Sheffield City Council

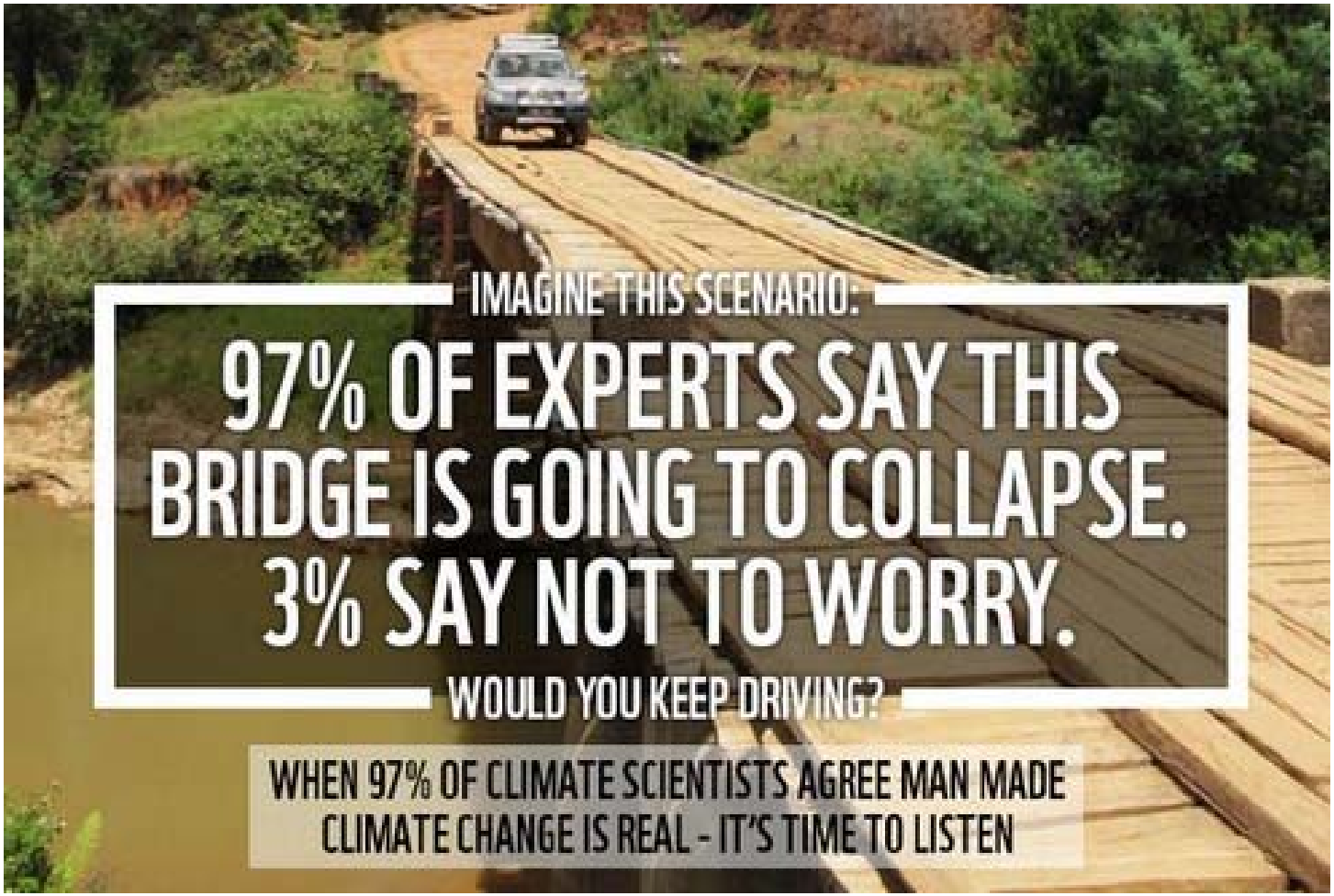
Investing In Low Emission Transport

Mark Daly

Air Quality

- All South Yorkshire districts have legally declared air quality management areas due to traffic emissions
- European, National & Regional issue – Sheffield named as a city that needs to take urgent action by EU
- Health impact of bad air similar scale to obesity and passive smoking.
- Each year, the impact of air quality on health costs the Sheffield economy £160m and results in up to 500 early deaths

Carbon reduction



No Magic Bullet – No 100% right or 100% wrong technology

No Magic Bullet – No 100% right or 100% wrong technology

But aren't electric cars…..?

THE TIMES

News

News | Opinion | Business | Money | Sport | Life | Arts | Puzzles | Papers

Welcome to your preview of The Times

Clarkson didn't give our electric car a sporting chance, says Nissan

Ben Webster Media Editor
Last updated at 12:01AM, August 2 2011

1 of 3

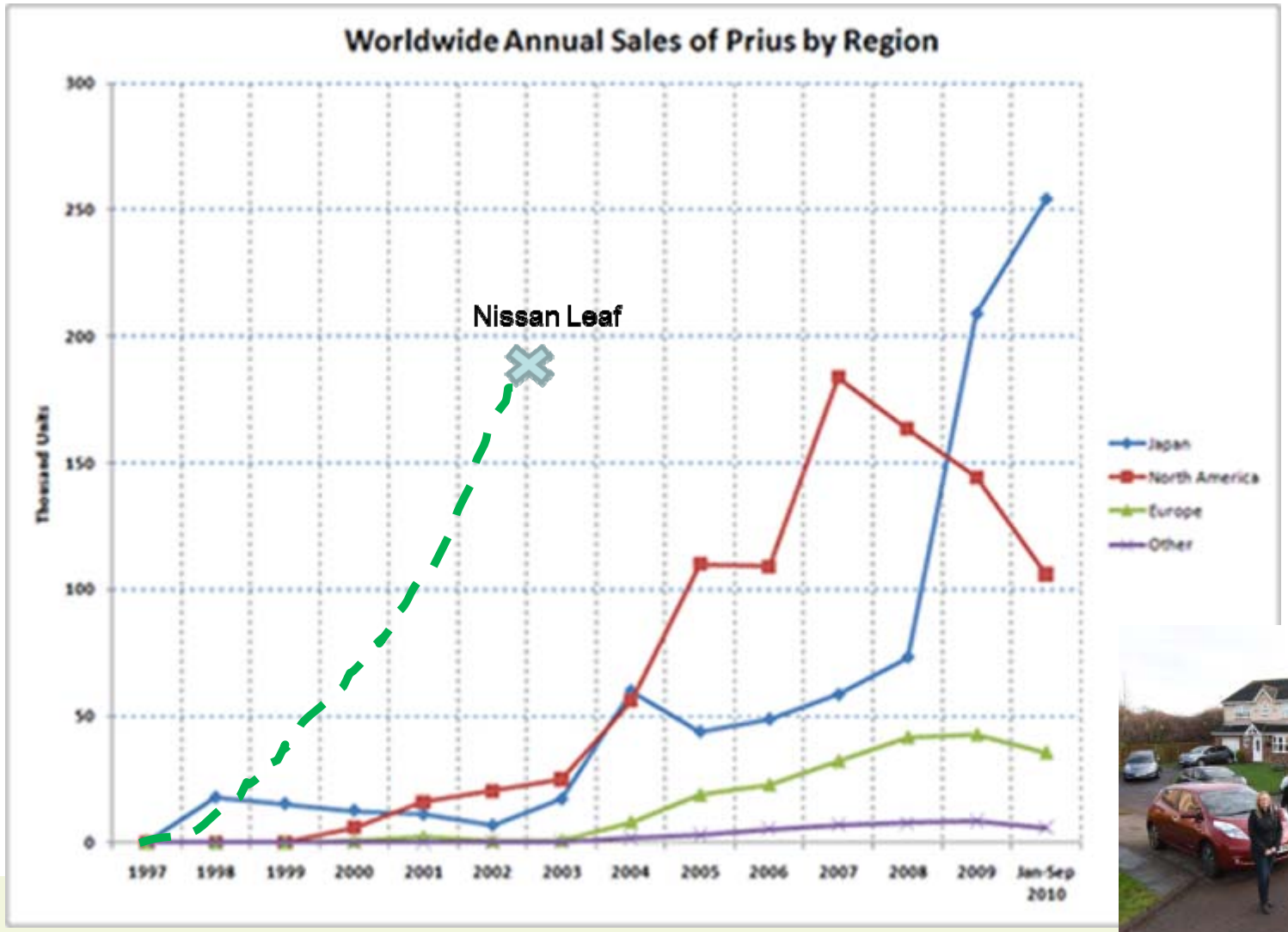
James May pushes Jeremy Clarkson in a Nissan Leaf during

