



Low Carbon Vehicles North East England

Dr Colin Herron, Managing Director,
Zero Carbon Futures

North East England
Leading the way for
Low Carbon Transport



Zero Carbon Futures

Innovative Transport North East England

UK Government support

IET International Hybrid and Electric Vehicle Conference 2014

2014 IET混合动力及电动汽车国际会议



Office for Low Emission Vehicles

R&D



Incentives



Energy issues



Infrastructure



Supply Chain

 UK H₂ Mobility



Office for Low Emission Vehicles





Office for Low Emission Vehicles

“To inform wider roll out of infrastructure as mainstream electric vehicles come to the UK, the Government is supporting the ‘Plugged-In Places’ programme”

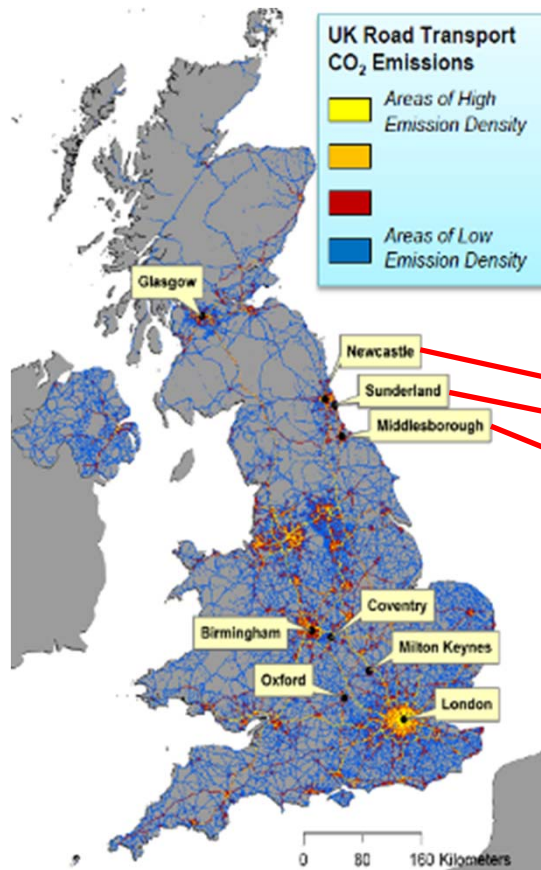


- N.E is One of Eight PIP regions
- N.Ireland
- Scotland
- Midlands
- East of England
- Milton Keynes
- London
- Manchester



Why in NE England ?

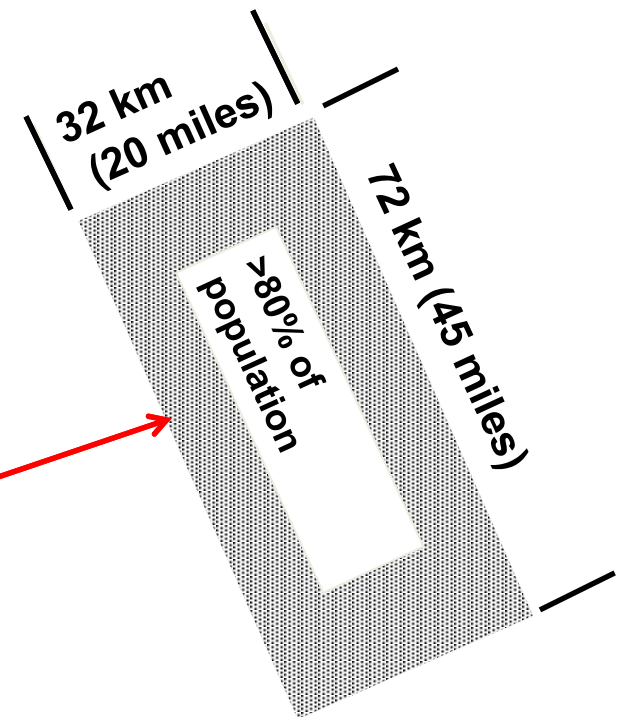
Carbon hot spots



Population density



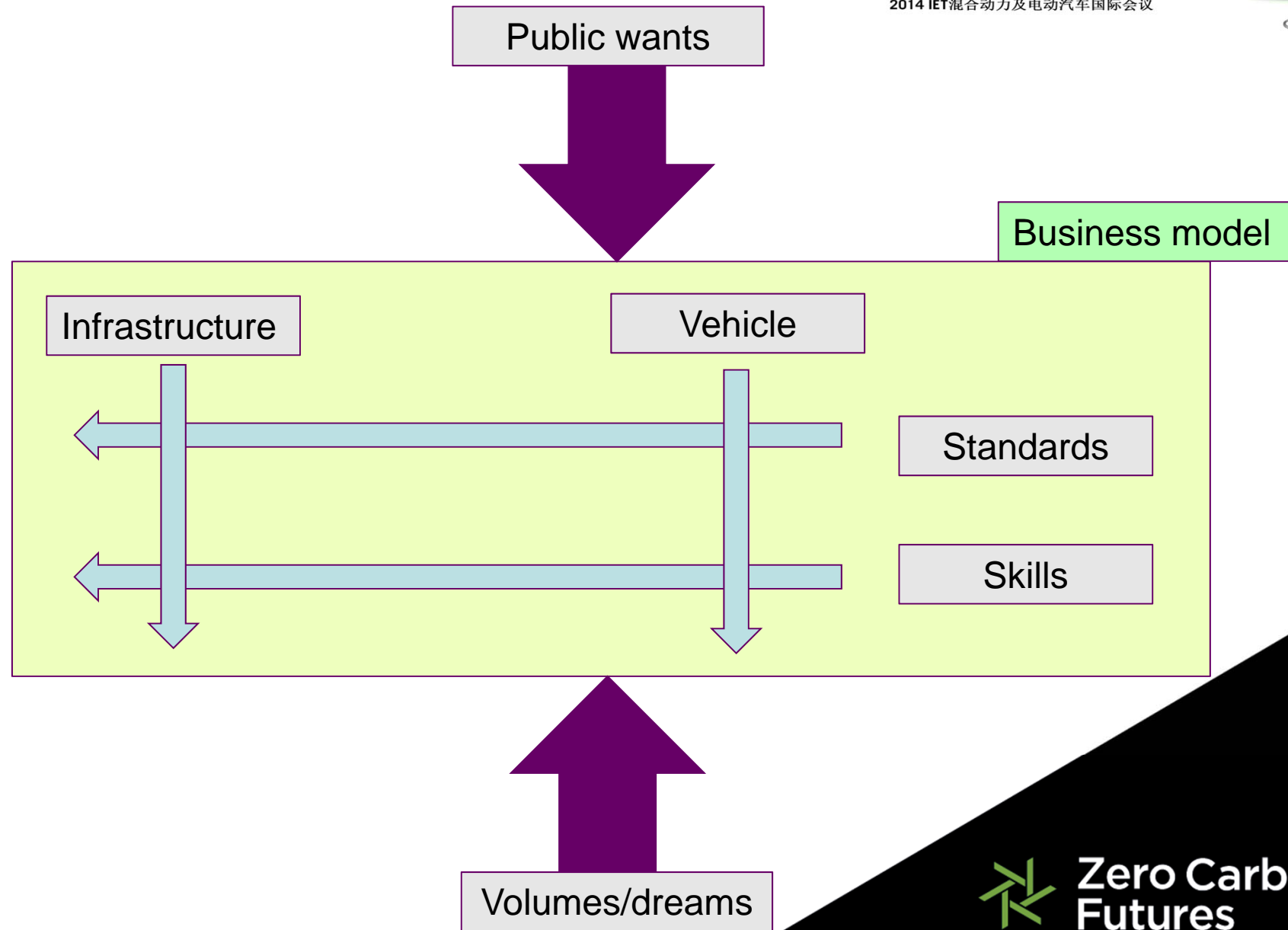
Population = 2.5 million



Ideal for EV



Challenges



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Dreams or reality?

Germany 1m

France 2m

Portugal 0.2m

Ireland 0.23m

Denmark 0.2m

Spain 0.5m

Holland 0.2m

4.33m EV by 2020
7/28 countries.

