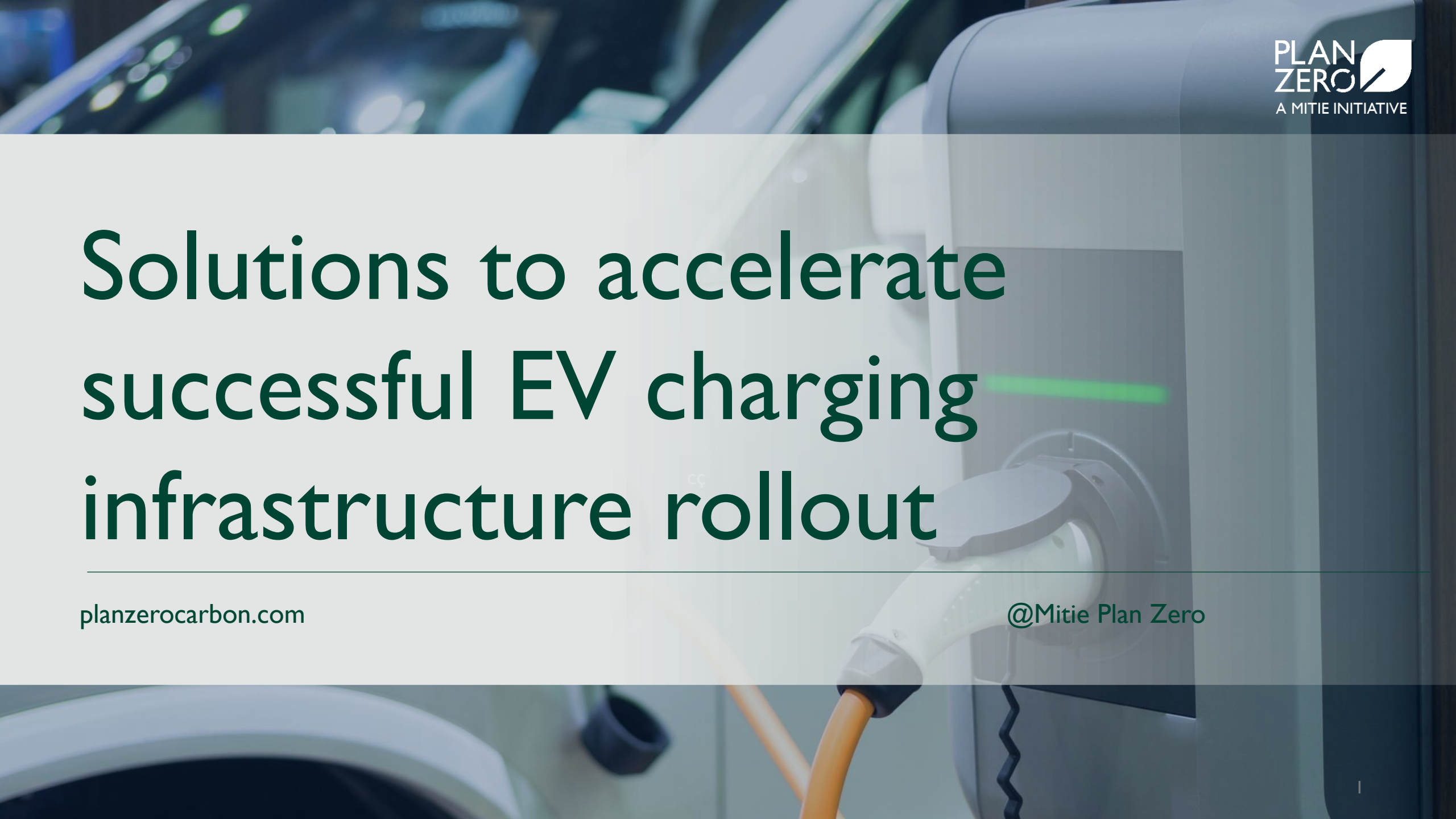


PLAN ZERO
A MITIE INITIATIVE

Solutions to accelerate successful EV charging infrastructure rollout

planzerocarbon.com

@Mitie Plan Zero

PLAN ZERO
A MITIE INITIATIVE

Welcome

Simon King
Director of Sustainability and Social Value, Mitie

PLAN ZERO
A MITIE INITIATIVE

Agenda

08:30-08:40 | Simon King – Mitie: Welcome

08:40-08:50 | Charlie Jardine – EO: Implementation of home charging

08:50-09:00 | Simon King – Mitie: Office charging and ensuring a future proof strategy

09:00-09:10 | Sam Clarke – Gridserve: Public charging and the roll out of EV

09:10-09:20 | Chris Wright - Moixa: Delivering value through optimisation software

09:20-09:30 | Alexis Percival – Yorkshire Ambulance: Integration of Blue Light services

09:30-10:00 | Discussion/Q&A

PLAN ZERO
A MITIE INITIATIVE

The Implementation of home charging

Charlie Jardine

Founder and CEO, EO

Solutions to accelerate successful EV charging infrastructure rollout.

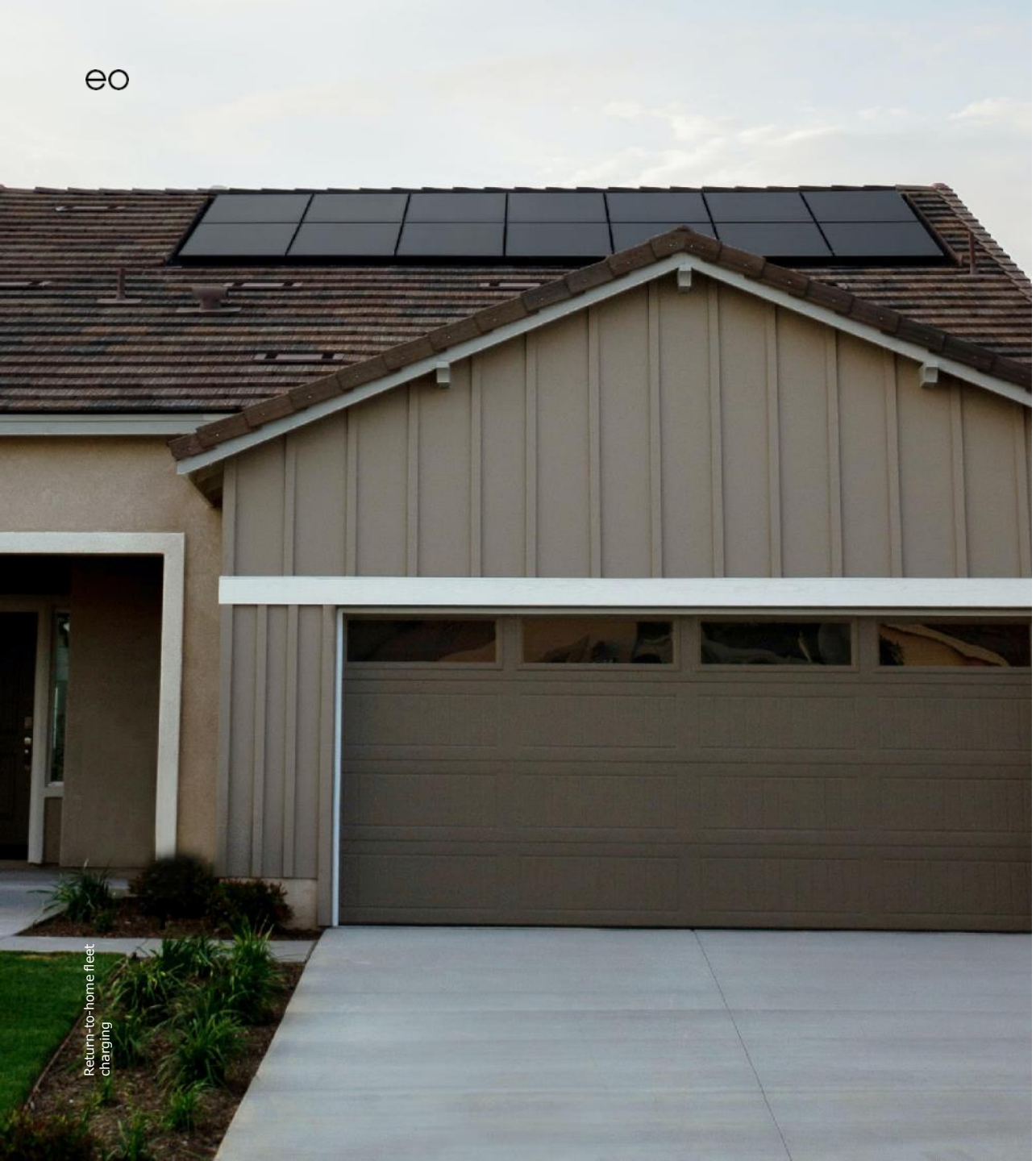
June 2021

eocharging.com

eo

Hello.

Charlie Jardine
Founder & CEO
EO Charging



Understanding return-to-home fleet charging.

If you have a driveway and take your vehicle home from work, then charging at home is often cheaper and easier than charging on-the-go or back at the depot. For anyone driving less than 100 miles a day, there is simply no need to charge anywhere else.

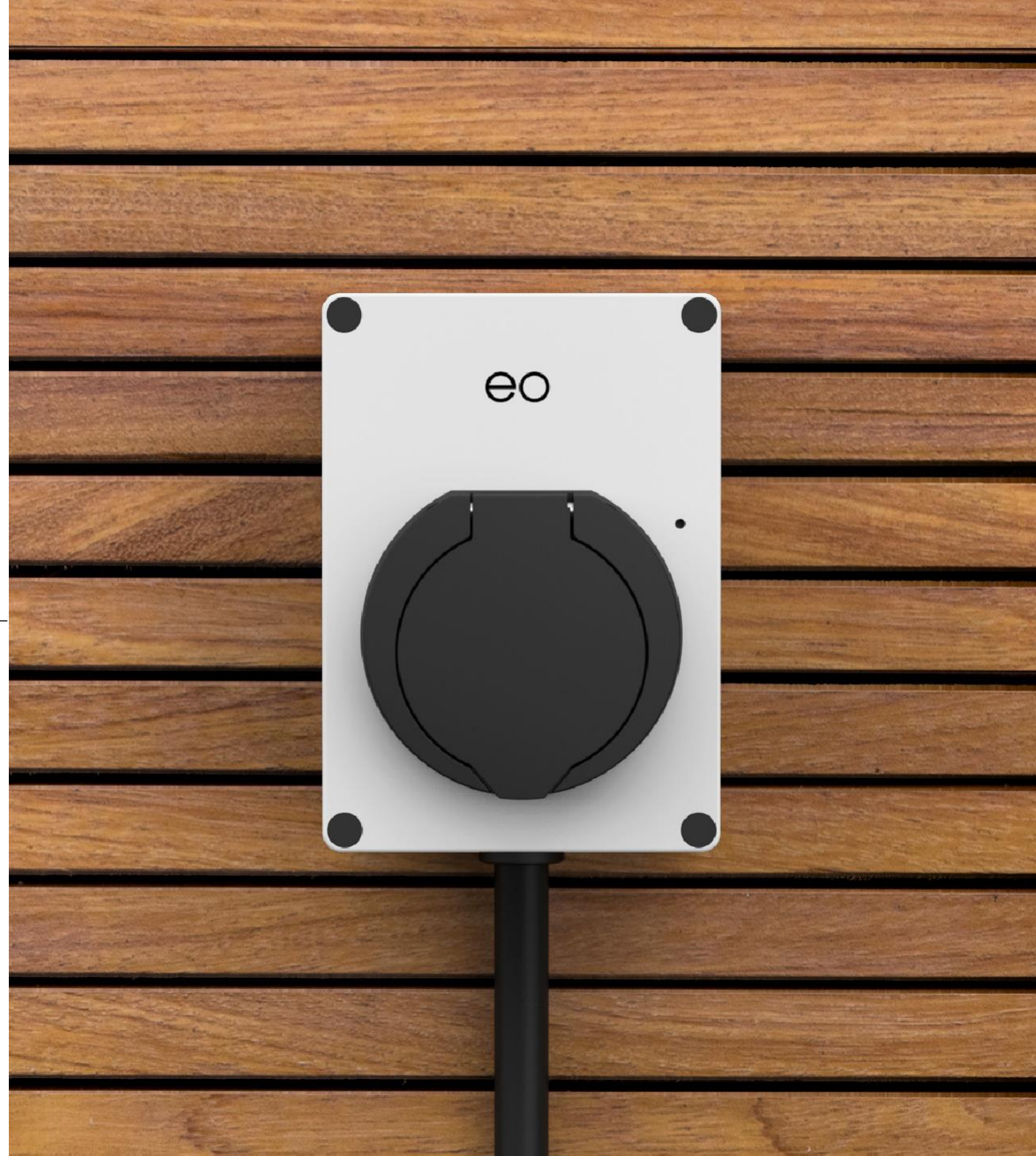
Convenient

Easy

Cost-effective

Implementing return-to-home fleet charging.

When you're looking to implement return-to-home charging for your fleet, it is important you find a partner who is able to supply and install OZEV eligible charging units at scale.



Reimbursing drivers.