When Jeremy Clarkson claimed on *Top Gear* that owners of electric cars were "more likely to get a girlfriend", regular viewers of the BBC

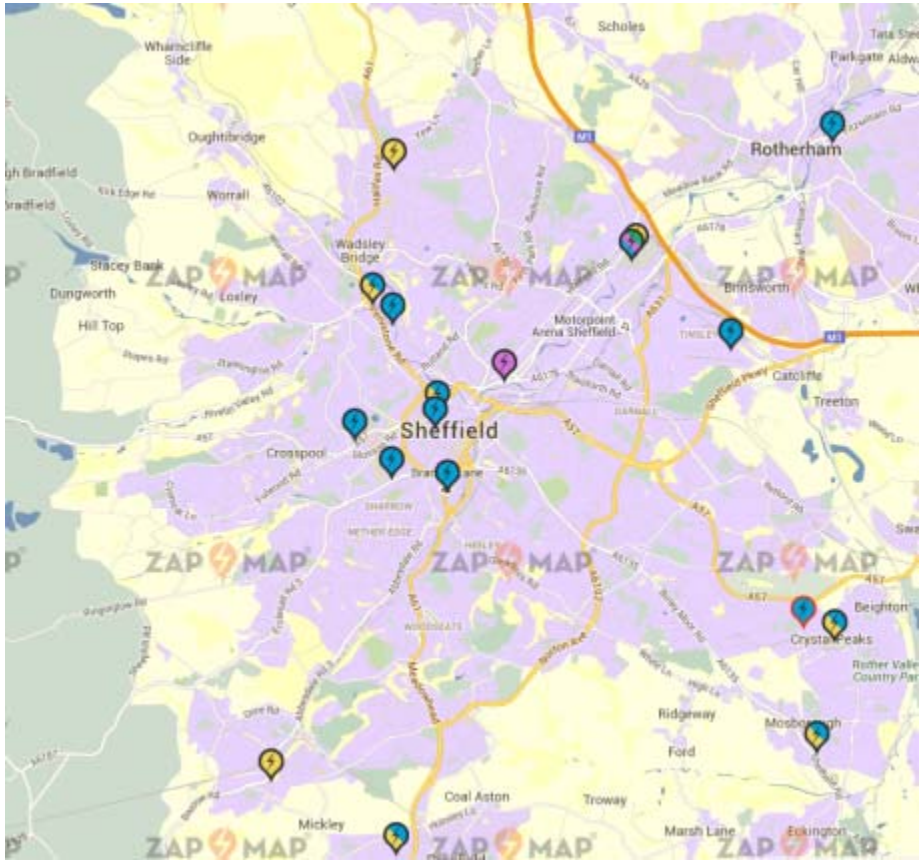
Electric Vehicles and Infrastructure

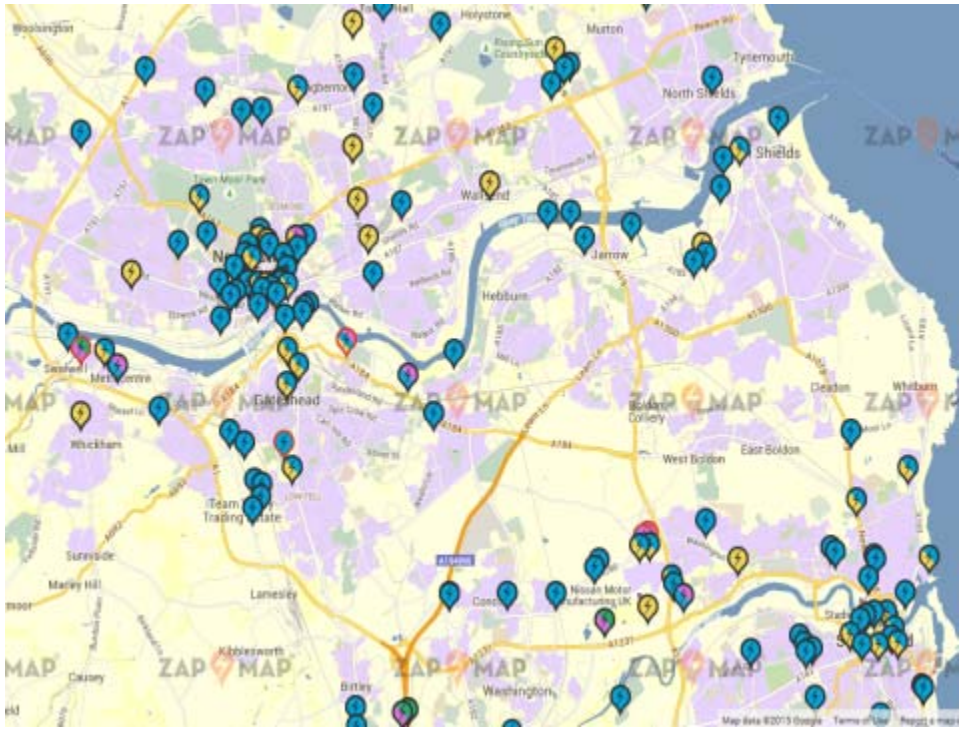
No longer niche

Electric Vehicles and Infrastructure

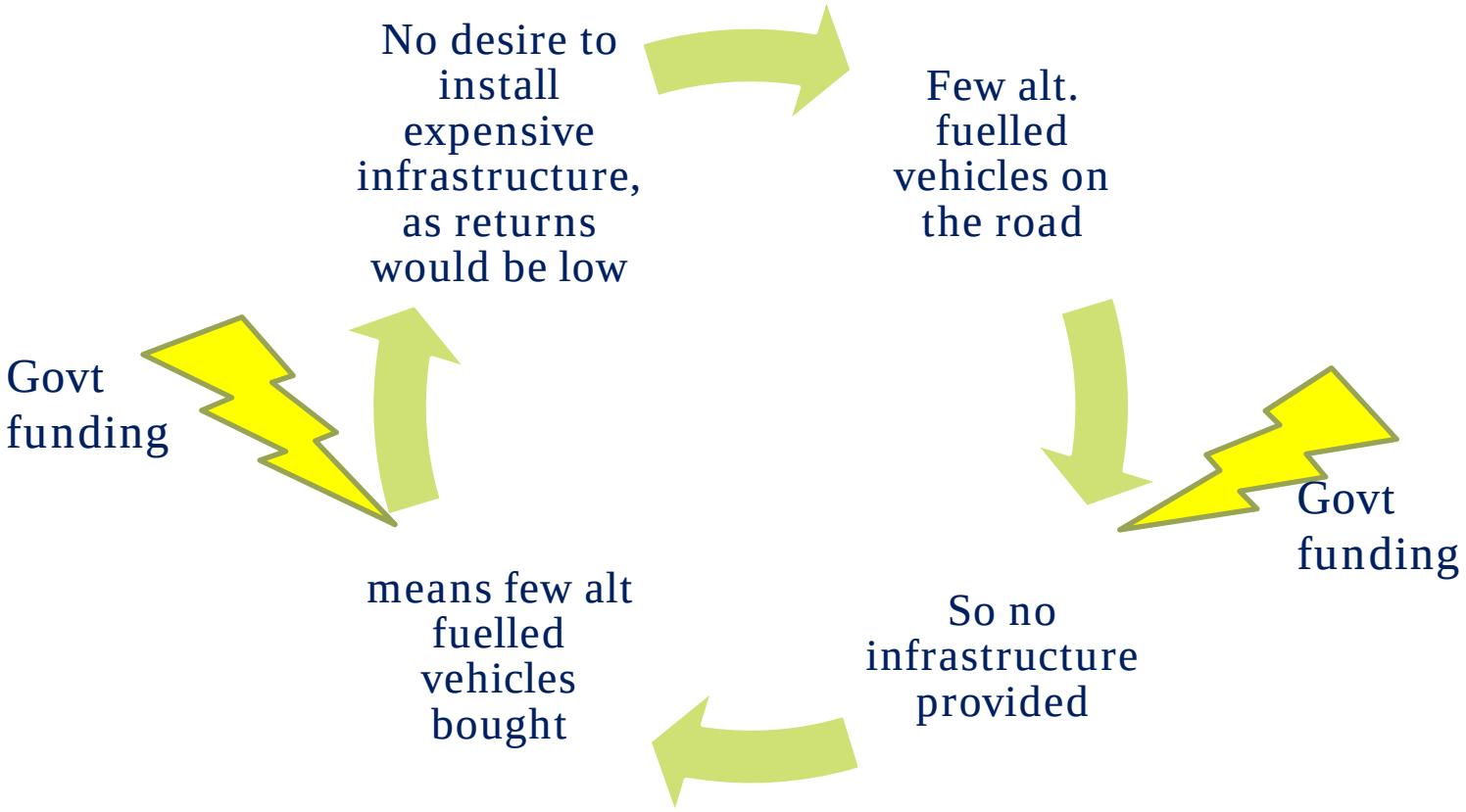


Sheffield playing catch up





Vicious Circle



Infrastructure and vehicle scheme

electric vehicles inmotion!

Focus on small/medium businesses as likely to have least appetite for risk but very keen to accrue financial savings

- Provide a grant to lease an EV car/van
- Also link the vehicle grant with a grant for standard charger at businesses location
- Total worth £3.5k on top of Govt grant
- Complement this with rapid and fast charge infrastructure