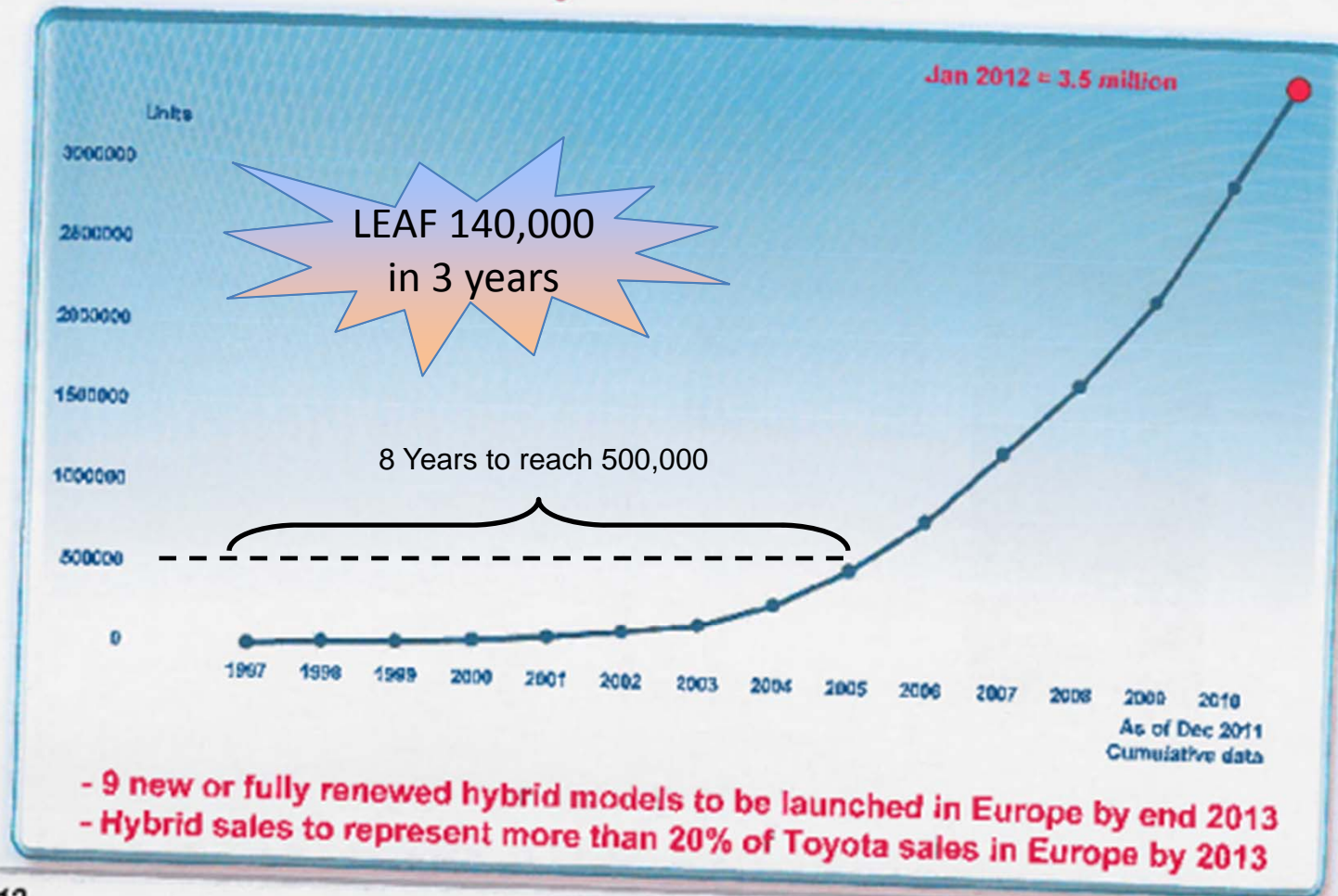


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Toyota Global Hybrid Sales



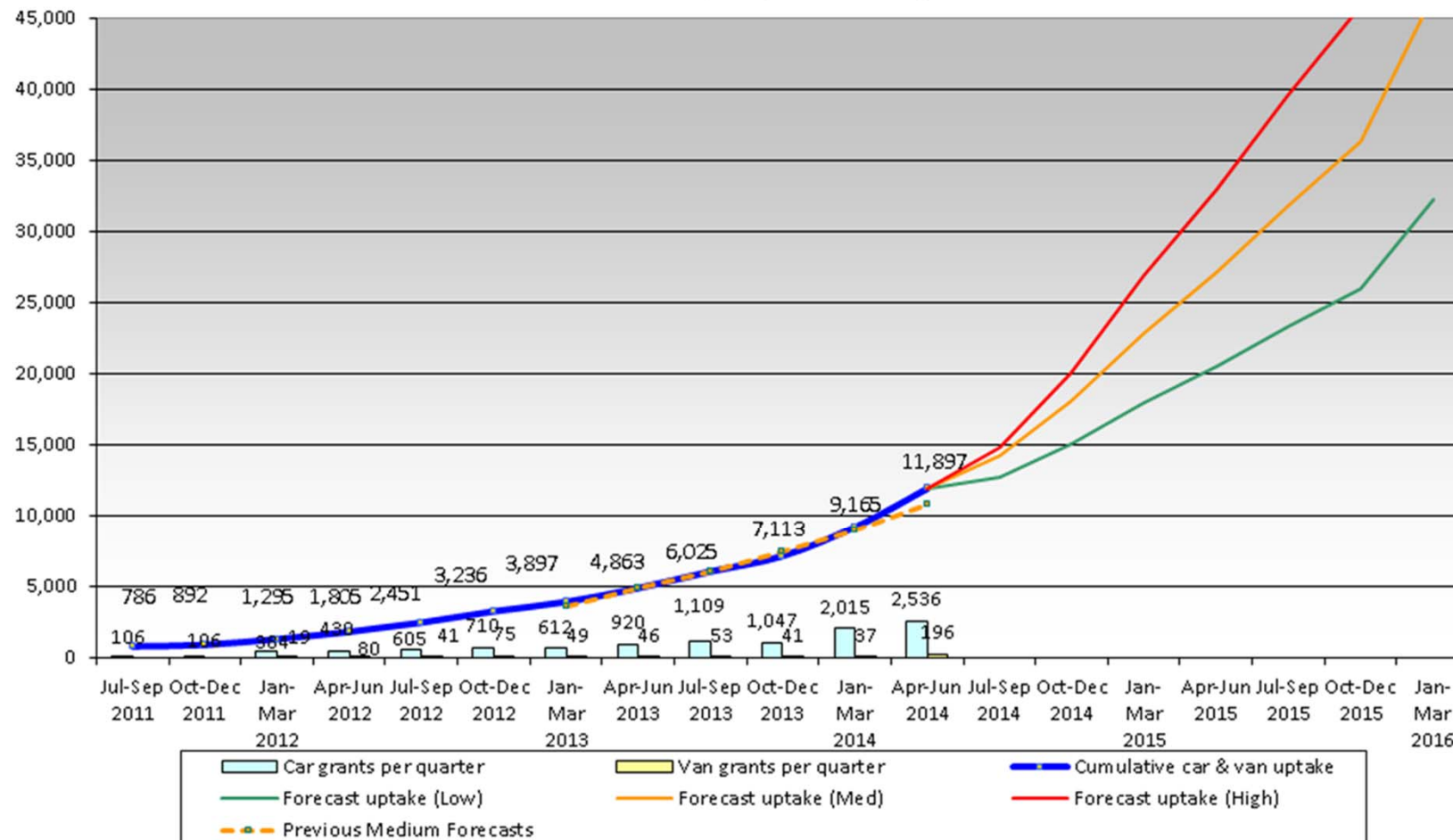
TOYOTA



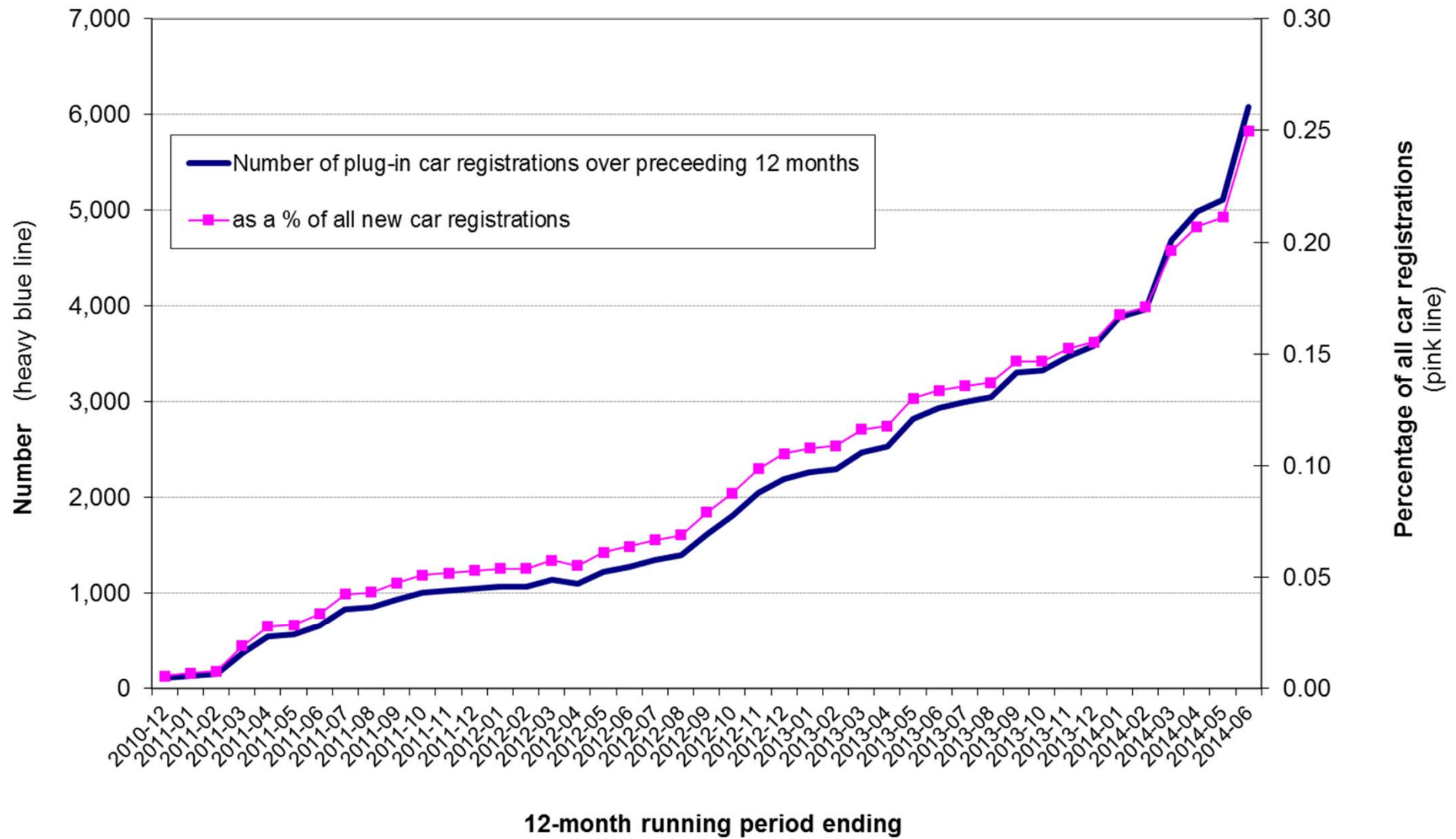
Office for Low Emission Vehicles

Plug-in Car and Van Grant Uptake / Forecast

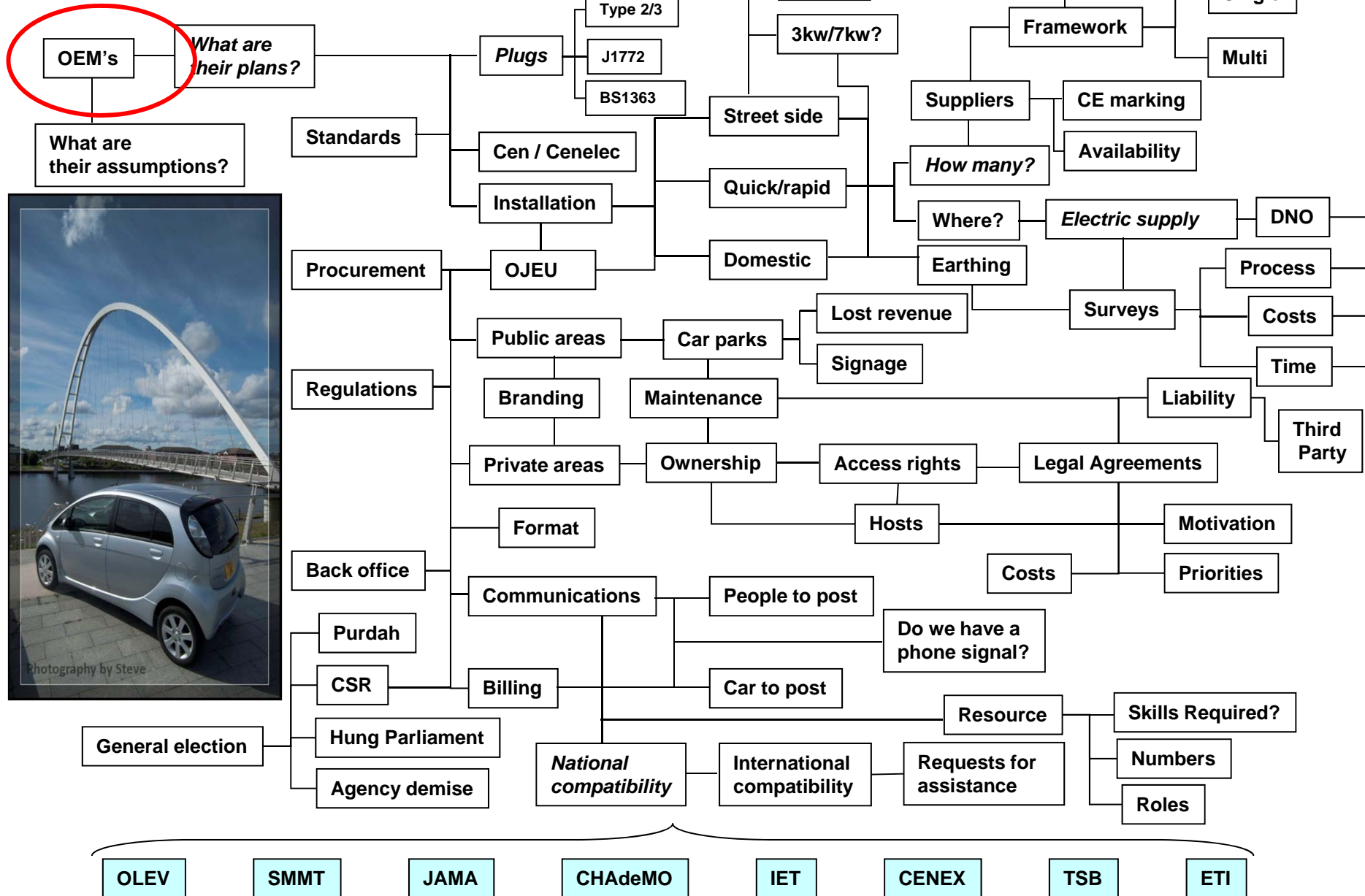
{at September 2014}



UK plug-in car new registrations: running 12-month totals



Challenges..



Promotion



FUEL YOUR CAR FOR THE PRICE OF A CAPPUCCINO

WHY NOT ELECTRIC?

Electric driving is here now, and it's a lot easier than you think with more than 400 convenient charge points. Plus, to fully charge your car at home could cost from around £2.60 – that's roughly the same amount as your morning coffee.



TAKE AN ELECTRIC TEST DRIVE.
YOU COULD **WIN A RENAULT ZOE** FOR A YEAR AT whynotelectric.com



**CHARGE
YOUR CAR**
PARK • PLUG • RECHARGE