One common concern with return-to-home fleets is the logistics and complications of paying drivers' energy bills.

But companies like Mina make it easy to manage all your EV charging costs. Their tool enables your drivers to charge at home or on-the-go and condense all energy bills into one single invoice, all without your drivers having to incur any costs.

Alternatively, you can also extract data from a smart charge point or back-office software platform.

Further things to consider.

When it comes to switching your fleet to electric, there are a few things to remember with a return-to-home solution.

Any home chargers you install are now critical infastructure to your business, and so it is important they are treated accordingly with a maintenance and support plan.

Secondly, it's important to remember even with a home charger that drivers will still sometimes need to charge on the road or back at work. So it's essential your drivers have a charge card or app to make paying on-the-go simple and seamless.

Thank you.

Join our journey
@eocharging

PLAN ZERO
A MITIE INITIATIVE

Office charging and ensuring a future proof strategy

Simon King

Director of Sustainability and Social Value, Mitie

Our EV Journey – Our Experience to Share…….

Top 10
One of the largest fleets in the UK

2021
Vehicles on the road by 2021

1,350+
Electric Vehicles on the road

7,200
Total Vehicles on the fleet

90%
Of our carbon emissions are due to our fleet

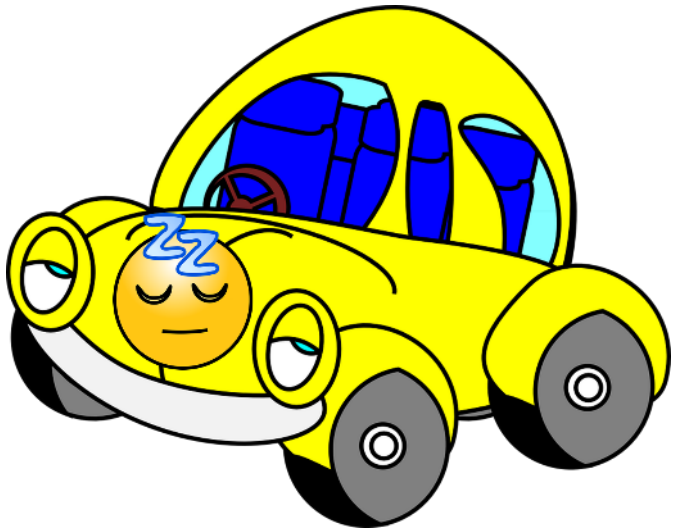
839
Charge points installed at homes

1,600 Staff
Charge points installed by the end of 2021

1000+
Charge points installed at commercial premises

Zero Carbon by 2025
Our entire fleet

Two key considerations…



Where do your vehicles "sleep"?

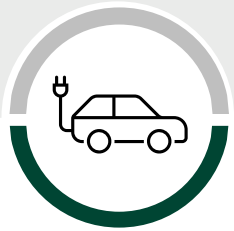
e.g. Mitie average drive time 2 hours 16 mins per day

What's the "need state" that you need to meet?

Top Up / Convenience / Attraction / Primary Charge

Think….Design….Deliver

Review EV fleet size vehicle types & use patterns



Design, open, flexible & managed EV system inc. MI and deduction / reimbursement

Identify renewable power generation options e.g. Solar PV & storage

Reinvent the wheel, or buy in solutions? But check they've done it themselves!

Optimise Capacity; off peak and load balancing

Driver engagement training & awareness

Data Driven expansion strategy fleet, staff, visitors, public ?

Its more than just a plug…….

