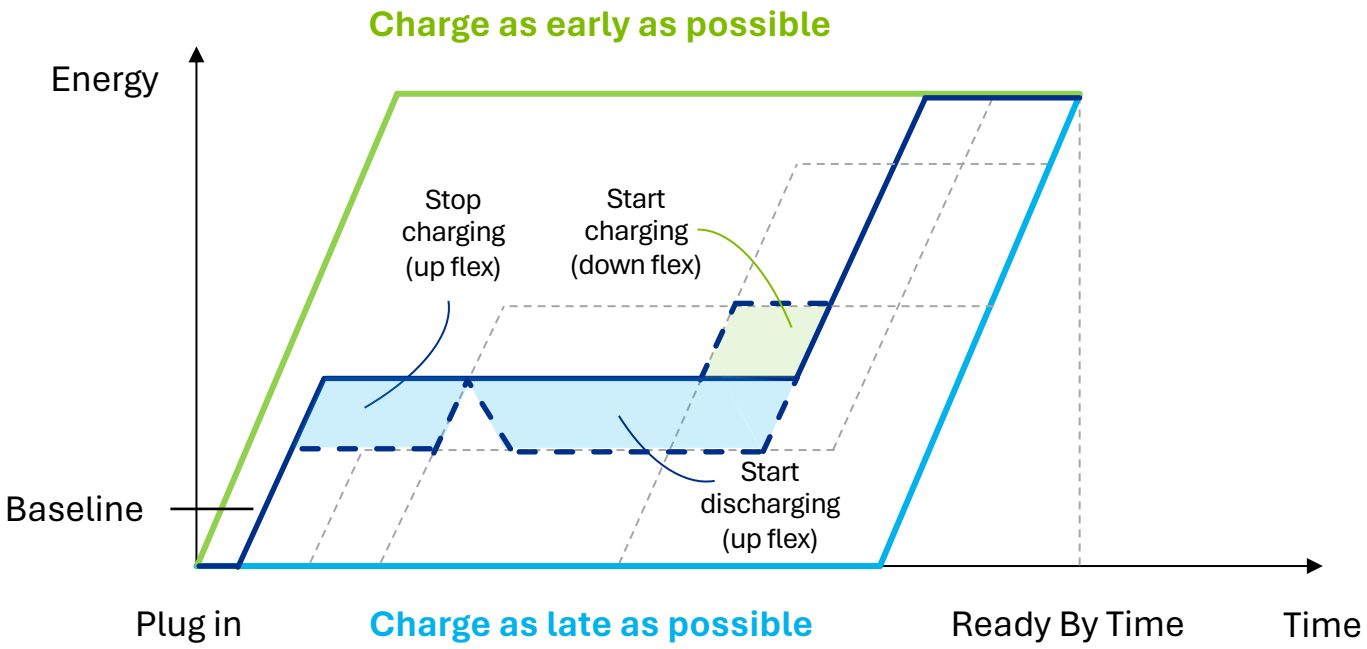

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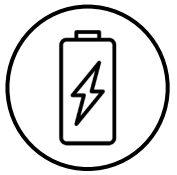

