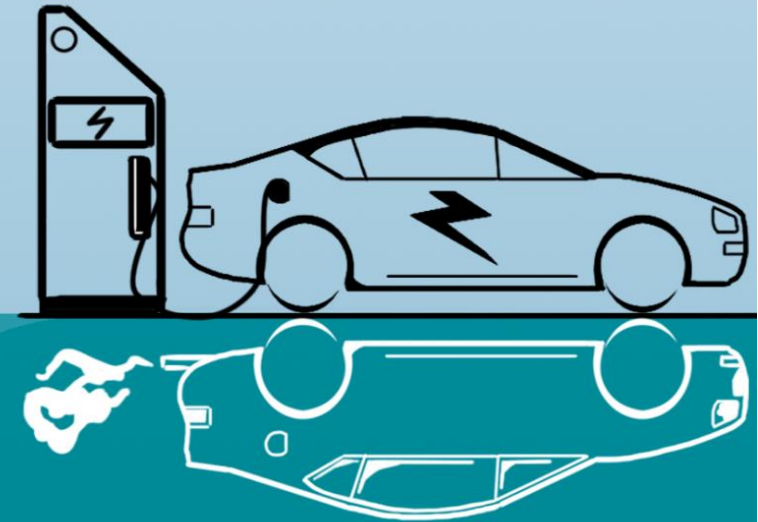


Electric vehicles and the electricity system

March 2019



SET-UP in a nutshell



Interregional cooperation project



6 regions in Europe + 1 Advisory partner