PLAN ZERO
A MITIE INITIATIVE

Public charging and the roll out of EV

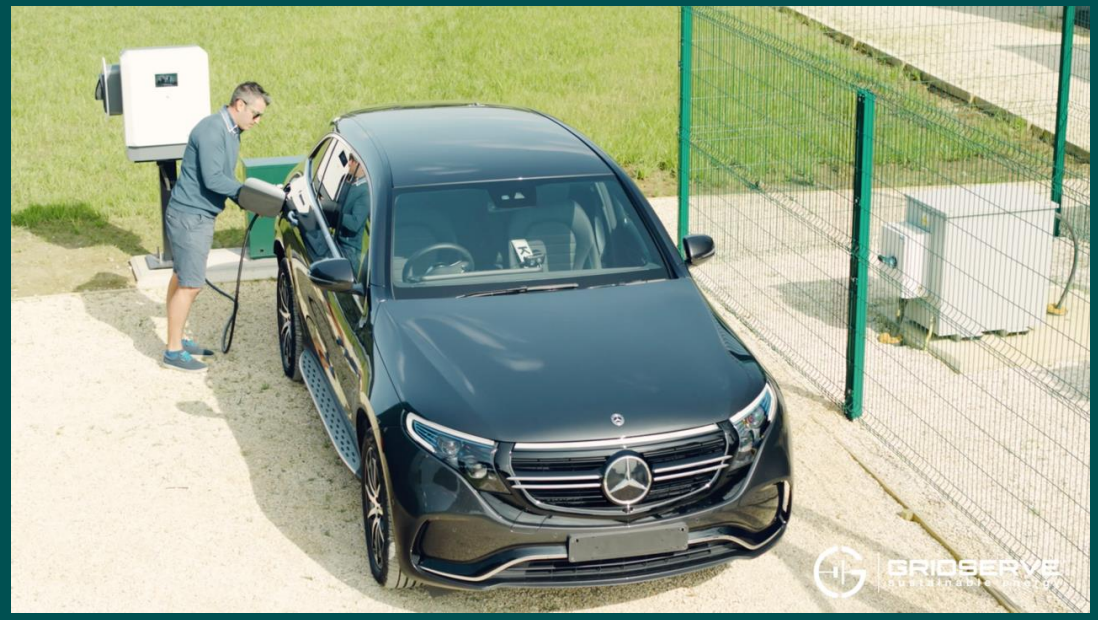
Sam Clarke

Chief Vehicle Officer, Gridserve

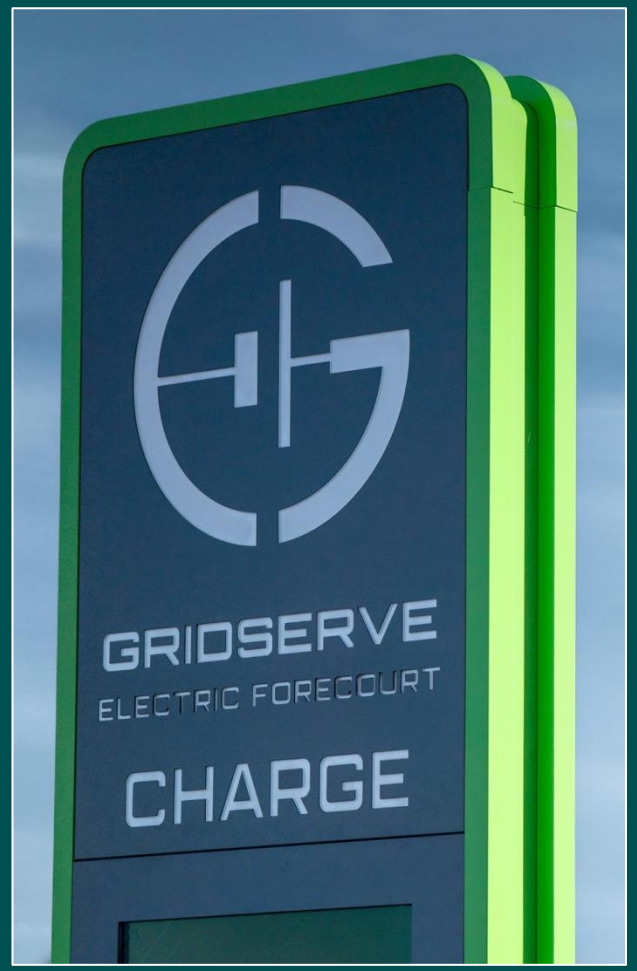

GRIDSERVE®
sustainable energy


mitie

GRIDSERVE®
sustainable energy



~~WELL~~ SUN TO WHEEL



+

GRIDSERVE sustainable energy

Electric Highway

CONCEPT vs REALITY

GRIDSERVE sustainable energy

GRIDSERVE

PUBLIC INFRASTRUCTURE

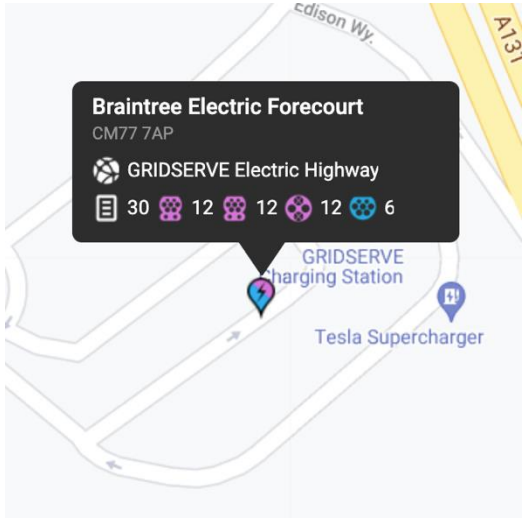
GRIDSERVE

PUBLIC CHARGING INFRASTRUCTURE CHALLENGES

Connector

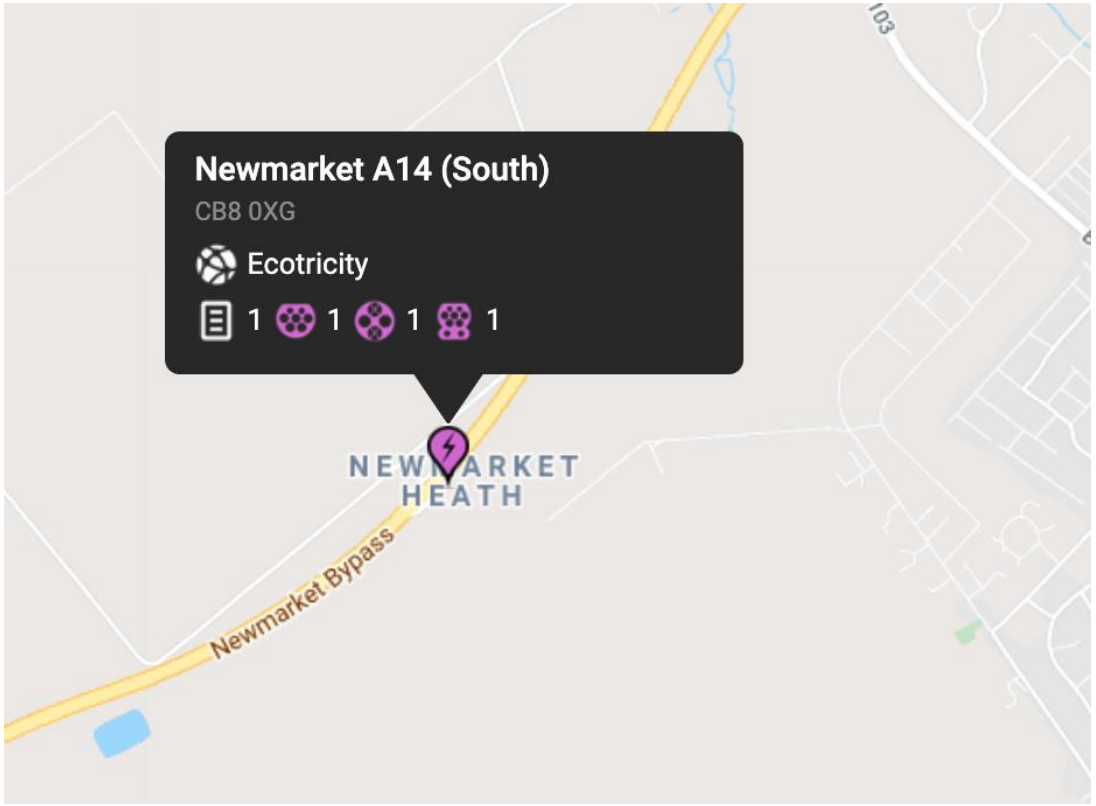
Device

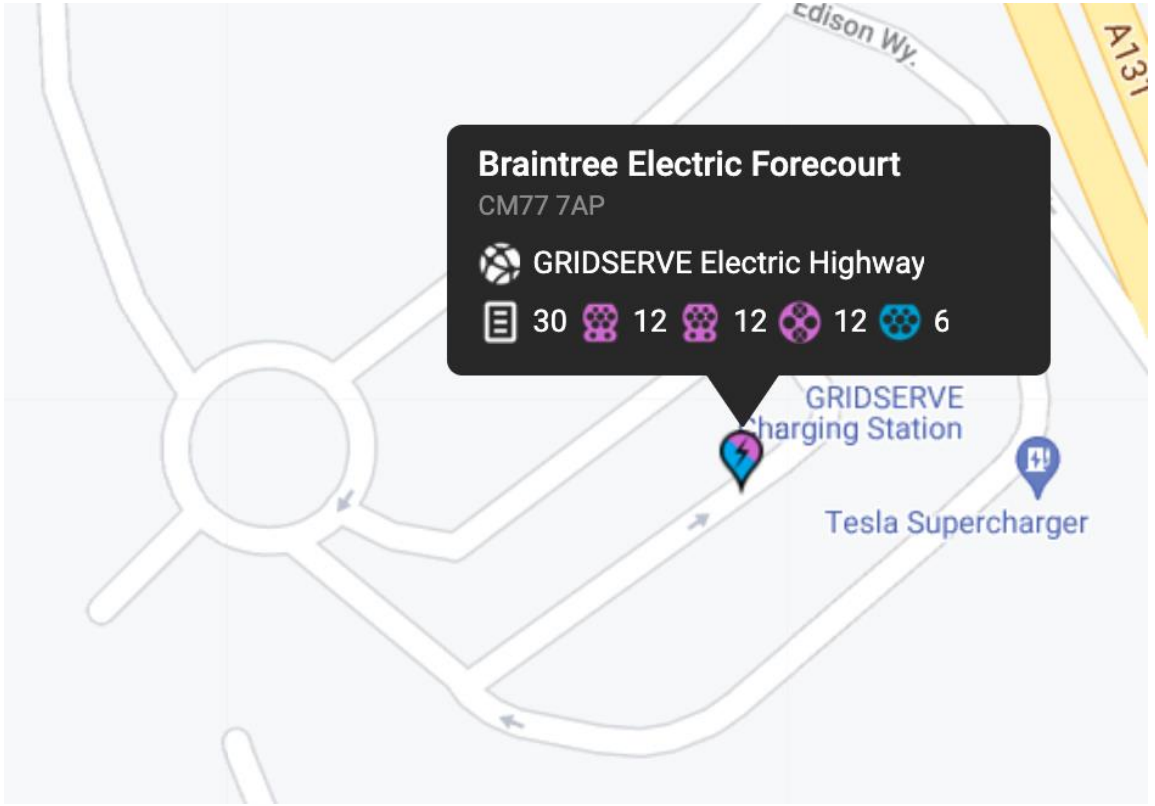
Location/Pin



NOT ALL PINS ARE CREATED EQUAL

SOURCE: WWW.ZAP-MAP.COM





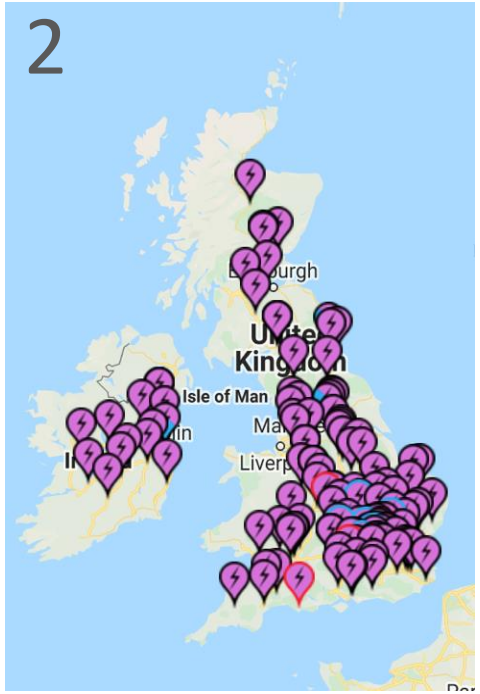
GRIDSERVE

SOURCE: WWW.ZAP-MAP.COM

ALL CHARGING LOCATIONS

15,500 LOCATIONS
41,849 CONNECTORS
24,315 DEVICES

‘RAPID’ CHARGING LOCATIONS 100KW+



2944 LOCATIONS
10,491 CONNECTORS
4528 DEVICES

‘ULTRA RAPID’ CHARGING LOCATIONS 350KW+

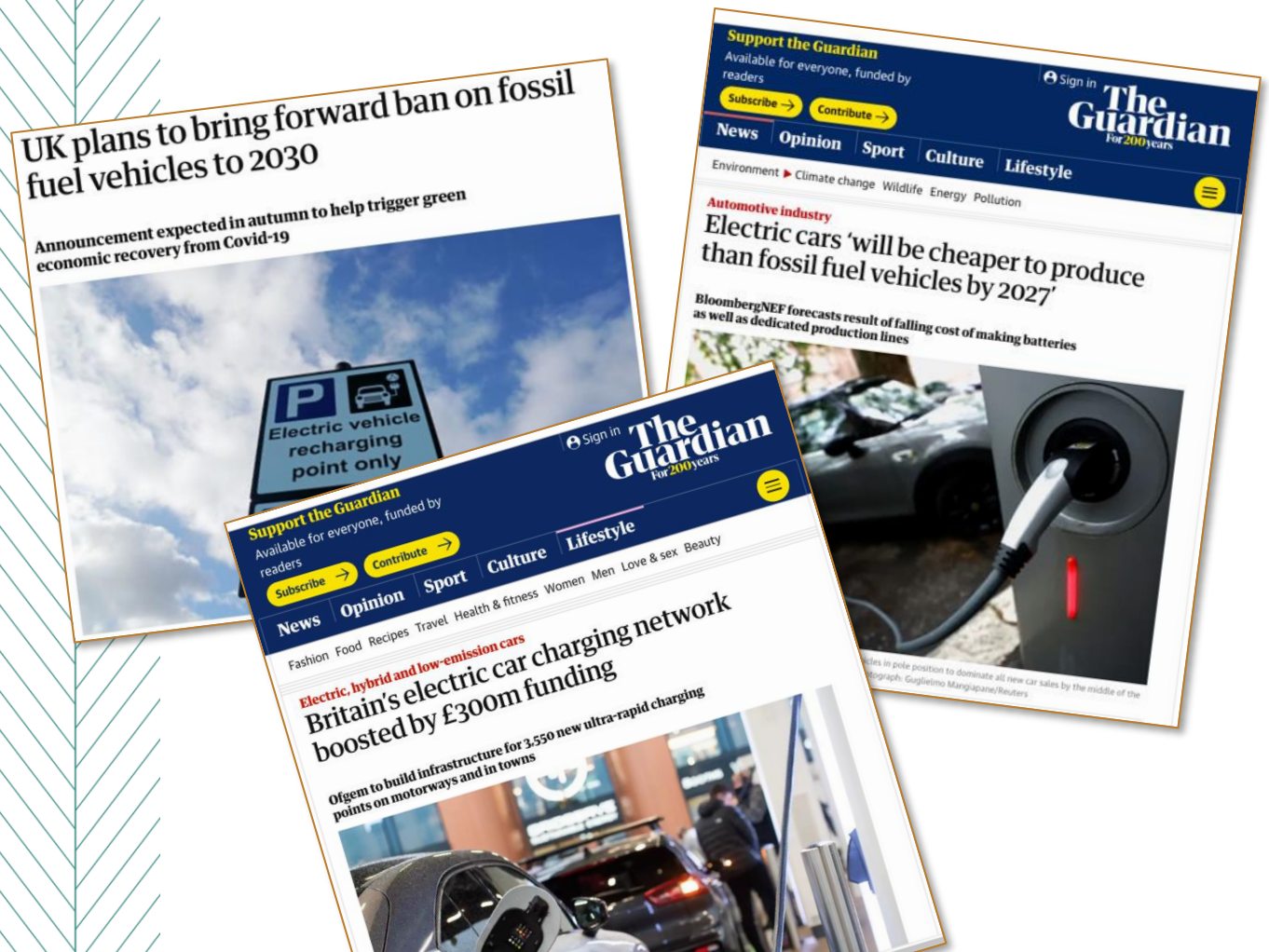
17 LOCATIONS
142* CONNECTORS
85 DEVICES**
(*54 at 2 GRIDSERVE LOCATIONS)
(**36 at 2 GRIDSERVE LOCATIONS)

8,385 PETROL STATIONS
c.125k DEVICES (pumps)

ROLL OUT OF EV

- c.36,000,000 registered car/LCV vehicles on UK roads - (end Sept2021)
- 235,000 registered Battery Electric Vehicles (BEV)

- c. 0.65% of vehicles on the road are (BEV)
- 99.35% ICE still to transition to EV



UK new car registration data, UK car market - SMMT

April

	2021	2020	% change	Mkt share -21	Mkt share -20
Diesel	14,012	1,079	1,198.6%	9.9%	25.0%
MHEV diesel	9,335	75	12,346.7%	6.6%	1.7%
Petrol	71,173	1,553	4,482.9%	50.3%	35.9%
MHEV petrol	16,518	97	16,928.9%	11.7%	2.2%
BEV	9,152	1,374	566.1%	6.5%	31.8%
PHEV	9,600	95	10,005.3%	6.8%	2.2%
HEV	11,793	48	24,468.8%	8.3%	1.1%
TOTAL	141,583	4,321	3,176.6%		

Year to date

	YTD 2020	YTD 2019	% change	Mkt share -20	Mkt share -19
Diesel	261,772	581,774	-55.0%	16.0%	25.2%
MHEV diesel	60,953	33,931	79.6%	3.7%	1.5%
Petrol	903,961	1,482,409	-39.0%	55.4%	64.1%
MHEV petrol	119,179	41,955	184.1%	7.3%	1.8%
BEV	108,205	37,850	185.9%	6.6%	1.6%
PHEV	66,877	34,984	91.2%	4.1%	1.5%
HEV	110,117	98,237	12.1%	6.8%	4.3%
TOTAL	1,631,064	2,311,140	-29.4%		

BEV - Battery Electric Vehicle; **PHEV** - Plug-in Hybrid Electric Vehicle; **HEV** - Hybrid Electric Vehicle, **MHEV** - Mild Hybrid Electric Vehicle

SMMT
DRIVING THE
MOTOR INDUSTRY


GRIDSERVE®
sustainable energy


mitie

PLAN ZERO
A MITIE INITIATIVE

Delivering value through optimisation software

Chris Wright
CTO and Co-founder, Moixa

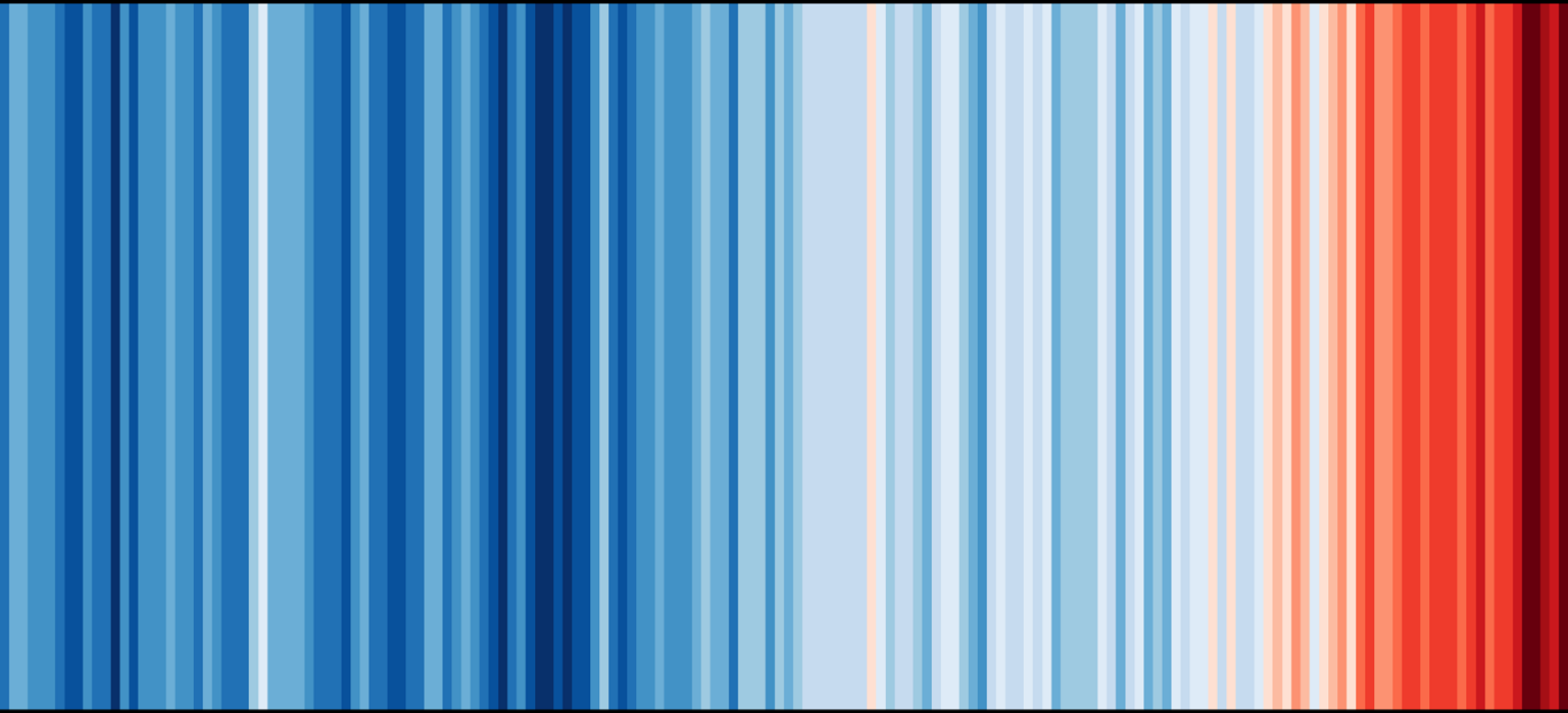
Moixa GridShare

Delivering value through optimisation software and intelligent control

Chris Wright - CTO

chris.wright@moixa.com

Global temperature change (1850-2019)



We believe that by increasing the IQ of batteries,

the world can live in a future powered by renewables.

