

# Electrifying your fleet

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# Energy Saving Trust Group Transport

- Provide advice to organisations running fleets on how to reduce costs, emissions and facilitate the transition to ULEVs.
- Manage incentives and programmes to enhance the uptake of ULEVs, installation of chargepoints and clean vehicle retrofit.
- Support low emission transport skills, expertise and best practice across the automotive supply chain..
- Eco-driving training including EV to fleet drivers

Independent

Impartial

Pragmatic



Department  
for Transport

# Agenda

- 1 Why the shift to electric vehicles?
  - 2 Vehicle technology and charging
  - 3 Electric car & van availability
  - 4 The Business Case
  - 5 Fleet analysis
-

# 1. Why the shift to electric vehicles?

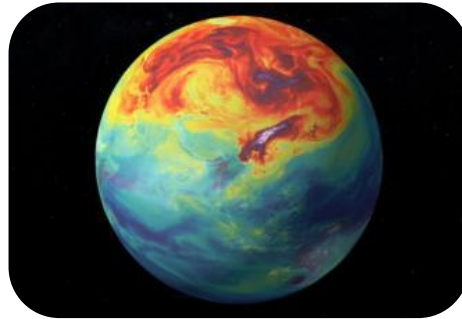


# Why the shift to electric vehicles?

UK Government plans to end the sale of new petrol and diesel cars and vans by 2030 and hybrids by 2035



Economic  
opportunities



Climate  
emergency



Air pollution

## 2: Vehicle technology and charging

What is a ULEV  
BEVs and PHEVs  
Batteries  
Charging



# What is an ultra-low emission vehicle?

An 'ultra-low emission vehicle' (ULEV):

Emits less than 75g CO<sub>2</sub>/km at the tailpipe

The definition is technology-neutral.

ULEVs do not need to be electric.

# Summary: Types of ULEVs



Battery electric vehicle or pure EV (BEV or EV)

Powered only by electricity.

- Zero tailpipe emissions
- Low running costs: fuel and SMR
- Overall emissions will reduce with greater use of renewables



Extended range electric vehicle (E-REV)

Combines a battery, electric drive motor and an ICE/generator.

- Like a pure EV but with added range



Plug-in hybrid electric vehicle (PHEV)

Combines a battery, electric drive motor and an internal combustion engine.

- Driver knowledge and selection important
- Only work if regularly plugged in



# Batteries and range



- Battery is essentially the fuel tank
- Capacity measured in kWh
- Bigger battery = more range in same size vehicle
- Charged at x kW – varies by vehicle – max rate determined by vehicle
- For Leaf/ Zoe sized cars 3-4 miles / kWh real world range, so Leaf with 40kWh battery = 120 to 160 miles range
- Heating and higher speeds are two main factors limiting range

# Charging 101

- Chargepoints are rated in kW
- Higher the kW output of the chargepoint, the quicker the charge
- Vehicles have a maximum charge rate that they can accept
- Charge time also depends on battery size



	Slow	Fast	Rapid	Ultra Rapid
Power rating	2.3 – 3.7 kW	7 - 22 kW	Up to 50 kW	120-350 kW

# 'Slow' and 'Fast' AC Charging Connectors

For AC charging, the chargepoint socket is the same, vehicle inlet may be different

Type 1 connection (5 pin)  
US and Japanese manufacturers



**Type 2 Connection (7 pin)**  
European manufacturers



# 'Rapid' DC Charging Connectors

CHAdeMO



Combined Charging System (CCS)



# Finding a public charge point

The screenshot displays the Zap-Map website interface. At the top, there are links for 'ANDROID' and 'IOS', the 'ZAP MAP' logo, and a 'SITE SEARCH' bar. Below the logo are navigation tabs for 'MAP', 'CHARGING', 'VEHICLES', 'STATS', 'TOOLS', and 'NEWS'. The main area is a map of Coventry, UK, with numerous charging points marked by colored pins. A search bar at the top of the map contains the text 'Coventry'. On the left side, there is a sidebar with a user profile icon and links for 'Sign In/Register', 'Add EV Model', 'Filters', 'Nearby chargers', 'Route planner', 'Zap-Chat', and 'Settings'. On the right side, there is a legend for 'Map markers' and 'Status'. The 'Map markers' legend includes: Rapid - 43kW+ (purple), Fast - 7-22kW (blue), Slow - 3-6kW (yellow), Public (light blue), Hydrogen (green), Charging (at least one device) (red), Out of service (all devices) (grey), Zap-Home (orange), and Zap-Work (grey). The 'Status' legend includes: Charging (blue), Available to use (green), No issues reported (green), Out of service (red), ICE'd (Internal Combustion Engine) (red), and Successful charge (green). At the bottom left, there is a link for 'Zap-Map Terms and Conditions'. At the bottom right, there is a 'Connectors' section.