200cc cappuccino from Starbucks is £2.75. An electric vehicle can cost from £2.60 to charge, based on the average electricity price and average energy requirement for electric vehicles available in the North East. Prices correct at time of print. Only test drives requested by 30th October 2012 via whynotelectric.com are valid entries. Entry is open to UK residents 18 and over. Prize includes insurance. Full T&Cs visit whynotelectric.com

Vehicle to Quick Charger

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CHAdemo

DAIMLER



AC



Combo2



Nissan LEAF



Mitsubishi eMiev
Peugeot iOn
Citroen C Zero



Nissan eNV200



Renault ZOE



Smart ED



BMW i3
Preview



BMW i8
Preview



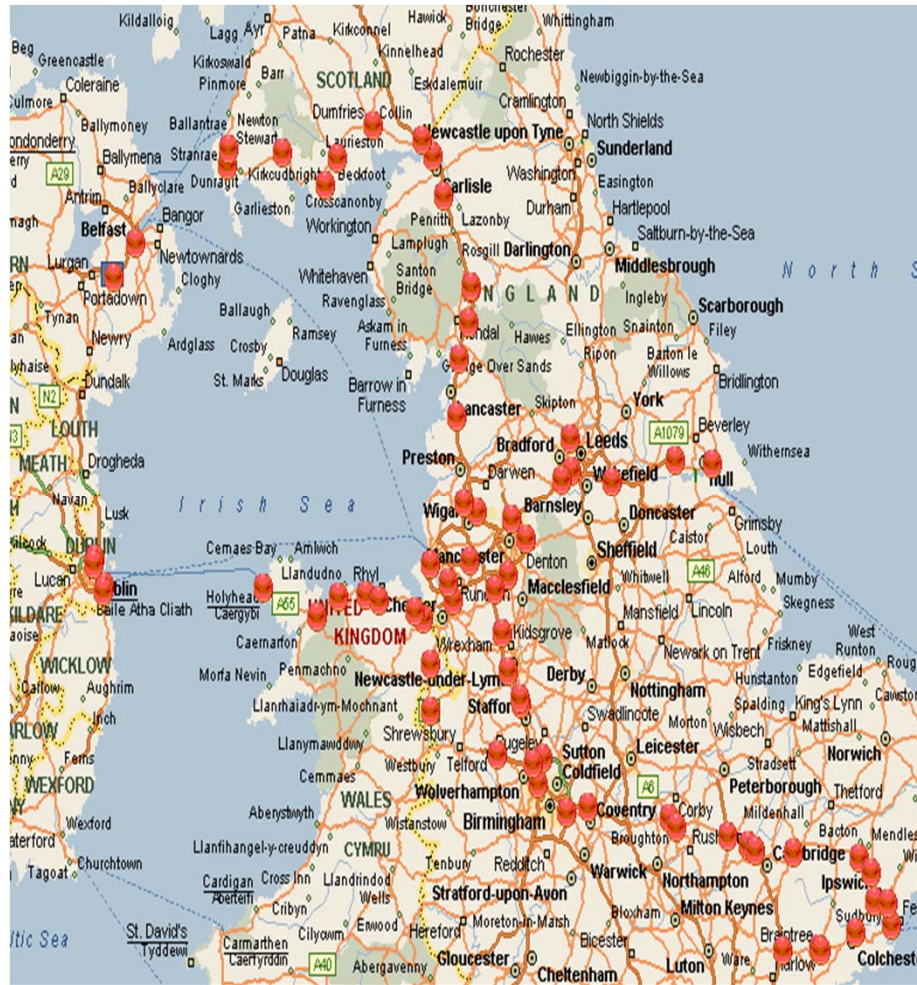
VW e-Up



VW Golf Blue
e-Motion



National Rapid Charging corridors



AC/ DC Type 2
Chademo/
Combo2



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- 200 people
- 40 cars
- 3 years
- 600,000 km