Example Fleet: 28,000 systems in Japan with ITOCHU

moixa

moixa Dashboard Devices Customers Tariffs Alerts Users Flex SUPERADMIN

search group name

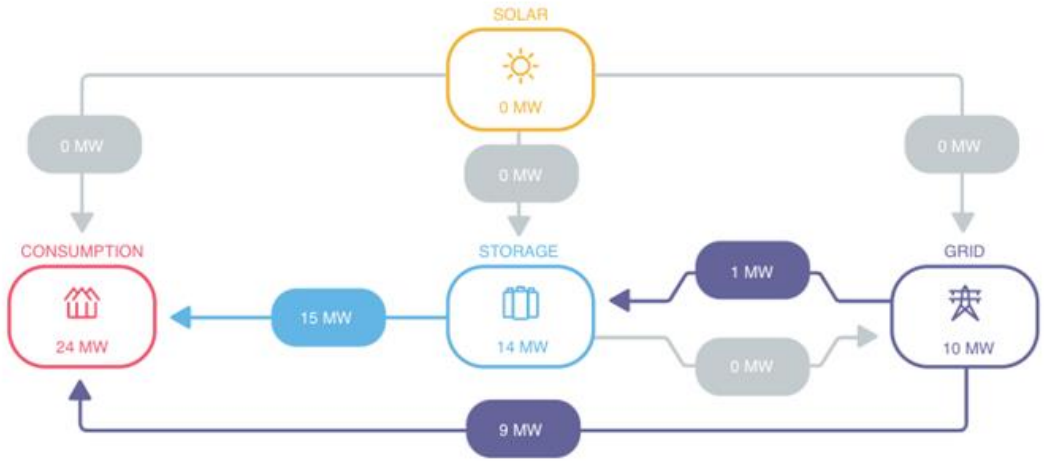
- Evtec Fleet
- Honda Fleet
- ITOCHU Managed Fleet
- Superadmin Fleet
- Flexibility Pool >
- Geographic >
- Network >
- ITOCHU planner enabl...
- Moixa Fleet >
- Bath West Community ... >
- Eguana Fleet
- Energia VE3
- Itochu Fleet >
- V3Pentest
- V3Pentest-2

Itochu Fleet

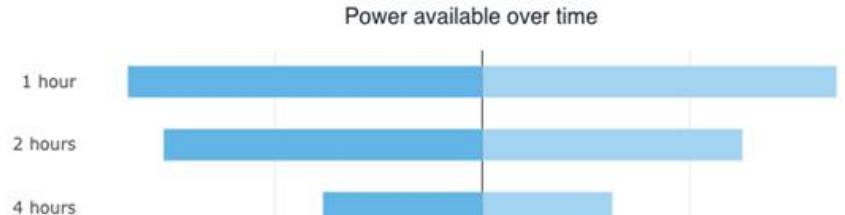
Itochu Fleet	Total devices	Energy available	Total storage	Storage level
	28478	154 MWh	279 MWh	55%