Storage

Heating

Mobility

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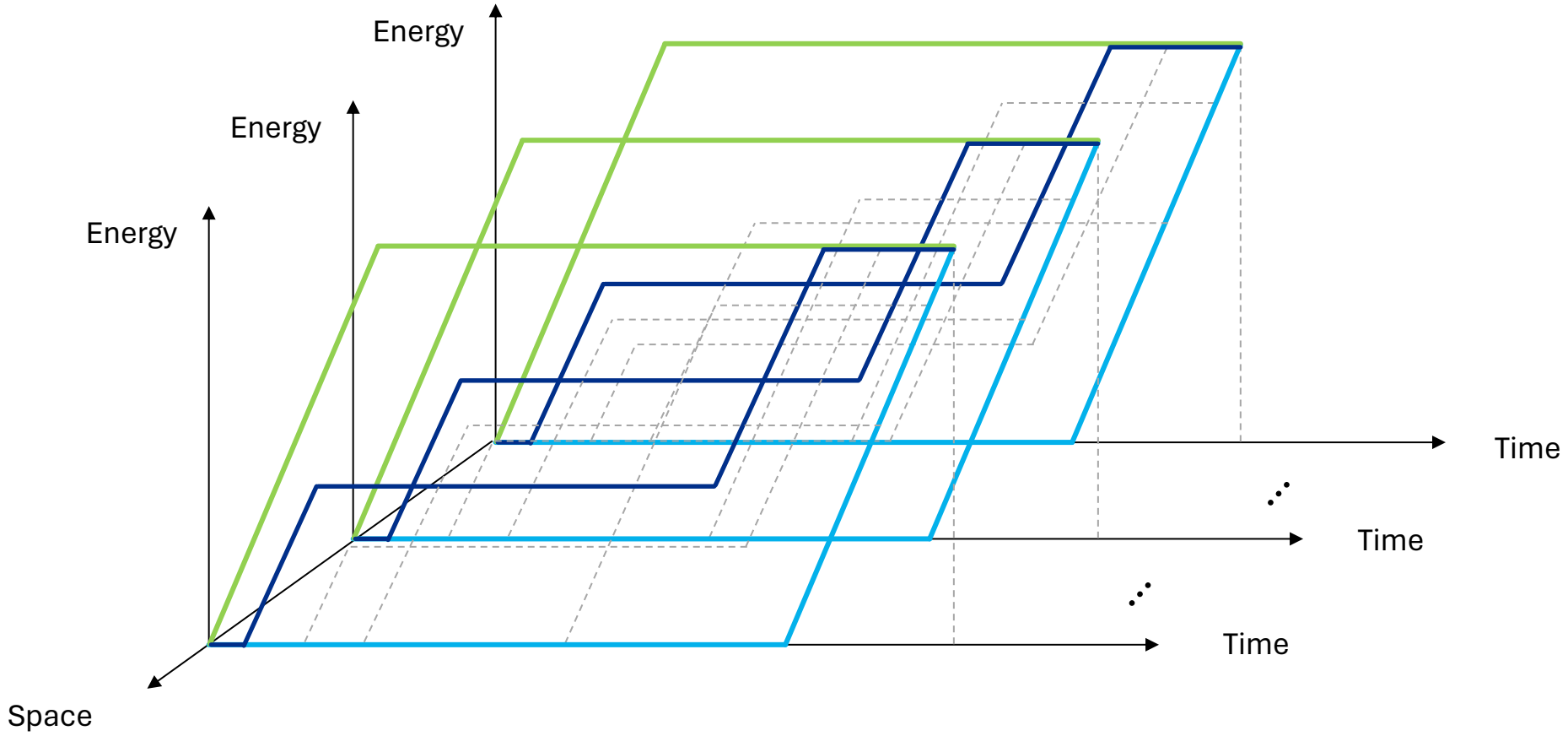
Residential Flexibility