Base data

IET International Hybrid and Electric Vehicle Conference 2014

2014 IET混合动力及电动汽车国际会议

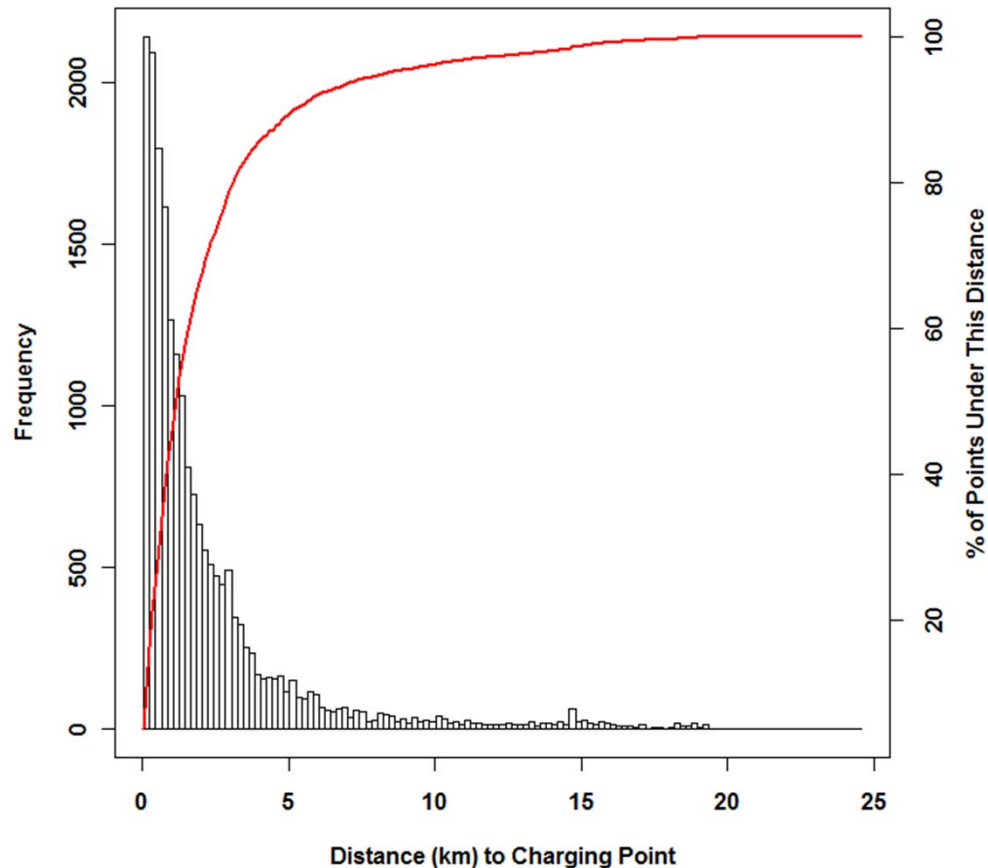


≡ Average journey length:	8.9 km
≡ Longest journey:	132 km
≡ Average journey duration:	14:30 min
≡ Total journey distance:	591,000 km
≡ Total number of journeys:	65,000
≡ Total number of charges:	17,000
≡ Total energy transferred:	105 MWh
≡ Total CO ₂ Saved:	65,000 kg CO ₂

Data from Dec 2010 to Jan 2013



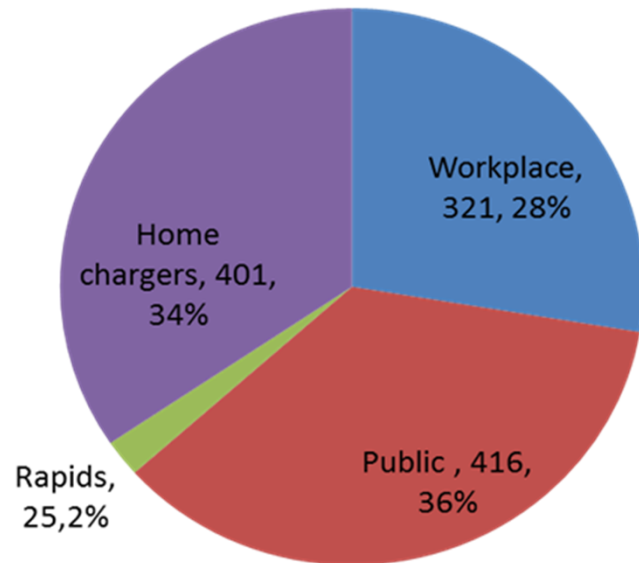
Typical Distance to Nearest Charge Point



- What this graph shows is that for over 90% of the time driving in the North East, the EV is within 5km of a charging point.
- The EV is within 15 km of a charge point for more than 99% of the time spent driving



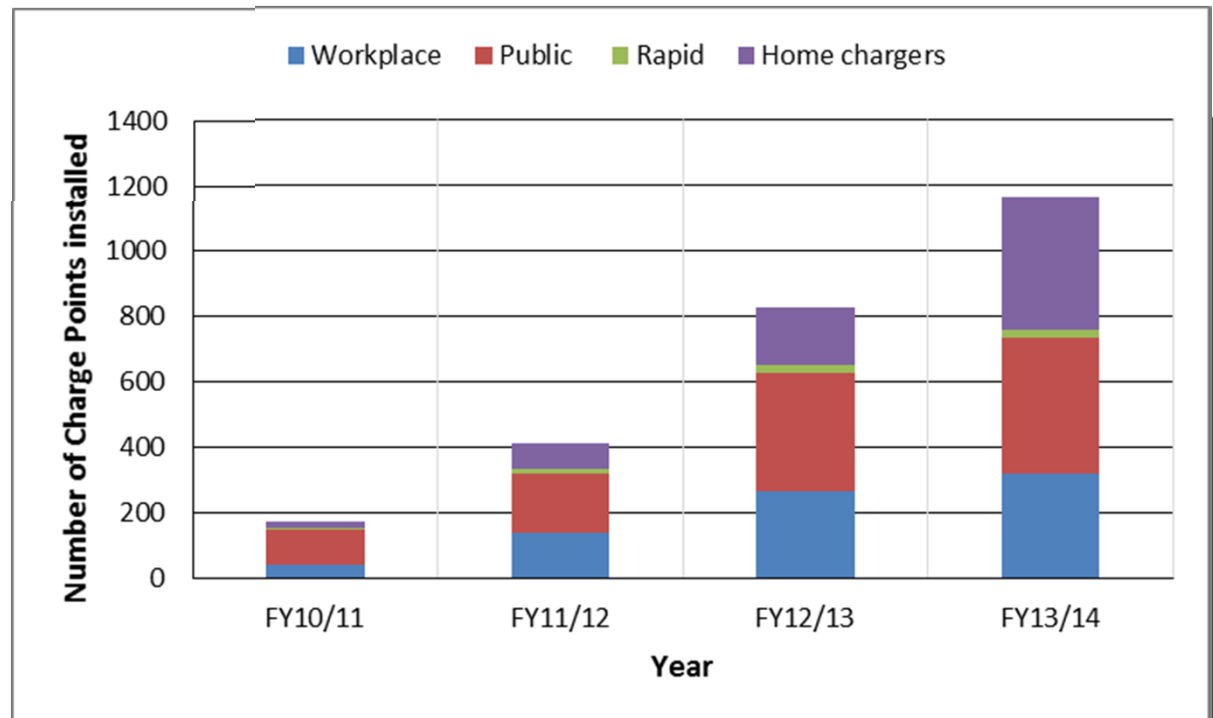
The NE's EV recharging Infrastructure



Estate Composition by June 2013

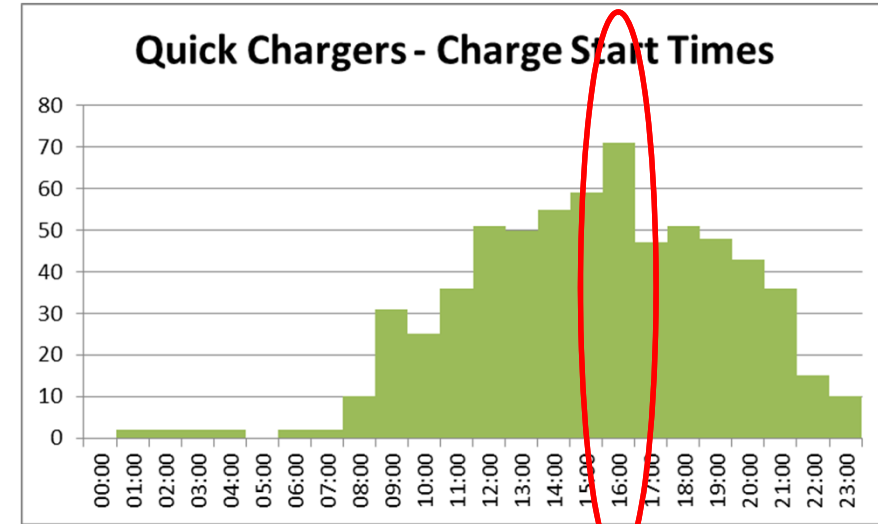
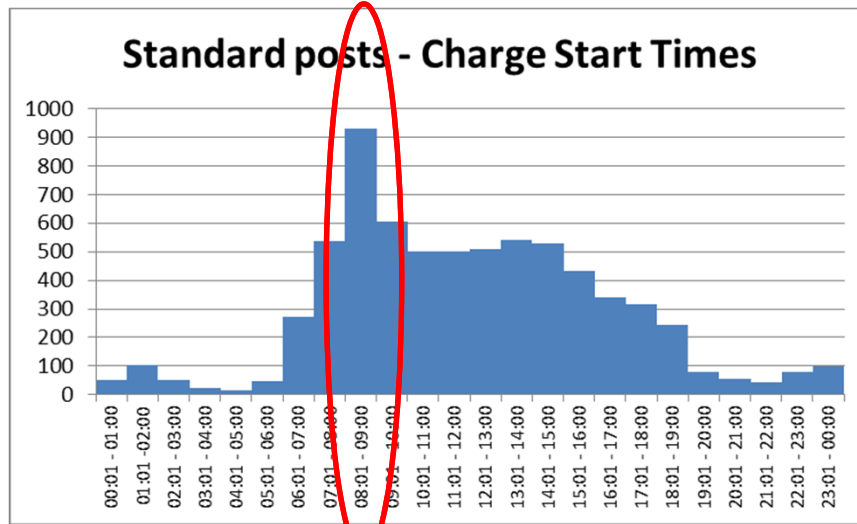
By June 2013 = 1163 Charge Points were installed