www.evinmotion.co.uk

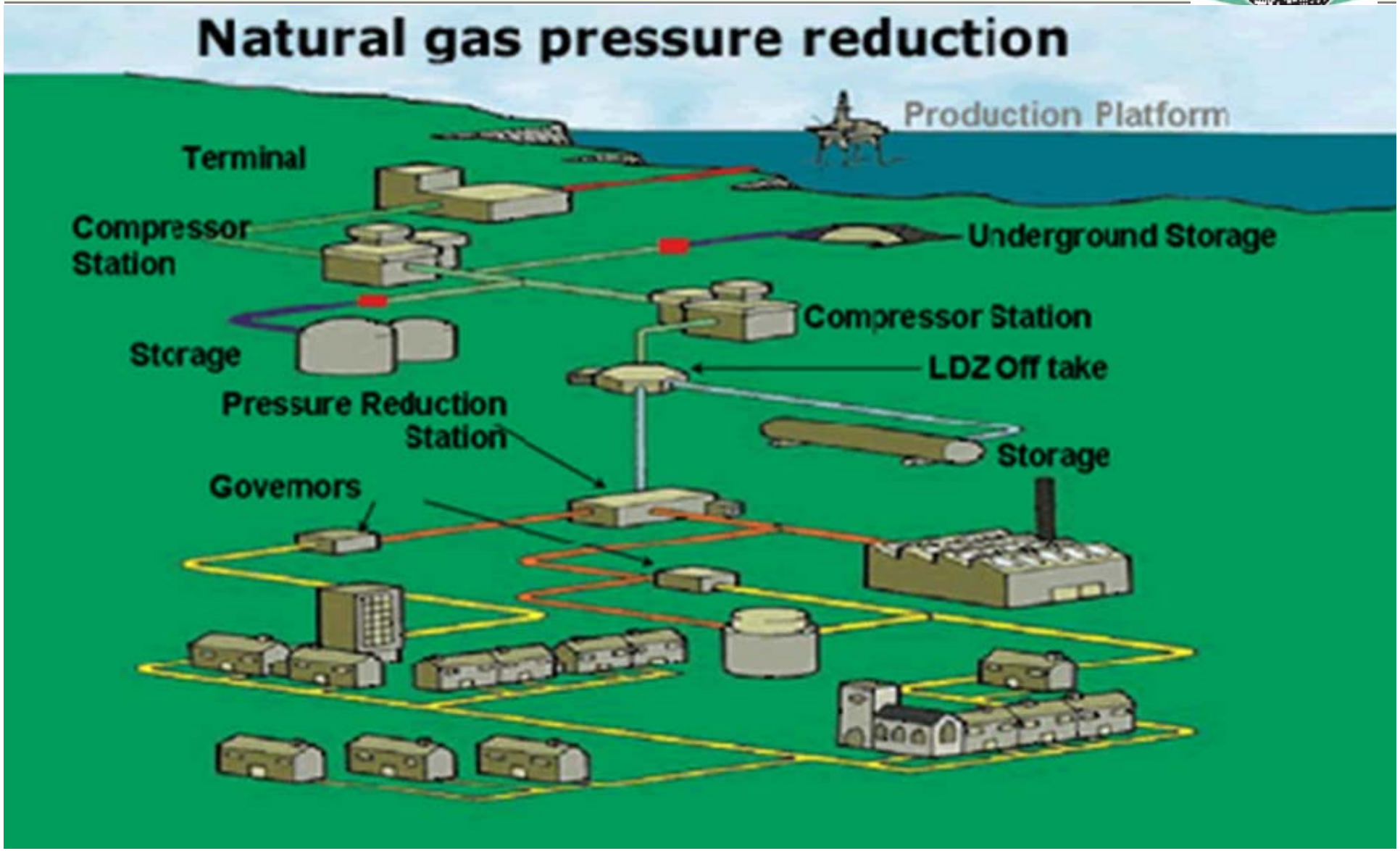
Personal experience

Owning an EV

Costs

- **Fuel 3p per mile compared to 15p day to day**
- **Driven to London and back 6 times – cost £7.20p (much less than 3pm per mile!)**
- **Time penalty - half to 1 hour**
- **Purchase price now roughly the same as ICE**
- **Insurance same or less**
- **Zero tax, 5% BIK company car tax**
- **Maintenance – nothing so far but only really 1 moving part, no oil filter, air filter, gearbox, clutch or radiator to go wrong**

Compressed Natural Gas/Biogas



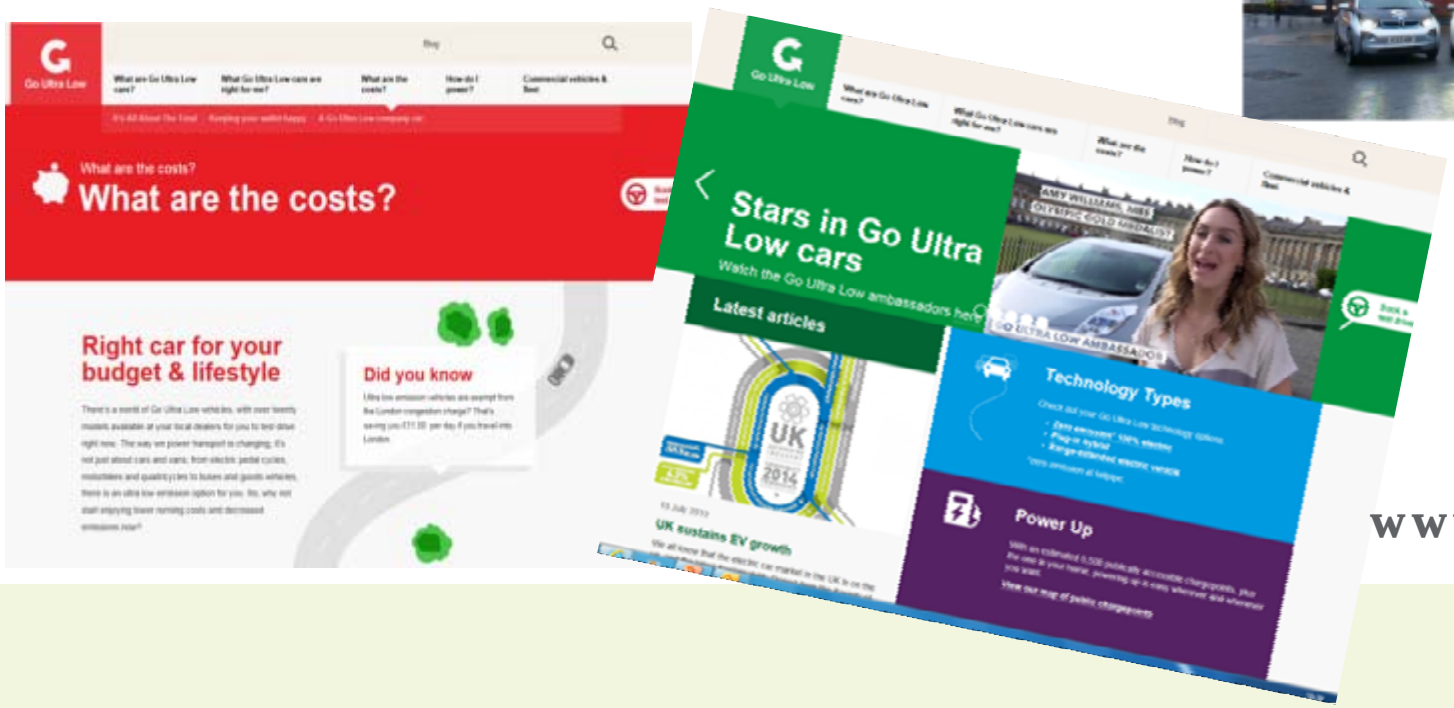
Hydrogen Fuel Cell Electric Vehicles

Where next?

Office for Low Emission Vehicles

Investing in ultra low emission vehicles in the UK, 2015 to 2020

- **Govt initiative launched "Go Ultra Low" to encourage further uptake**
- **Sheffield in final shortlist of Go Ultra Low City bid for £35m to be spread amongst 4 UK cities**
- **Looking to put significant numbers of electric vehicles (>50) into Sheffield Council fleet**



www.goultralow.com

Questions?

Thanks

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Cutting Carbon and Cost from your fleet

Keith Budden, Cenex

Cenex

Centre of excellence for low carbon and fuel cell technologies

Cenex services and client examples

- 'Not for Profit' Independent Consultancy and Research Organisation
  - Established in 2005 as a Centre of Excellence for low carbon and fuel cell technologies
  - Specialised in low carbon vehicles and energy infrastructure
  - Operate through collaboration and partnership working
  - Manage the UK's largest low carbon vehicle event (www.cenex-lcv.co.uk)
  - UK based, operating primarily in UK but with operational reach in Europe, Japan and USA
- Delivery to clients via

Economic development business case advice, techno-market consultancy, due diligence

Low carbon vehicle and energy infrastructure advice and implementation support for fleets and cities (e^-,H_2,CH_4)

Policy, public affairs and operational 'project brokerage' support, project dissemination including the LCV event

LCV Event Overview

Technology Exhibition

www.cenex-lcv.co.uk

9-10th September 2015

Ride & Drive Activities

Seminar Programme

Expecting;