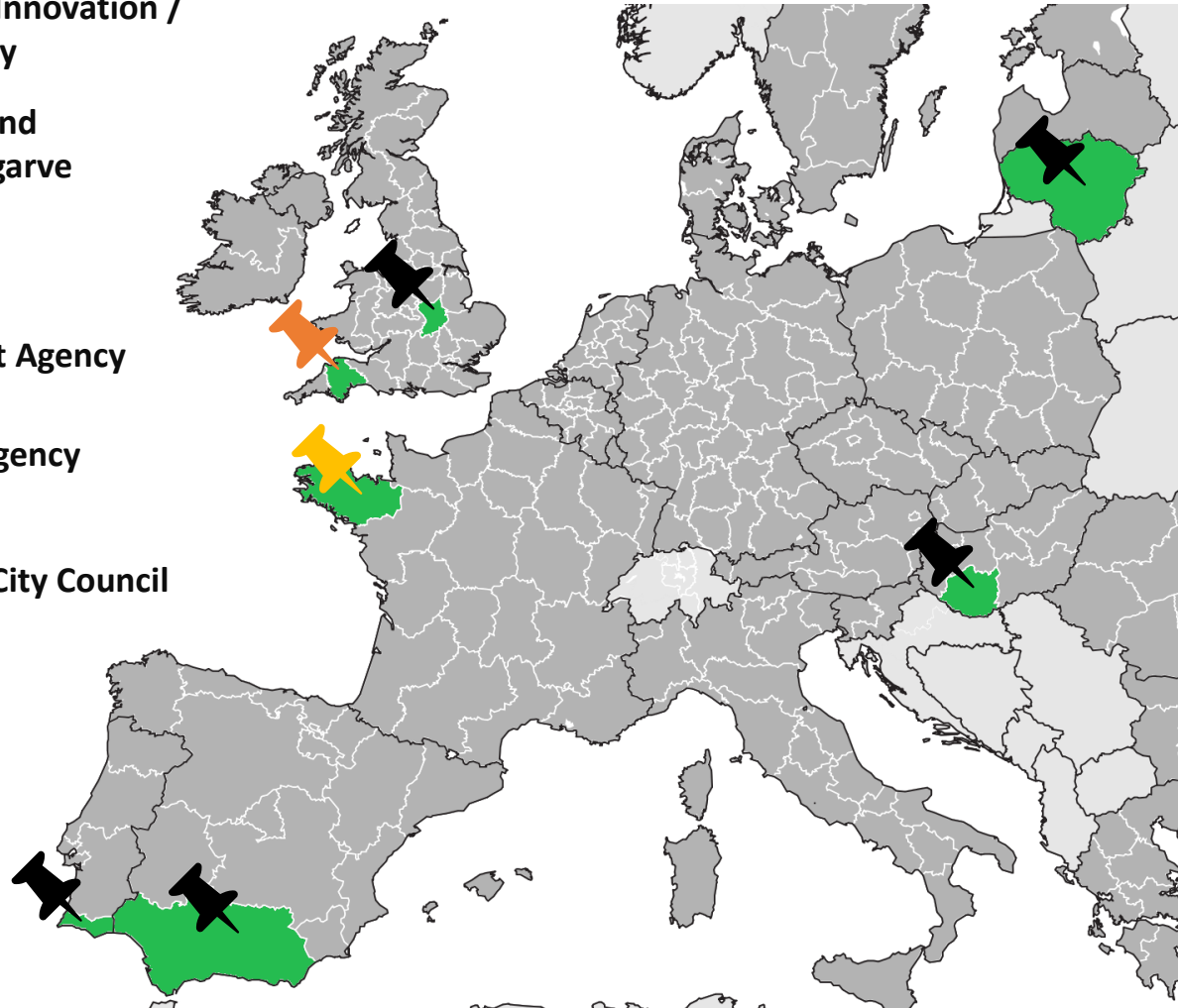
Improved Smart Grids Policies



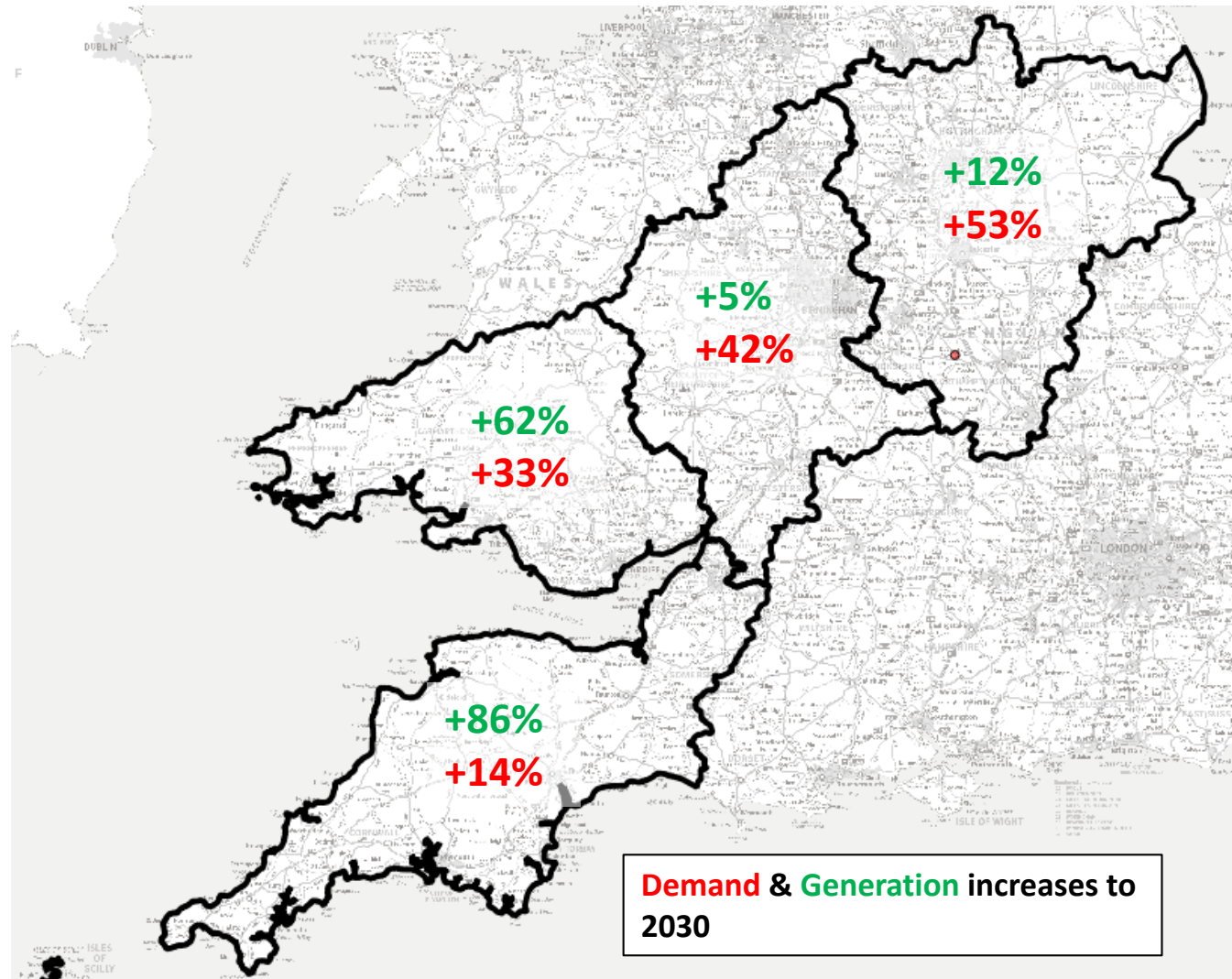
**Business models, consumer engagement,
funding opportunities**

