GreenFlux
Smart charging

Leading Smart Charging

Nico Spoelstra

Proud to be GreenFlux

Leader in EV smart charging solutions

20.000 connected charge points

61.000 drivers

Access to **100.000+** charge stations in Europe

Supporting **1.000.000+** drivers to use our customers' stations

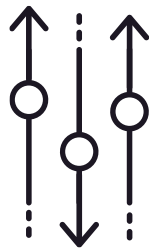
International customers in **20+ countries**

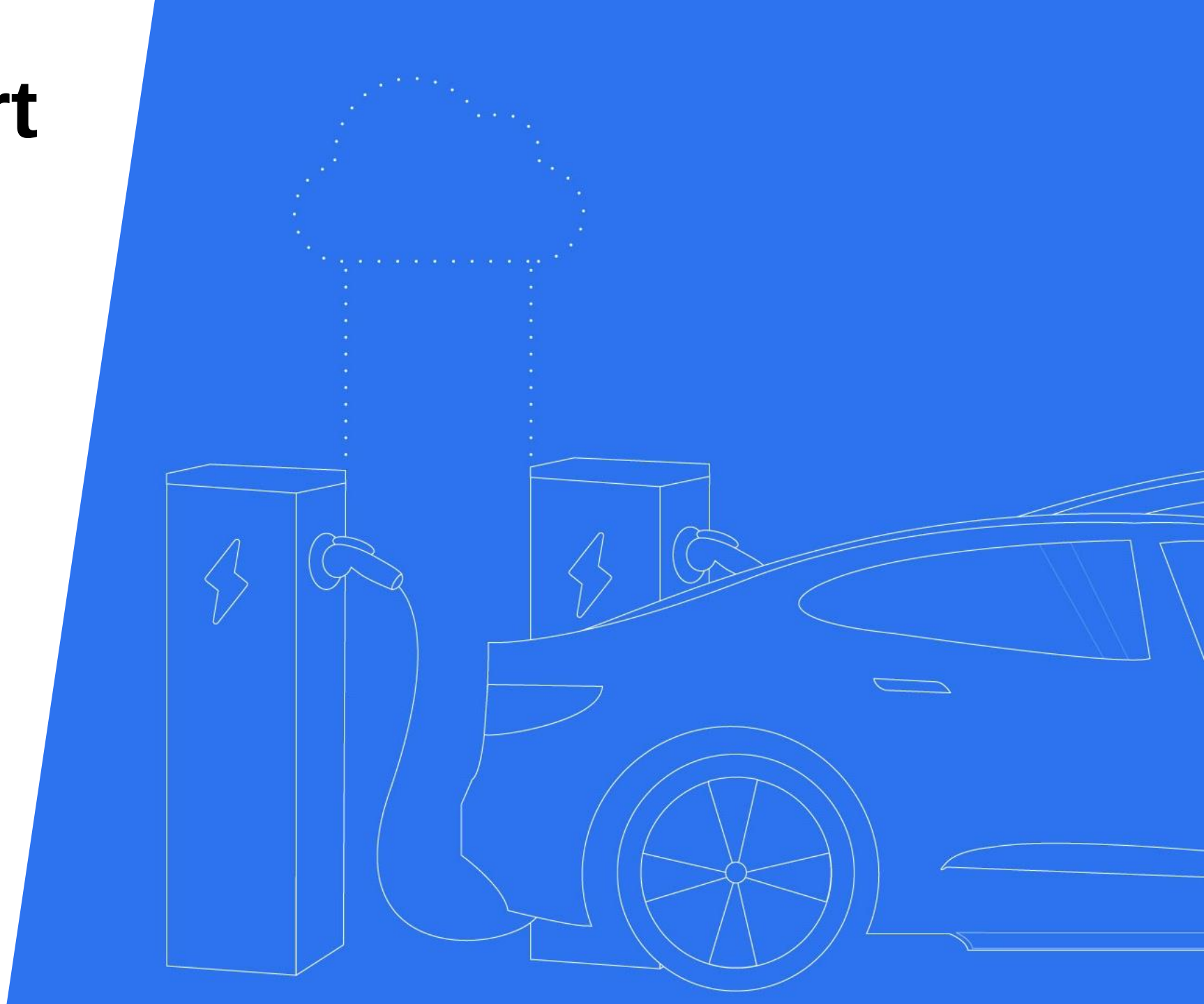
White label CPO & eMSP platform

- Billing and transaction management
- Remote management and support
- Global Roaming via open standards
- Smart Charging
- App
- Interfaces / API

What is smart charging?

increase/decrease
maximum charge rate

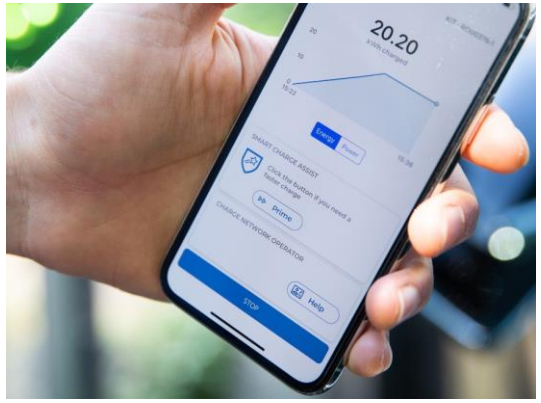




Why do you do smart charging?