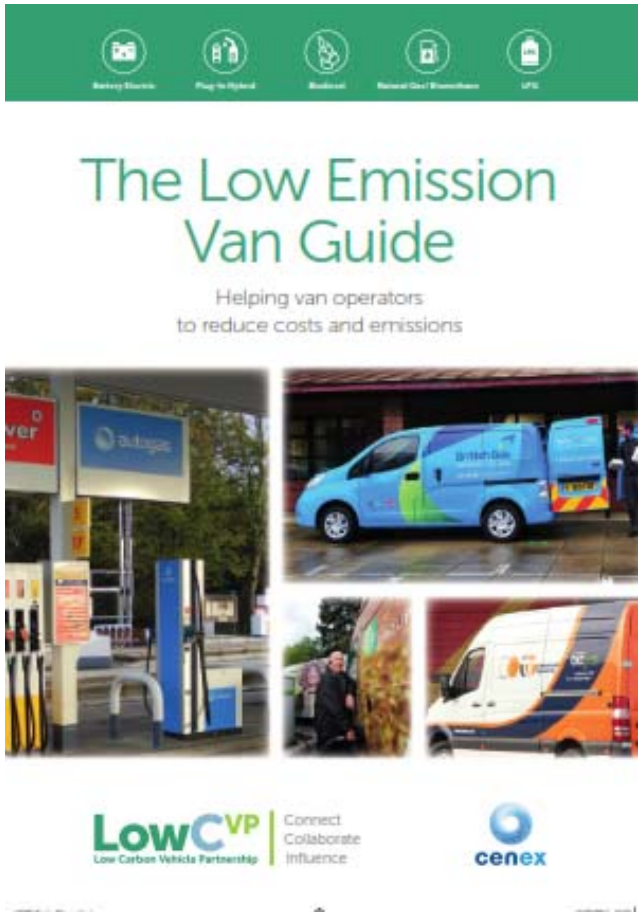
- 2,400+ visitors
- 180+ exhibiting organisations
- 950+ organisations attending

Now includes Automated Vehicles

Facilitated Networking

Introduction to the LEV guide and tool

- Why choose a low emission van?
- What to consider?
- Incentives
- Low emission van topic sheets
  - Battery electric vans
  - Plug-in hybrid vans
  - LPG vans
  - CNG / Biomethane vans
  - Biodiesel vans
- Van best practise
- What to do next?



Factors to consider

For a fleet of vans it may be possible to specify vehicles differently in order to arrive at a mix of van types to deliver the variety of duties required. This allows low emission vans to play a role in your fleet which is best suited to their capabilities.

Flexibility

- Technology options
- Daily / annual mileage
- Refuelling and recharging
- Emissions
- Cost
- Dealer support
- Vehicle size
- Payload

Factors to consider

Payload	**What type of goods will be carried, what is the maximum payload required?** Payload is often reduced slightly in alternatively fuelled vehicles due to the weight of additional components such as batteries, motors or gas tanks.
Vehicle size	**What load space is required?** The best way to reduce emissions and cost is to use smaller and lighter vehicles. Downsizing from a larger vehicle will also open doors to more low emission van options, for example most plug-in vans are only available in the smaller van range.
Daily / annual mileage (range)	**Local runs or long distance driving? Return to base for refuelling?** Refuelling station availability and the time taken to refuel/recharge can vary for the different low emission van options.
Fuel/technology options	**What are the benefits of low carbon fuels?** Apart from lower emissions and running costs, a quieter vehicle may be beneficial, or you may be looking to improve your company's image.
Local considerations	**Is any preferential treatment given for a particular type of vehicle, such as concessionary parking charges or access to low emission zones?** Low emission vans are often encouraged into cities by local authorities offering discounted access and parking fees.
Dealer support	**Where is my closest trained dealer? Will my warranty be affected?** Make sure your local service centre is able to support your alternatively fuelled vehicle. Different service frequencies have to be followed when running on biodiesel. An additional third party warranty may be needed to maintain full warranty cover of an LPG converted vehicle.
Buy or lease	**What discount can you get through your dealership? Do you want a guaranteed fixed cost for vehicle ownership?** The examples in this guide give whole life costs for vehicle ownership. You should look at both lease rates and ownership costs. Leasing companies can get much bigger discounts on buying vehicles compared to low volume van buyers. They offer convenient fixed monthly charges that can include maintenance. Plus many have specialists offering free advice for customers wanting to switch to lower carbon vehicles. Purchasing the vehicle yourself, especially if you can get a good dealer discount, can be cheaper, although you'll have to absorb some risk when it comes to estimating the value of an alternatively fuelled van in future years when you want to sell it.
Flexibility	**Finally, flexible thinking will help.** This guide will show you that the cost and emission savings are there, you may just have to rethink how you operate your vans to take full advantage of them.

Evaluating the cost

It's easy to fall into the trap of purchasing the lowest cost van available to you.

- Whole life cost
- Plug-in van grant
- Road tax
- Van benefit charge
- Enhanced capital allowance
- Fuel duty
- Free / discounted parking
- Congestion charge

INCENTIVE	INFORMATION	WHAT'S IT WORTH?
Plug-in van grant	The plug-in van grant currently gives 20% off the cost of a new Ultra-Low Emission Vehicle up to a maximum of £8,000. A van which emits less that 75g CO_2 per km driven is classed as an ULEV.	Up to £8,000
EV charging points	The government offers a grant of 75% towards the cost of charging infrastructure installed at residential addresses.	Up to £750
Road tax	The road tax rate for battery electric vans is £0.	Up to £225 per year
Van benefit charge	Using a company van for significant personal use is a taxable benefit. The government value this benefit at £3,150 per annum and a driver must pay their normal rate of tax on this. Further taxable benefits are imposed if the company also pay for the driver's fuel. The tax payable if a battery electric van is used is reduced and will increase steadily over 5 years before reaching the same level as a conventional van.	£630 for year 2015/16 basic rate (20%) tax payer
Enhanced capital allowance	Zero emission goods vehicles are eligible for 100% first year allowance until 2018. So if your business pays corporation tax at 20%, £20,000 spent on a battery electric van would reduce your tax bill in the year of purchase by £4,000. You cannot claim an enhanced capital allowance if you have received the Plug-in van grant.	£4,000 on a £20,000 purchase
Fuel duty	Some clean fuels such as natural gas, LPG and biomethane are cheaper than diesel and petrol because the government applies less fuel duty to them. In the case of electricity, there is no fuel duty applied at all.	Up to 70% reduction in fuel costs
Free or discounted parking	Some cities offer free or discounted parking at public charge points for electric vans.	Up to £10 per day
Congestion charge	Vans that emit 75g/km or less of CO_2 receive a 100% discount on the London Congestion Charge.	£11.50 per day, or £10.50 if using auto-pay

Topic Sheets

(Battery electric, PHEV, CNG / Biomethane, LPG, Biodiesel)