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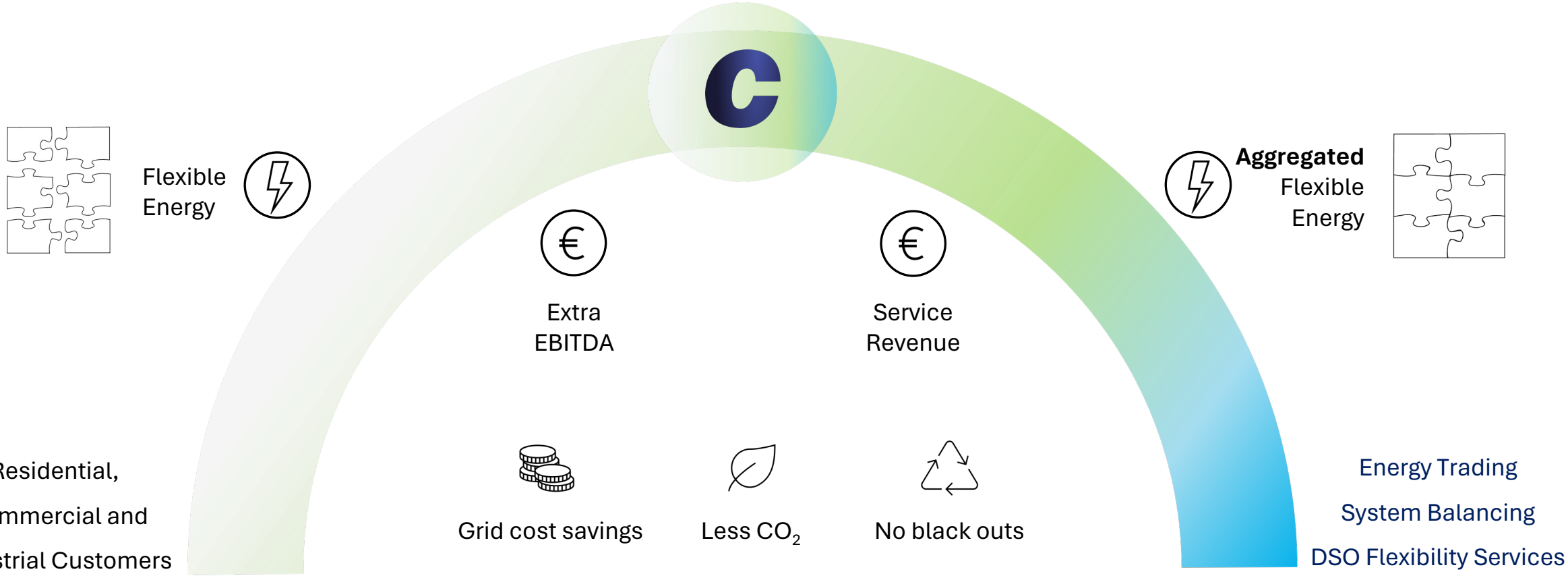
Value of flexibility aggregation



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Pathway of (small) flex to the market

DSR proposition

From the initial business case to the contract / tariff development

Operational monitoring

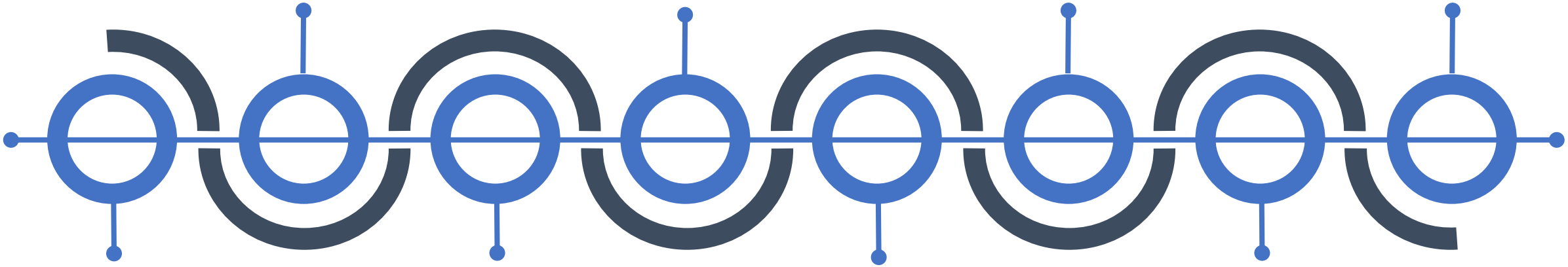
Access and track asset data to validate asset state and controls

Aggregation

Combine devices into pools and virtual power plant to trade flexibility in the markets

Customer UI/UX

Provide insights in value, performance, activations, availability, maintenance



Material participation

Prosumers emerge by acquiring and installing low-carbon technologies

Connectivity

Access to devices via gateway, cloud APIs or software integration. This includes telemetry data and control, customer UI/UX

Optimisation

Extract optimal device flexibility based on local conditions (e.g., energy tariffs, grid capacity, user comfort)

Market access

Provide market interface to balancing, reserve, and network services and energy markets

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Prosumer Services

Storage

Batteries / PV

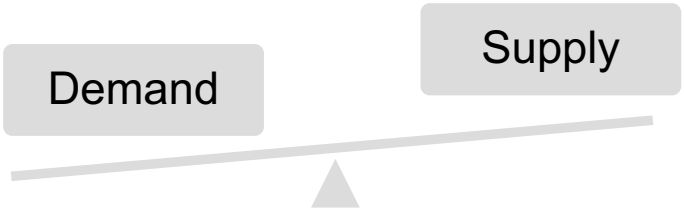
Heating

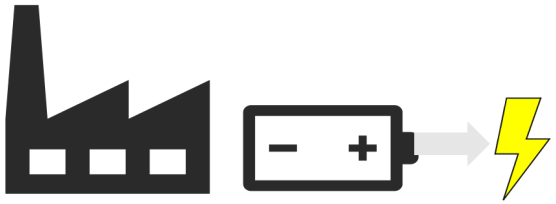
Heat pumps, how water tanks, electric storage heaters