Power now | Energy history | Cost and savings

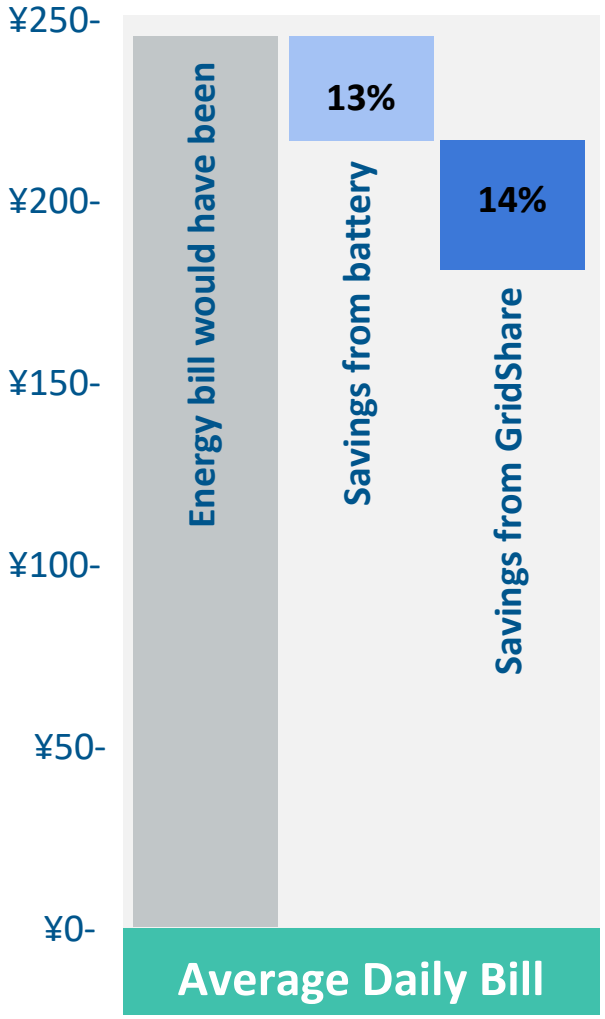
Live Power Flow

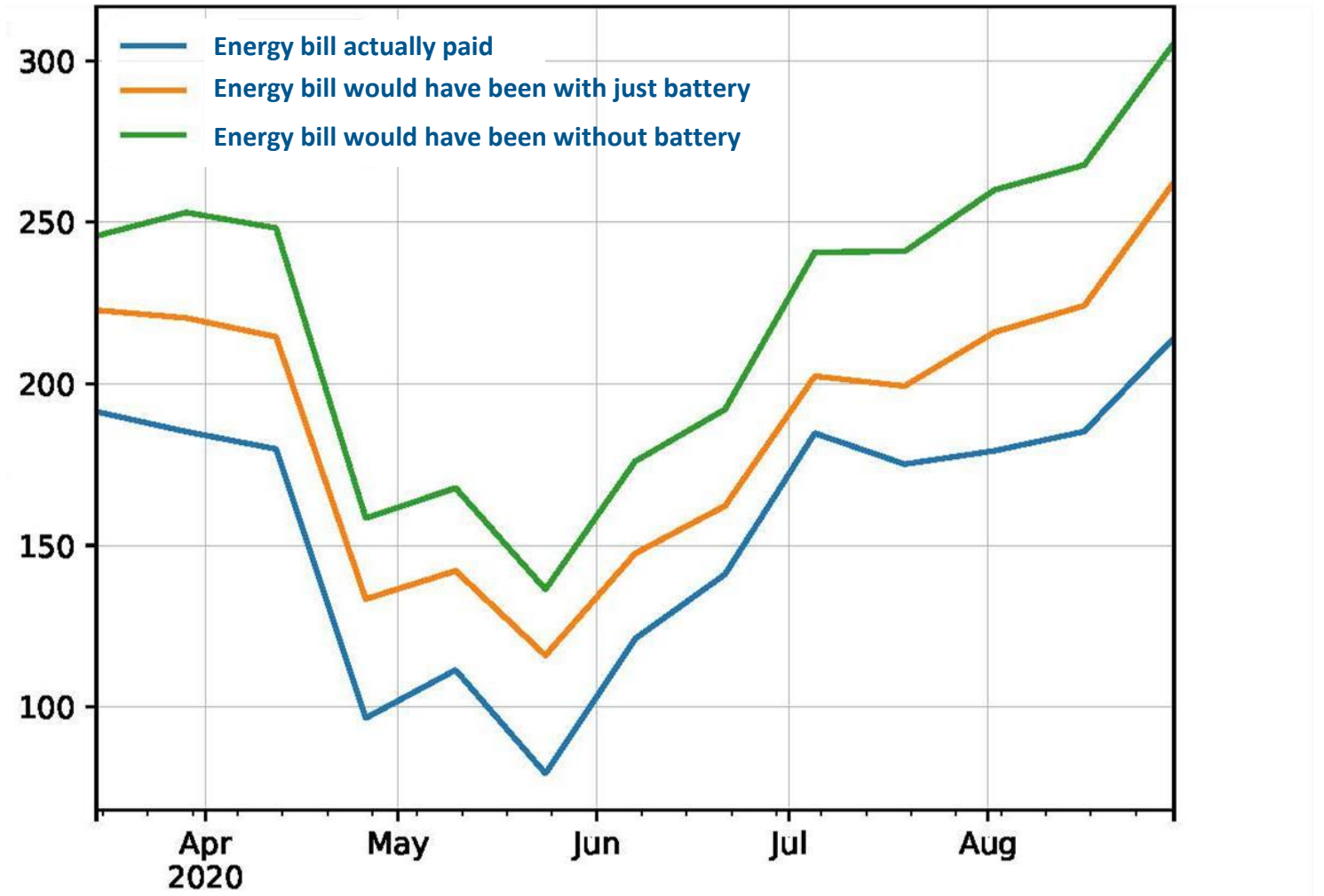


Power Available

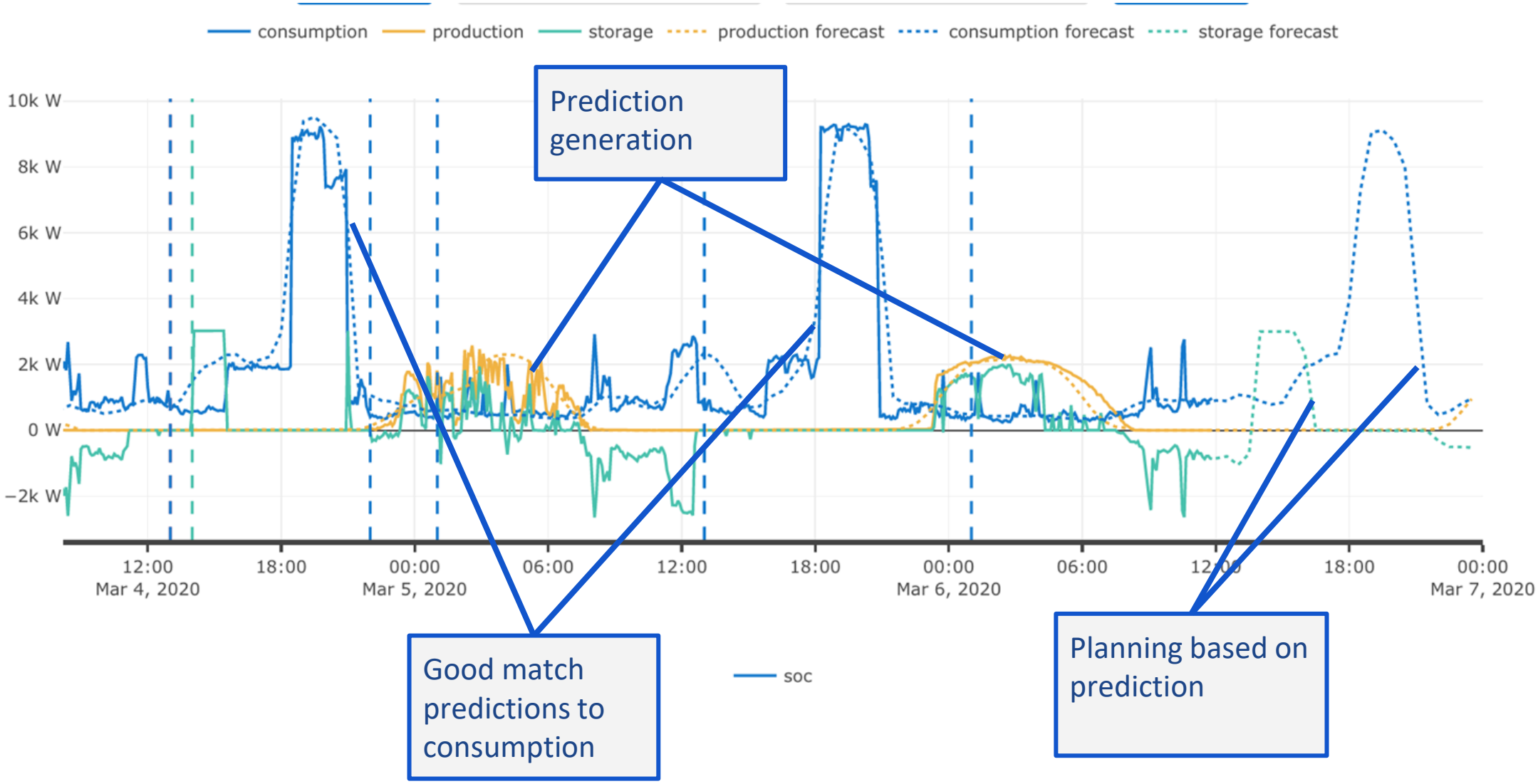


Average savings delivered by GridShare (6 months data)
ITOCHU fleet of ESS





Core: Prediction and optimisation



Moixa + Honda: launch of e:progress smart EV charge + energy

moixa

+

HONDA

The Power of Dreams

e:progress customer journey

OCTOPUS ENERGY

Energy tariff

moixa

centrica

Charger install

HONDA AUTHORISED DEALER SALES SERVICE EXPERTISE

Customer leads

moixa e:PROGRESS

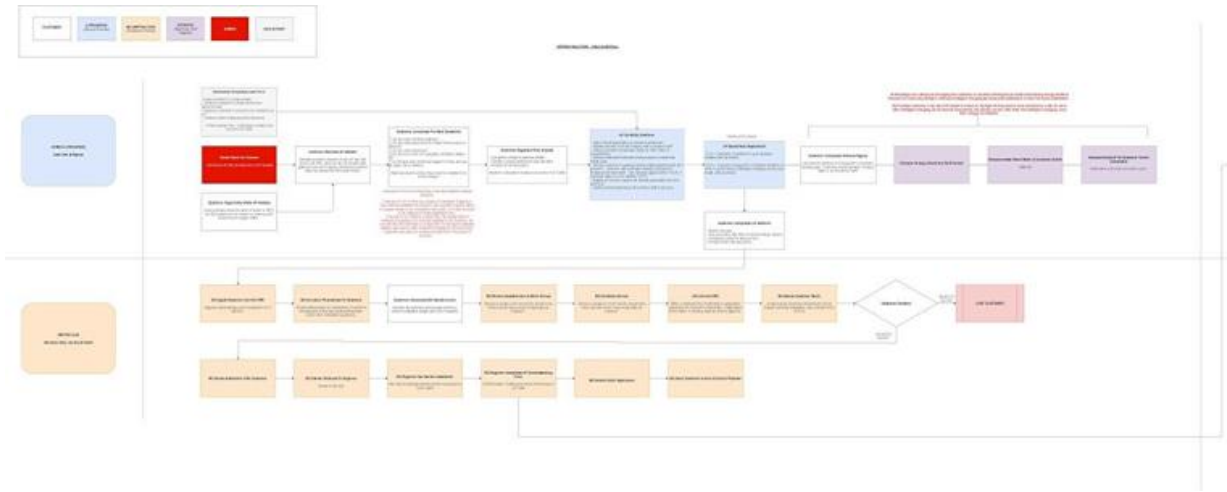
HONDA The Power of Dreams

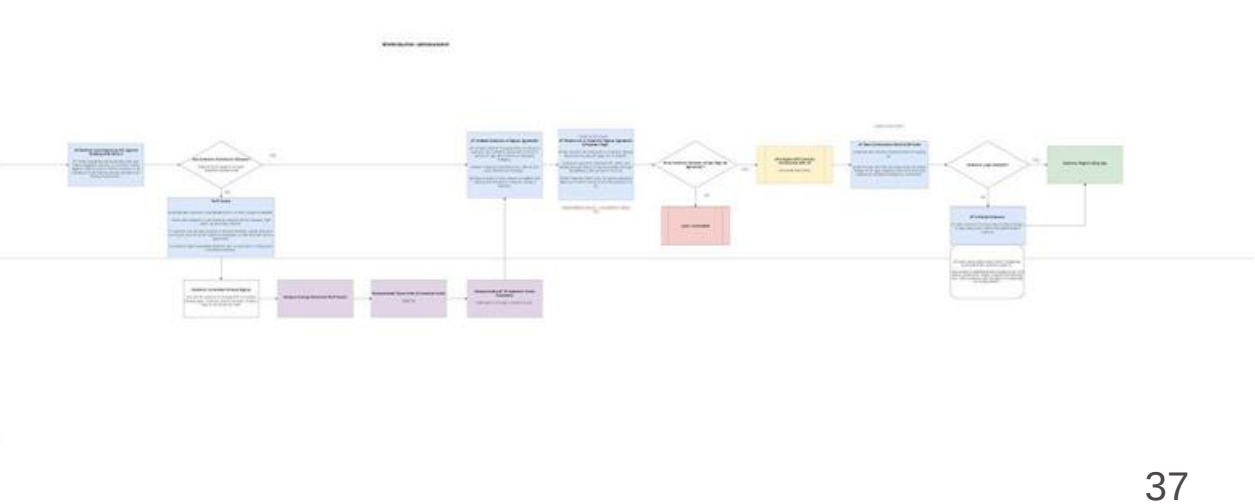
HONDA The Power of Dreams

Car telematics + App

VATTENFALL

OCPP platform





V2G - Islington town hall +

V2G: Electric Islington

Intelligently Managing and Controlling Distributed Energy Resources for Islington Council

- Moixa and Honda are supporting Islington Council manage the electrification of their 500+ vehicle fleet.
- Five V2G Power Managers at Islington Town Hall

Savings and income generation for peak avoidance and commercial flexibility services in the future

Decarbonising Islington Councils 500+ strong fleet ensuring compliance with ULEZ regulations

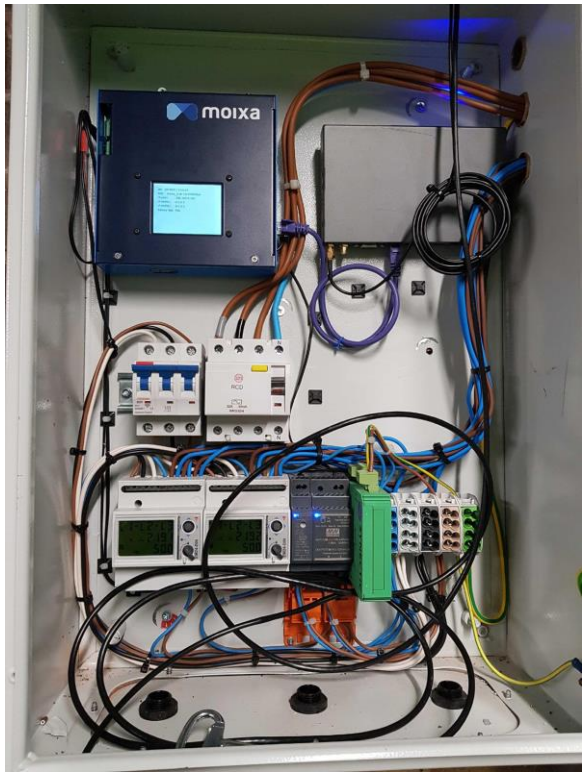
Flexibility Local constraint management capability