Technology introduction

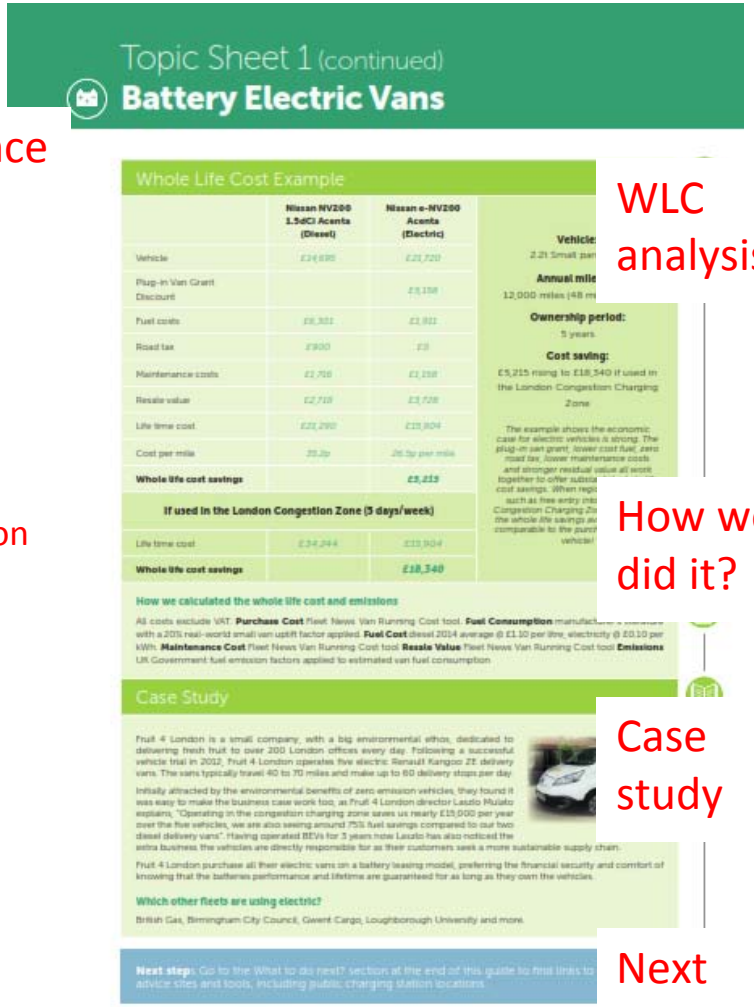
Fit for purpose

Environmental

Market status

Quick reference panel

- Tailpipe
- Fuel life cycle
- AQ
- Range
- Refuelling
- Ideal operation
- Typical fleet



WLC analysis

How we did it?

Case study

Next steps

Whole life cost example

Whole Life Cost Example

	Nissan NV200 1.5dCi Acenta (Diesel)	Nissan e-NV200 Acenta (Electric)
Vehicle	*£14,695*	*£21,720*
Plug-in Van Grant Discount		*£5,158*
Fuel costs	*£6,301*	*£1,911*
Road tax	*£900*	*£0*
Maintenance costs	*£1,716*	*£1,158*
Resale value	*£2,718*	*£3,728*
Life time cost	*£21,290*	*£15,904*
Cost per mile	*35.2p*	*26.5p per mile*
Whole life cost savings		***£5,215***
If used in the London Congestion Zone (5 days/week)		
Life time cost	*£34,244*	*£15,904*
Whole life cost savings		***£18,340***

Vehicle:
2.2t Small panel van

Annual mileage:
12,000 miles (48 miles per day)

Ownership period:
5 years

Cost saving:
£5,215 rising to £18,340 if used in the London Congestion Charging Zone

The example shows the economic case for electric vehicles is strong. The plug-in van grant, lower cost fuel, zero road tax, lower maintenance costs and stronger residual value all work together to offer substantial whole life cost savings. When regional incentives, such as free entry into the London Congestion Charging Zone are included the whole life savings available become comparable to the purchase cost of the vehicle!

How we calculated the whole life cost and emissions

All costs exclude VAT. **Purchase Cost** Fleet News Van Running Cost tool. **Fuel Consumption** manufacturer's literature with a 20% real-world small van uplift factor applied. **Fuel Cost** diesel 2014 average @ £1.10 per litre, electricity @ £0.10 per kWh. **Maintenance Cost** Fleet News Van Running Cost tool **Resale Value** Fleet News Van Running Cost tool **Emissions** UK Government fuel emission factors applied to estimated van fuel consumption

Other areas

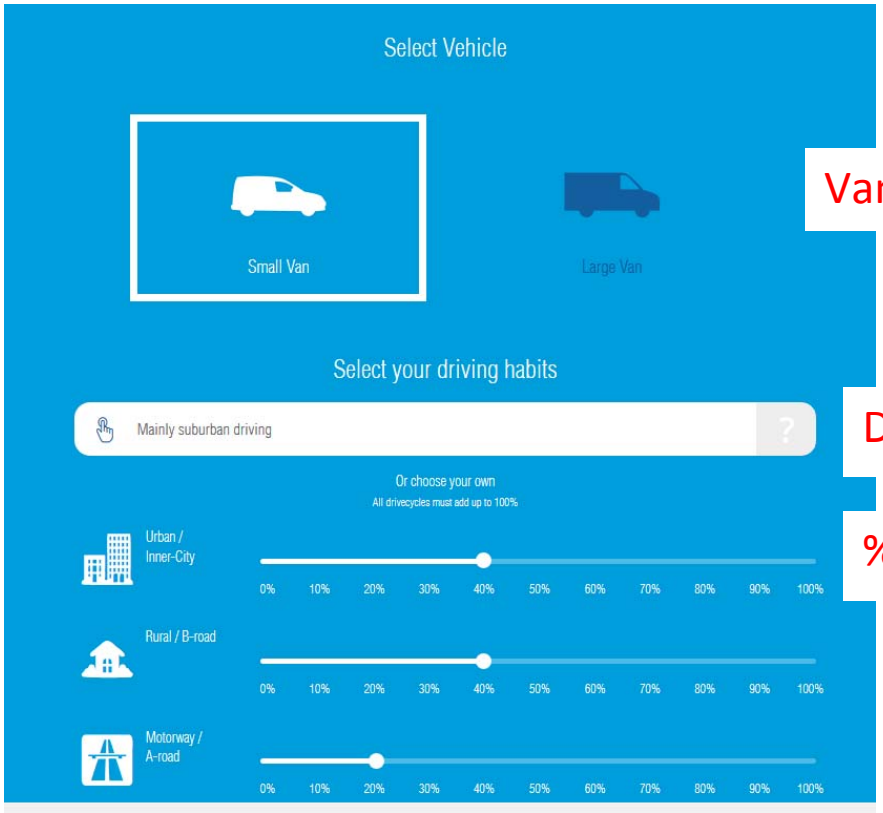
- Finance cost
- Infrastructure
- Training
- Night time elec.
- Pollution cost

Technology comparison

	Battery Electric	PHEV	CNG	LPG	B30 Biodiesel (30% Biodiesel blend in diesel)
Whole life cost	✓	✓	✓	✓	✓
	Cost improvements dependent on annual mileage and ownership period				
Financial incentives	Vehicle and infrastructure funding. 100% London congestion charge discount. Regional council schemes for discounted/ free parking.		Reduced fuel duty rate	Reduced fuel duty rate	None
	Enhanced capital allowance OR Van grant on purchase. Reduced van benefit charge until 2020. No fuel duty applied. £0 road tax	No fuel duty applied to electricity			
Market status	Available, around 15 models	One vehicle model only (Outlander 4Work)	Two models available	Conversions available for petrol vans	Some models warranted for biodiesel use
Example vehicles	Nissan e-NV200, Renualt Kangoo, Allied eBoxer	Mitsubishi Outlander 4Work	Merc Sprinter, Iveco Daily	Retrofit	Peugeot Partner, Boxer
Ideal operating location	City, suburbs	City, suburbs and occasional motorway	City, suburbs, motorway		
Ideal refuelling location	Back-to-base			No restrictions	Back-to-base