GRID CONSTRAINTS

DYNAMIC ENERGY PRICES



USER REQUIREMENTS

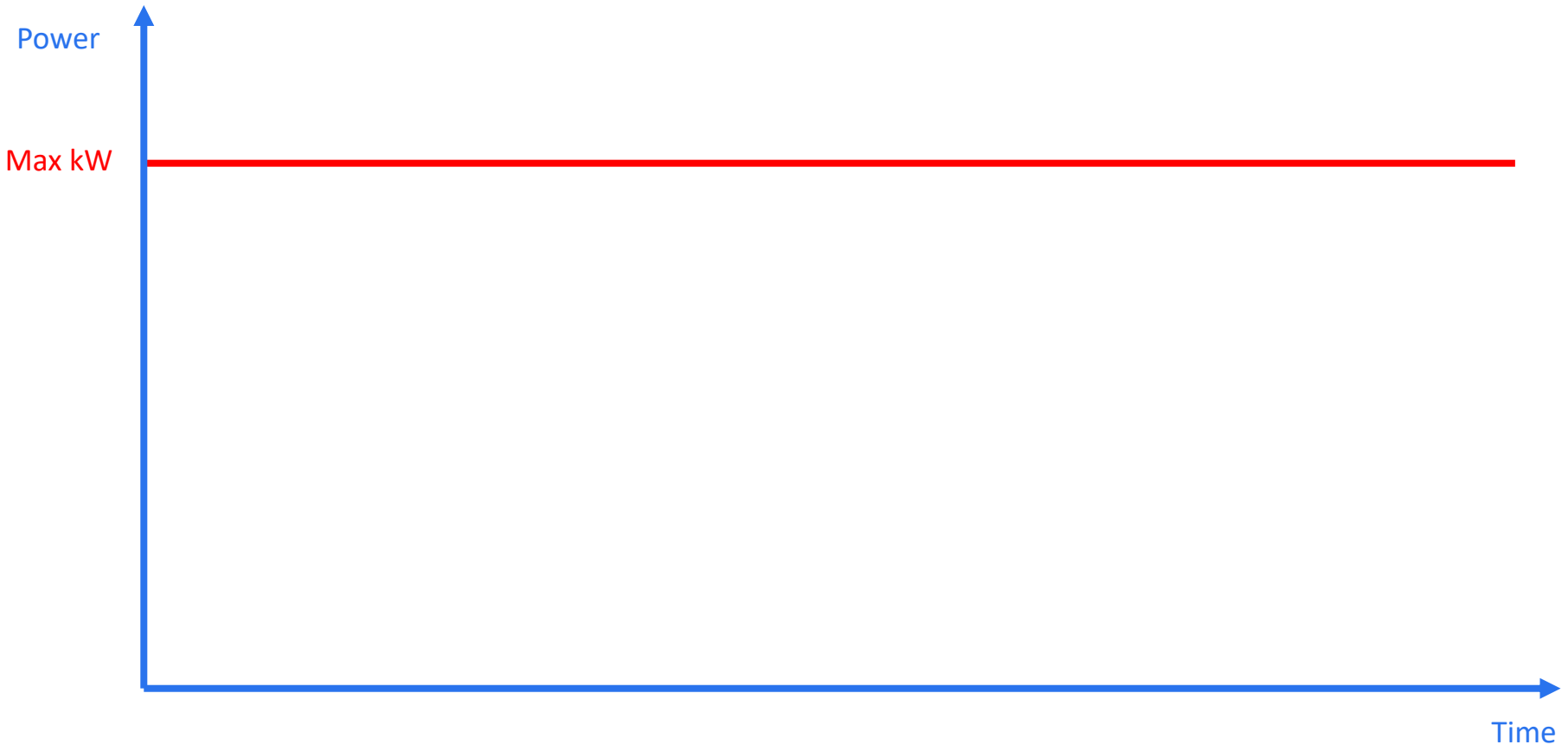
LOCAL RENEWABLE ENERGY

How do we do it

How do we do it

STEP 1

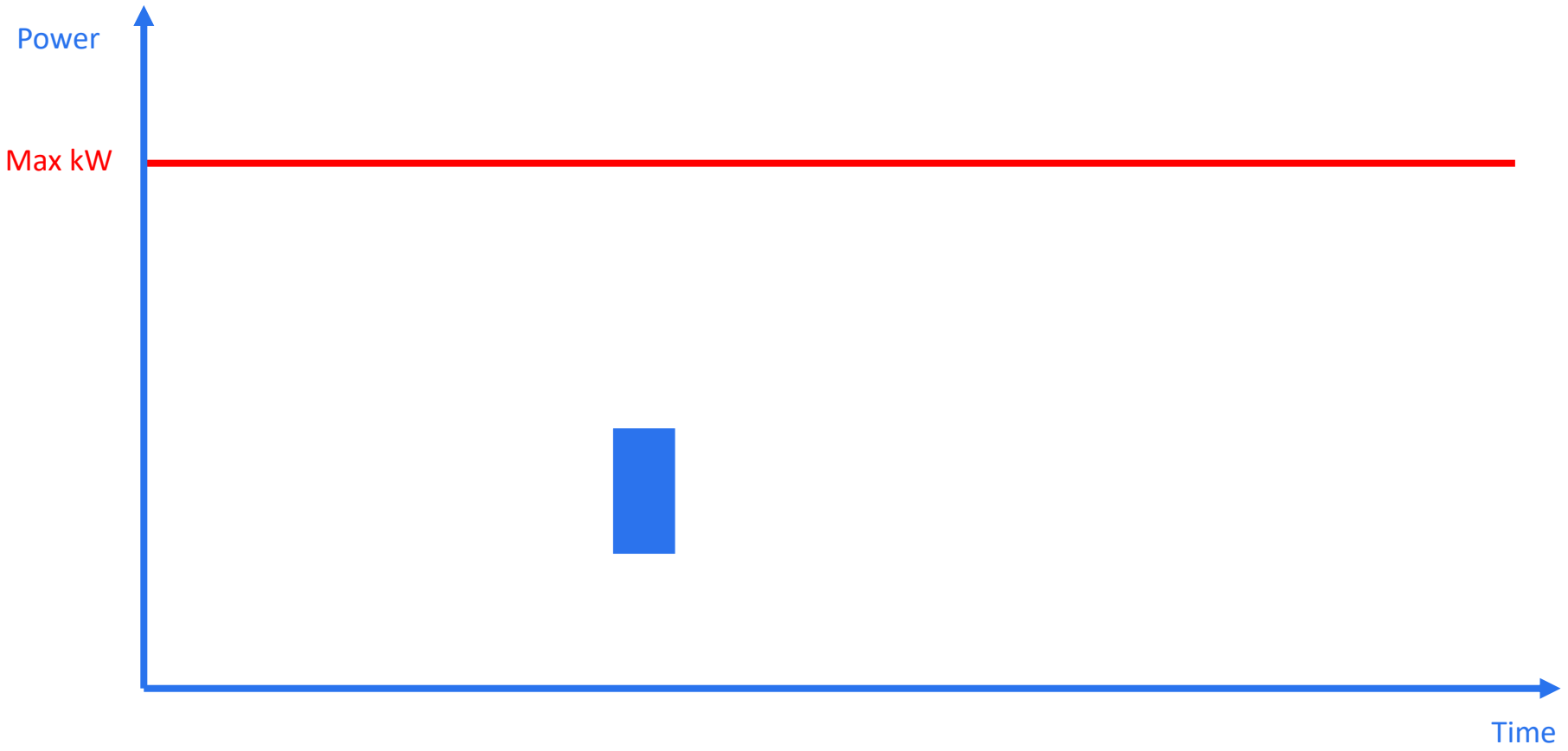
We set the available capacity over time



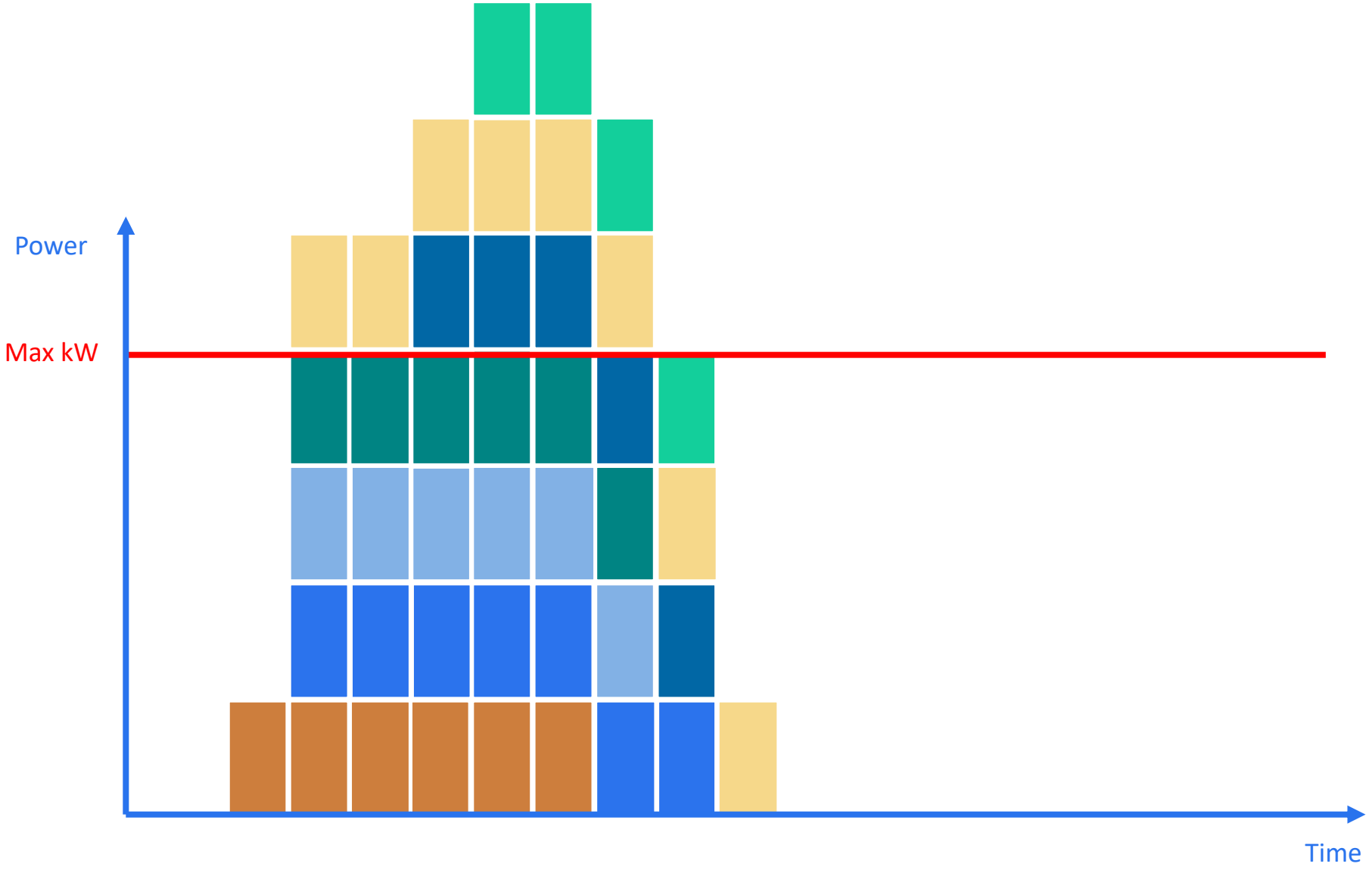
How do we do it

STEP 2

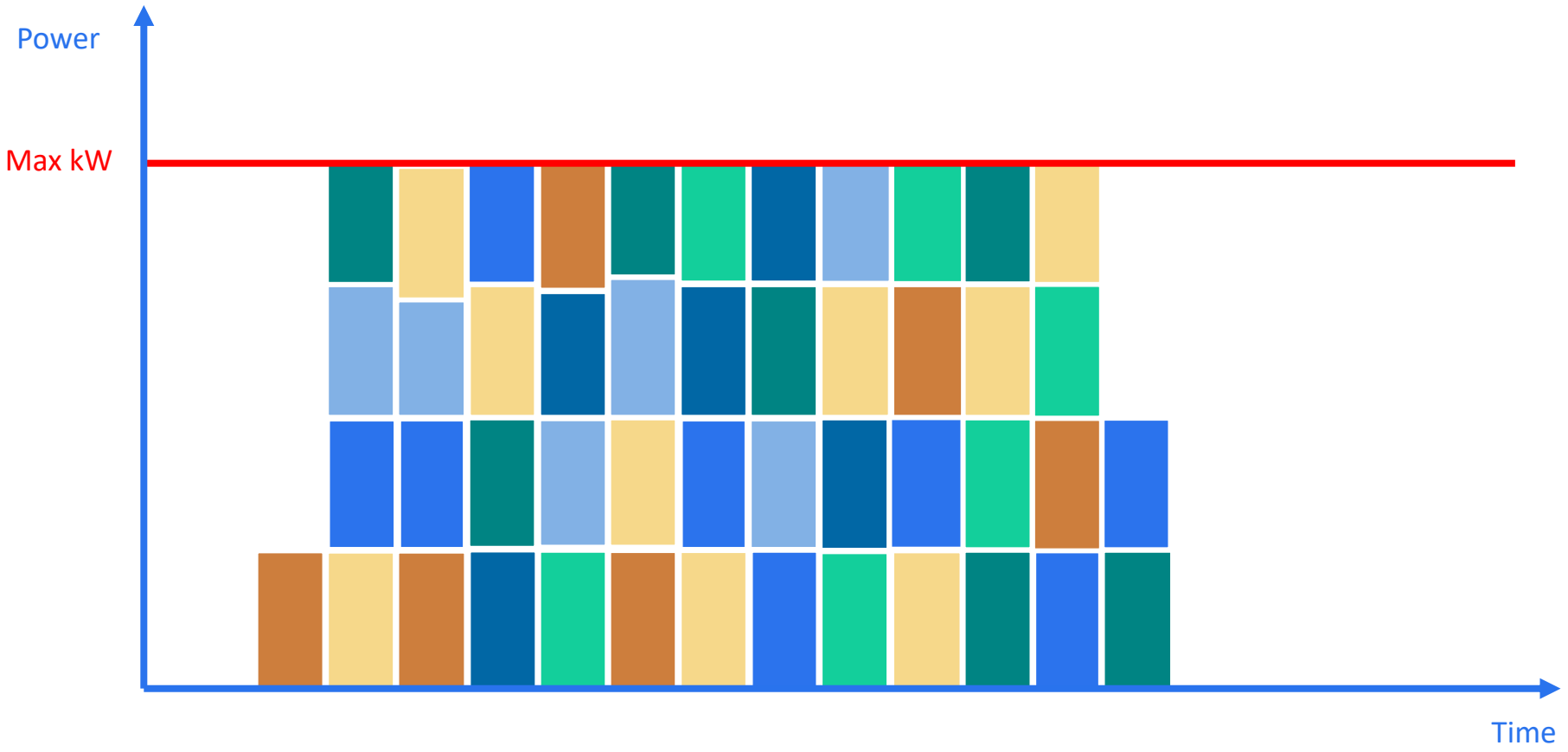
We distribute energy over time



How do we do it



How do we do it



Use case

Head office of the largest Dutch grid operator

ENEXIS NETBEHEER

2013: 16 chargers at 250A
2018: 100 chargers at 400A

Smart charging **saved ~€250.000** on infrastructural costs

Smart charging is active ~10% of the time, resulting in a **90% higher charge rate** for an EV