## 3: Electric car & van availability

Makes and models  
Availability  
Suitability for different  
sectors



# Electric vans



Maxus e-Deliver 9



Maxus e-Deliver 3



Renault Kangoo ZE



Renault Master ZE



Renault Zoe van

# Electric Vans



FIAT Ducato electric



Nissan e-NV 200



Vauxhall Vivaro-e



Peugeot e-Boxer



LDV EV 80



Mercedes eVito



Citroen e-Dispatch



Ford Transit Custom  
PHEV



# Electric vans - conversions



Refrigerated vans



# Electric Cars



Nissan Leaf



Kia e-Niro



Renault Zoe



Vauxhall Corsa-e



MG 5



VW ID.3



Volvo XC40



Jaguar IPace



Mercedes EQC

## 4: The business case

Benefits

Whole life costs

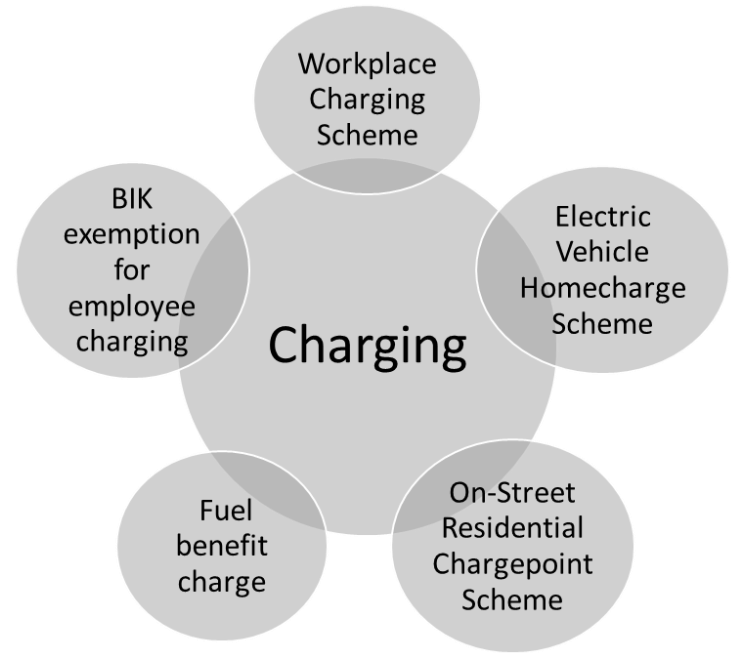
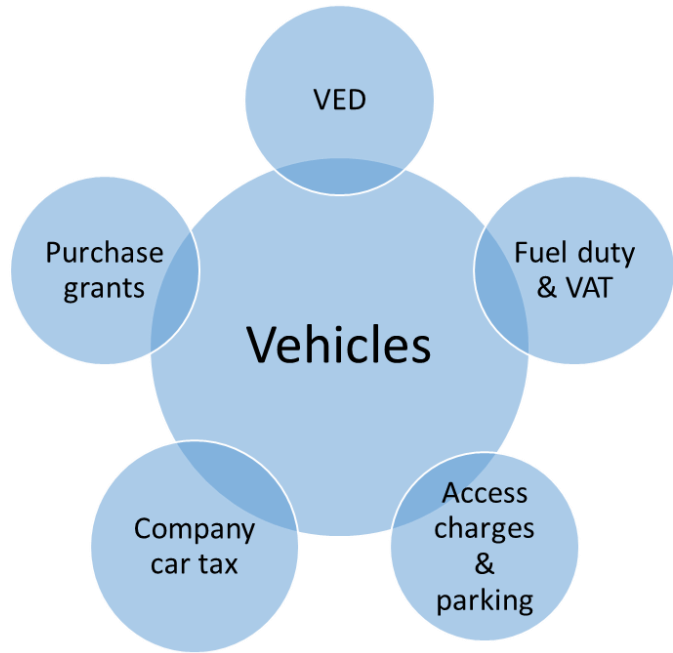