Van cost and carbon calculator (VC^3)

Van Cost & Carbon Calculator

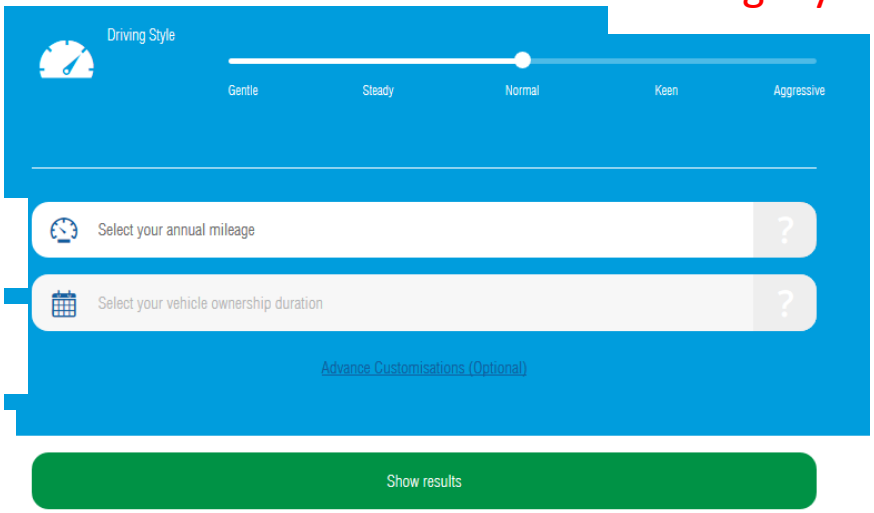


Van type

Driving habit

% Urban, % Rural, % Motorway

Driving style



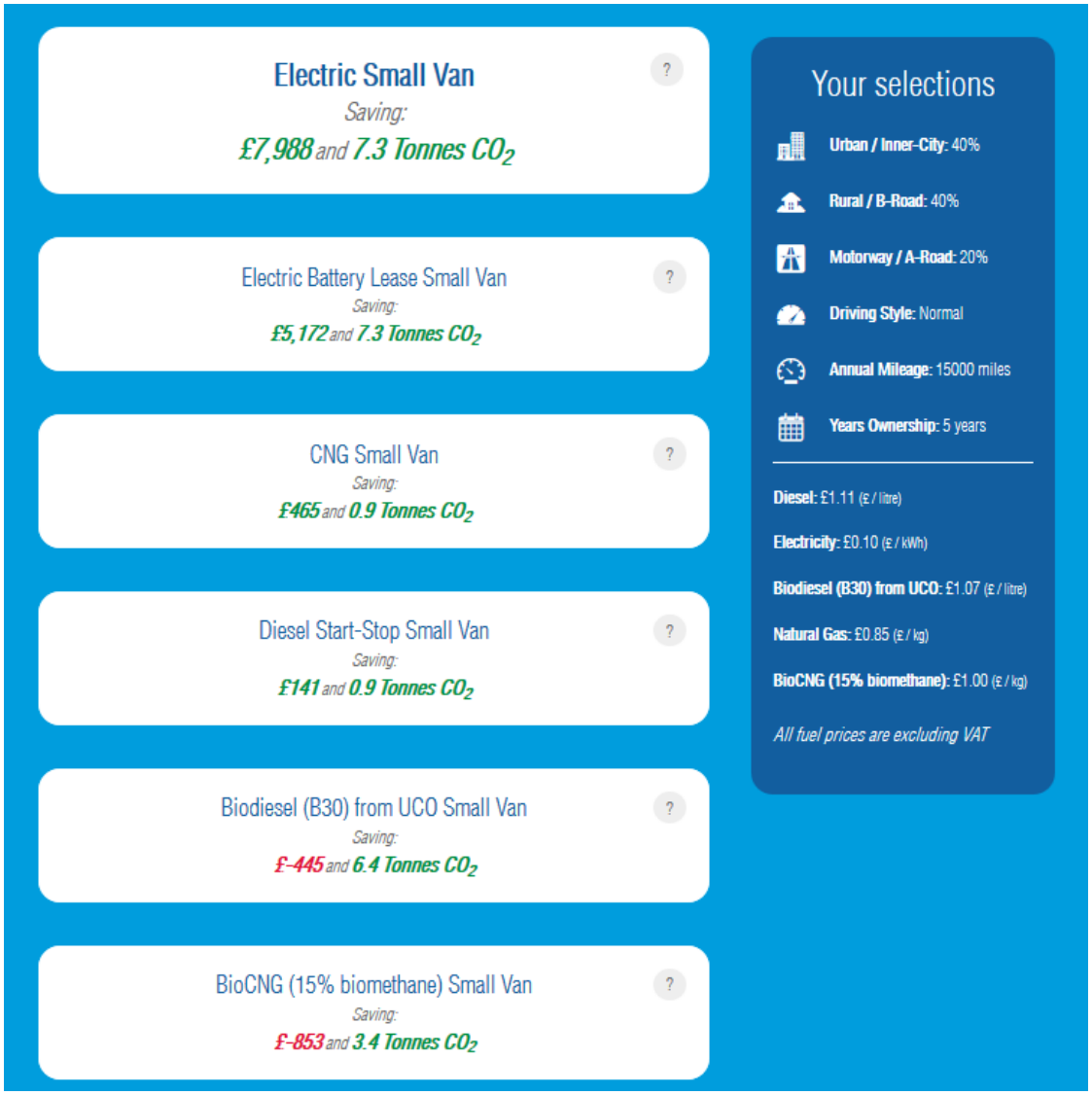
Annual mileage

Ownership period

Advanced options

Van cost and carbon calculator (VC^3)