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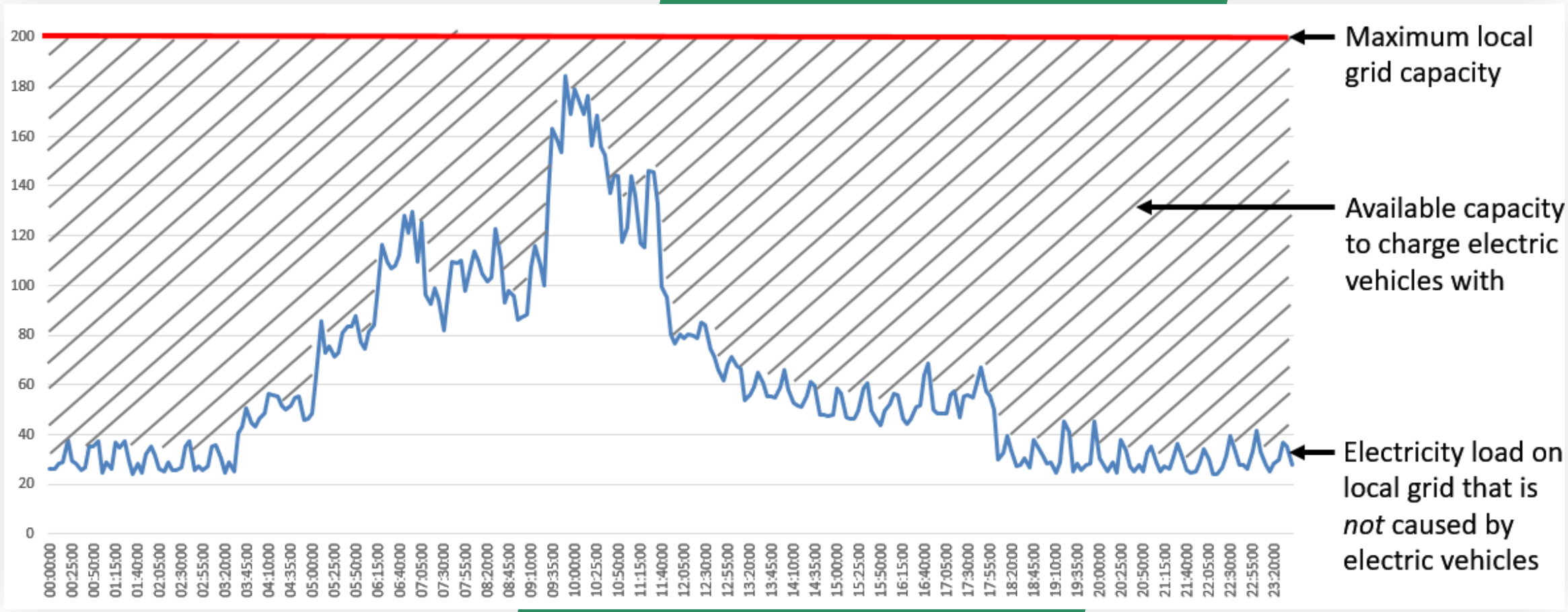
How do we do it



Use case

Electric Nation Project

ELECTRIC NATION
YOUR ELECTRIC VEHICLE YOUR SMART CHARGE

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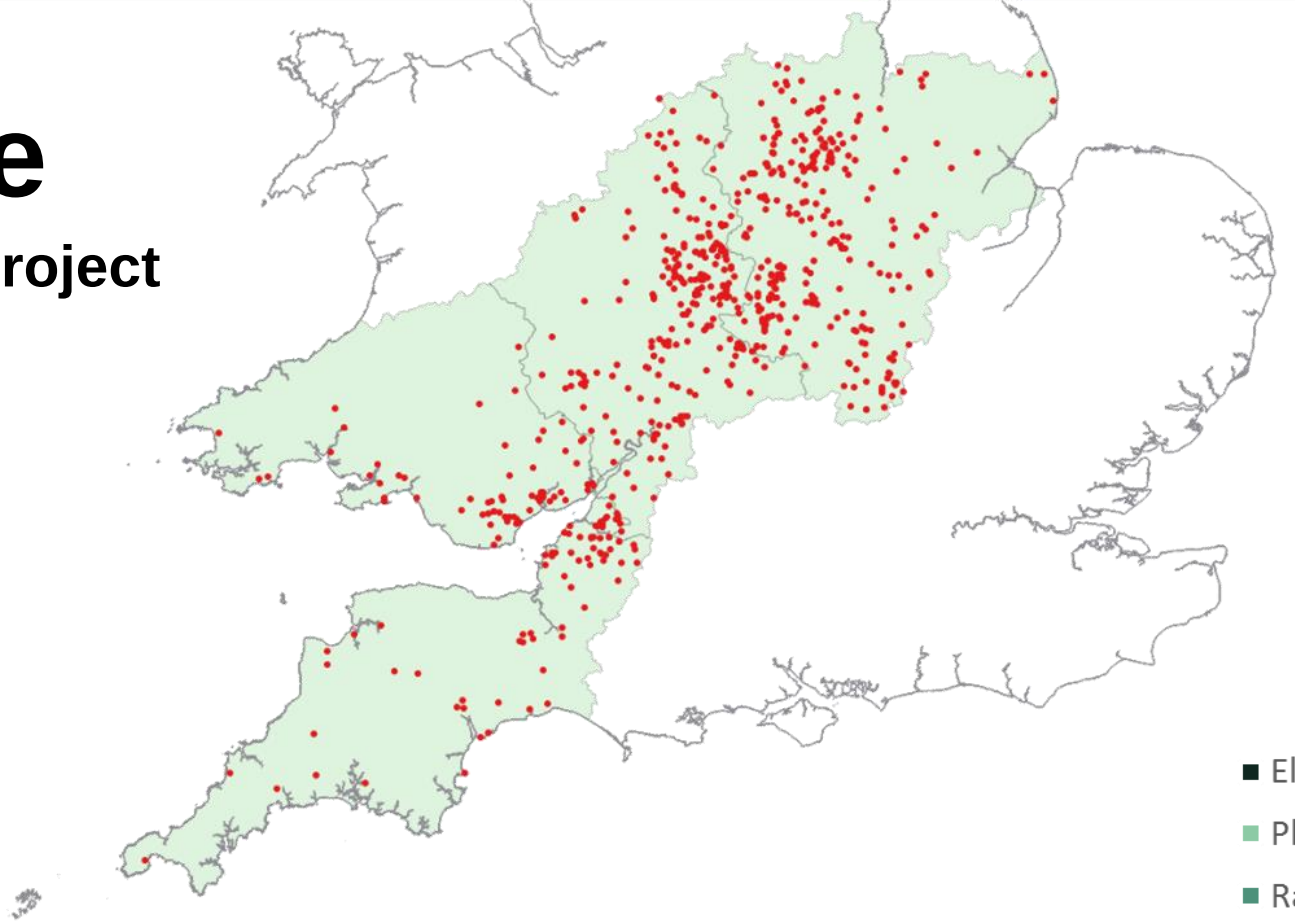
Use case

Electric Nation Project



ELECTRIC NATION
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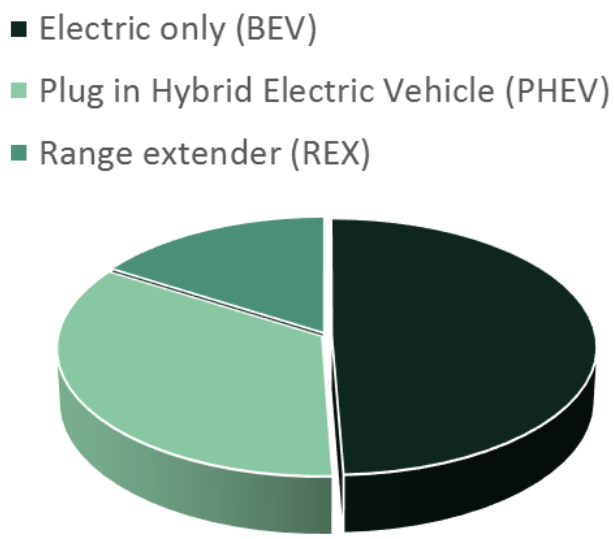

673 participants

2 year trial

Over **130,000** charging events

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Electric Nation

Households come first

ELECTRIC NATION

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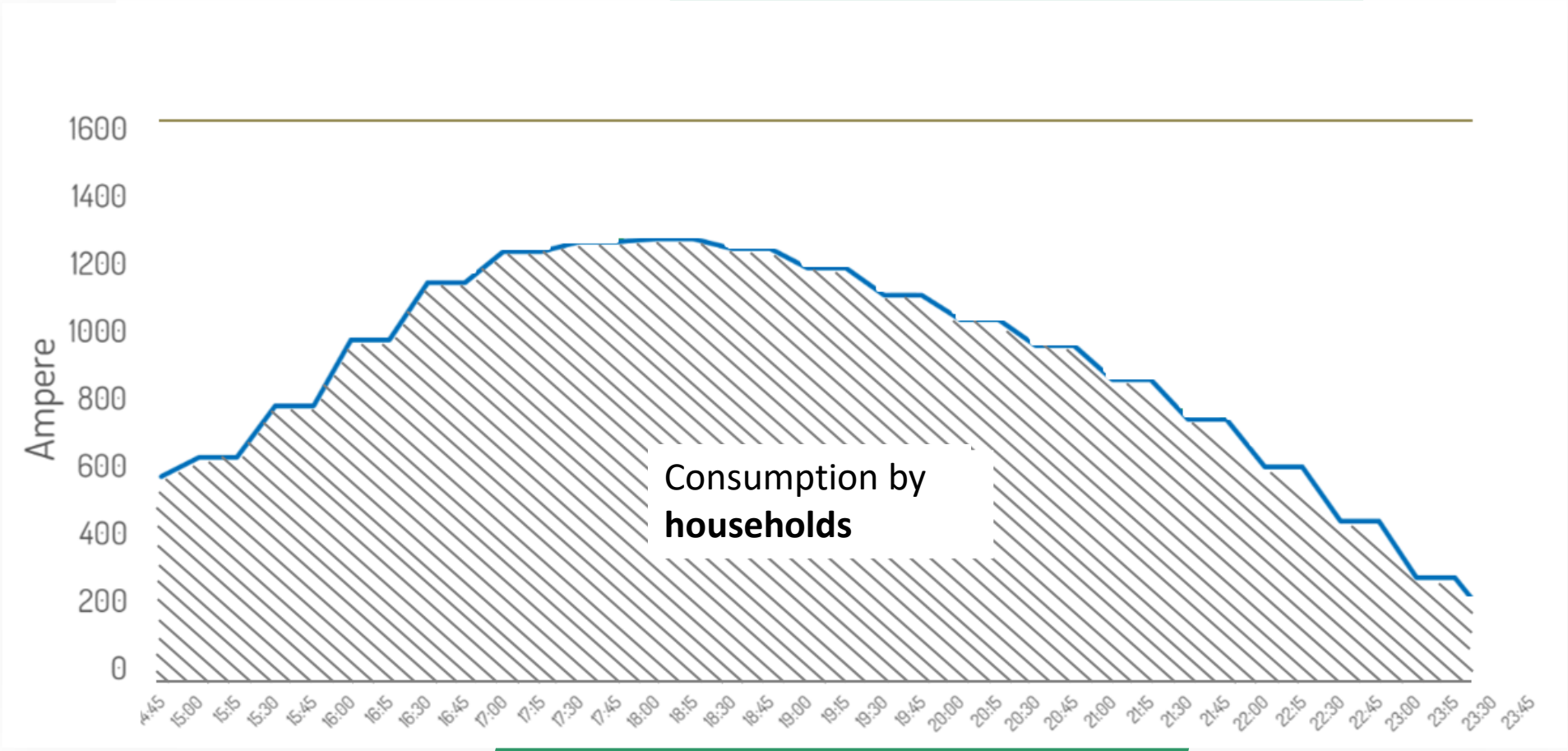