Installation timing

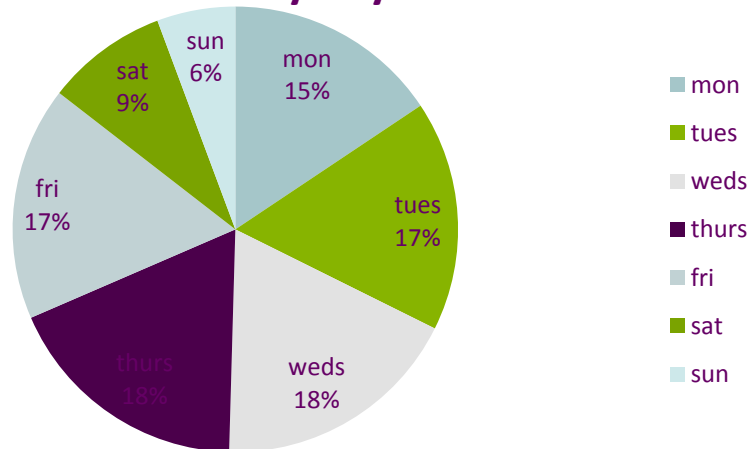




CYC Estate Usage characteristics



Transactions by day of week



Standard Charging stats (WP/PP etc :

- >90% of charging 06:00 – 19:00
- >90% of users on post for <4hrs
- Only 10% of charging at weekends
- Average energy del'd per trans = 6 kWh

Quick Charging stats :

- > 90% of usage between 09:00 – 21:00
- No drop in usage at weekends
- Average energy del'd per trans = 8 kWh



The role of Subsidies in NE England.

Up to June 2013.

- Funding for charge point purchase
- Funding for Installation works
- Funding for operating costs
- Free Electricity
- Free Parking
- Parking Spaces allocated to EVs only
- EV Grants
- Road Tax Waiver
- Congestion Charge Waiver

Since July 2013.

- Limited Funding for charge point purchase

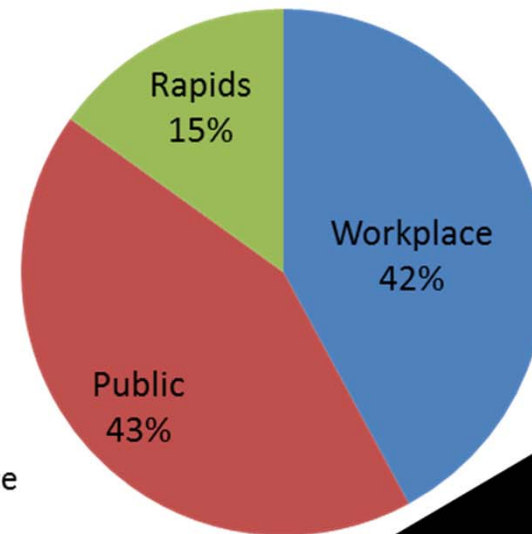
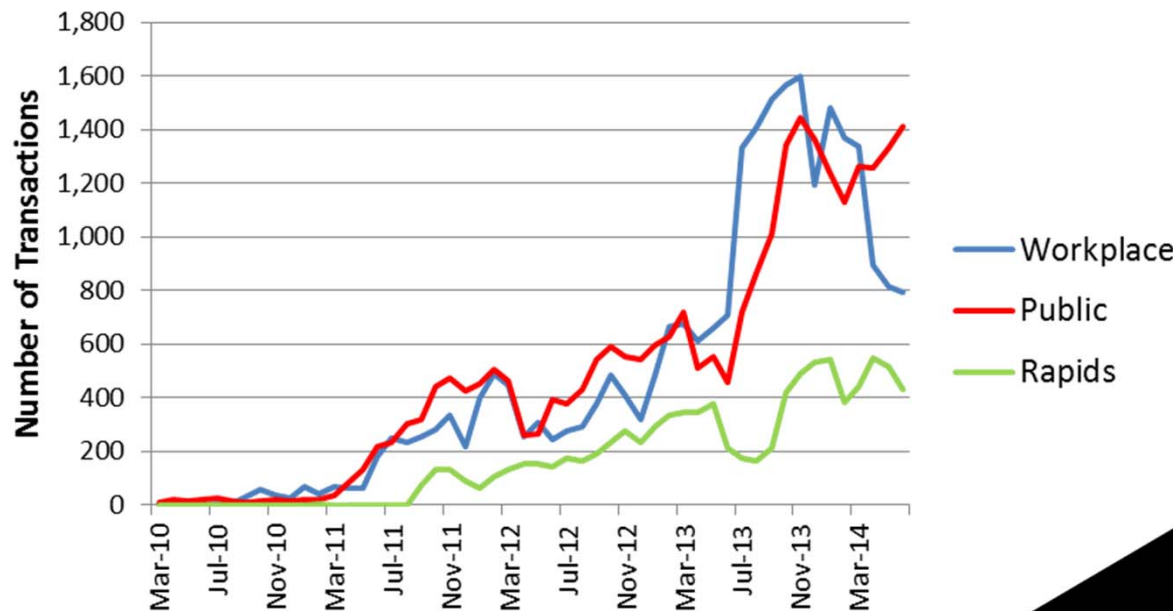


Usage of the NE's EV recharging Infrastructure

NE Growth in Transactions
by CP Location Type to June 2014

NE Proportion of Transactions
by CP Location Type to June 2014

Total Transactions = 60,814 recorded over 51 months



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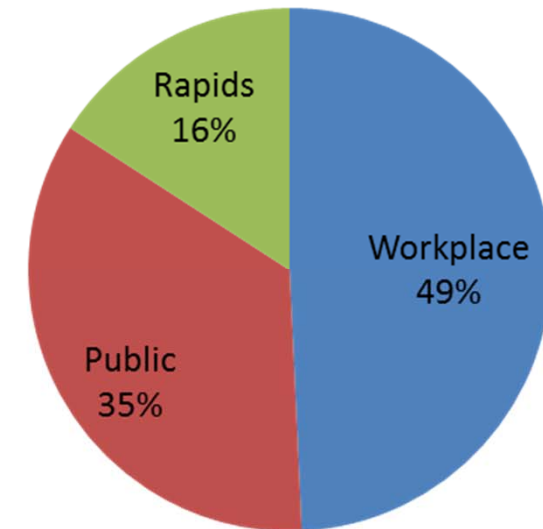
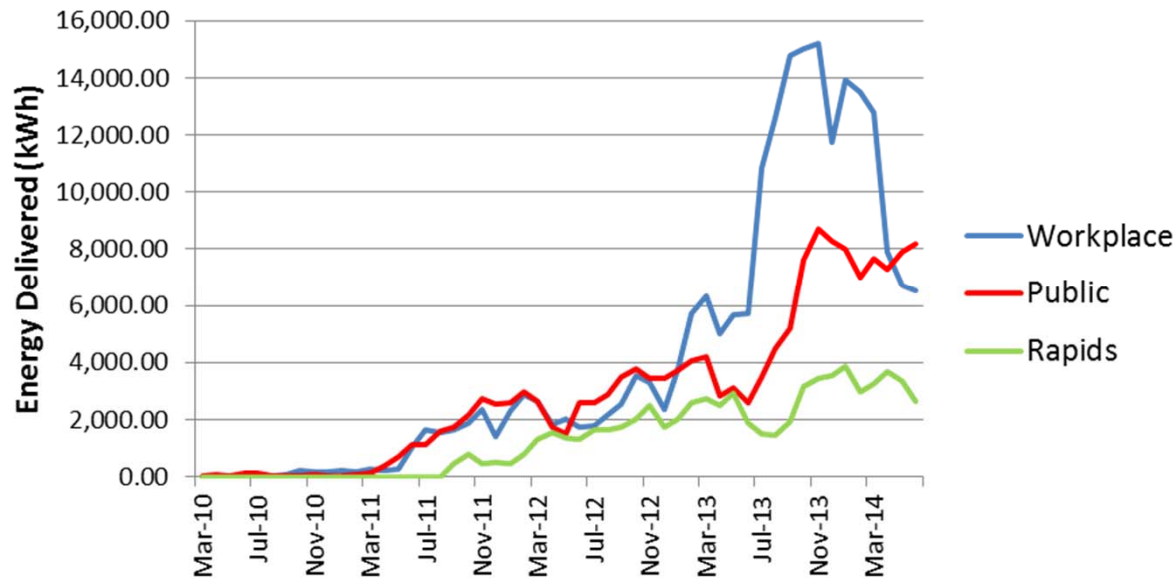


