



Flexpower
Amsterdam

Friso Schuring
June 5th, 2019



Introduction to FlexPower Amsterdam

Amsterdam aims to be
an emission free city
by 2030



Amsterdam wants
its drivers to make a
seamless transition
to the electric car

Uitstootvrij Amsterdam



Communiceren maakt de noodzaak van schone lucht helder en biedt handelingsperspectief (je voelt je betrokken bij de mogelijkheden)



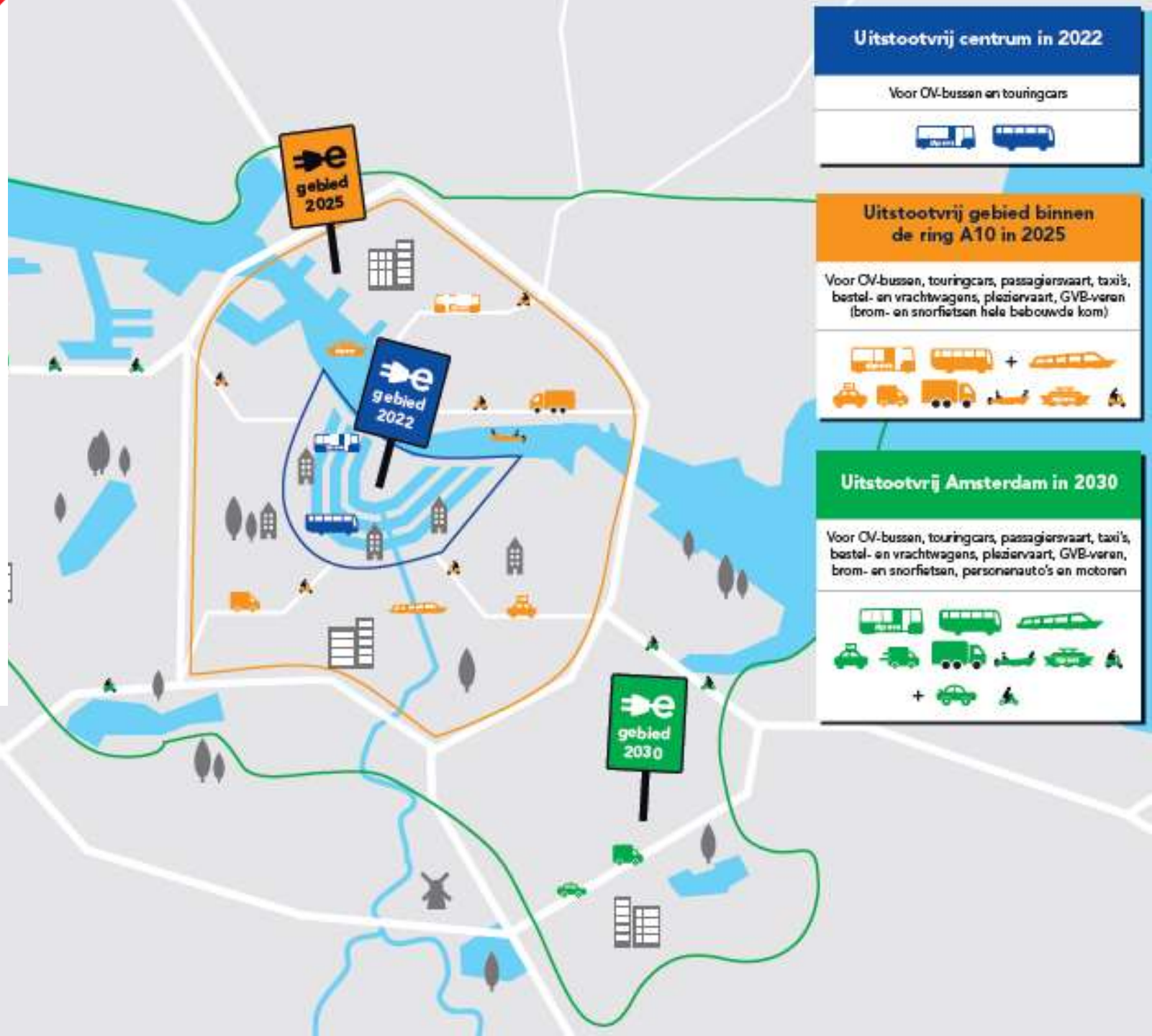
Stimuleren maakt de overstap naar een schoon alternatief aantrekkelijk (het alternatief is aantrekkelijk)