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Electric Nation

Households come first

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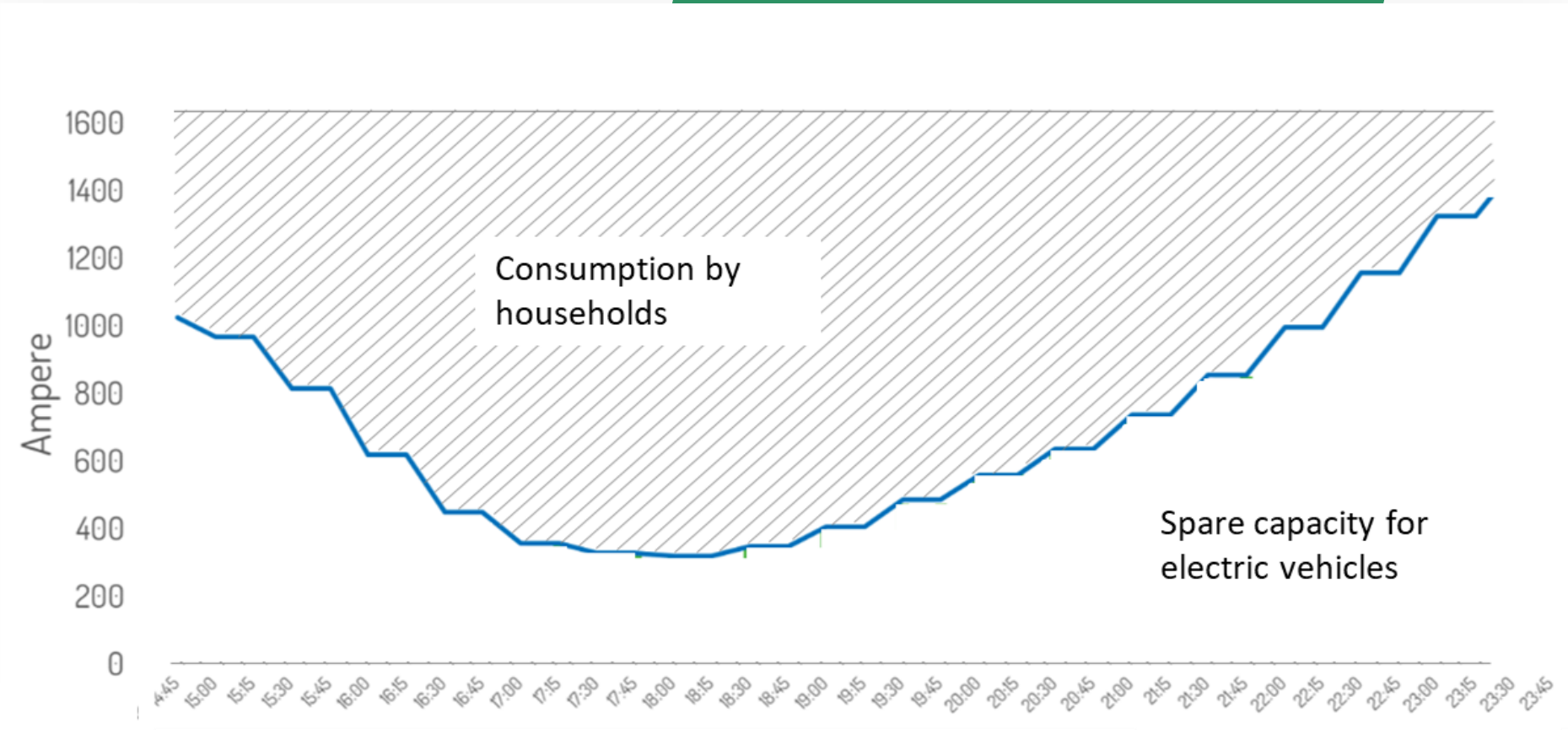

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Electric Nation

Households come first

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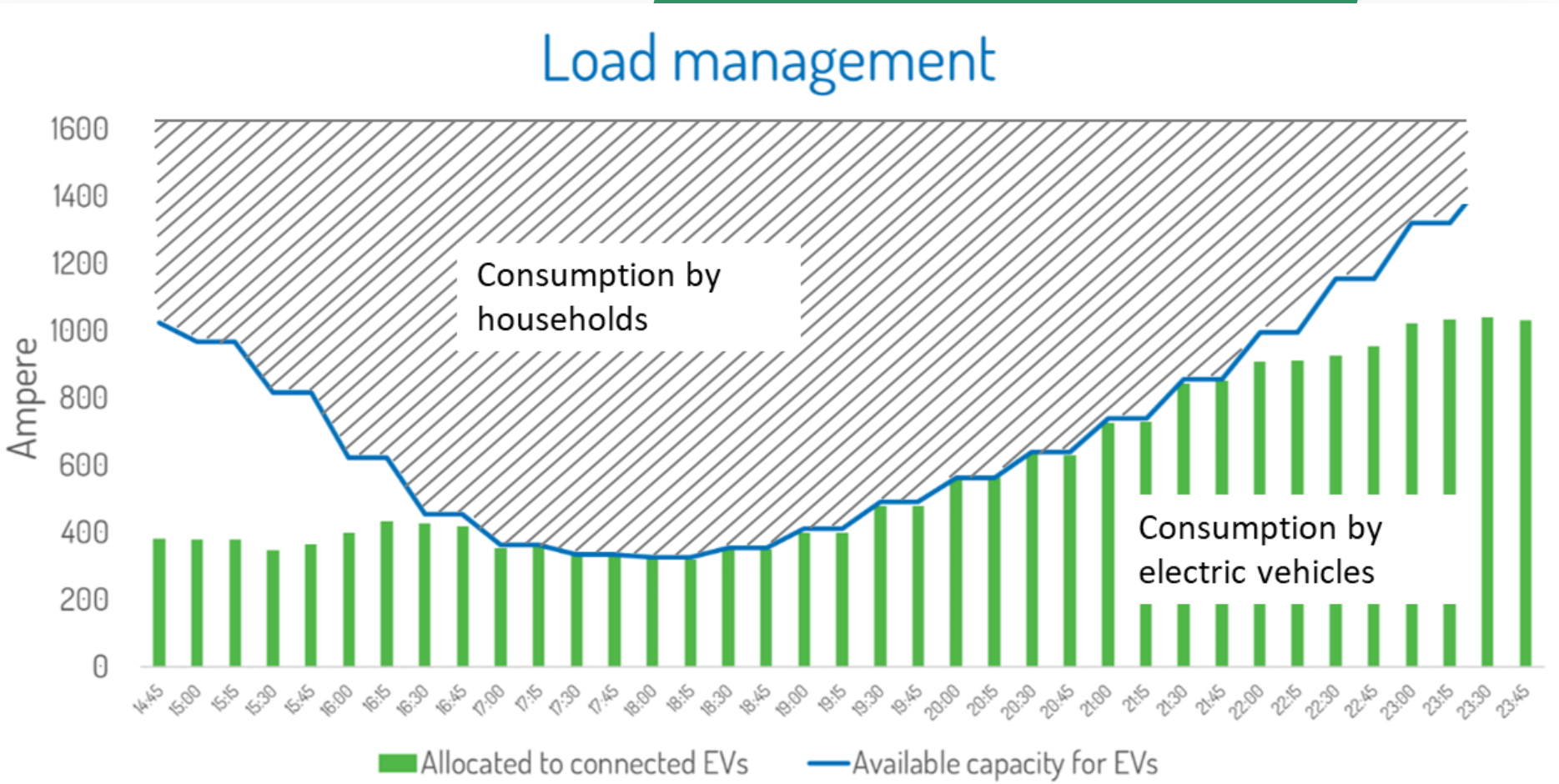