Energy supplied by the NE's E . recharging Infrastructure

Growth in Energy delivered (kWh)
by CP Location Type to June 2014

Proportion of Energy delivered
by CP Location Type to June 2014

Total Energy Delivered = 438,828 kWh recorded over 51 months

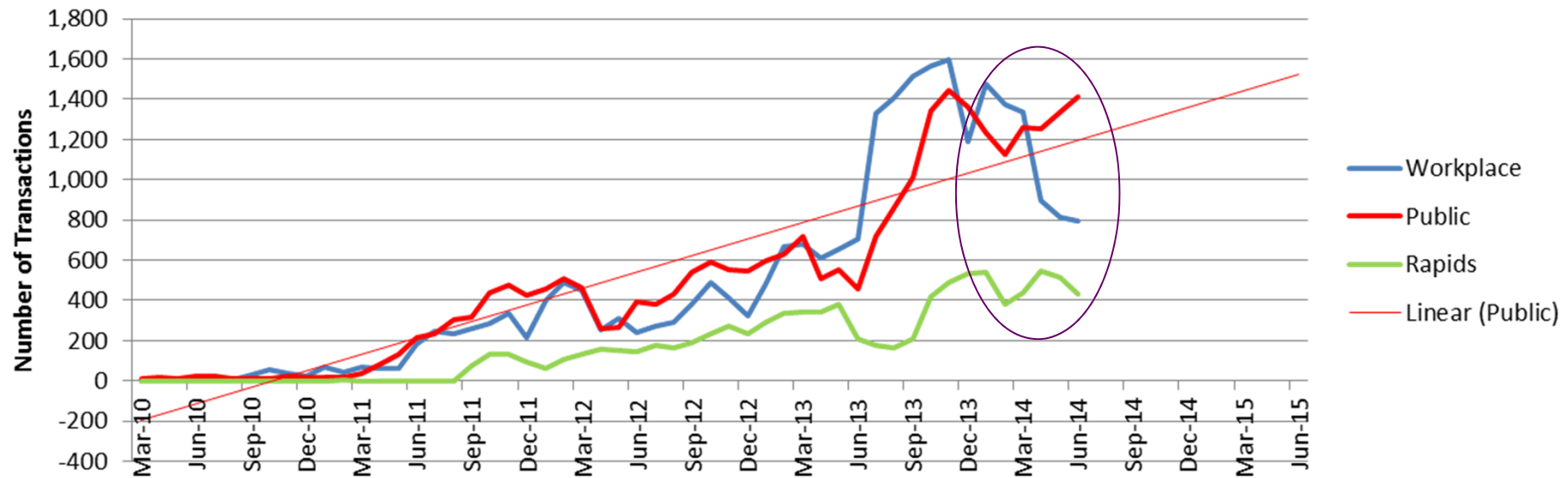


Average energy drawn per Transaction

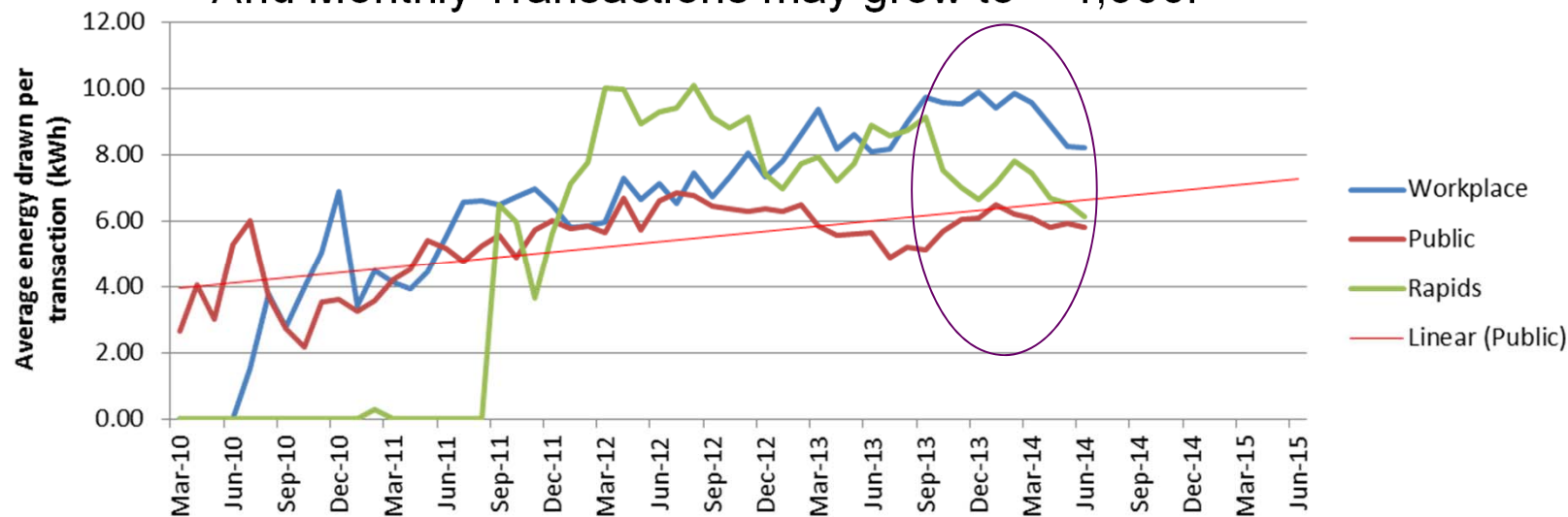
Avg energy drawn per transaction (kWh) BY YEAR	2010	2011	2012	2013	2014
Workplace	4.42	6.18	6.78	9.06	9.17
Public	3.99	5.33	6.27	5.72	6.04
Rapids	0.00	5.25	8.97	7.60	6.92



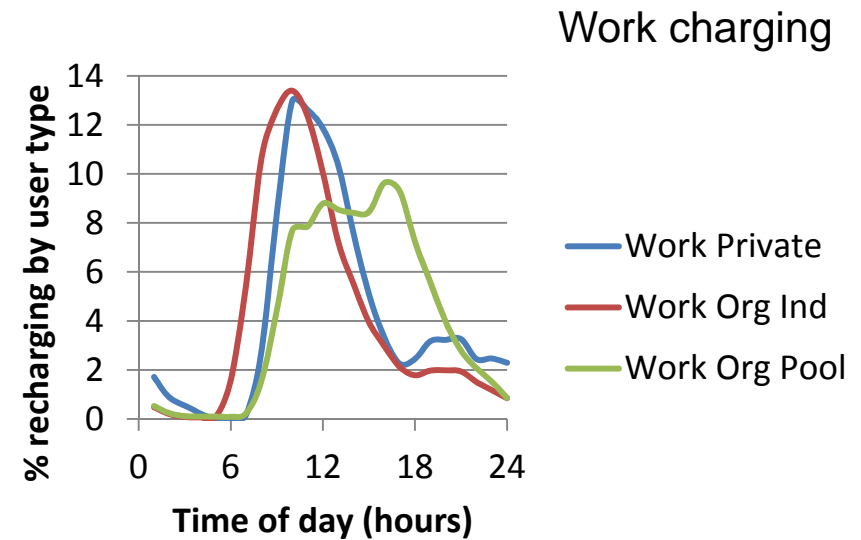
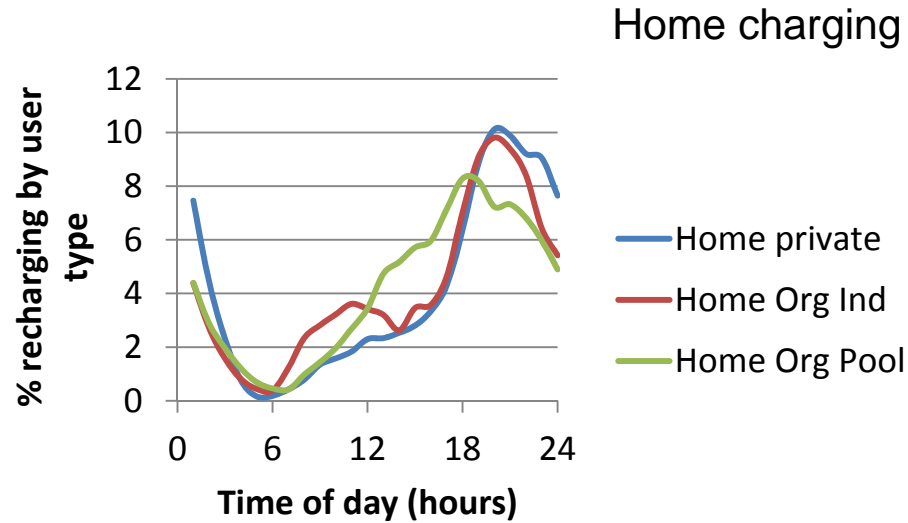
Future forecasts

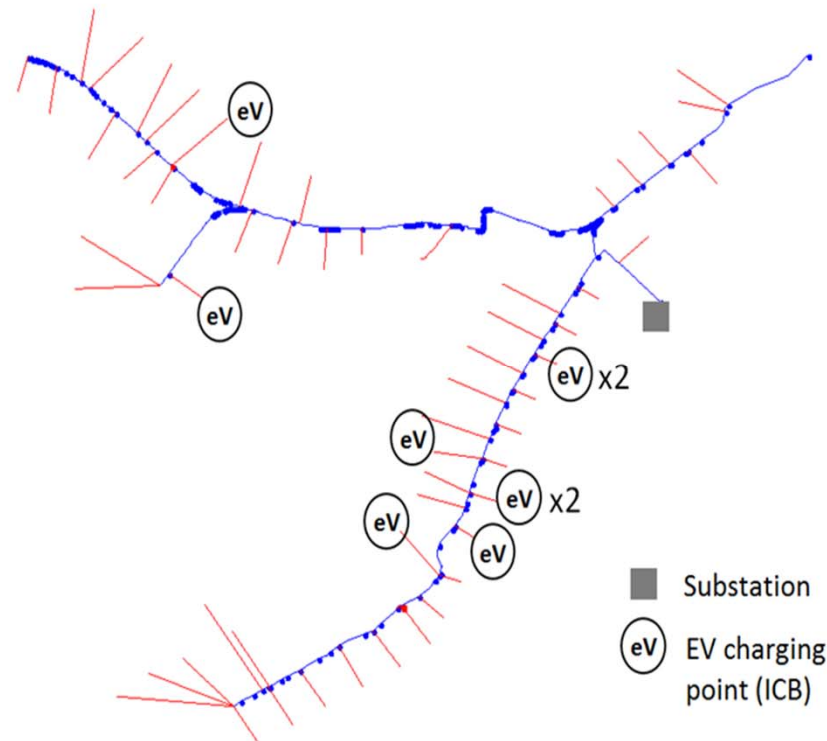


By June 2015, average energy per Public transaction may grow to = 7.5 kWh
And Monthly Transactions may grow to = 1,500.