Fleet management and control delivered to Islington Council

Building load prediction for energy consumption optimization

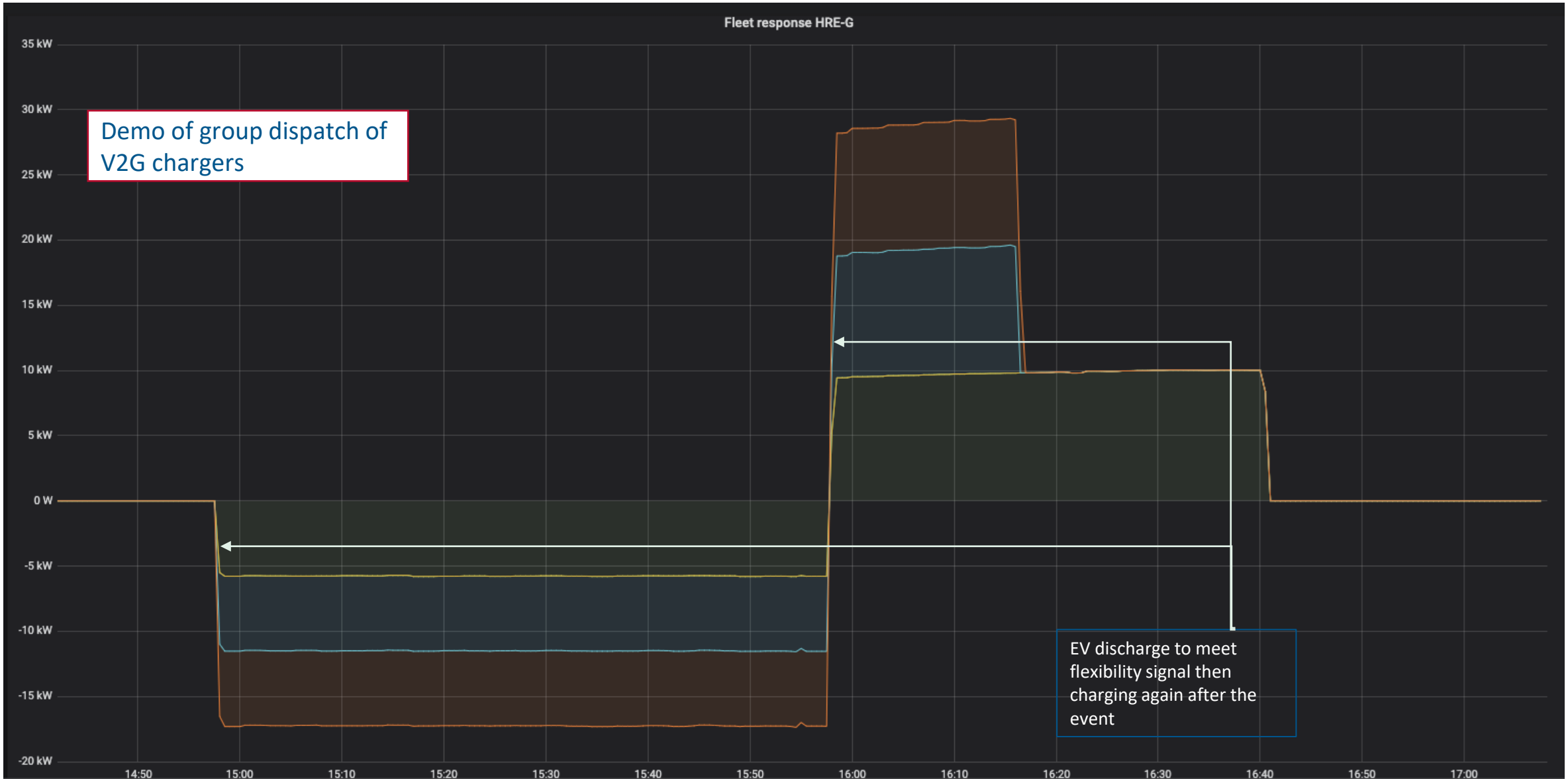
Installation at Islington Town Hall

Moixa Cabinet

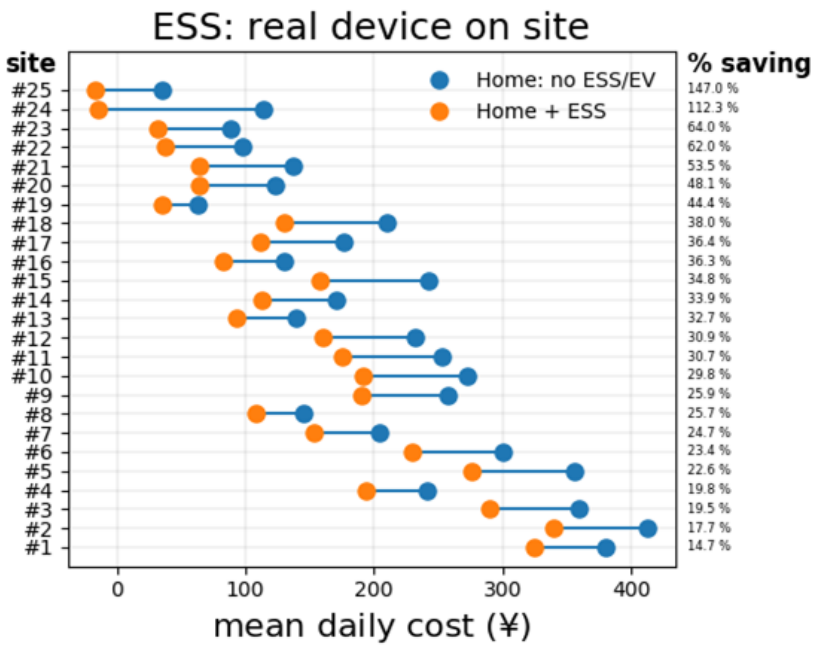


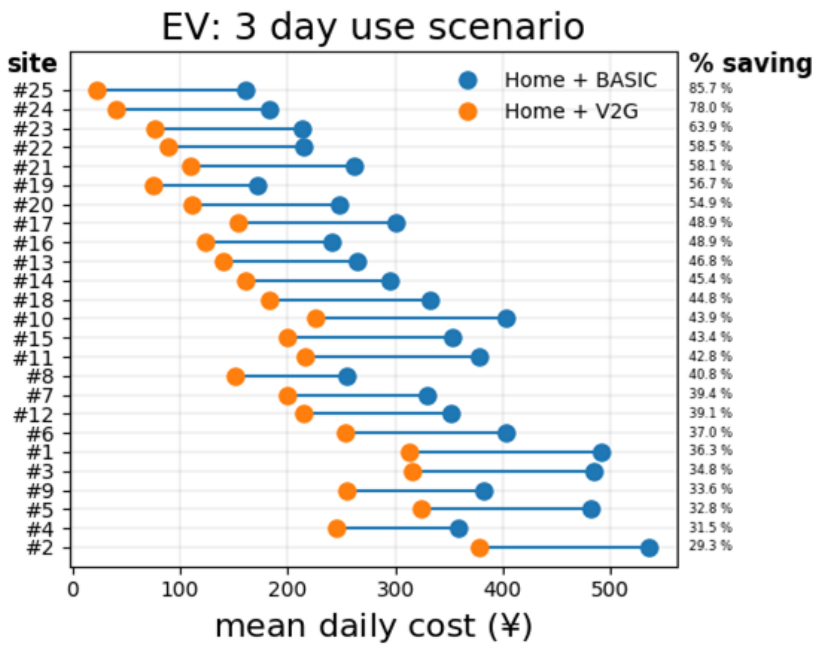
Honda Power Manager

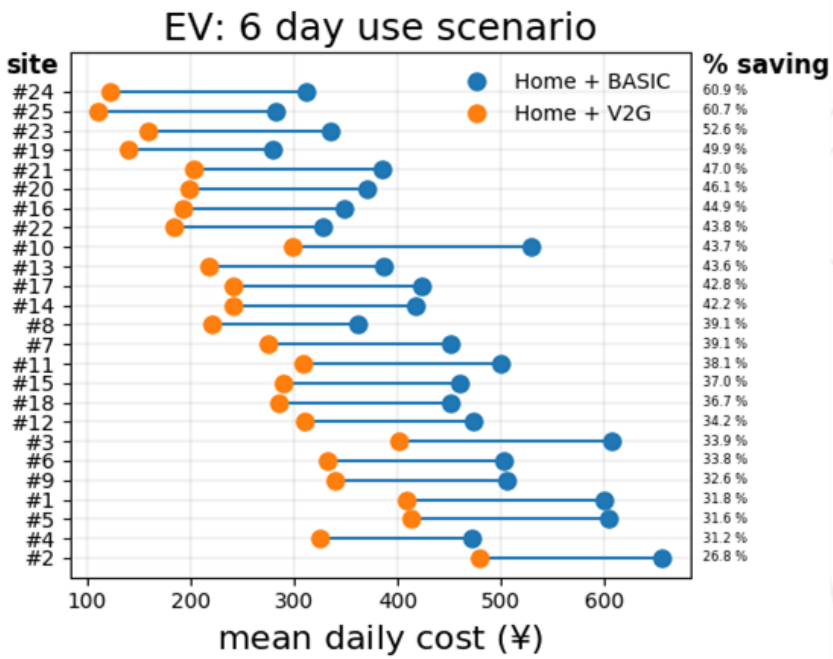
V2G Flexibility Grid Services



The power of GridShare (site breakdown)







Smart planning brings cost savings in every site and every scenario, particularly for EV charging.


moxa

PLAN ZERO
A MITIE INITIATIVE

Yorkshire Ambulance: Integration of Blue Light services

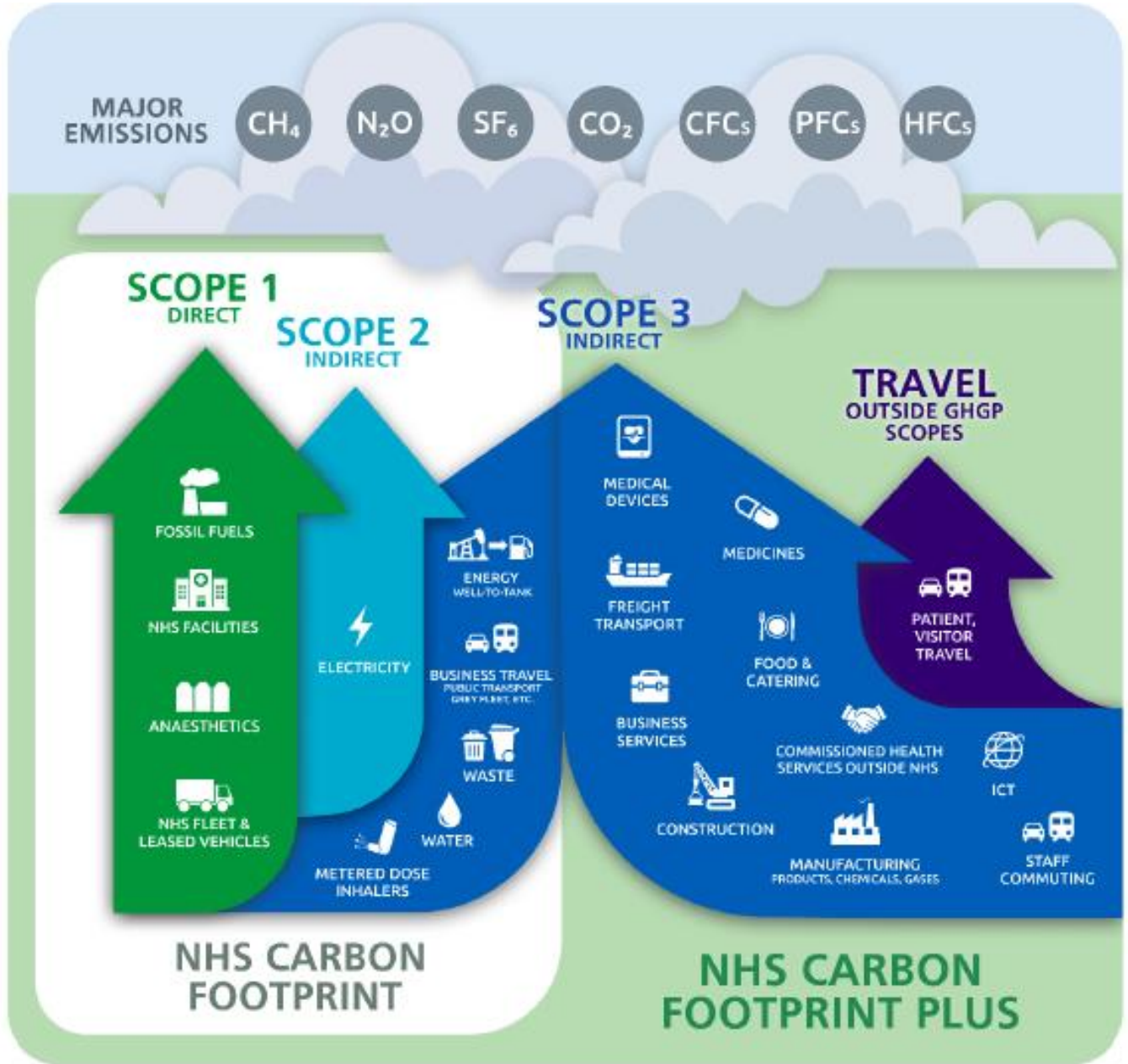
Alexis Percival
Environmental and Sustainability Manager,
Yorkshire Ambulance NHS Trust

NHS
Yorkshire
Ambulance Service
NHS Trust

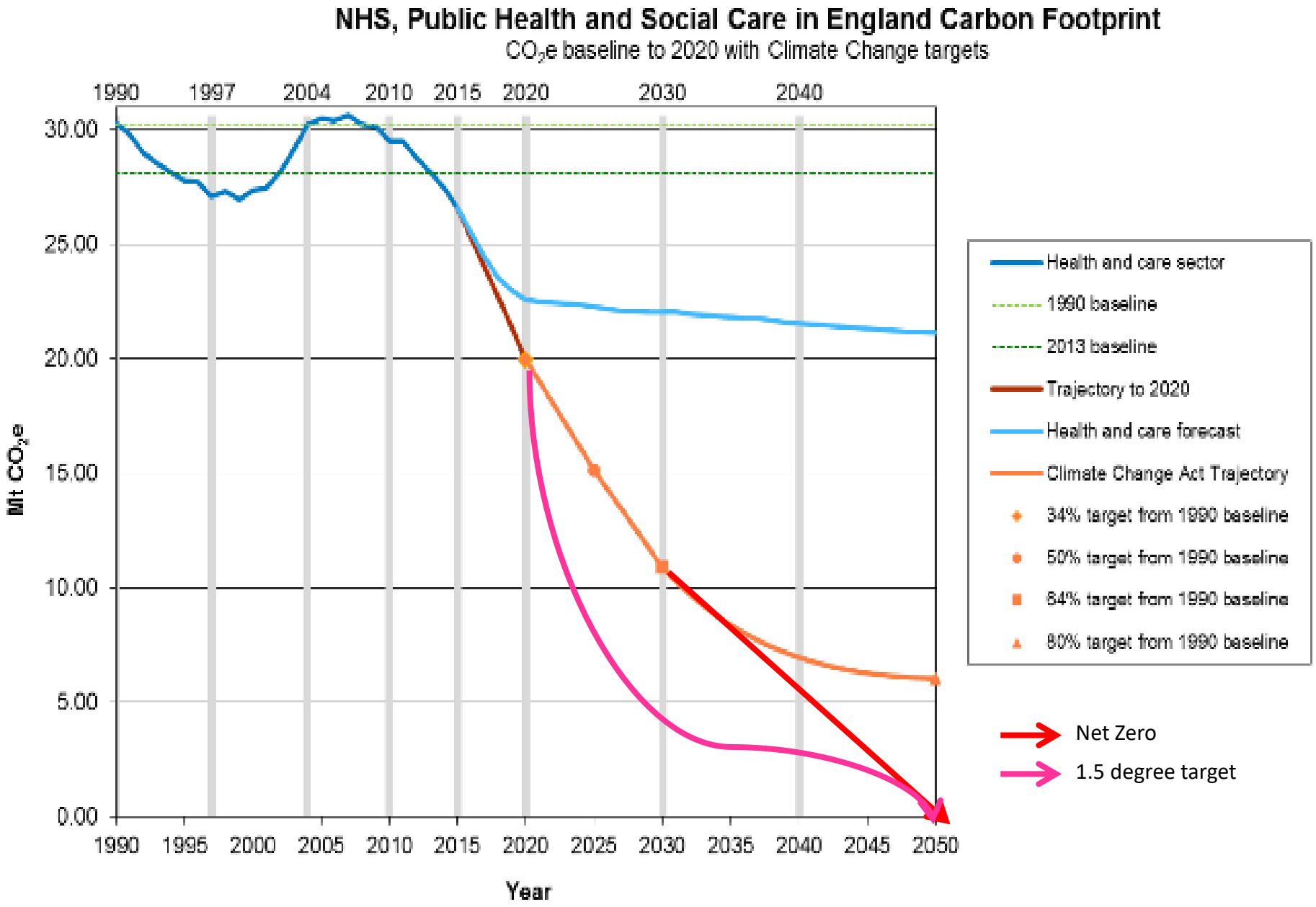
Road to Zero for Net Zero Fleets and Ambulance Service of the Future

Alexis Percival

Yorkshire Ambulance Service



Source: Greener NHS


NHS, Public Health and Social Care in England Carbon Footprint
CO_2e baseline to 2020 with Climate Change targets
1990
1997
2004
2010
2015
2020
2030
2040
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Mt CO_2e
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
Year
Health and care sector
1990 baseline
2013 baseline
Trajectory to 2020
Health and care forecast
Climate Change Act Trajectory
34% target from 1990 baseline
50% target from 1990 baseline
64% target from 1990 baseline
80% target from 1990 baseline
Net Zero
1.5 degree target

‘Net Zero’ Plan at a glance

Decarbonisation Agenda

- **NHS Carbon Footprint**

  For the emissions controlled directly by the NHS (the ‘NHS carbon footprint’): ambition to reach an 80% reduction by 2028–32