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ELECTRIC NATION

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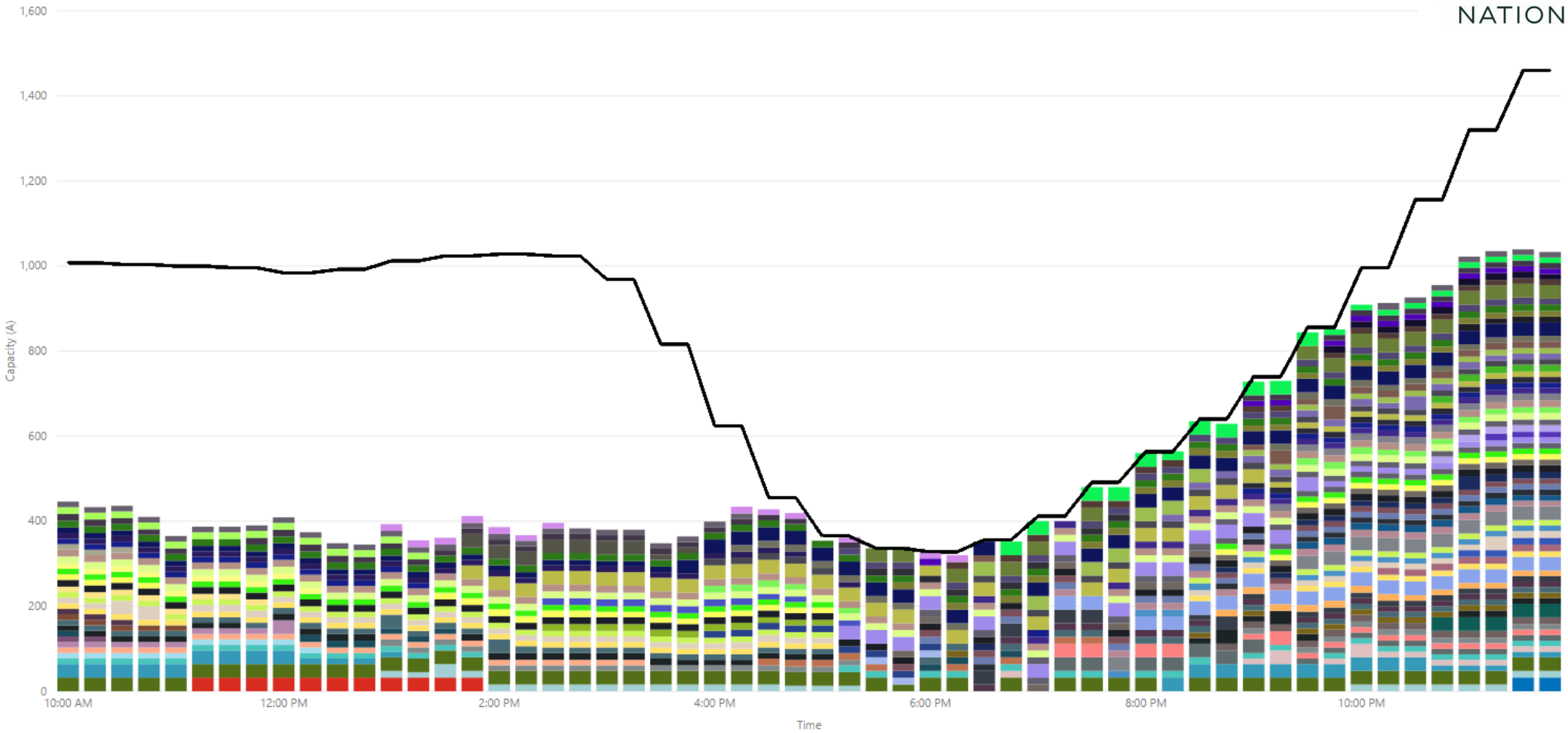

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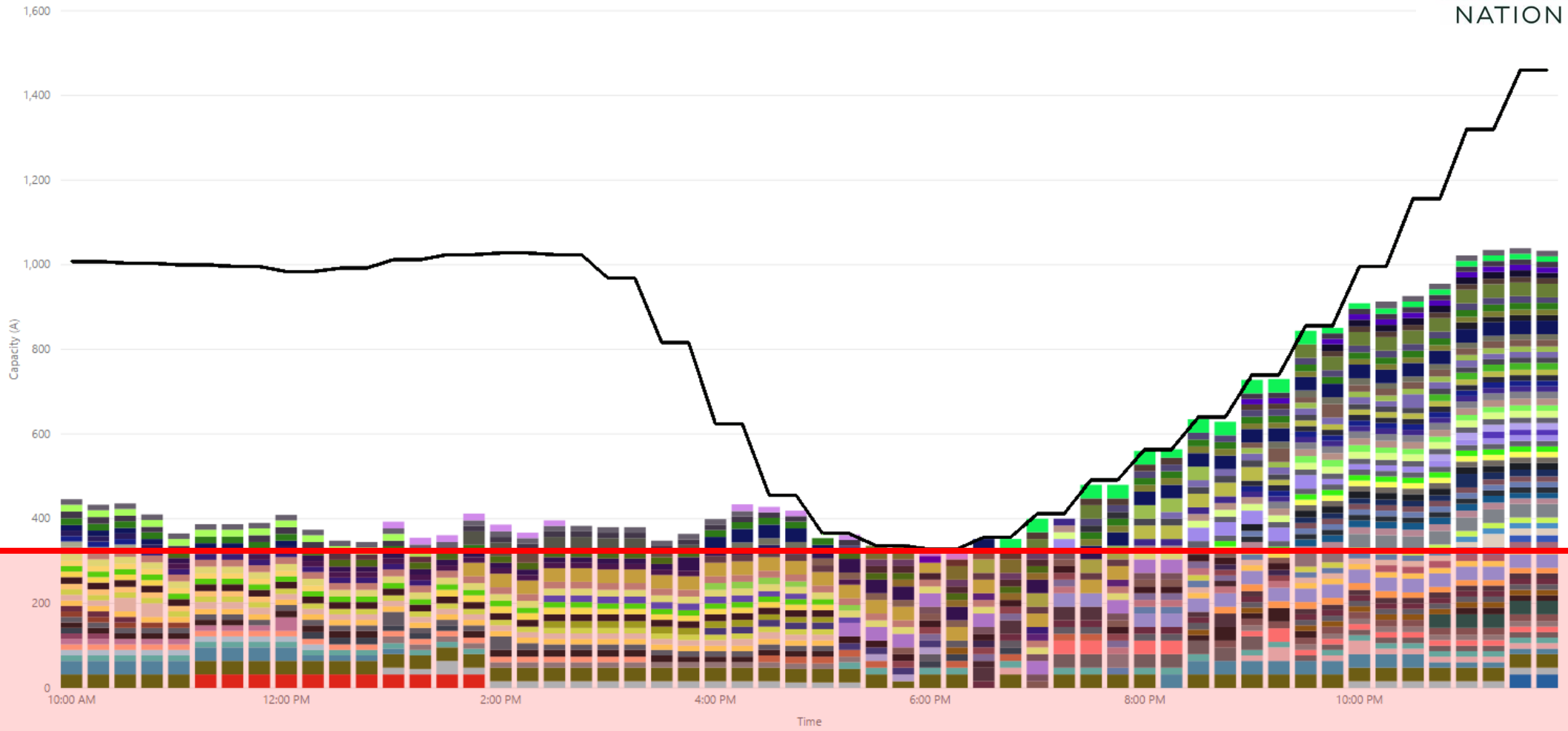

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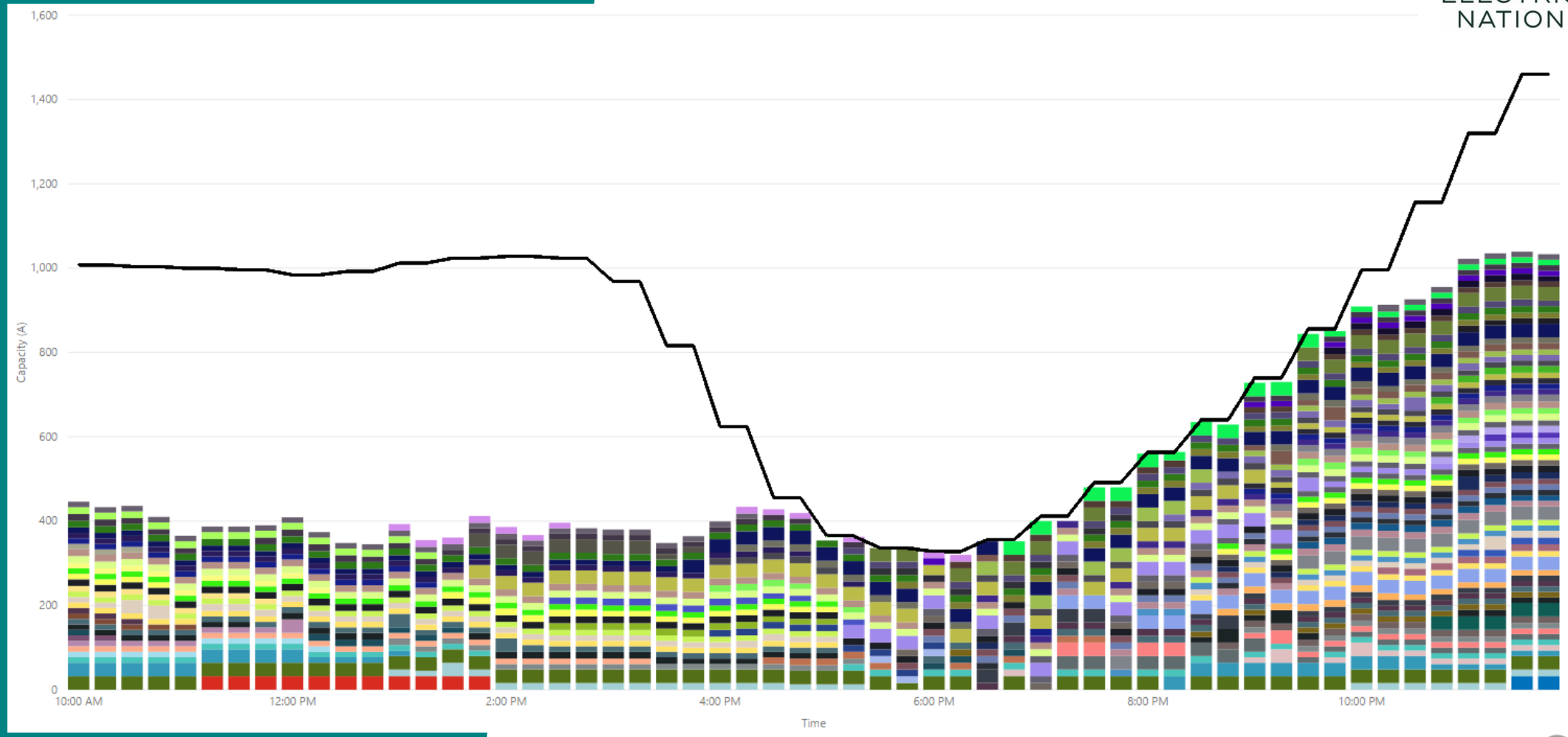
1st iteration