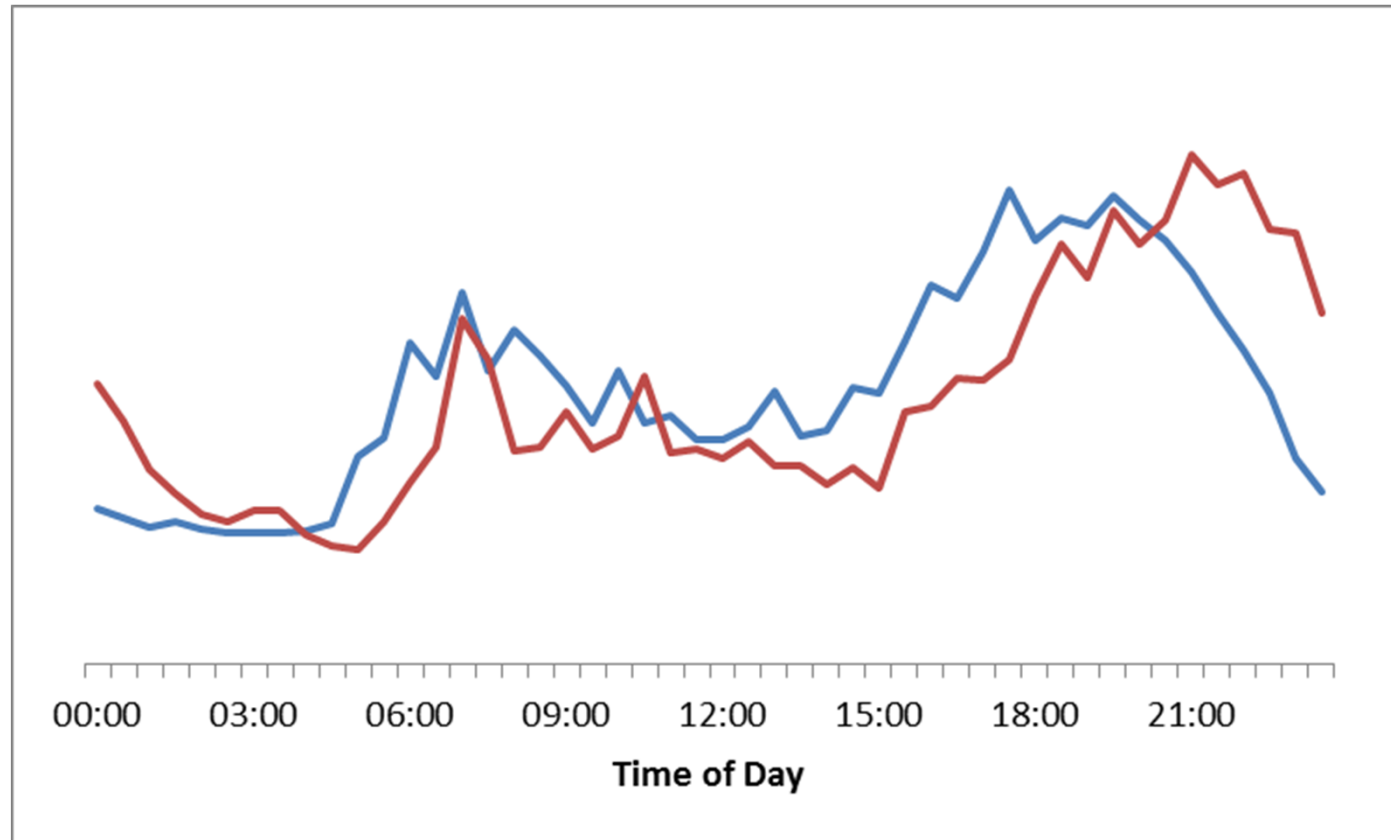


Charging profiles at different locations



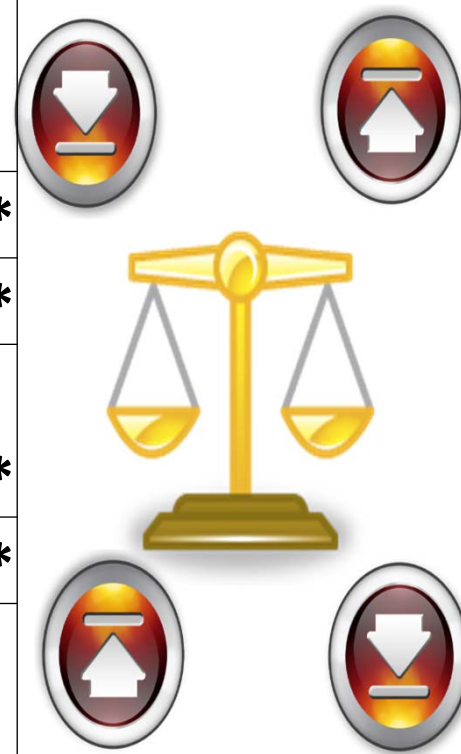


**MY
ELECTRIC
AVENUE**

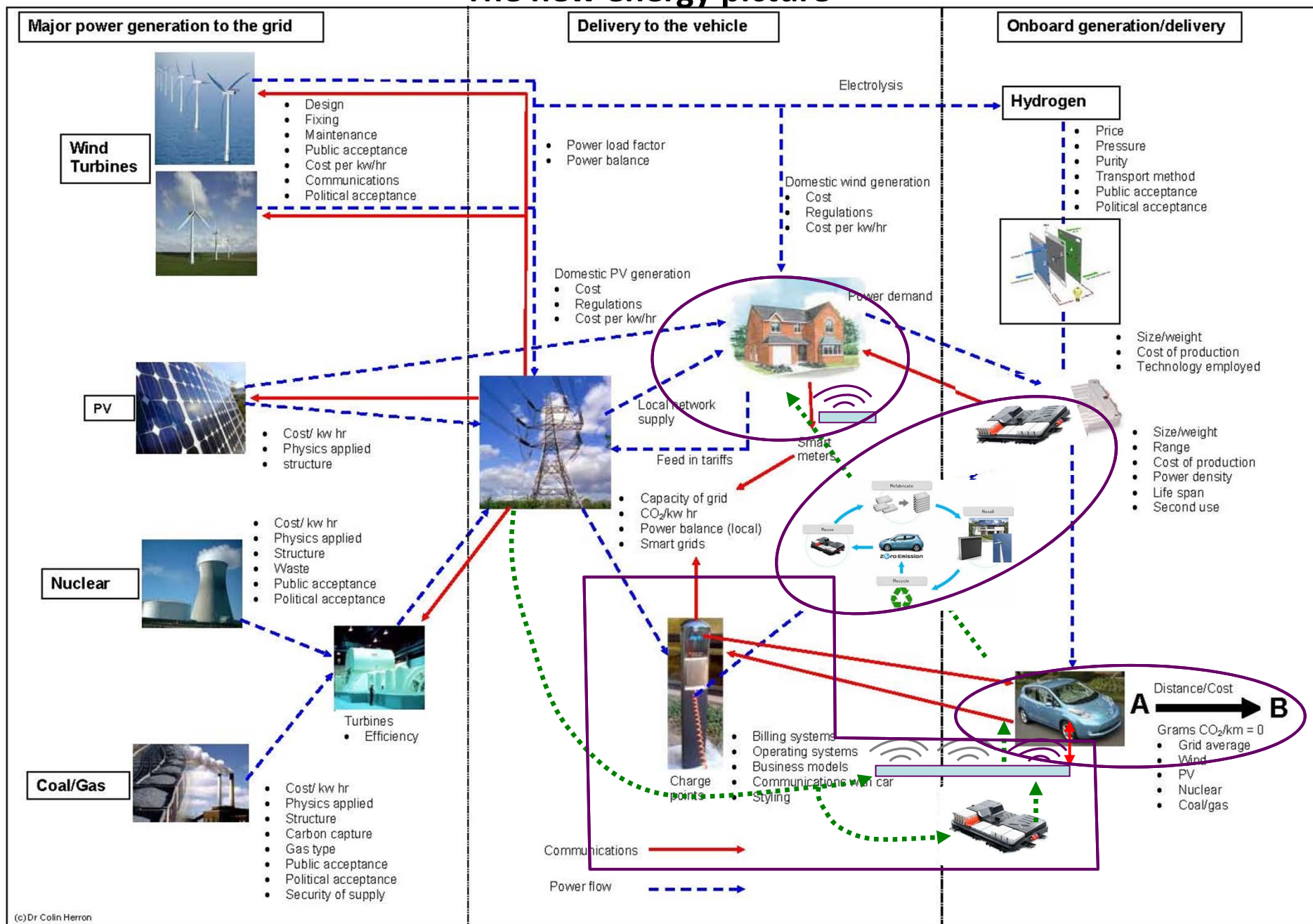


What the differing power levels offer ?