# Why choose an EV?

- Zero tailpipe emissions
- Quieter and smoother driving experience
- Usually higher upfront purchase/lease cost but lower running costs – Electricity costs roughly a third of petrol or diesel if charging at home
- Lower servicing and maintenance costs
- Zero road tax (VED) or benefit-in-kind on company cars (2020/21)
- Increasing choice of models at lower price points as battery prices per KW reduce and manufacturers invest



# Taxation and grants



# Benefit in Kind

g/km CO <sub>2</sub>	Electric range	2020/21	2021/22	2022/23	2023/24	2024/25
0		0	1	2	2	2
1-50	>130	0	1	2	2	2
1-50	70-129	3	4	5	5	5
1-50	40-69	6	7	8	8	8
1-50	30-39	10	11	12	12	12
1-50	<30	12	13	14	14	14
51-54		13	14	15	15	15
125-129		28	29	30	30	30

# Company car tax & class 1 NIC

Vehicle	Company Car Tax	Class 1A NIC
Vauxhall Corsa-e 5dr 50kWh SE Nav	£184	£127
Vauxhall Corsa 5dr 75 SE Nav	£2,837	£1,958
<b>Saving</b>	<b>£2,653</b>	<b>£1,831</b>
KIA e-Niro 64kWh 4	£231	£159
Ford Focus 1.0 125 Active X	£4,592	£3,168
<b>Saving</b>	<b>£4,361</b>	<b>£3,009</b>
Tesla Model 3 Dual Motor	£306	£211
BMW 2.0i M Sport Auto	£7,247	£5,000
<b>Saving</b>	<b>£6,941</b>	<b>£4,789</b>

# Van price comparison

	Renault Kangoo ZE ML20 Business	Renault Kangoo ML19 Dci 80 Business
Lease cost 48 months/40,000 miles	£11,215 +VAT	£10,915 +VAT
Maintenance	£854 +VAT	£1,740 +VAT
Fuel cost @ 16.36 p/kWh & 97.7ppl	£1,925 +VAT	£3,948 +VAT
Total cost	£13,994 +VAT	£16,603 +VAT

Lease prices Leasing.com, maintenance KeyResources, Electricity cost EST Domestic, Fuel AA November 2020.



# Grants for vehicles

Category	CO <sub>2</sub> emissions	Zero emission range	Grant	Maximum grant
Car Category 1	Under 50g/km	At least 70 miles	35% of cost	£3,000
Vans	Under 75g/km	At least 10 miles	20% of cost	£8,000
Large Vans & Trucks	At least 50% of Euro VI equiv'	At least 10 miles	20% of cost	£20,000*
Taxis	Under 50g/km	At least 70 miles	20% of cost	£7,500
Motorbikes	0g/km	At least 31 miles	20% of cost	£1,500
Mopeds	0g/km	At least 19 miles	20% of cost	£1,500

Source: Office for Low Emission Vehicles \*First 200 orders

# Grants for chargepoints

Scheme	Details	Value
Electric Vehicle Homecharge Scheme	Registered keeper, lessee or primary user of eligible electric vehicle	75% up to £350
Workplace Charging Scheme	Registered business, charity, or public sector organisation	75% up to £350 per socket up to 40 sockets
On-street Residential Chargepoint Scheme	Local authorities only, funding for on-street chargepoints	75% of capital costs £6,500 per cp

Source: Office for Low Emission Vehicles

## 5: Fleet analysis



# ULEV review - building the case

## Identify the vehicle opportunity

- Vehicle profiles / duty cycles that appear to work
- Vehicles where there is an appropriate alternative

01

Which vehicles?

## Understand the costs

- Carry out whole life cost analysis vs ICE
- Factor in grants and tax benefits

02

Understand costs

03

Operational

## Operational considerations

- How and where to re-charge
- Duty cycle and route optimisation

04

## Driver acceptance

- Ensure drivers are educated, informed and enthusiastic!
- Consider specific efficient driver training to improve range

Driver acceptance

# Any questions?

Further information at  
[www.energysavingtrust.org.uk/transport](http://www.energysavingtrust.org.uk/transport)