Faciliteren maakt de overstap naar een schoon alternatief mogelijk (het alternatief is reëel)

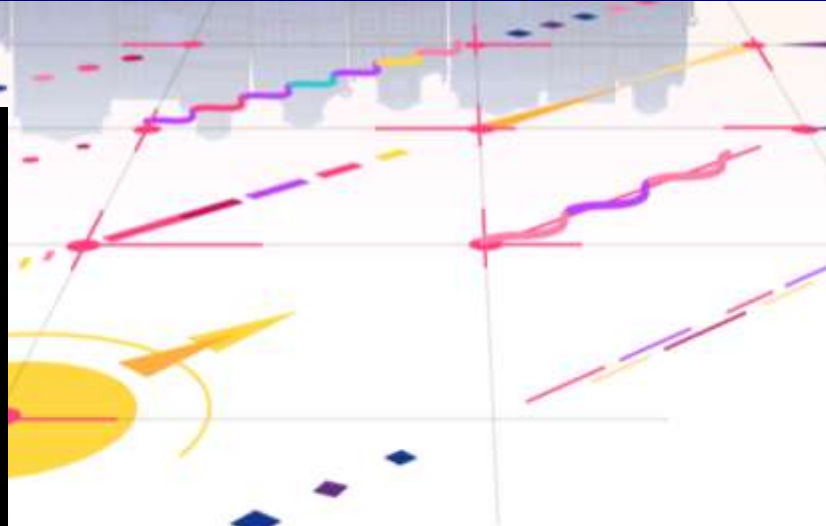


Reguleren verplicht de overstap naar een schoon alternatief (er is een stok achter de deur).



Electricity System Challenge

On average an electric car will need 3.000kWh per year, that's about the same as a household. Our century will have to handle



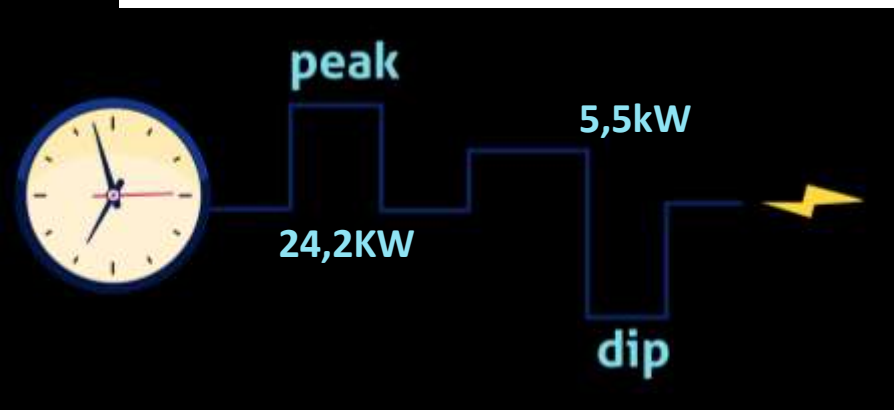
With larger batteries an electric car will charge for hours with a charging speed 10 times as high as the peak demand of a single household. This will become a challenge for the LV-grid and electricity peak production when electric cars become mainstream.