Mobility

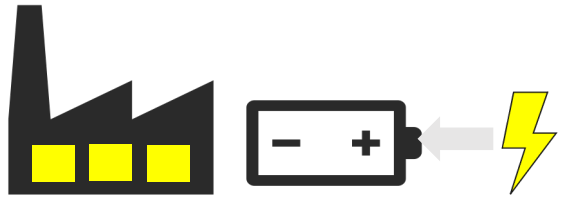
Electric vehicle charge points

Storage



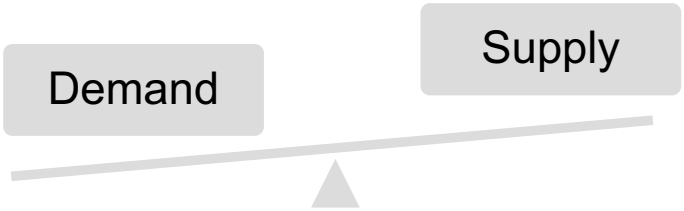


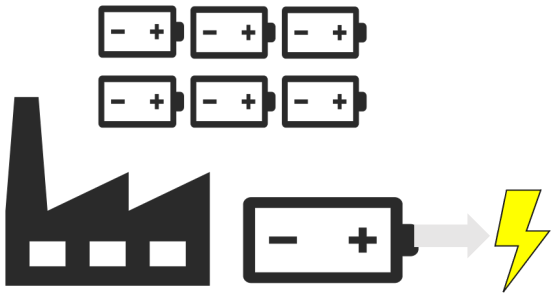
Reduce energy use / discharging



Use energy / Charging

Storage





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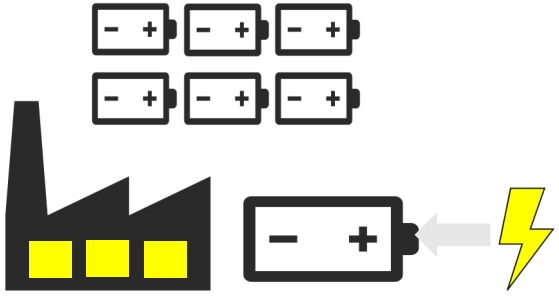

Use energy / Charging

Storage

Frequency Containment Reserve (FCR)

> 5000 home batteries in Belgium

~ €100s / year savings

Balancing the grid

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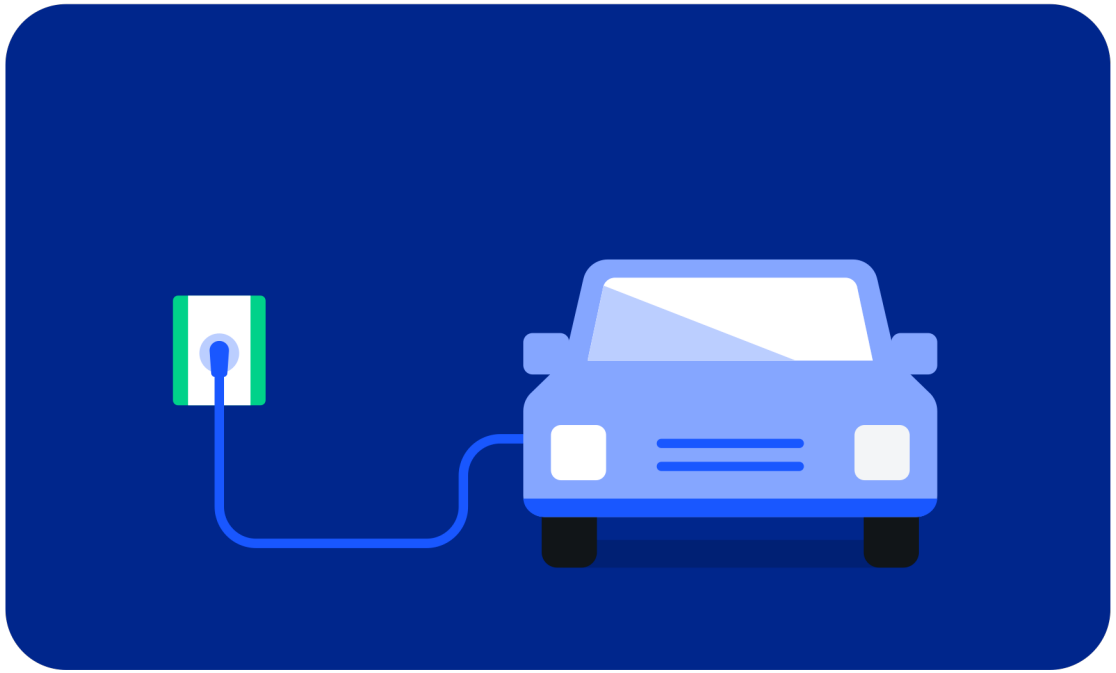
Mobility