SET-UP partners

-  Bretagne Développement Innovation /
Regional Council of Brittany
-  AREAL – Regional Energy and
Environment Agency of Algarve
-  Andalusian Energy Agency
-  Tolna County Development Agency
-  Kaunas Regional Energy Agency
-  Leicester
Energy Agency/ Leicester City Council
-  Regen

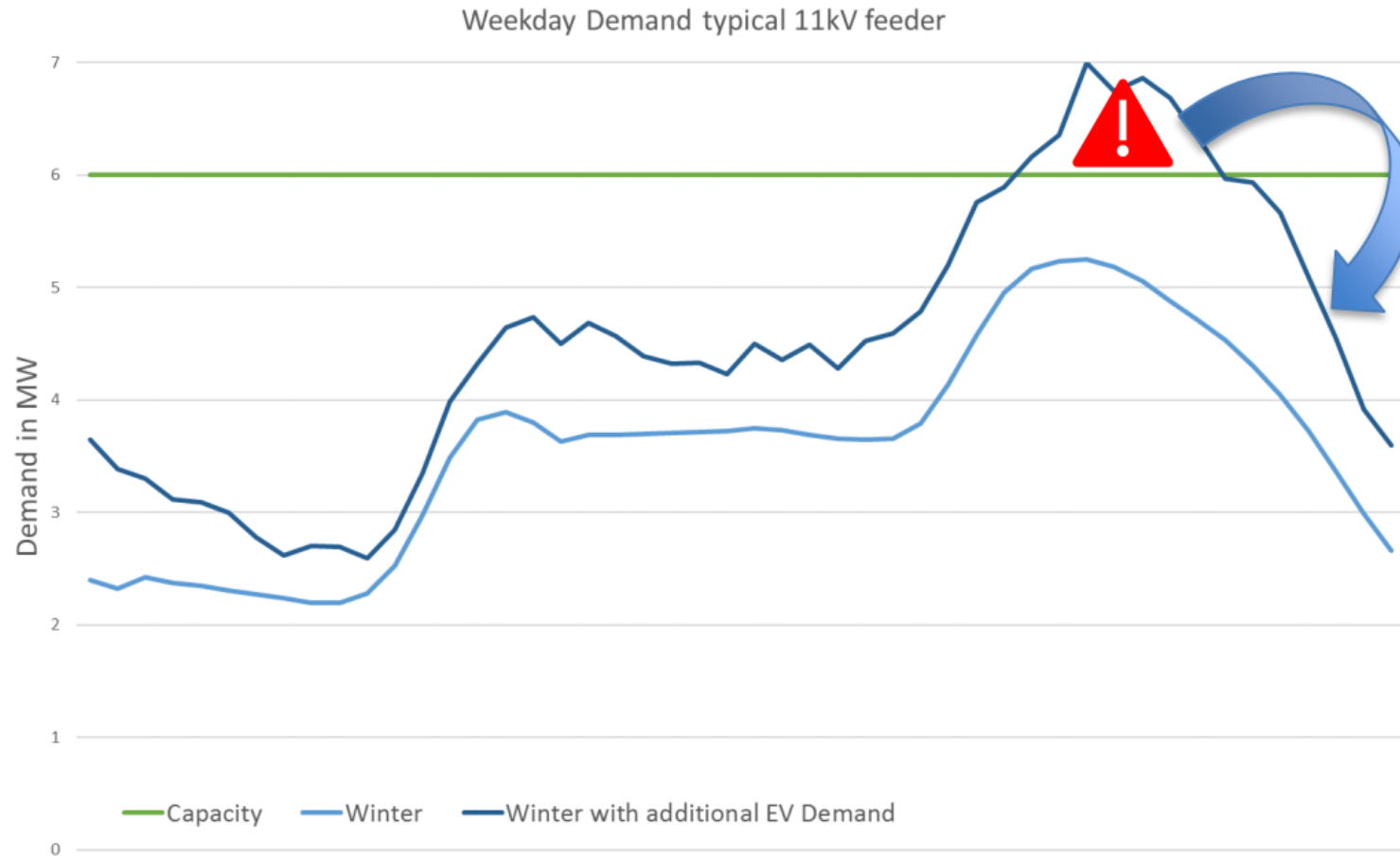