Basic idea behind FlexPower

Faster Charging
when there is a surplus
of renewable energy

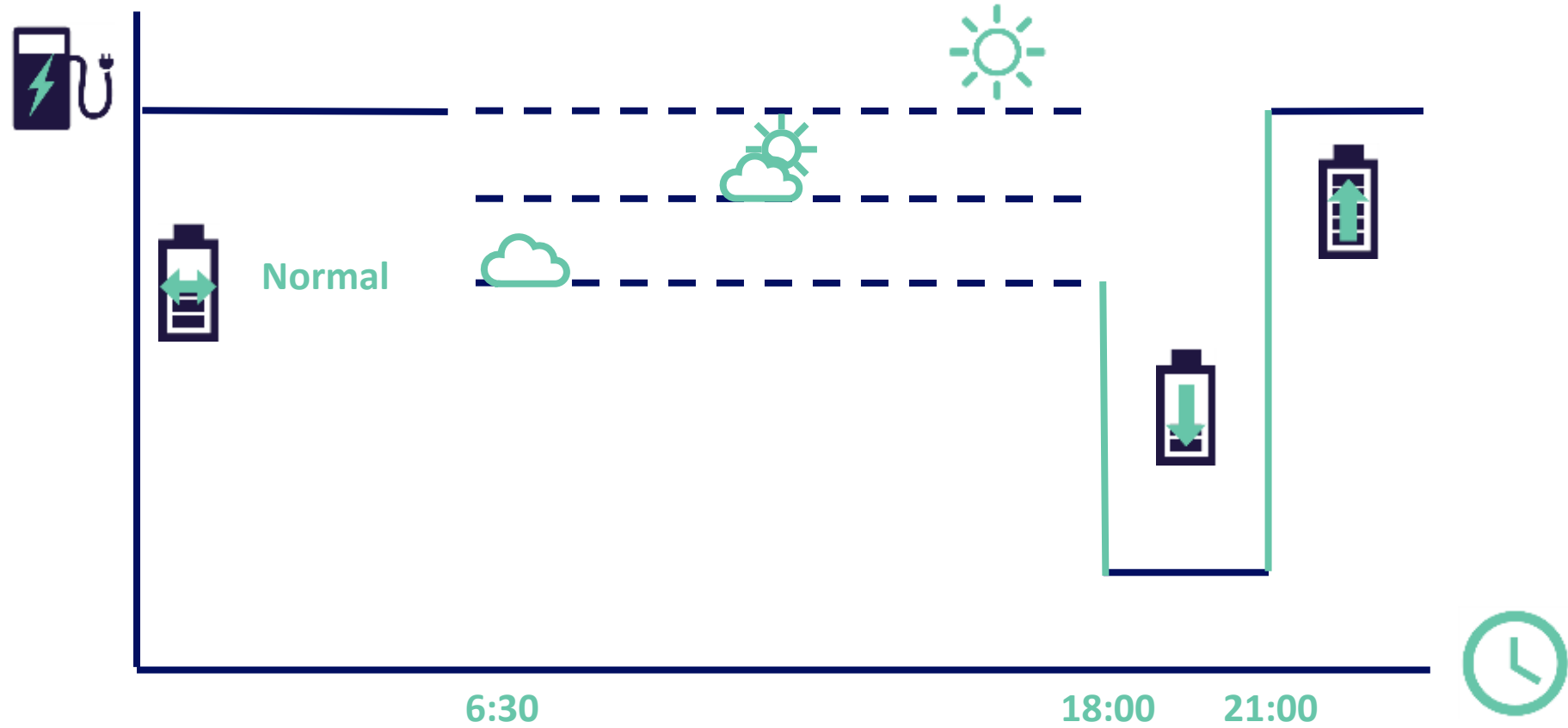


Slower Charging
when demand
for energy is high



Daily balance game

BALANCE