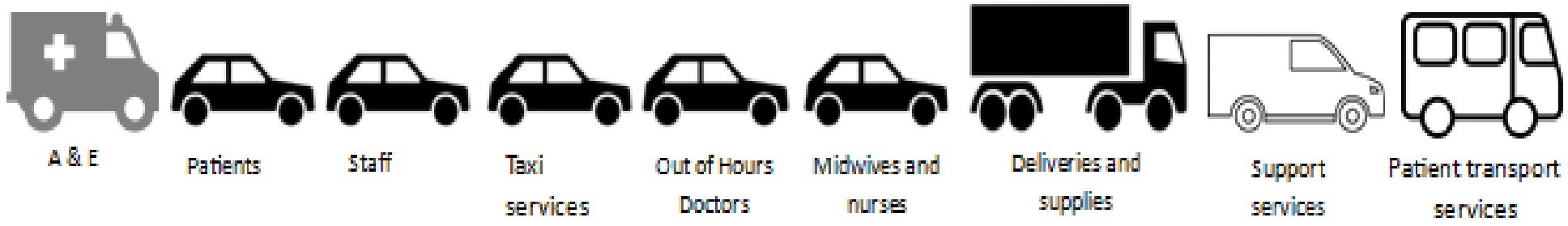
  Net-zero by 2040

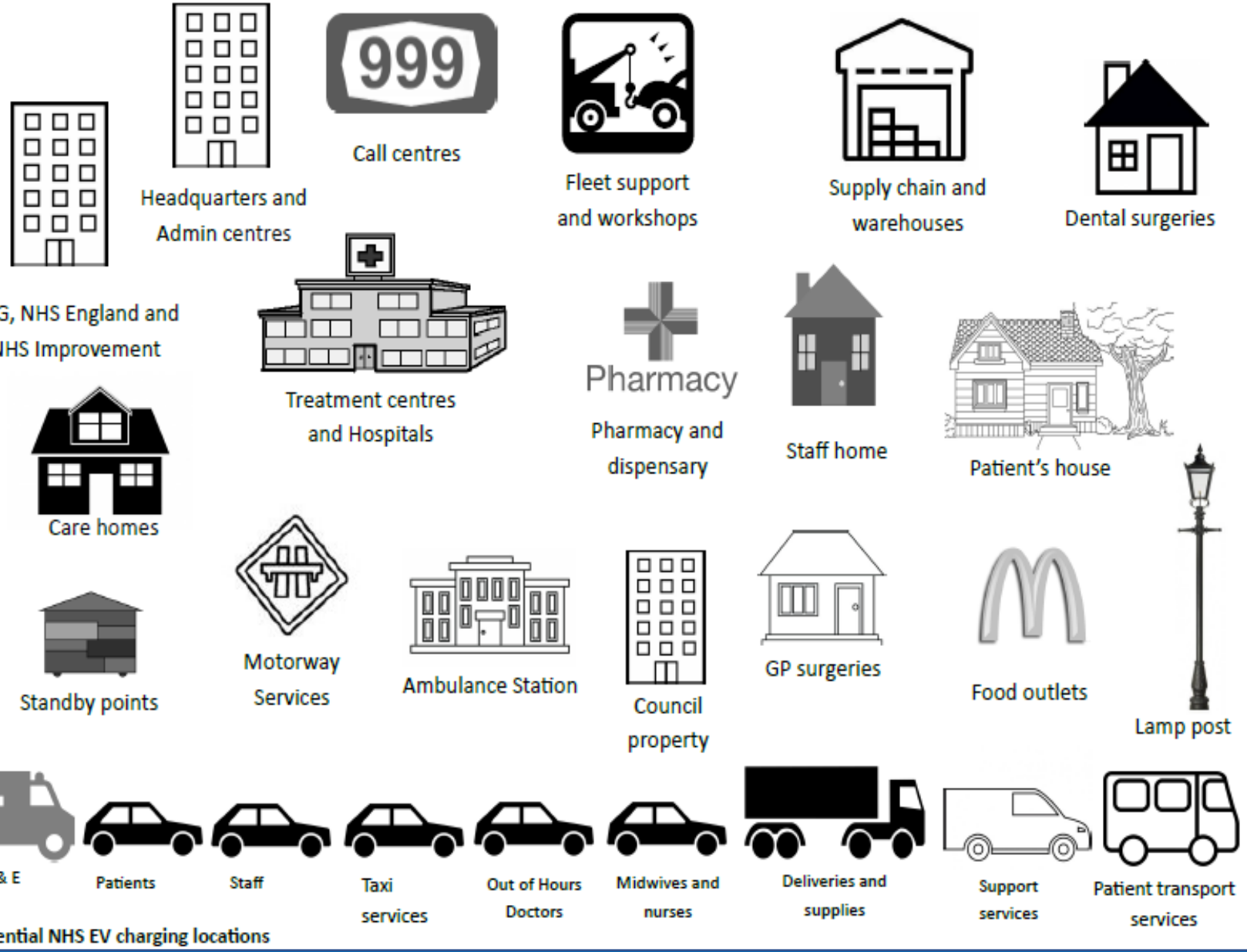
- **NHS Carbon Footprint Plus**

  For an extended set of emissions including those that can be influenced in the supply chain (the ‘NHS carbon footprint plus’): ambition to reach an 80% reduction by 2036–39,