Energy System and local energy challenge



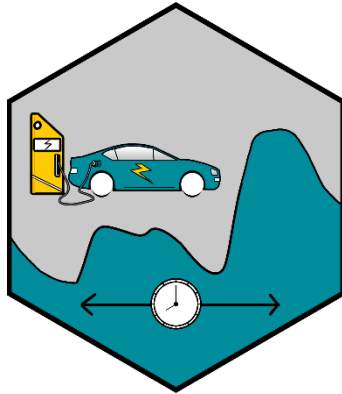
Energy System and local energy challenge

+3-8 GW in peak electricity demand by 2030 (+4-14%)



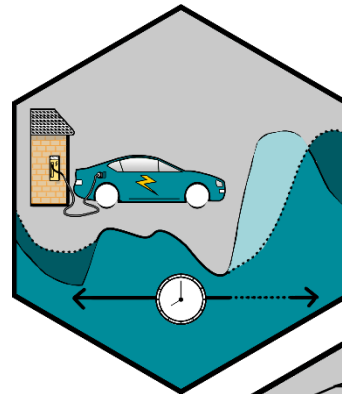
Types of chargepoint management

Time of use tariff

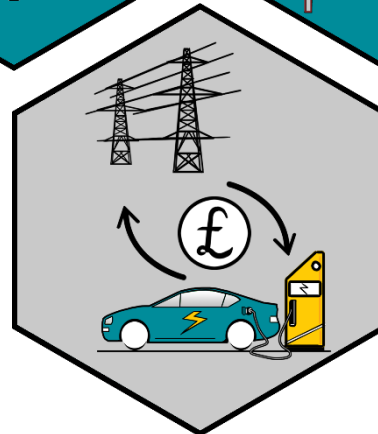
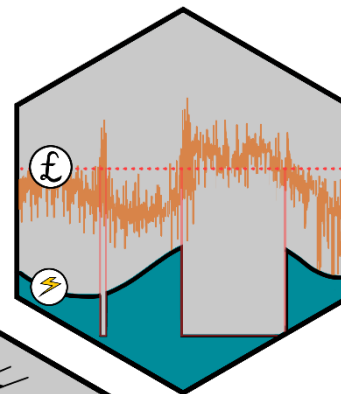