Saves 1.3 tones of carbon a year[1]

4p/kWh discount for availability[2]

up to £298 / year in savings[4]

Off-peak consumption

HIVE SmartCharge

[1] Based on the BEIS GHG conversion factor for average petrol engine cars and the average electricity mix in the UK, switching to EVs.
[2] If the customer is under Electric Driver tariff with BG and if you plug in overnight between 12am – 5am for 6 hours and more.
[3] FreeCharge is only available for customers with a Hive EV Charger and a British Gas Electricity Tariff and Smart Meter
[4] Based on maximum credit-earnings made by existing SmartCharge users over three months of actual performance data, then estimated on a pro-rata basis for one year of credits.

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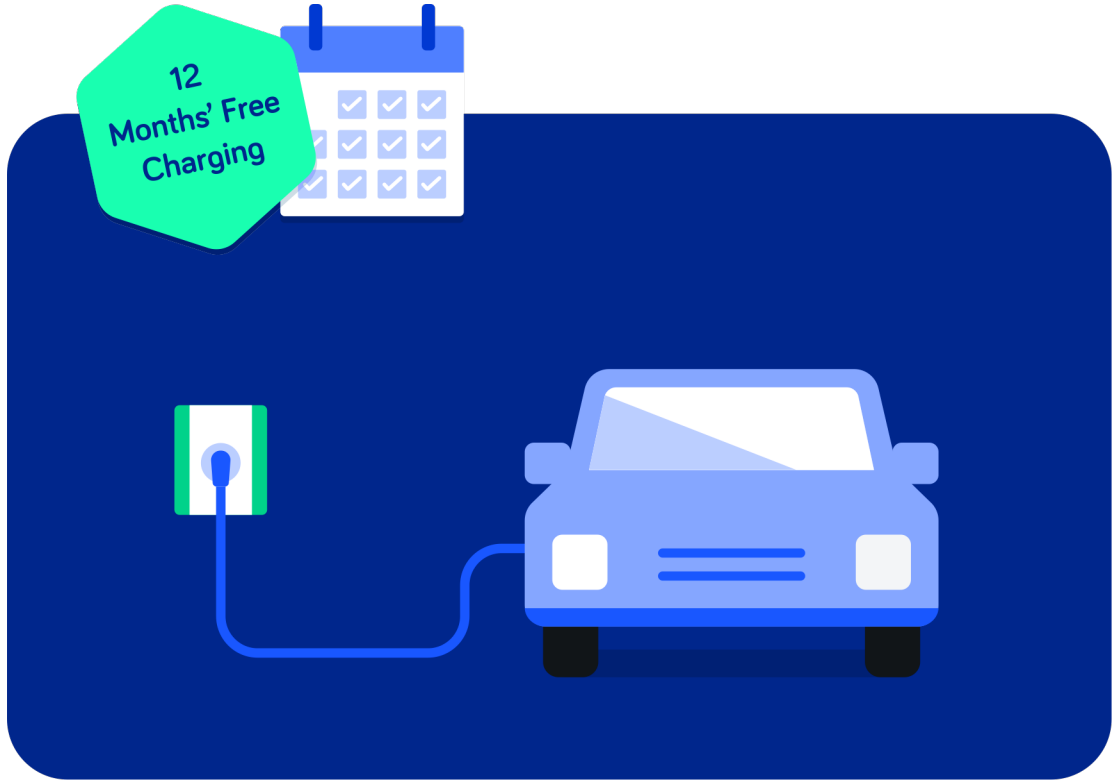