ELECTRIC NATION

YOUR ELECTRIC VEHICLE YOUR SMART CHARGE



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2nd iteration

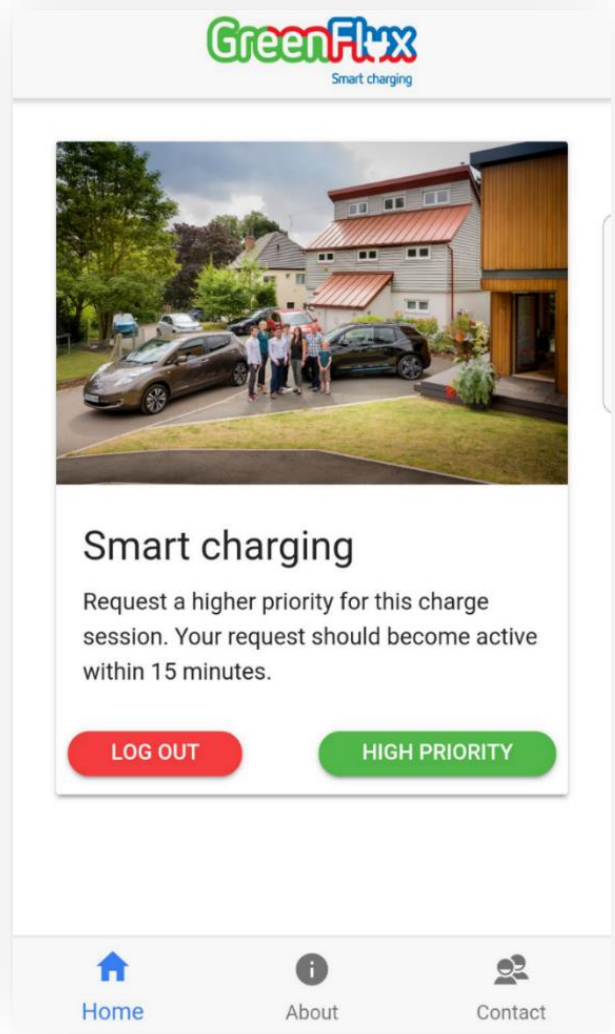
High Priority

↑ ↓

Medium Priority

↑ ↓

Low Priority



Electric Nation project learnings

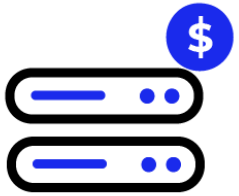
Smart charging can be a challenge

1. Most **Data** is not available, so algorithms must do without

2. Some cars do not respond to smart charging **signals**

3. Some cars are on **timers**

4. Possible **network failure** requires fallback scenario’s



5. **Data costs** can ruin your business case

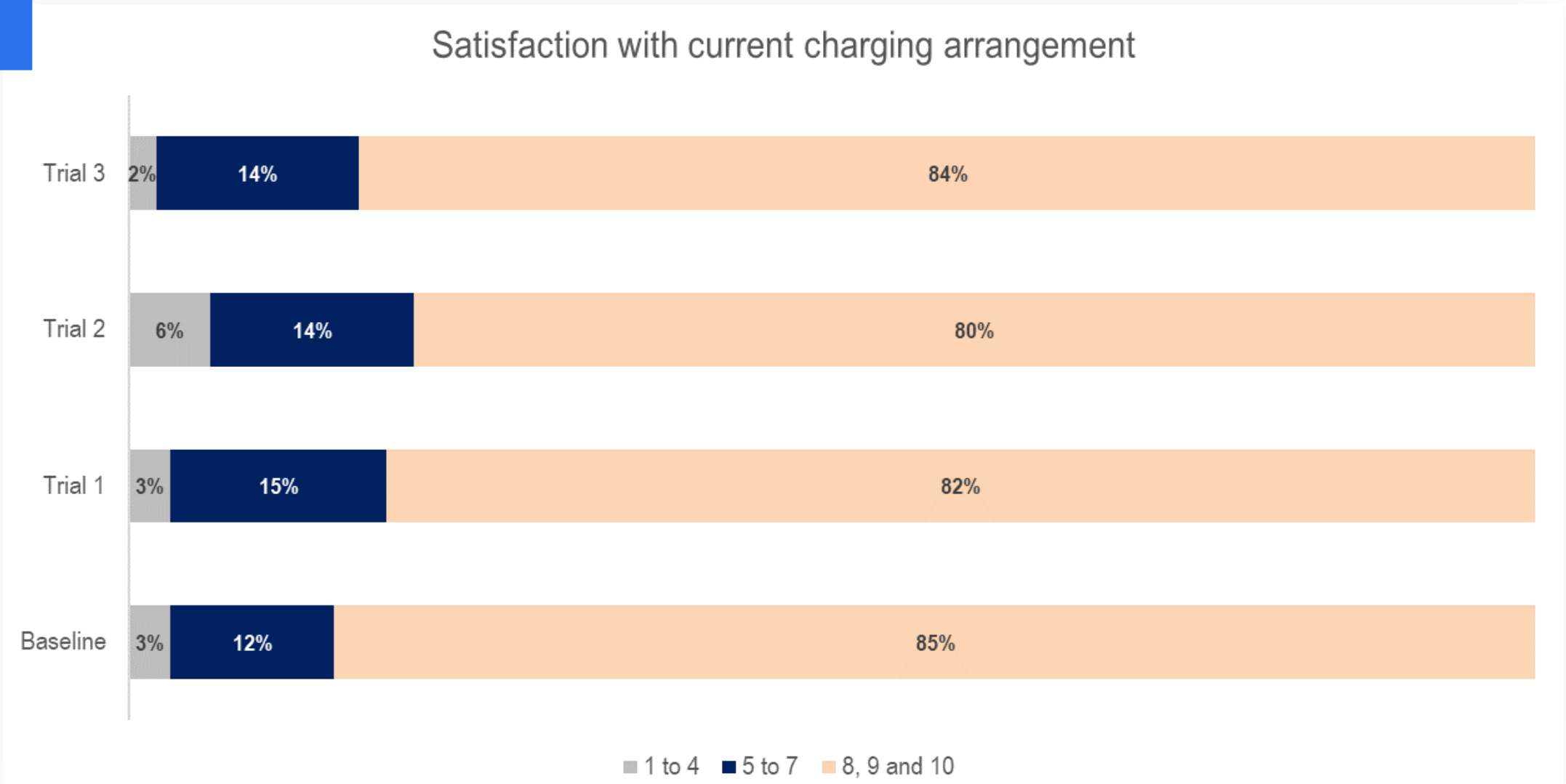
6. Limited **bandwidth** with 2G

Electric Nation
Project Learnings

1

Demand management is **technically feasible**, and **acceptable** to the majority of participants.

1


Satisfaction with current charging arrangement
Trial 3
2%
14%
84%
Trial 2
6%
14%
80%
Trial 1
3%
15%
82%
Baseline
3%
12%
85%
1 to 4
5 to 7
8, 9 and 10

2

Data from smart chargers can provide a **strong data source** for building an evidence base for future developments.

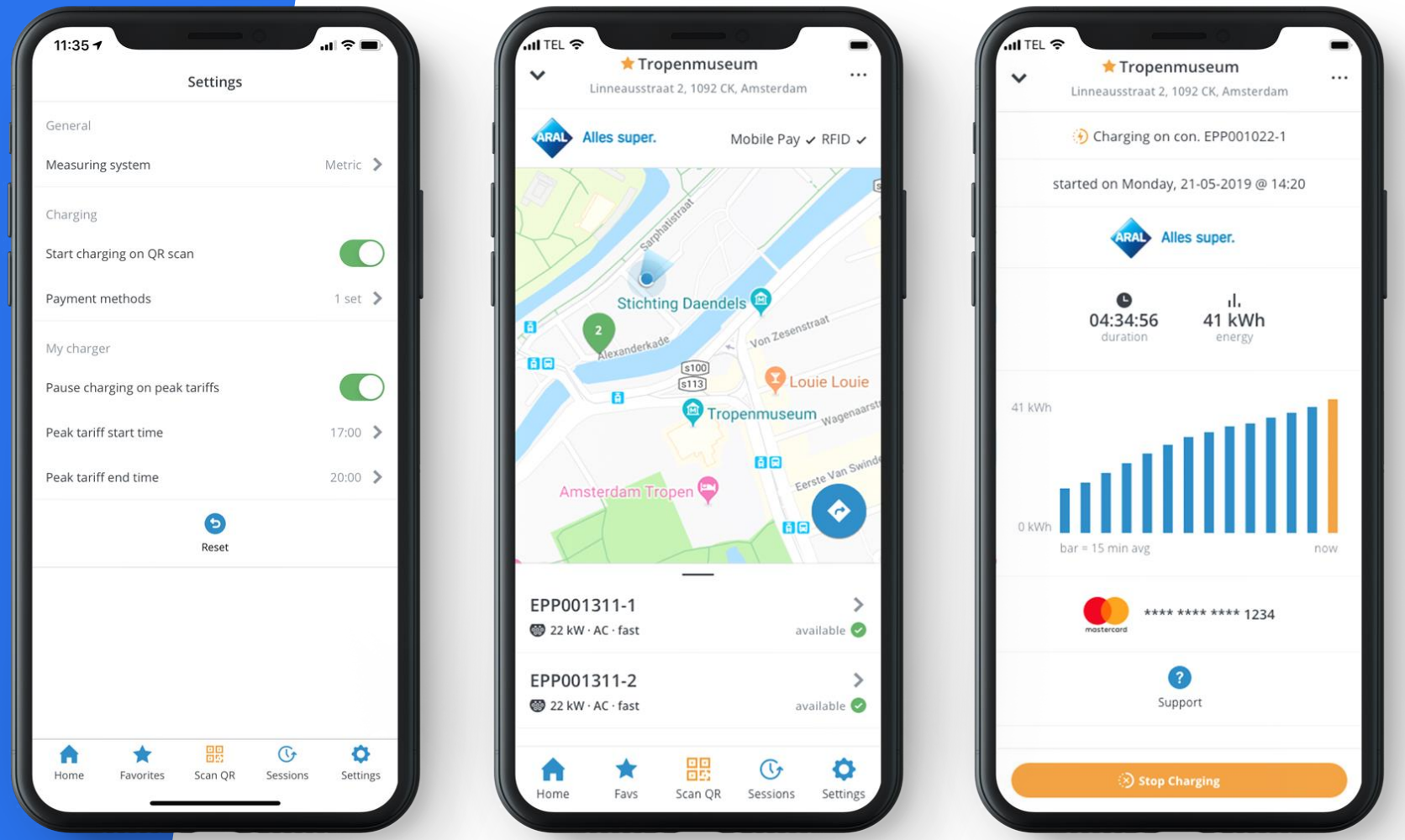
Data shows there is **a lot of flexibility** in EV charging.

