



Low Emission
Strategies

Building on Good Practice

Low Emission Strategies

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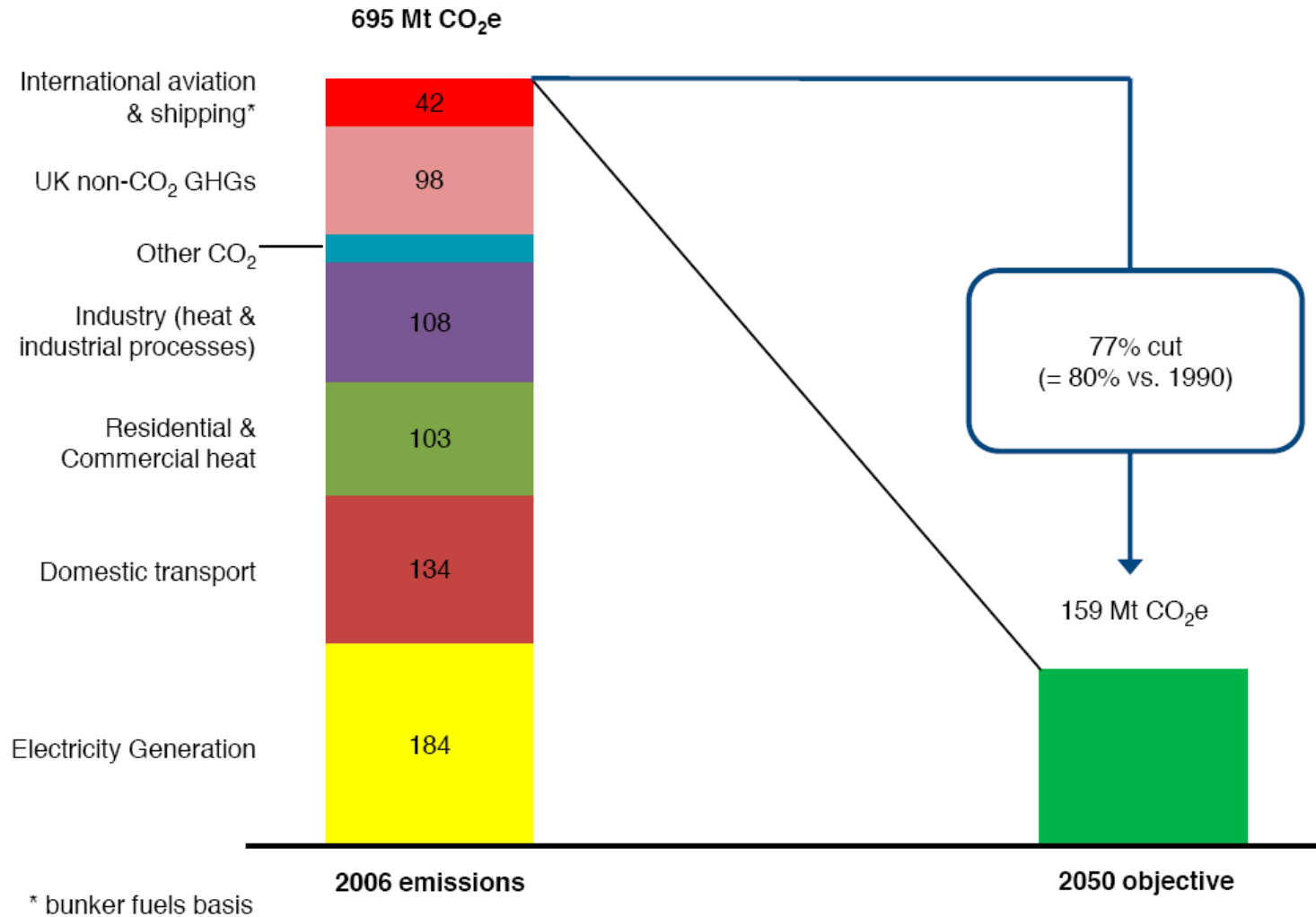
Low Emission Strategies Programme

- **Background to Low Emission Strategies**
- **Supplementary Planning Guidance**
- **Low Emission Vehicles**
- **Procurement Guidance**
- **Low Emission Toolkit**



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www.defra.gov.uk

Low Emissions Strategies

using the planning system to reduce transport emissions

Good Practice Guidance

January 2010



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defra
Department for Environment
Food and Rural Affairs



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Emission Reduction Progression

Avoid



Shift



Improve



Box 1: Low emission funding - 'The Greenwich Formula'

Contributions will be sought for all residential schemes of 10 dwellings and above, and mixed use and commercial schemes of 500 m² and above.