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Mobility

ESO to make change allowing up to 300MW of flexible assets into the Balancing Mechanism

€

£100 million/year extra savings for system cost[1]

€

~ £100s/year extra savings per BM and/or DSO services

[1] if the 10 million EVs expected to be in the UK by 2030 participated in the BM

Heating

Balancing Mechanism (BM)[1]

2.5 MW of capacity

On/off control

Balancing the grid

[1]Sandbox trial approved by Ofgem

Heating

Balancing Mechanism (BM)[1]

2.5 MW of capacity

On/off control

Balancing the grid

Dimplex Quantum Tariff

Dimplex | British Gas

Night rate of 9.9p per kWh between 12.30 – 7.30am, lower Economy 7 tariff

[1]Sandbox trial approved by Ofgem

Heating

Firm frequency response (FFR)

300 ms reaction time

~10% savings on hot water bills

1 MW of capacity[1]

[1] 1MW milestone reached at the moment of 2021

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What comes next?

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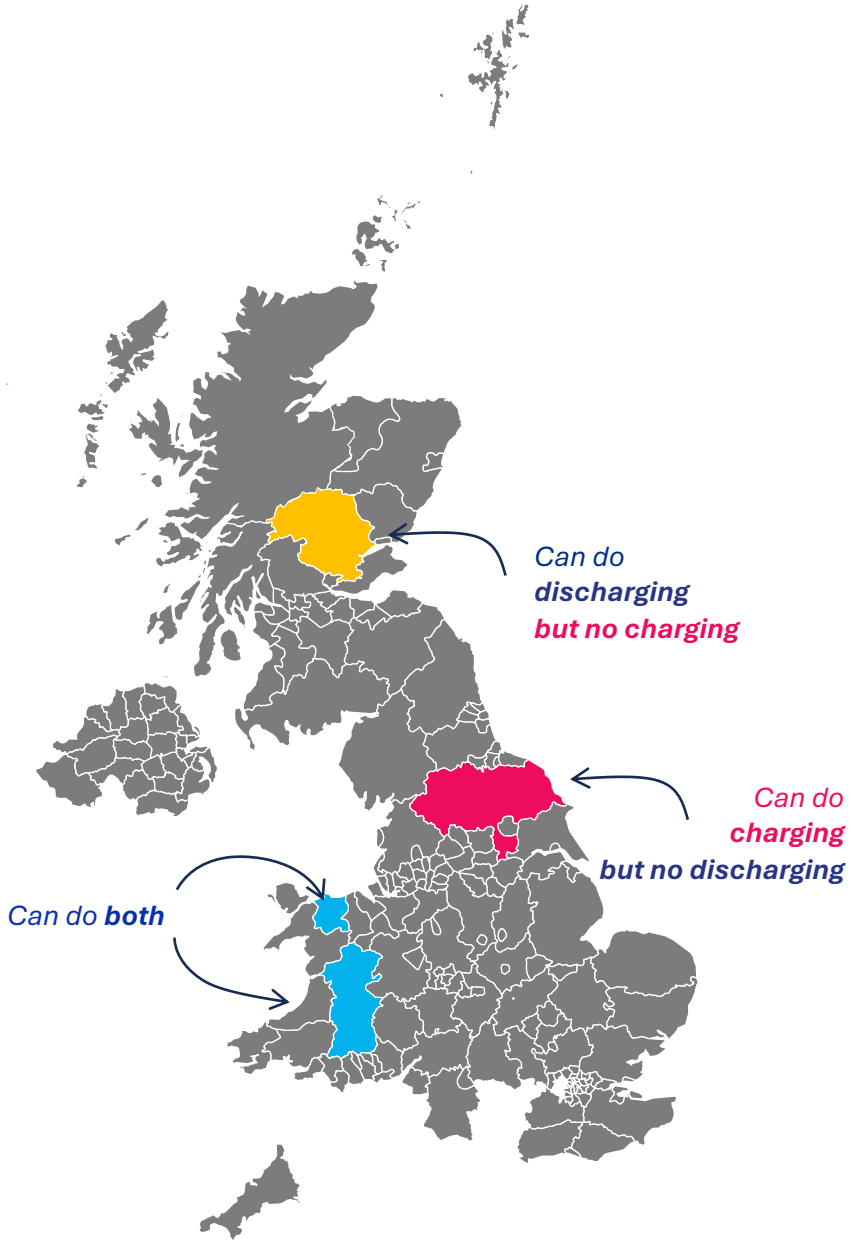
What comes next?