Dynamic tariff

Smart price signals

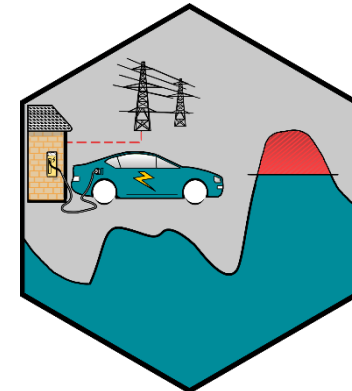


Optimised



Third party aggregation

Network managed intervention



Managing the network – smart chargers

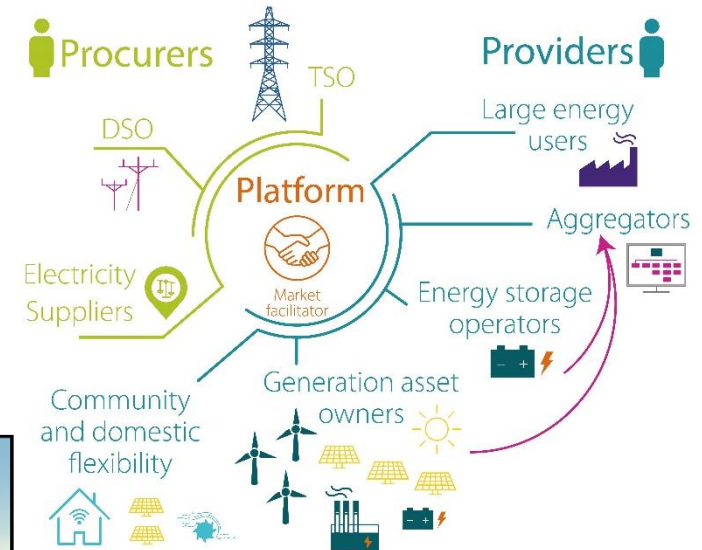
Managed charging



Targeted network investment



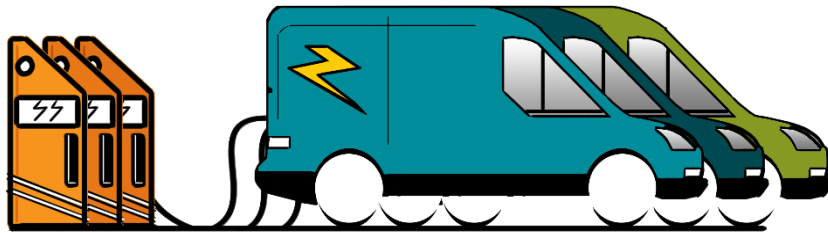
Local flexibility market



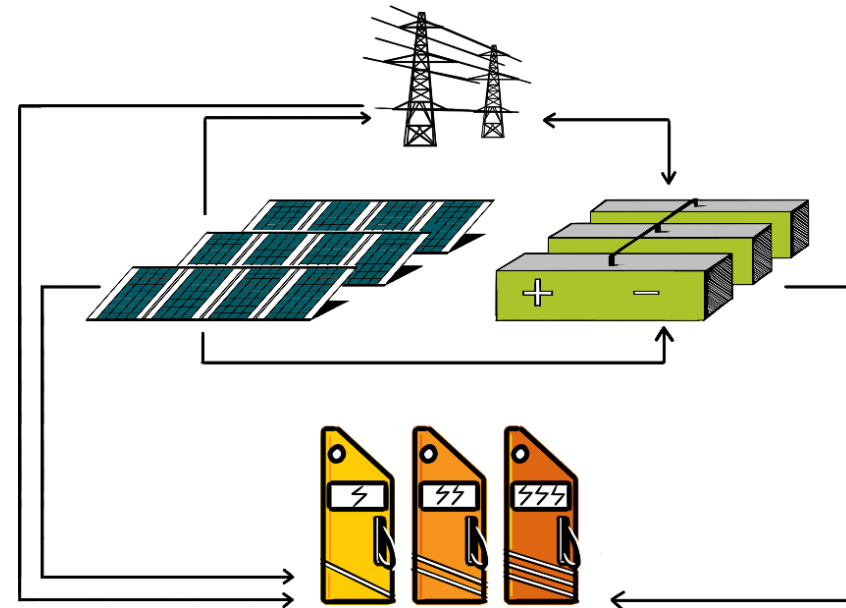
Harnessing the opportunity

Fleets and optimising value from renewable energy

Fleet as a forerunner



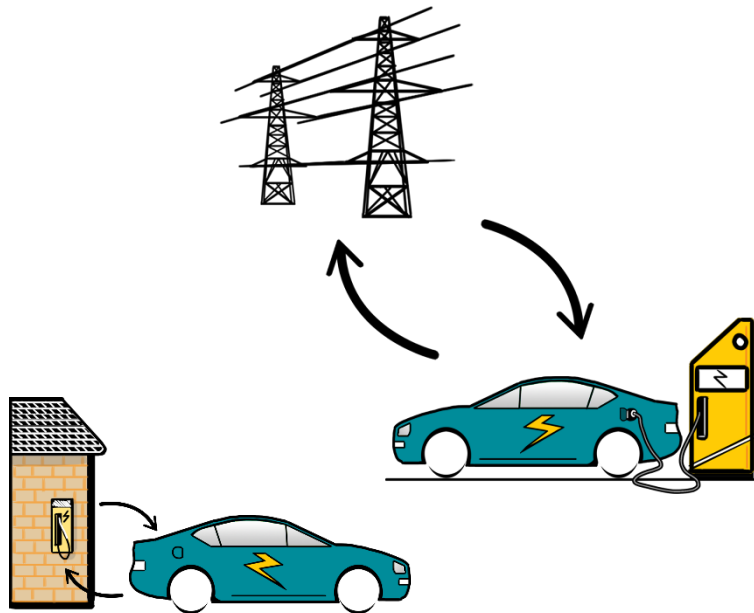
Optimising value from renewable energy



Harnessing the opportunity

Vehicle to Grid, Smart cities and public transport....