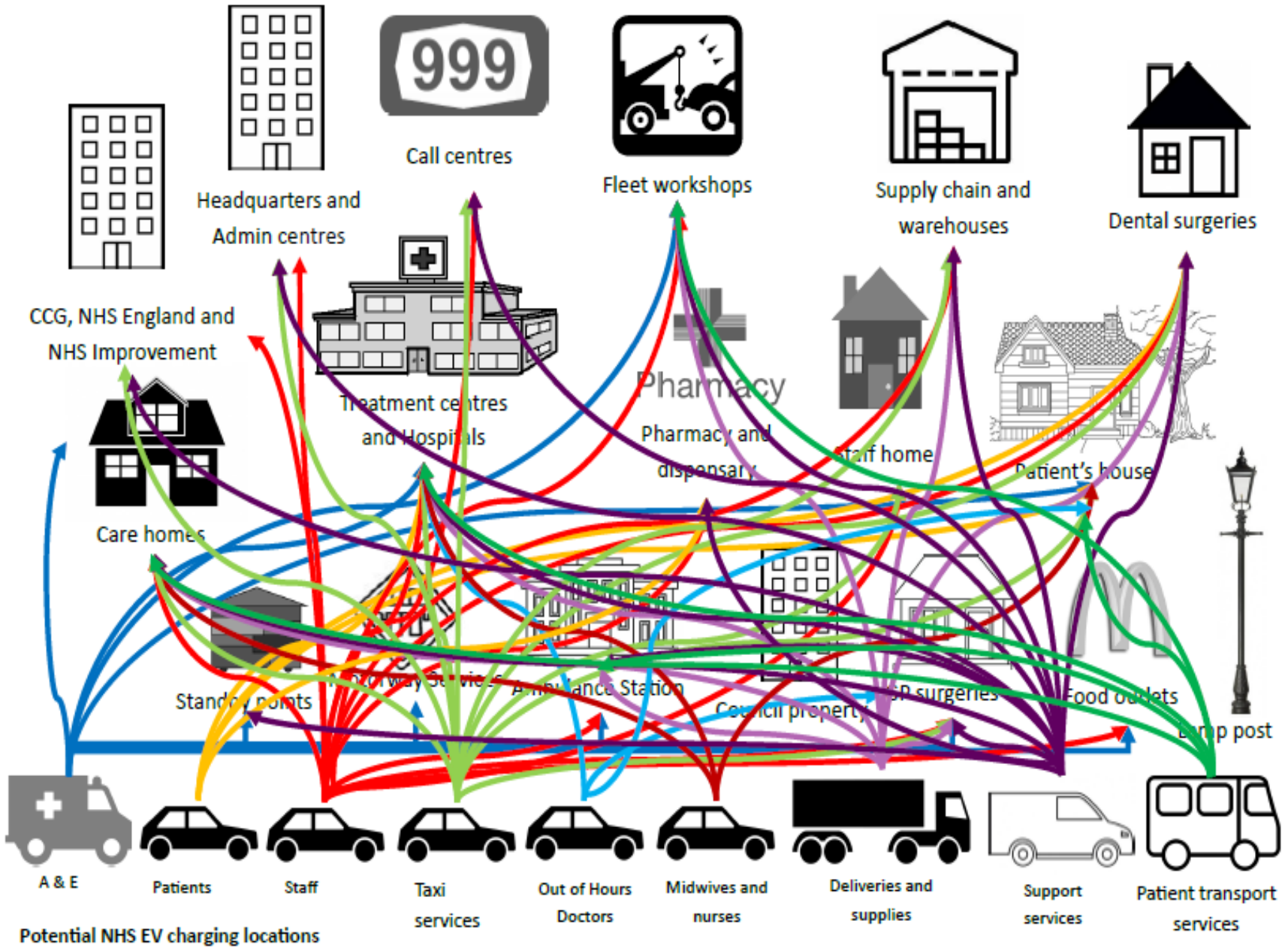
  Net-zero by 2045

Vehicle types





Potential NHS EV charging locations



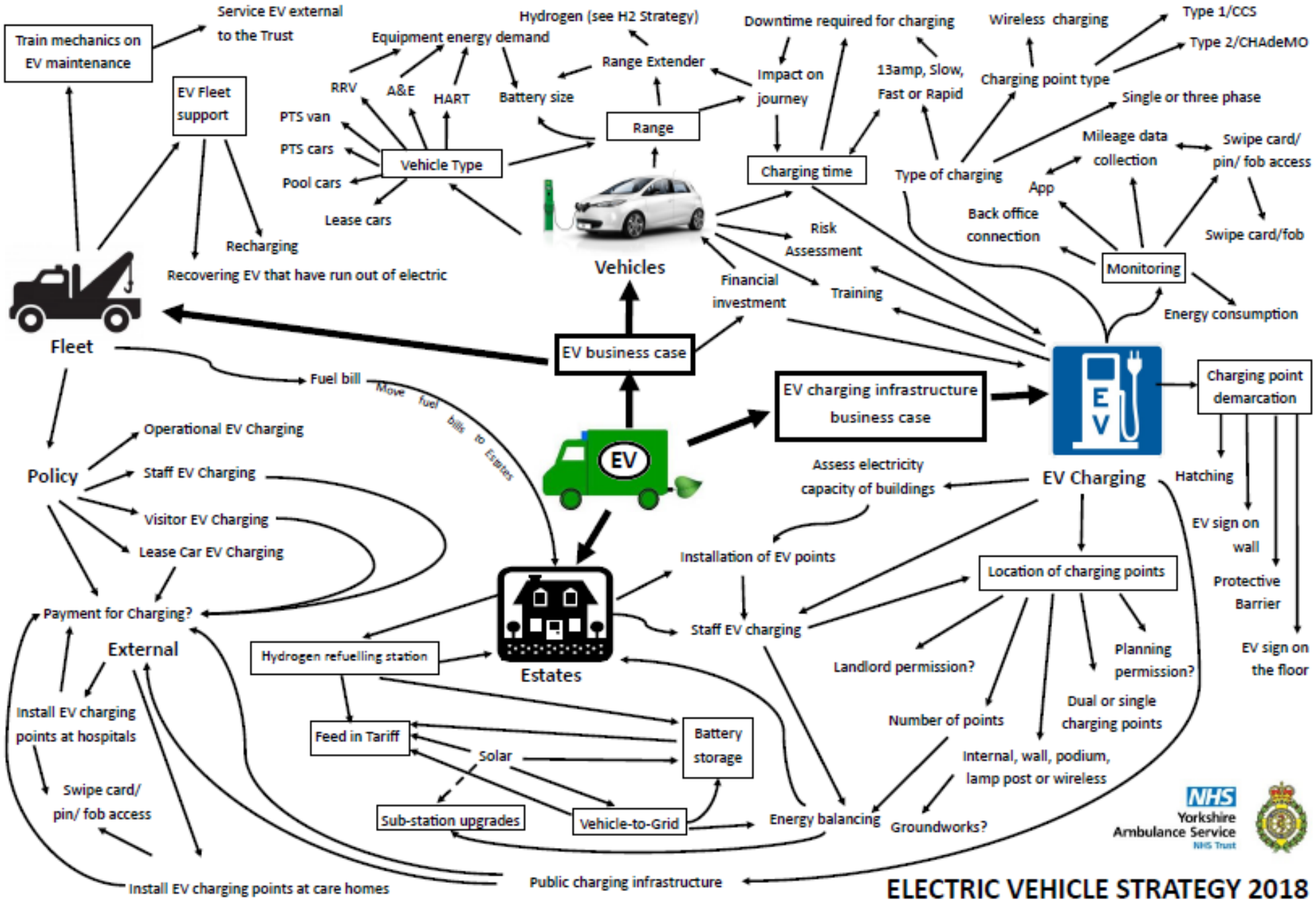
Potential NHS EV charging locations

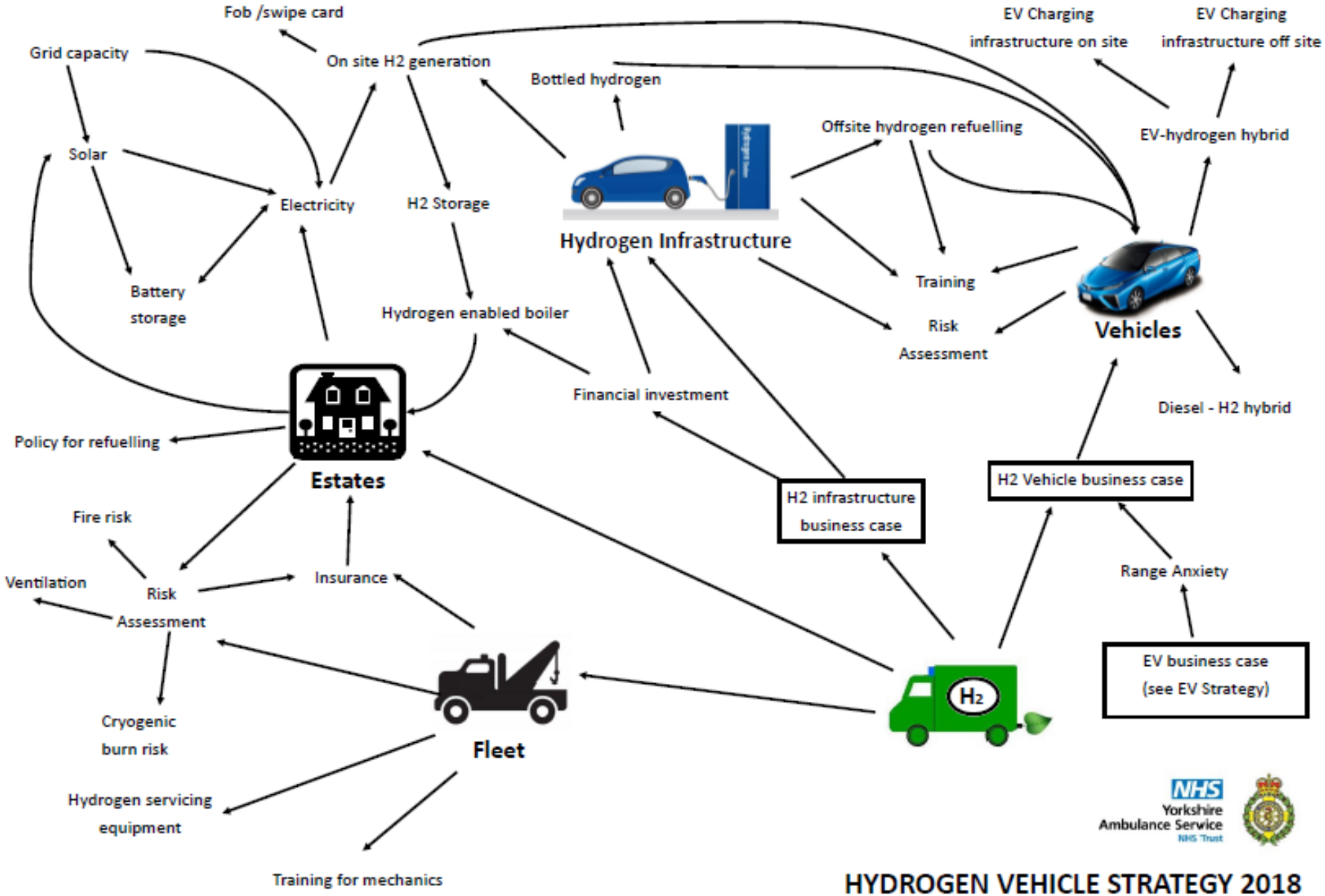
Ambulances/Fleet of the Future

DIESEL WITH PHASE OUT FROM 2030

ELECTRIC

HYDROGEN-ELECTRIC

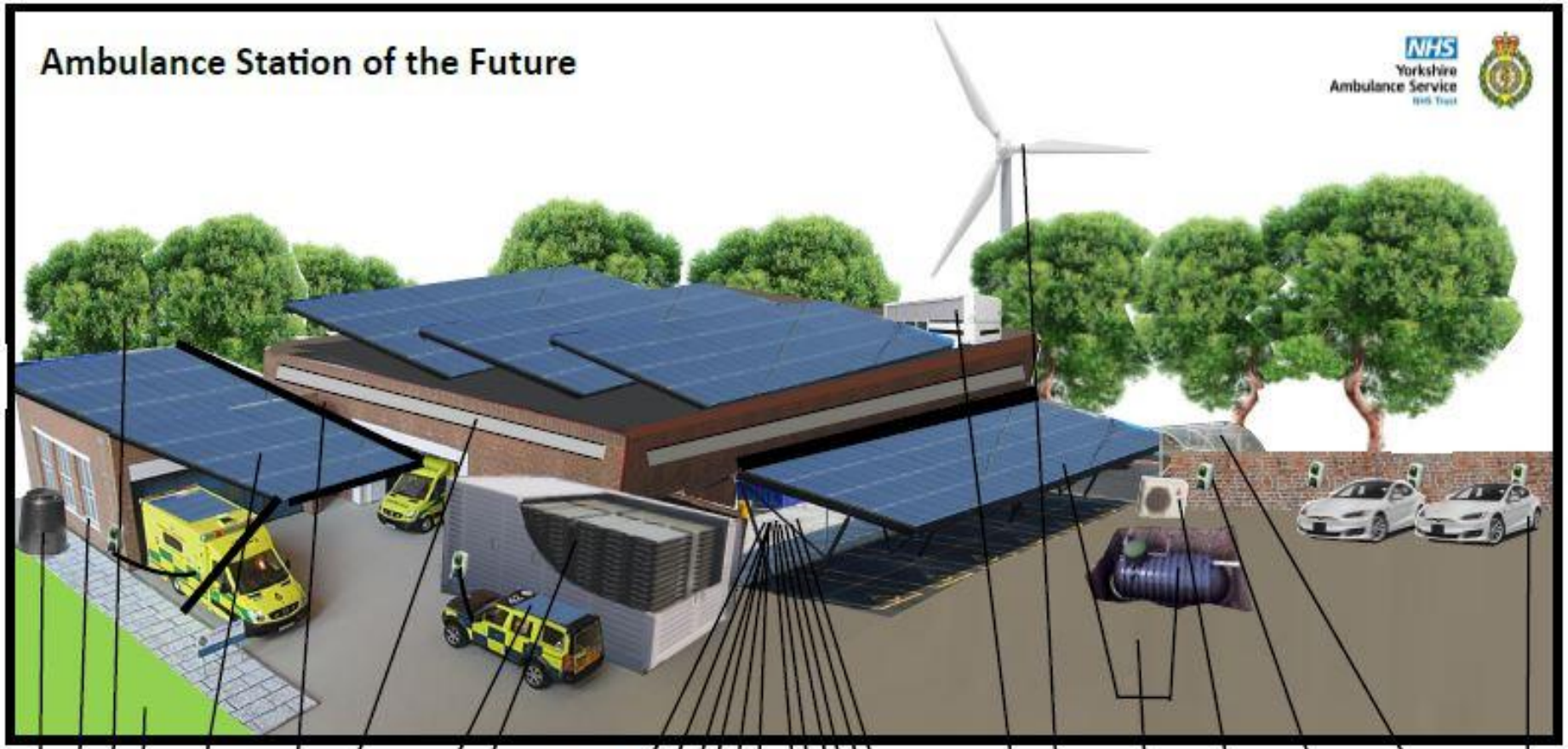

Train mechanics on EV maintenance
Service EV external to the Trust
EV Fleet support
Recharging
Recovering EV that have run out of electric
Fleet
Hydrogen (see H2 Strategy)
Equipment energy demand
RRV
A&E
HART
PTS van
PTS cars
Pool cars
Lease cars
Vehicle Type
Battery size
Range Extender
Range
Vehicles
Downtime required for charging
Impact on journey
Charging time
13amp, Slow, Fast or Rapid
Wireless charging
Type 1/CCS
Type 2/CHAdeMO
Charging point type
Single or three phase
Type of charging
Mileage data collection
Swipe card/ pin/ fob access
App
Back office connection
Swipe card/fob
Monitoring
Energy consumption
Risk Assessment
Financial investment
Training
EV business case
Fuel bill
Move fuel bills to Estates
Policy
Operational EV Charging
Staff EV Charging
Visitor EV Charging
Lease Car EV Charging
Payment for Charging?
External
Install EV charging points at hospitals
Swipe card/ pin/ fob access
Install EV charging points at care homes
EV
EV charging infrastructure business case
EV Charging
Charging point demarcation
Hatching
EV sign on wall
Protective Barrier
EV sign on the floor
Assess electricity capacity of buildings
Installation of EV points
Location of charging points
Staff EV charging
Landlord permission?
Planning permission?
Number of points
Dual or single charging points
Internal, wall, podium, lamp post or wireless
Groundworks?
Estates
Hydrogen refuelling station
Feed in Tariff
Solar
Battery storage
Sub-station upgrades
Vehicle-to-Grid
Energy balancing
Public charging infrastructure
NHS Yorkshire Ambulance Service NHS Trust
ELECTRIC VEHICLE STRATEGY 2018



HYDROGEN VEHICLE STRATEGY 2018

Ambulance Station of the Future

NHS Yorkshire Ambulance Service NHS Trust



Compost facilities

Double glazing

Trees for shading and cooling

Green space: Wildflower and vegetable growing, green roof, fruit trees, outdoor area for health and wellbeing

Solar panels/ solar canopies for generating electricity and hot water

Solar panels on the roof of operational vehicles for battery top up and auxiliary power charging for electric/ hydrogen vehicles

Skylights and sun tubes

Recycled/ Eco building materials

Roof, wall and floor insulation

Trigen or micro CHP

Battery and/or hydrogen generation and storage from solar energy and from the grid

Vehicle washing with water recycling system

Dual flush toilets using rainwater and grey water from hand washing

LED lighting

Low flow taps

Motion sensors

Voltage optimisation

Boiler optimisation

Flood protection, if required: flood barriers, toilet backflow

Washing water recycled for grey water

Building orientation to take advantage of sun

Wind turbine or small roof top turbines

Free cooling air conditioning. Ambient temperature air used for cooling

Air source/ground source heat pump

Rainwater collection and underground storage. Rainwater from roof and porous paving on car parking area used for toilet flushing and vehicle washing

Secure bike storage with e-bike charging

Electric vehicle charging points for staff and operational vehicles

Staff electric cars to be used as a grid balancing through V2V (vehicle to vehicle) or V2I (vehicle to infrastructure) charging

2010	Initiation of the Carbon Management Programme identifying the road map to reducing carbon emissions for the next 5 years in line with the Carbon Act
2015	Light weight ambulances brought into the YAS fleet with solar panels, lithium batteries, lighter redesign, van conversions,
2017	Hydrogen electric vans brought into the fleet
2018	EV strategy developed. Commitment to reducing emissions from the CEO. Assess EV capacity within the Estate. Start to roll out electric vehicle charging points and battery storage across the YAS estate and work with partners (hospitals). CEO commits to the Clean Van Commitment with a target of eliminating our ICE fleet by 2028 for vehicles under 3.5 tonnes. Commit to buying hybrid technologies or electric vehicles where applicable. Hydrogen-diesel Patient Transport Vehicle introduced into fleet.
2020	Need to reduce carbon emissions by 37% Introduce a lease policy that stipulates all lease cars must be electric or hybrid
2024	Introduce a lease policy that stipules all lease cars must be electric
2025	Need to reduce carbon emissions by 50% Utilise solar and battery storage to generate on site hydrogen
2028	All vehicles below 3.5 tonnes will be zero emission
2030	Need to reduce carbon emissions by 55%
2035	All vehicles will be hybrid or zero emission
2040	All Diesel and Petrol only vehicles stop being produced All vehicles will be zero emission within the fleet
2045	
2050	Ban on Diesel and Petrol vehicles on the road. Aim to have a completely Zero emission fleet Need to reduce overall carbon emissions by 80%

Road to Zero Targets

- 2028 - 90% of NHS Fleet must be ULEV
  - 25% of NHS fleet must be ZEV
- 2030 diesel/petrol sales of vehicles banned
- 80% reduction of Scope 1/2 (fleet) emissions by 2030 (Greener NHS targets)
- 957 ambulance stations around England to have EV charging installed

Road to Zero Challenges

- Need to decarbonise 1200 vehicles at YAS; c. 14,000 vehicles nationwide
- Need infrastructure
- Need grid upgrades
- Need hydrogen infrastructure
- Need rapid infrastructure for fast recharging
- Need funding
- No charging at A&E at hospitals
- Only 140 charging points in the entire UK ambulance service stations to date

NHS
Yorkshire
Ambulance Service
NHS Trust

Contact details

Alexis.Percival@nhs.net

@alexiskeech

PLAN ZERO
A MITIE INITIATIVE

Q&A

planzerocarbon.com

@Mitie Plan Zero

Thank you

planzerocarbon.com

@Mitie Plan Zero

Speaker Bio's

Sam Clarke, Chief Vehicle Officer, Gridserve

Sam Clarke is a life-long entrepreneur, EV evangelist, industry advisor and EV driver for nearly 20 years. He was a 2015 winner at the Great British Entrepreneurs Awards and in 2021 was voted #17 in the greenfleet.net top 100 most influential people in Low Carbon Fleets.

Charlie Jardine, Founder & CEO, EO

Charlie Jardine is the founder and CEO of EO Charging (EO), a UK-based electric vehicle charge-point and charging software developer. EO has become a leading provider of end-to-end fleet electrification solutions and EO's technology is now used by many of the world's biggest businesses and fleet operators in over 30 countries.

Speaker Bio's

Simon King, Director of Sustainability and Social Value, Mitie

Simon is responsible for leading Mitie's industry-leading 'Plan Zero' commitment to achieve net zero carbon emissions by 2025. This includes a pledge to switch its entire fleet of 5,500 cars and vans to ultra-low emission vehicles by the same date. Prior to joining Mitie, Simon held many senior roles in procurement and fleet management including Global CPO for Tata Global Beverages, Group Procurement Director for Dairy Crest.

Chris Wright, CTO and Co-founder, Moixa

Chris Wright founded Moixa with Simon Daniel in 2006 and leads technology development as CTO. Over the last 10 years Moixa have developed the GridShare VPP software platform to deliver our vision, "by increasing the IQ of batteries, the world can live in a future powered by renewables". GridShare is now connected to over 28,000 energy storage systems in Japan, we are partnered with leading Japanese companies including ITOCHU & Honda, delivering next generation energy models in Japan and globally.

Speaker Bio's

Alexis Percival, Environmental and Sustainability Manager, Yorkshire Ambulance NHS Trust

In 2009 Alexis became the first Sustainability Manager for an ambulance service in the country. She is responsible for facilitating the roll out of EV charging infrastructure for the ambulance service fleet across ambulance service sites, as well as working with civic and other healthcare partners