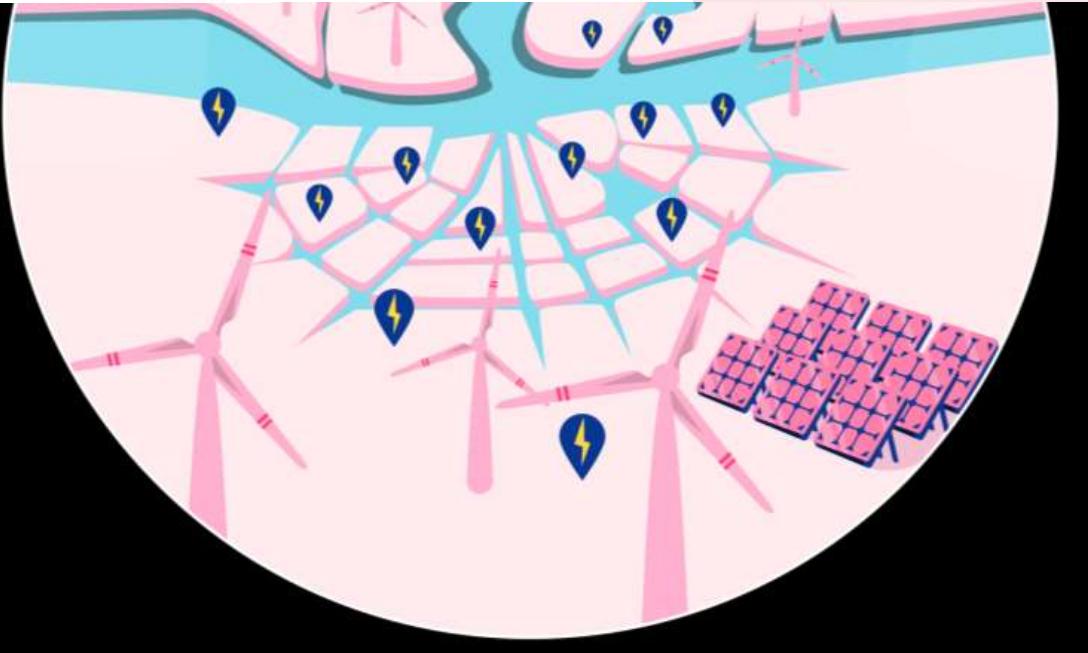


Launch Phase 2 2019 May 7th

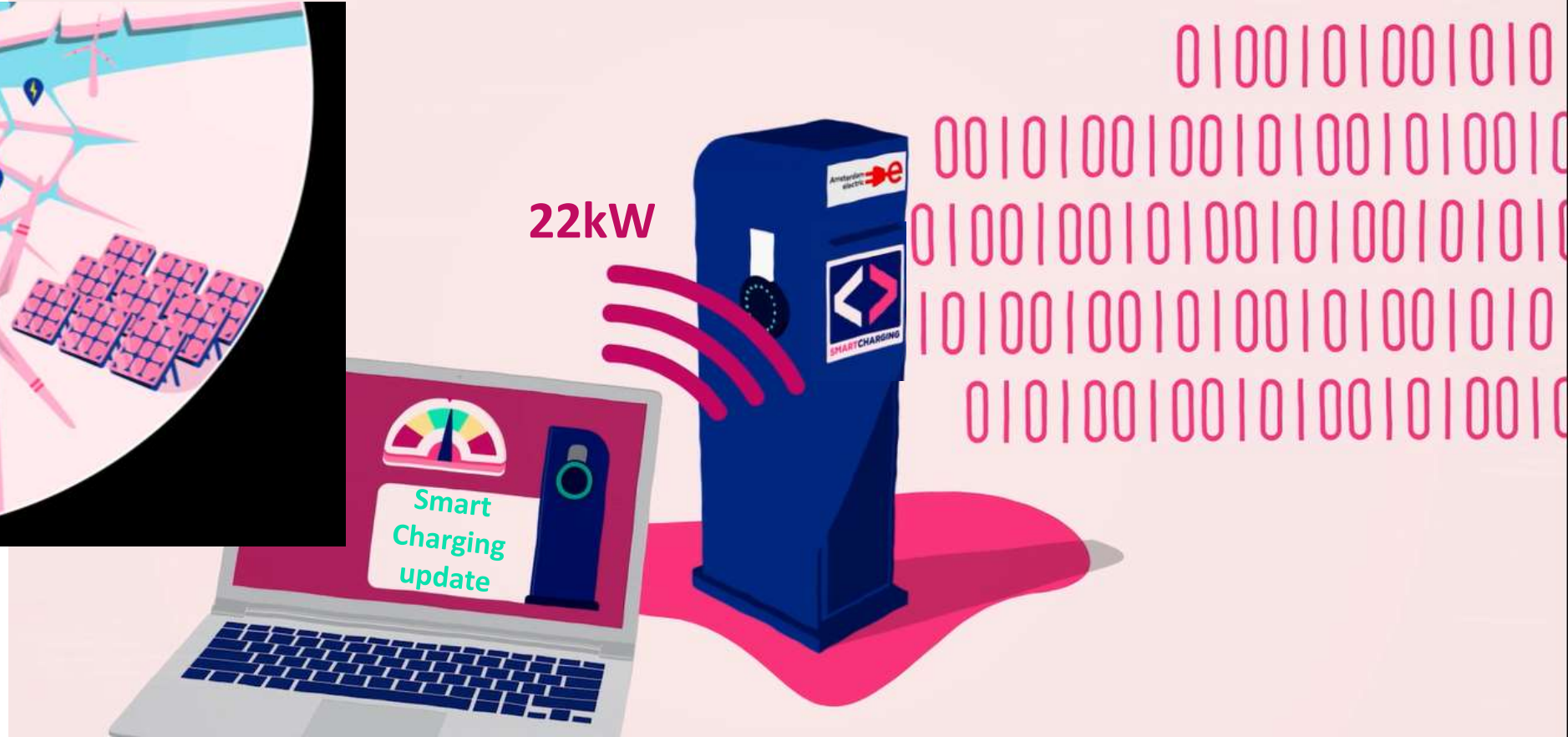




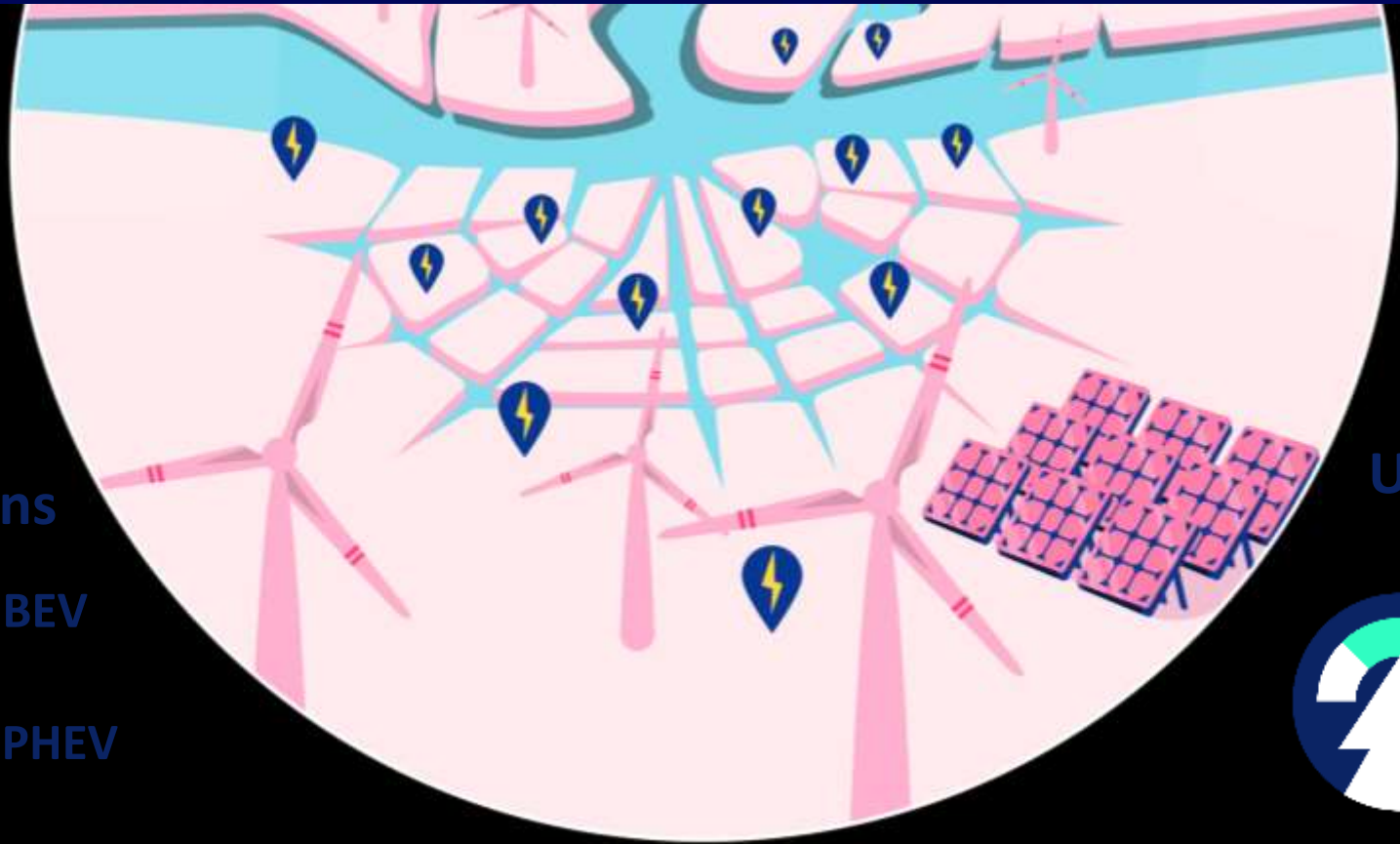
Scaling up using open standards for interoperability and scalability



456
FlexPower
Chargers



Lessons from Pilot phase



52
Chargers



7.738
Unique users



41.605 transactions



226.386 kWh

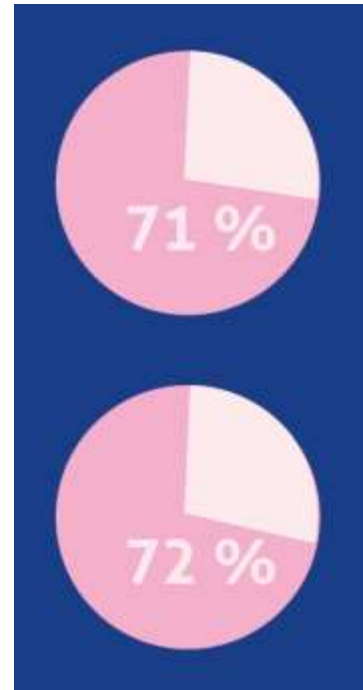


20.642 BEV



20.625 PHEV

Outcomes are very promising!