Power Level	Time to Charge (24kWh)	Cost of Charger **	Cost of Installation	Cost of Charge
3kW	8 Hrs	£2.5K	£3K	£3.00***
7kW	<4 hrs	£3K	£3K	£3.00***
22/43kW	50 / 30 min*	£4.5k	£5k - £20K	£3.00***
50kW	30min*	£10 -20K	£10 – 20K	£3.00***
	* 80% charge	** - Not Domestic		*** 20kWh@ 15p / kWh



The new energy picture





**Max output: 6kW from Nichicon PCS unit.
Delivers enough power to use main home
appliances at once.**

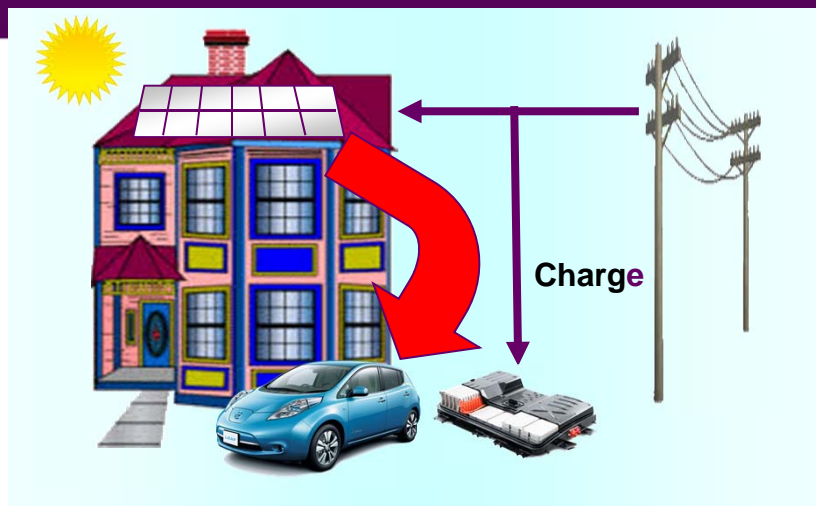
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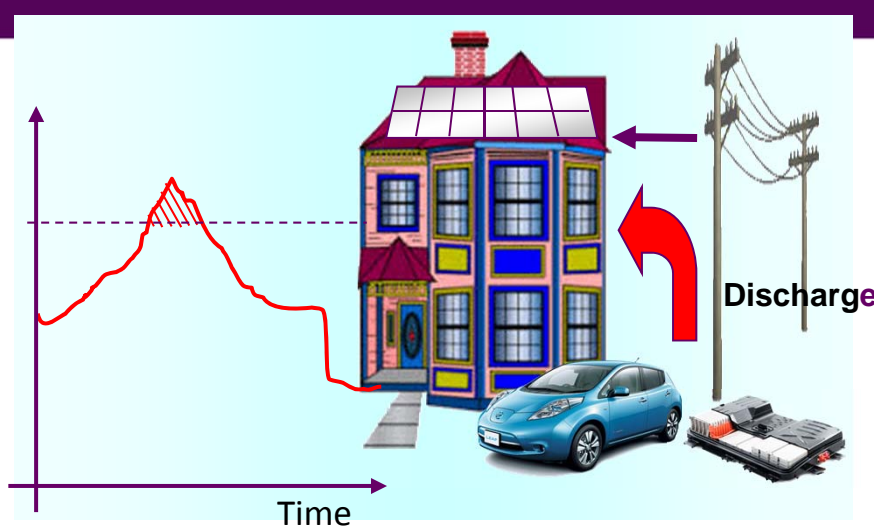
Optimisation of Electricity Usage (Vehicle to Home)

**CHARGE
YOUR CAR**
PARK + PLUG + RECHARGE

Storage Solar Energy



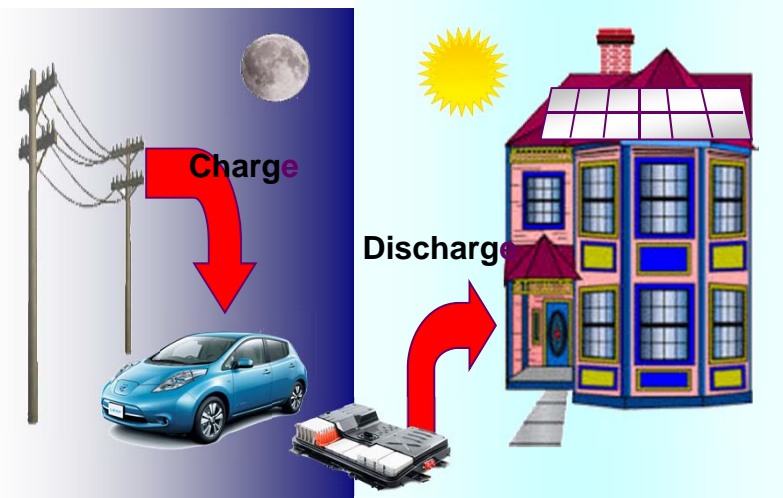
Peak-shaving



Backup during black out

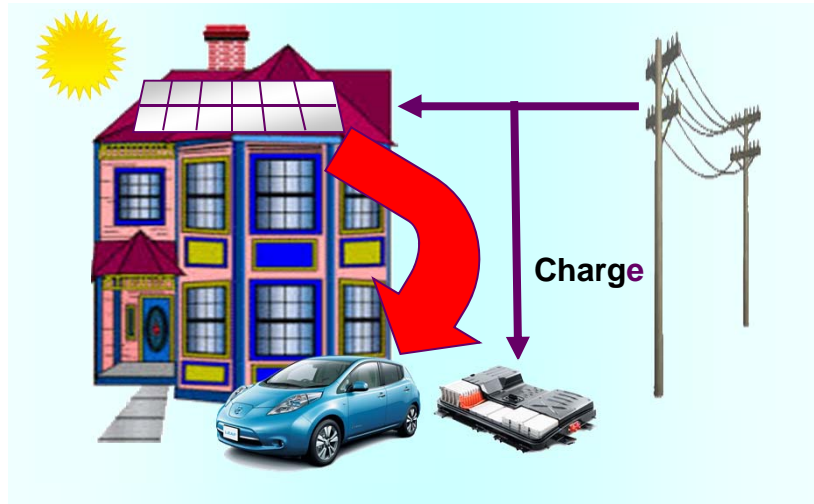


Demand Optimisation

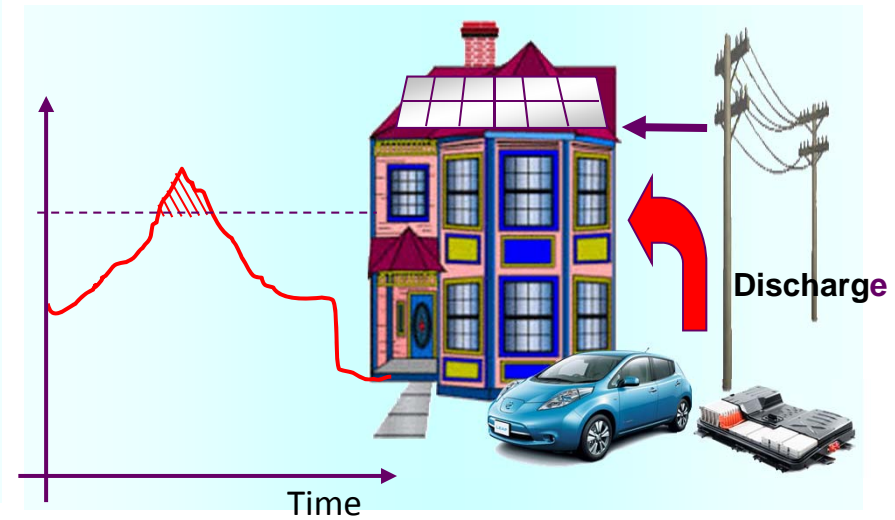




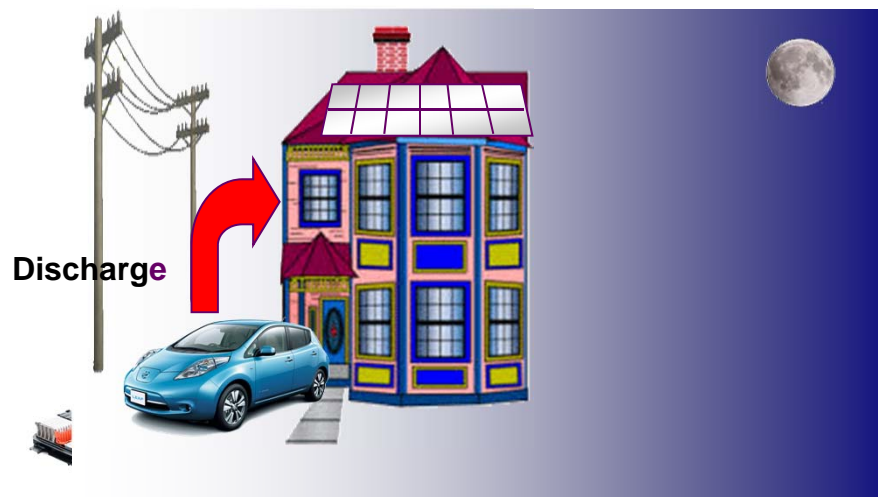
Storage Solar Energy



Peak-shaving



Backup during black out



Demand Optimisation