Grid congestions happen now and will increase soon



- No feed-in congestion (ok to discharge)
- **Feed-in** congestion (not safe to discharge)
- No off-take congestion (ok to charge)
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BD4NRG project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 872613

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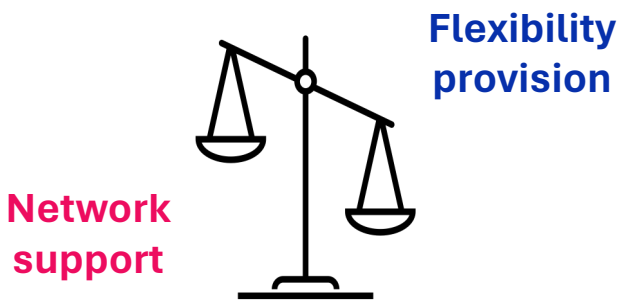
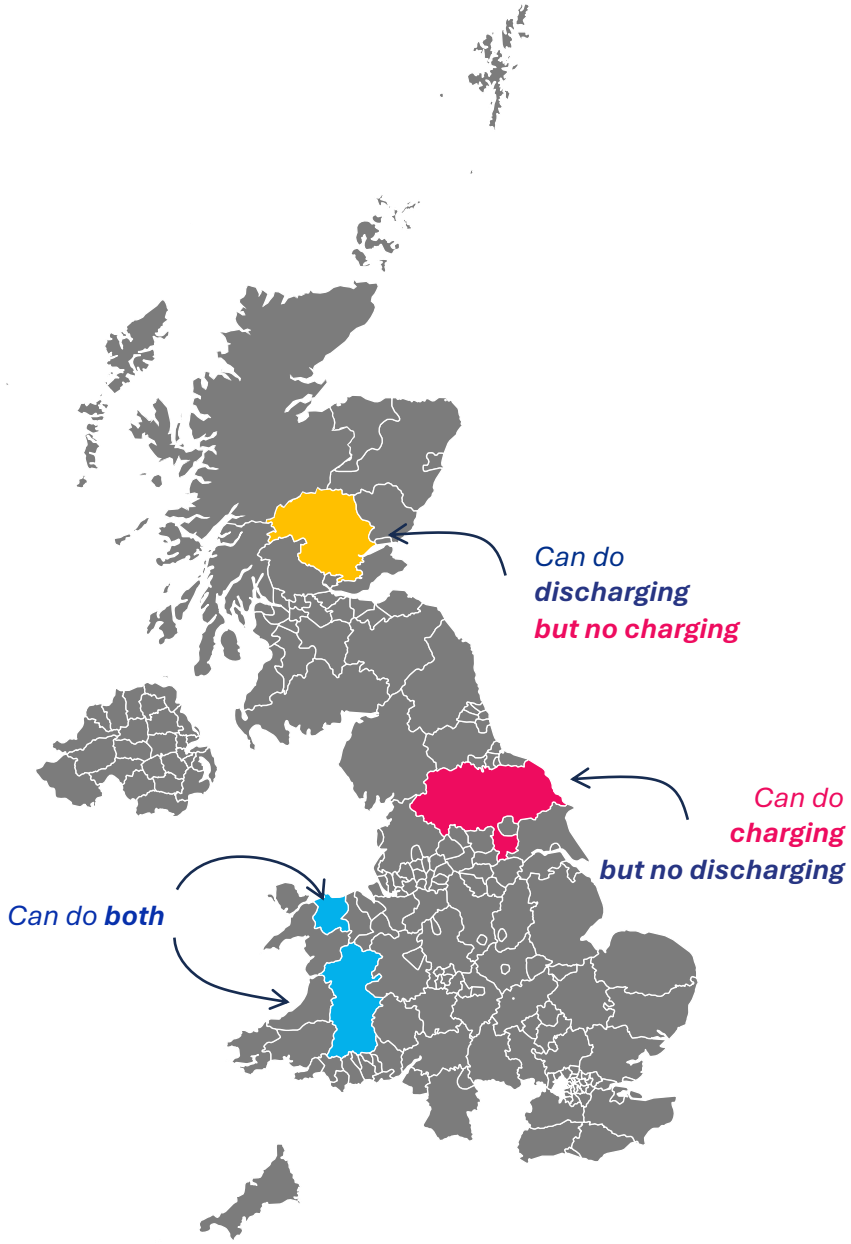