3

Informing and empowering EV-drivers is essential and it needs to be easy.

3

- Find chargers
- Smart charging
- Roaming and Paying



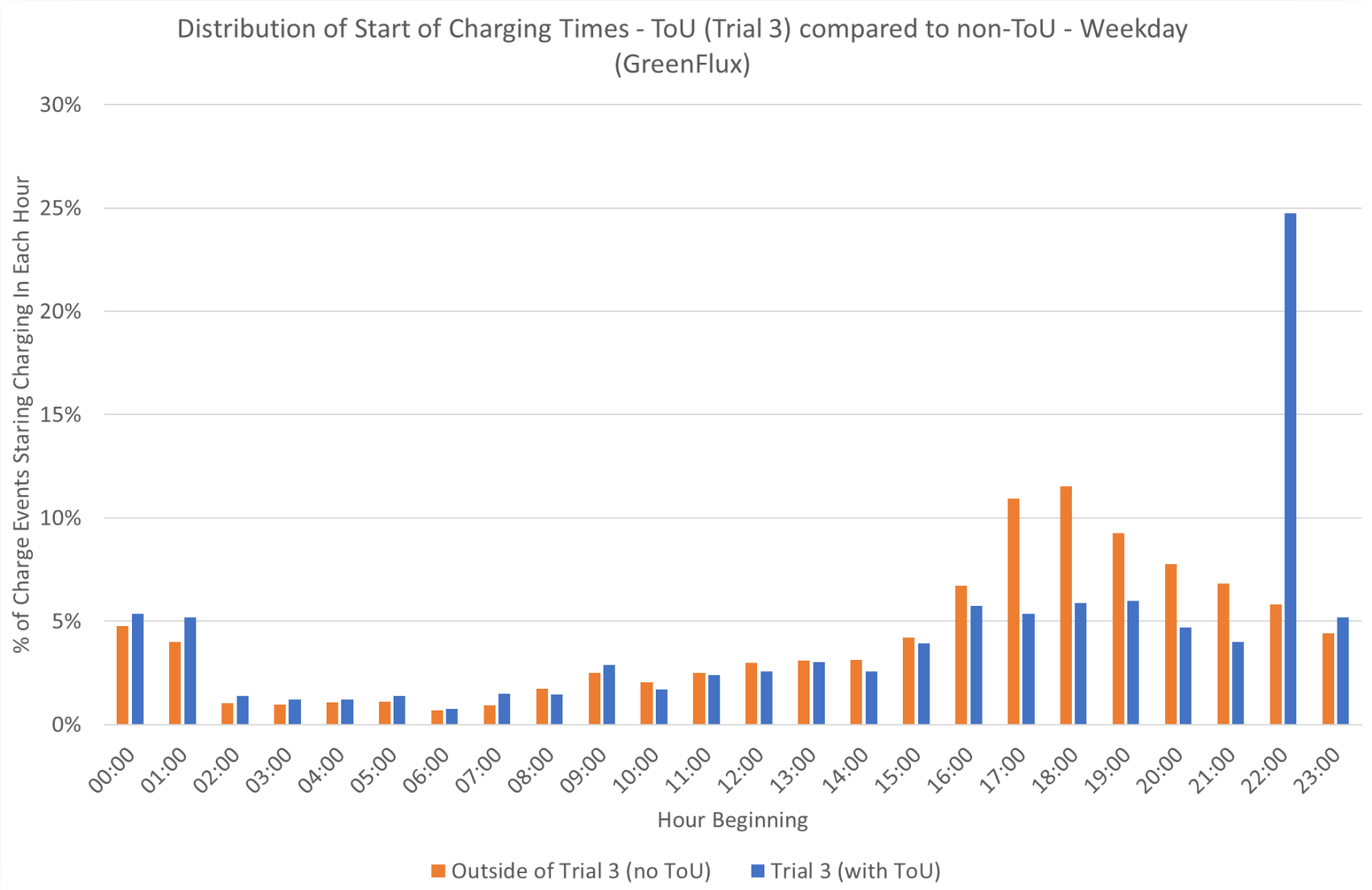
The best apps never leave the pocket

4

Trial data shows that **Time of Use incentives** appear to be highly effective at moving demand away from the evening peak.

The **right incentive is crucial** though.

Time of Use tariffs



4

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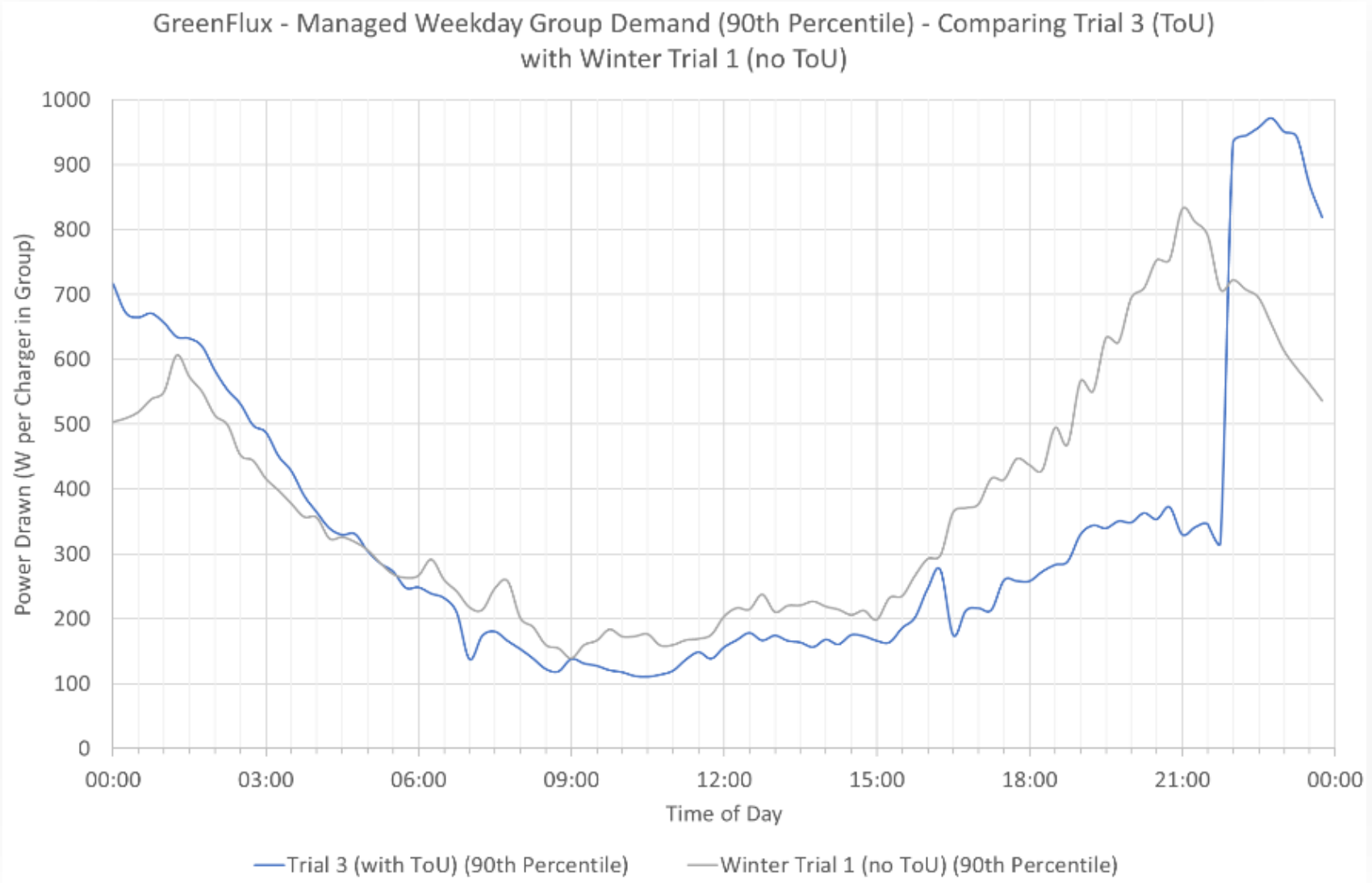
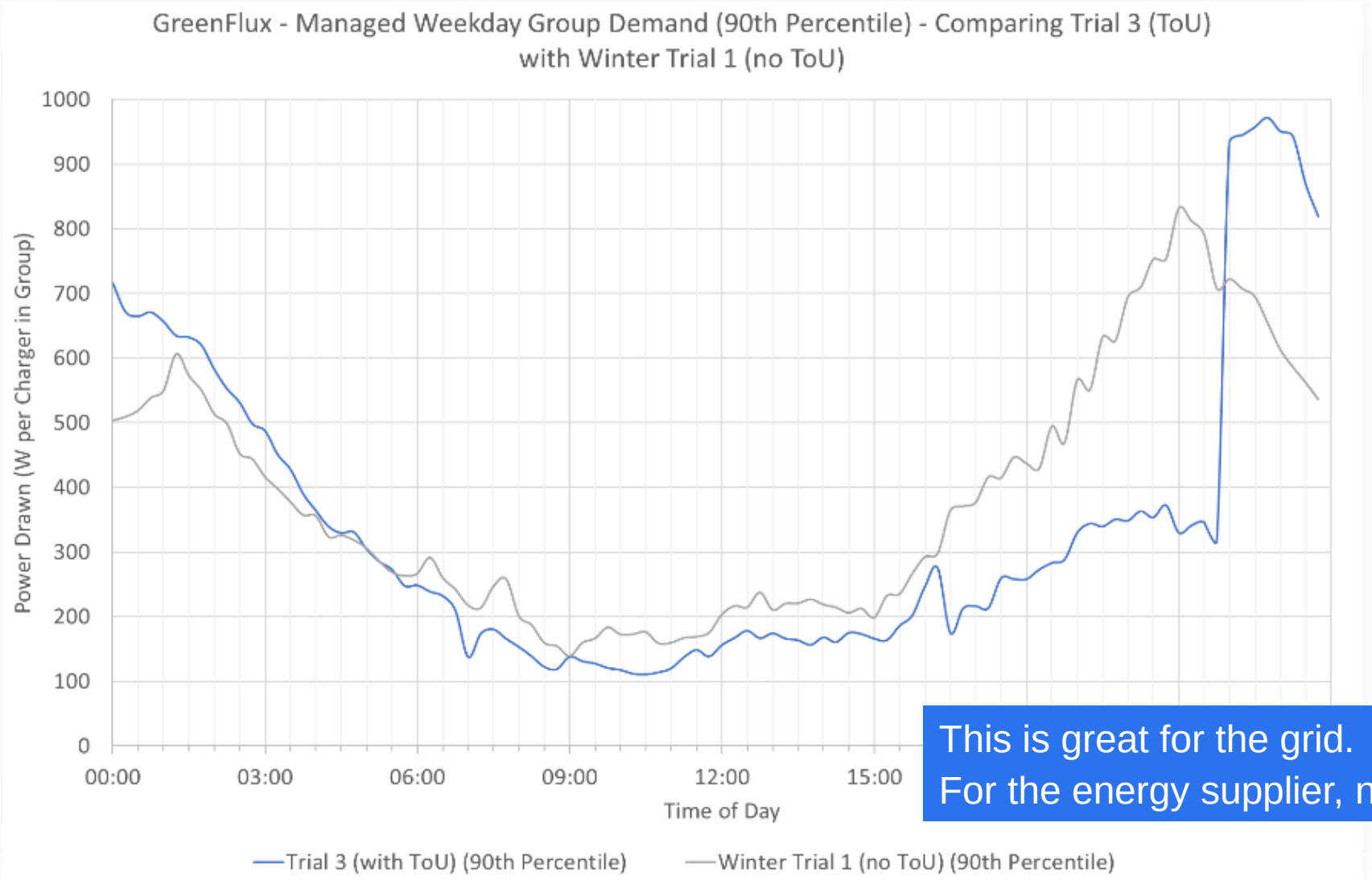
Time of Use tariffs