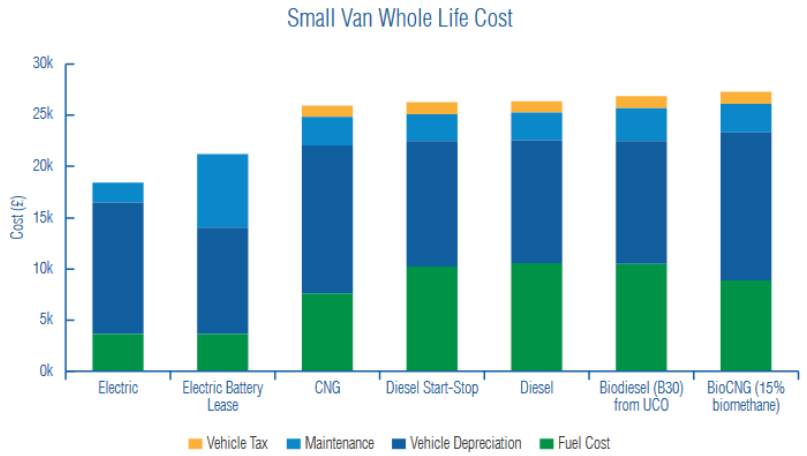
Van Cost & Carbon Calculator



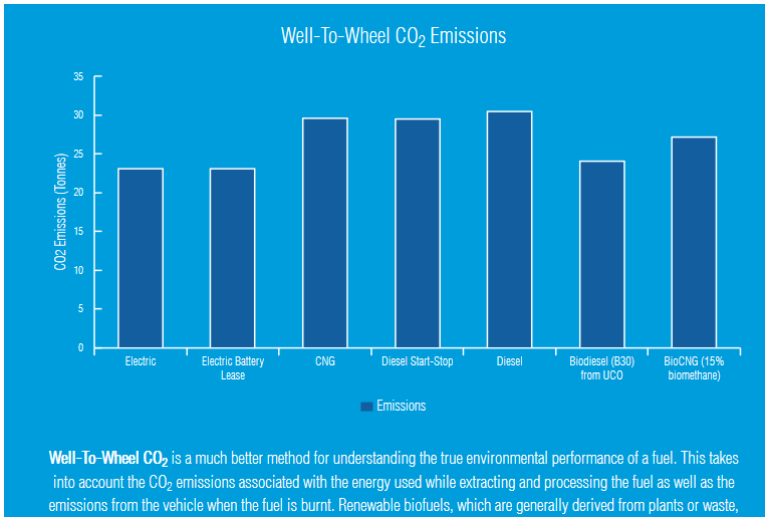
- Results splash screen
- Saving
- Increase

Van cost and carbon calculator (VC^3)

Van Cost & Carbon Calculator



It's easy to fall into the trap of purchasing the lowest cost van available to you. Since your choice of van will determine your business costs for years to come it pays to undertake a whole life cost analysis. This includes not only the purchase cost



Well-To-Wheel CO_2 is a much better method for understanding the true environmental performance of a fuel. This takes into account the CO_2 emissions associated with the energy used while extracting and processing the fuel as well as the emissions from the vehicle when the fuel is burnt. Renewable biofuels, which are generally derived from plants or waste,

Whole life costs

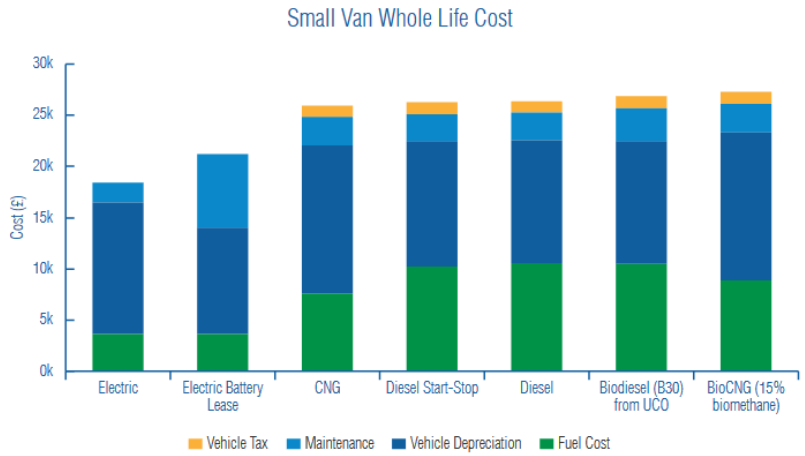
- Depreciation
- Tax
- Maintenance
- Fuel

CO_2 Emissions

- Tailpipe emissions
- Well-to-wheel emissions

Van cost and carbon calculator (VC^3)

Van Cost & Carbon Calculator



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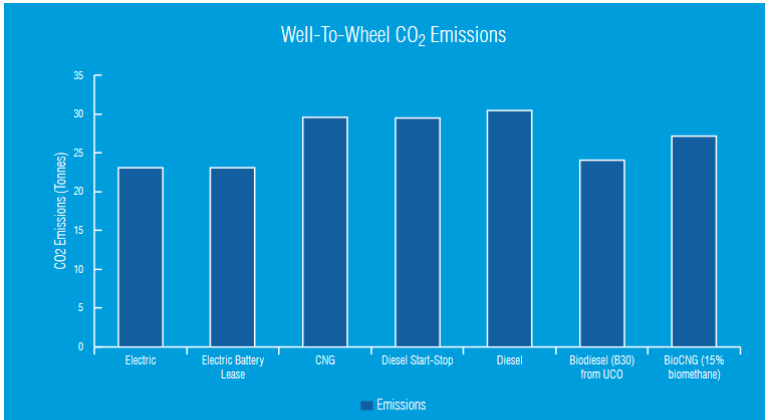

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Whole life costs

- Depreciation
- Tax
- Maintenance
- Fuel

CO_2 Emissions

- Tailpipe emissions
- Well-to-wheel emissions

Next steps

- Van comparison sites
- Van advise sites
- Refuelling / recharging station locations
- Grants

General Advice And Calculator Tools	
www.cenex.co.uk/vc3	Cenex provide a tool for allowing operators to calculate emission and cost savings available from alternatively fuelled vans
www.lowcvp.org.uk/lev	The LowCVP provide an advice site for operators looking to make the switch to low emission vans
www.vanchooser.net	Van chooser allows users to search for a van type that meets their requirements and can display list price, emission performance, fuel costs and much more
www.fleetnews.co.uk/vans/tools/	The Fleet News web site has whole life cost and emission calculator tools, best practise case studies and much more
www.ukconversionfactorscarbonsmart.co.uk	The UK Conversion factors site provides official UK Government recommended factors for converting your fuel use into carbon emissions
Battery Electric And Plug-In Hybrid Electric Vehicles	
www.zap-map.com	Zap Map contains a list of publically available charge points, vehicle model availability and charge point provider contact details
www.goultralow.com/commercial-vehicles-fleet	The Go Ultra-Low web site provides information about switching to ultra-low emission vehicles and vehicle availability
www.ukevse.org.uk	UKEVSE, the electric vehicle supply equipment association, provide a guide for procuring charge points including equipment considerations and location choice
www.gov.uk/government/publications/plug-in-van-grant	The Office for Low Emission Vehicles (OLEV) provides a list of vans that are eligible for the Plug-in Van Grant
LPG Vehicles	
www.drivelpg.co.uk	Drive LPG provides advice and information about converting to LPG including a list of approved installers and UK refuelling stations
CNG Vehicles	
www.gasvehiclehub.org	The Gas Vehicle Hub provides a map of UK CNG refuelling stations, a list of vehicle model availability and gas vehicle case studies plus much more
Biodiesel Vehicles	
www.biodieselfillingstations.co.uk	Biodiesel Filling Stations provides a list of filling stations and biodiesel blends available by UK area, with links to suppliers websites where many show pricing and other information

RCVs and HGV

- CNG
- LNG
- Biomethane

www.gasvehiclehub.org/

Questions?

www.cenex.co.uk/vc3

www.lowcvp.org.uk/lev

www.gasvehiclehub.org