Can we help the grid to prevent grid congestions?



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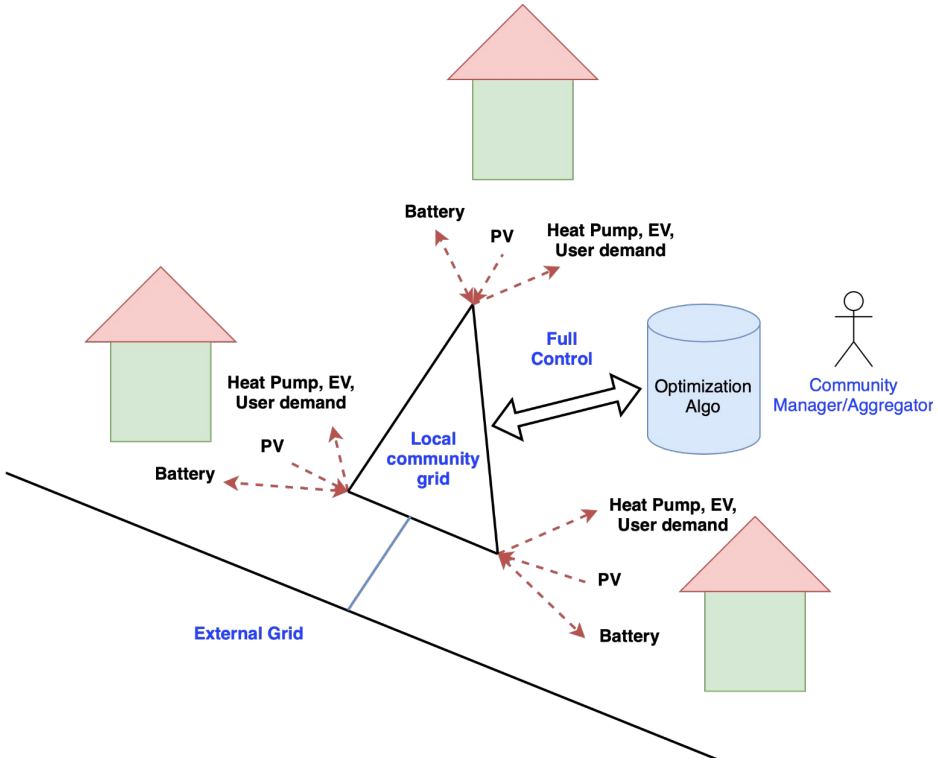

Can we empower local energy governance but valorise local flexibility for the grid?

LocalRES project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 957819

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What comes next?

European commission grant funding

BD4 NRG
Big Data for Next Generation Energy

- Scalable PV forecasting
- Grid-friendly aggregation

Bright

Scalable, personalized control policies for multi-service offerings

EUniversal
UMEI

Low-voltage flexibility offering in DSO markets:
- Stakeholder interfaces
- Bidding and dispatch algo development

MAESHA

- Product and market design for low-inertia systems
- Development of VPP combining PV and HVAC units

LocalRES

- Comparison of optimal control techniques
- Offering community flexibility in AS markets
- Coordination between FSPs operating in same neighborhood

DESNZ grant funding

iREF

Part of Interoperable Demand Side Response programme

Analysis and feedback on OpenADR for use with residential appliances

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Demand Side Response

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Stay Tuned!

THE FUTURE IS NET ZERO

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