Vehicle to Grid (V2G)



Smart cities and public transport



Integrated Smart mobility solutions



Summary

'Dumb' energy system

Smart energy system



Inflexible EV charging

Impacts

- Increasing peak demand
- Risk of local outages
- Reduced system diversity
- Constrained areas become more constrained
- Reinforced costs paid for across energy consumers



Flexible EV charging

Benefits

- Lower increase in peak demand
- More efficient use of existing assets
- Improve system diversity
- Deferred/avoided reinforcement costs
- Market rewards consumers for their flexibility

Thank you for listening

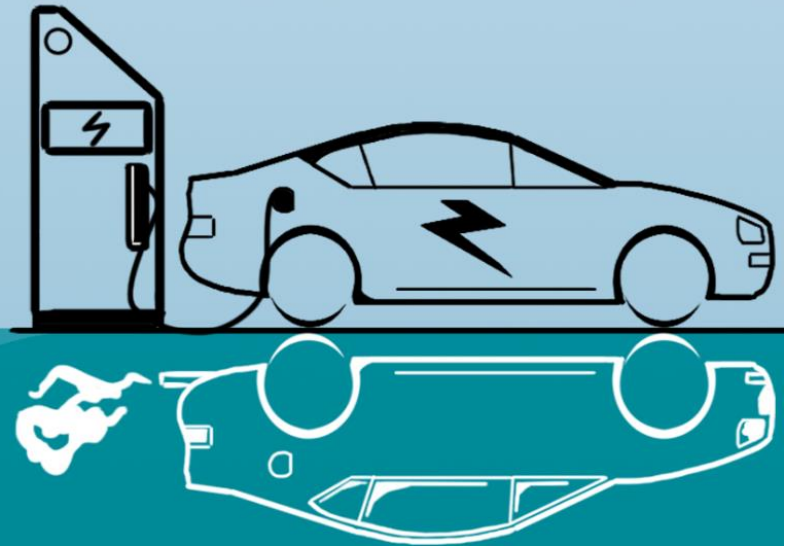
Contact:

Olly Frankland

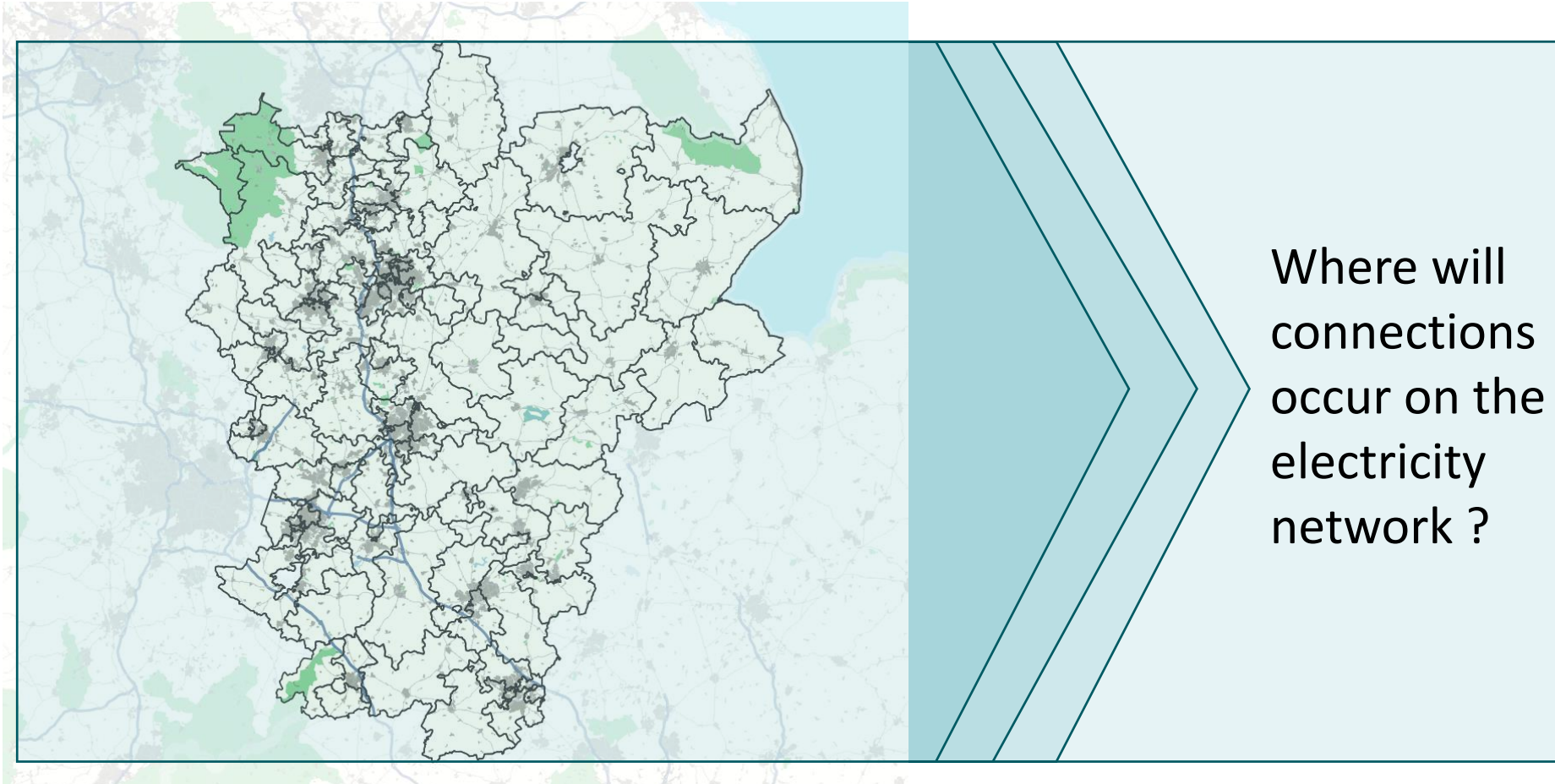
Regen

www.regen.co.uk

ofrankland@regen.co.uk



Distributed Future Energy Scenarios for DSOs

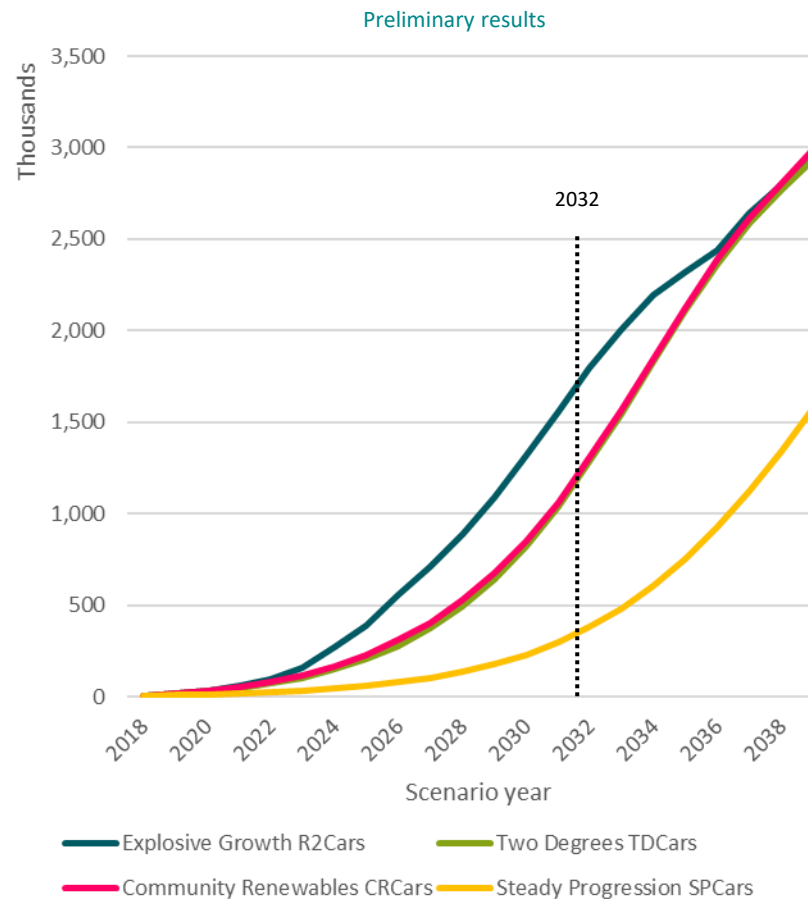


Electric vehicles: results for East Midlands

Preliminary results for Battery-electric cars

Scenario	Baseline	2025	2032
Community Renewables	5,500	229,000	1,302,000
Two Degrees		205,000	1,282,000
Consumer Power		57,500	364,000
Steady Progression		59,000	379,000
Regen 'Explosive' growth		388,500	364,000

Growth of Battery electric cars in the WPD East Midlands licence area



Electric vehicles: spatial distribution

Spatial distribution:

Our weightings include:

- Availability of off-street / on-street parking
- Current distribution of vehicle types
- Commercial properties
- Distribution of multi-car households
- Car park distribution
- Depots, distribution centres

Range of vehicle types		Range of charger types
Cars	PEVs	Domestic on-street
	PHEVs	Domestic off-street
LGVs	PEVs	Workplace
	PHEVs	En-route local charging station
HGVs		En-route national charging station
Buses and coaches		Destination
Motorcycles		Fleet/Depot
		Car parks

Our weightings include:

- Off-street EV chargers distributed by off-street PEV and PHEV cars
- Urban / rural designations
- Commercial properties
- Existing petrol stations
- Service stations
- Depots
- HV network proximity

Energy system profile

Peak time charging and the effects of engaged consumers and V2G in 2040