... of **fully electric cars (BEV)** charged with a higher power level. In 70% of the cases of cars that were not fully charged on departure, these cars had charged more energy.



... of **hybrid electric cars (PHEV)** were charged with the same power level. 95% of PHEVs charged the same energy as when using standard charging stations. Only 2% charged less energy.

Rush hour is controlled effectively, but unfortunately also results in new peak after 8pm



FLEXIBLE POWER BY CHARGING SMART AMSTERDAM SMART CHARGING THE FUTURE



A PROJECT BY



Contact us for more information



Friso.Schuring@Alliander.com

<https://amsterdamsmartcity.com/projects/flexpower-amsterdam>





Flexpower
Amsterdam

Friso Schuring
June 5th, 2019



Flexpower Amsterdam

No more CO₂

Amsterdam aims to be an emission free city by 2025

- ✗ Amsterdam wants its drivers to make a seamless transition to the electric car

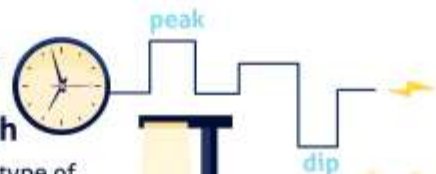
How we do this?

Fast charging when there is a surplus of renewable energy

Power for our public chargers is generated by "Windpoort", a windfarm near Amsterdam operated by NUON.

Slower charging when demand for energy is high

FlexPower uses a new type of connection, which allows for charging speeds to be increased to a maximum of 24.2kW and reduced to 5.5kW when needed



The City of Amsterdam is the global leader in the field of electric transport and has almost 3000 public chargers.

The challenge for our electricity grid is to supply enough power during peak demand. The electric car of the future will have an even larger battery and will be able to charge for hours on end with a speed of 7 kW or even 11 kW. This is 10 times as much as the peak demand of a single household!

Flexpower Mass-charging electric vehicles by using flexible charging speeds

Due to the arrival of the electric car, the demand for power will rise sharply. On average, an electric car will need about 3,000 kWh per year, that's about the same as an average household in the Netherlands. Don't worry, calculations show that our electricity grid will be able to handle the extra load!

THIS WAY WE MAKE OPTIMAL USE OF OUR ELECTRICITY GRID



KEY FIGURES



Flexpower

Pilot

Outcomes are very promising!

duration

19 MONTHS



Our electricity grid

The evening peak demand hasn't increased any further, however, the length of the peak did increase. Immediately after 20:00, we see a slight increase in demand, as EVs are starting to charge faster again. We therefore learned that we had to increase supply just after the evening peak.



The Pilot ran on **104** charging points, divided over 52 chargers in Amsterdam City Center, West, New-West and South

7.738

unique users participated in the pilot

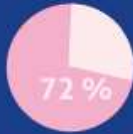


226.386 kWh

was charged by FlexPower chargers



71% of **fully electric cars** charged with a higher payload. In 70% of the cases of cars that were not fully charged on departure, these cars had more energy.



72% of **plugin hybrid EVs (PHEV)** were charged with the same level of power. 95% of PHEVs charged the same energy as when using standard charging stations. Only 2% charged less energy.

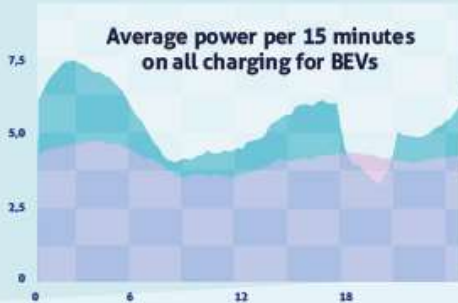
41.605 transactions

- 20.642 BEV
- 20.625 PHEV



On average, BEV charging speeds increased by **30%**

*excluding 1x16A BEVs



Due to a higher charging speed during the day, more power from solar panels is used.

Contact us for more information



Friso.Schuring@Alliander.com

<https://amsterdamsmartcity.com/projects/flexpower-amsterdam>