4

Time of Use tariffs



4

This is great for the grid.
For the energy supplier, not so much

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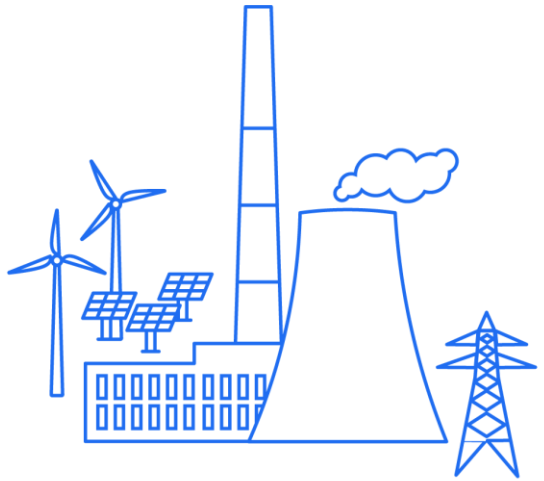
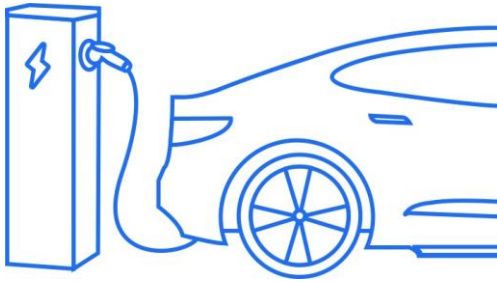
What we now offer

Grid limitations

Wholesale markets





Fixed discount / free charger / saving for towels …

4

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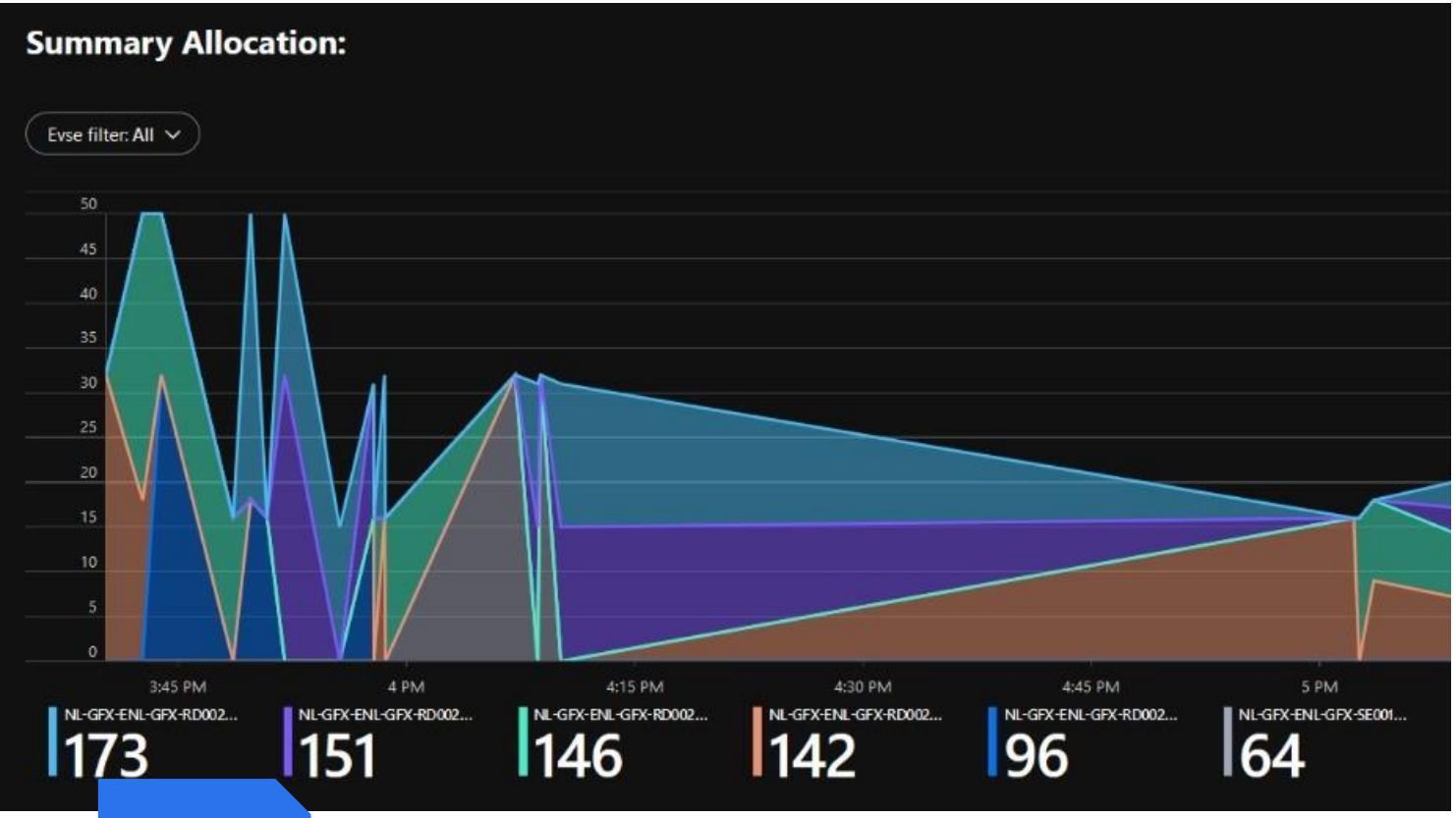
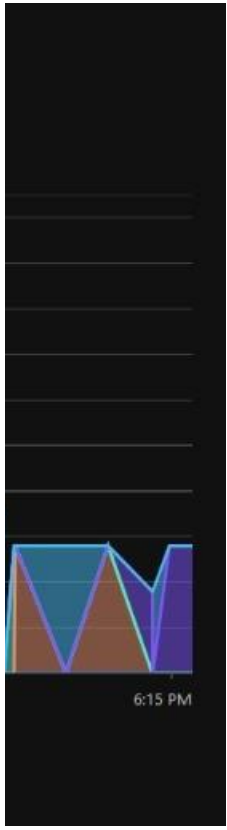
Switching to event-based algorithms



Responding directly to events:

- Start of charge session
- Stop of charge session
- EV nearly full
- EV full
- High priority request from driver
- High priority request from charger
- DC charger starting a session
- Sudden change in available capacity
- New setpoint from energy supplier
- New setpoint from TSO
- …



5

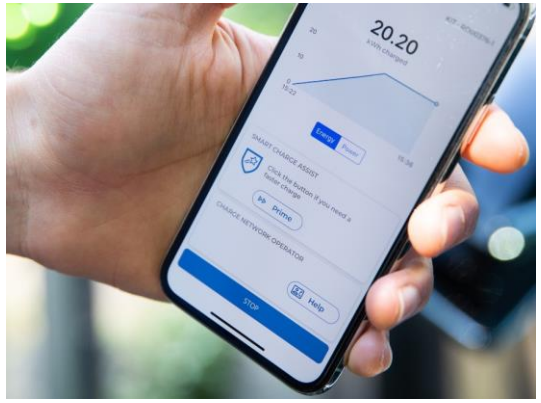
6

We can apply all of this **TODAY.**

Why do you do smart charging?

GRID CONSTRAINTS

DYNAMIC ENERGY PRICES



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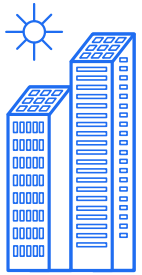

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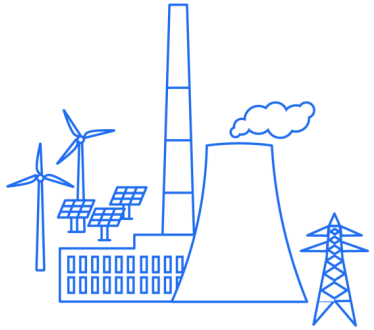

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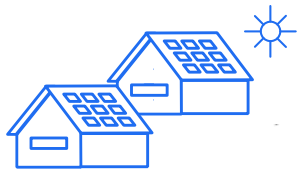

input

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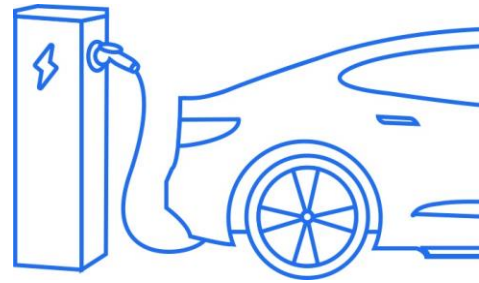
smart signal



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Project summary: https://www.westernpower.co.uk/downloads/64369