A standard contribution will be sought of £100 per dwelling for residential development and £10 per m² for town centre and commercial developments.



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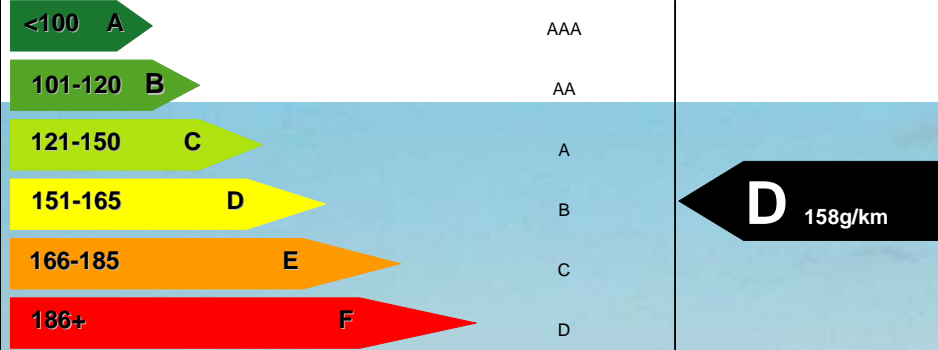
Measure	Operational Phase Measures
Construction phase	Refer to the London Code ²¹ and TGB case study ²²
On-site parking	Graduated price parking permit schemes (e.g. graduation based on VED emission bands/Euro Standards)
	Residential parking space set aside (e.g. for car clubs and/or low emission vehicles)
	Customer parking allocation for low emission vehicles (e.g. supermarket)
Low emission infrastructure	Provision of electric charging bays or low emission fuelling points
	Car clubs - development and promotion (including provision of low emission vehicles or electric charging bays)
Fleet emission improvement	Fleet improvement agreements
Emission-based differential tolling	Toll rates based upon emission performance of vehicles
Innovative ideas	Creative and opportunistic measures. For example: <ul style="list-style-type: none"> ● Low emission travel incentives via store loyalty card ● Local ESCO addressing transport issues ● Inter-authority partnership (see paragraph 31)
Procurement and supply chains	Forward commitment procurement
	Use of procurement potential to help accelerate market entry for low emission technologies
Contributions to local plans/projects	See paragraph 34

Fuel Economy

Ford Fiesta 1.4 ZETEC

Carbon dioxide emissions CO2 grams per kilometre

VED bands equivalents



Running costs

Fuel cost for 10,000 miles (16,000 km)

Calculated on a combined (town centre and motorway) drive cycle with a base fuel price of 80 pence/litre. Fuel costs may differ from this due to driving behaviour as well as other non-technical factors.

£858

VED for 12 months

Vehicle excise duty (VED) or road tax is graduated according to the CO2 emissions of the vehicle and is paid for 12 or 6 months.

£125

Environmental Information

A free guide on fuel economy and CO2 emissions which contains data for all new passenger car models is available at any point of sale and on the web at: www.vca.gov.uk. Some specifications of this make/model may have lower CO2 emissions than this. Check with your dealer. In addition to the fuel efficiency of a car, driving behaviour as well as other non-technical factors play a role in determining a car's fuel consumption and CO2 emissions. Carbon dioxide is the main green house gas responsible for global warming.

Make/Model: **Ford Fiesta 1.4 ZETEC**
 Engine capacity (cc): **1399**

Fuel type: **Petrol**
 Transmission type: **5 Speed manual**

Fuel Consumption

Measured according to Directive 93/116/EU

Drive cycle	Litre/100km	mpg
Urban (e.g. town centre)	8.8	32.1
Extra-urban (e.g. motorway)	5.4	52.3
Combined (e.g. town centre and motorway)	6.7	42.2

Carbon Dioxide Emissions: 158g/km

Important note: Some specifications of this make / model may have lower CO2 emissions than this. Check with your dealer.



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Leeds City Region

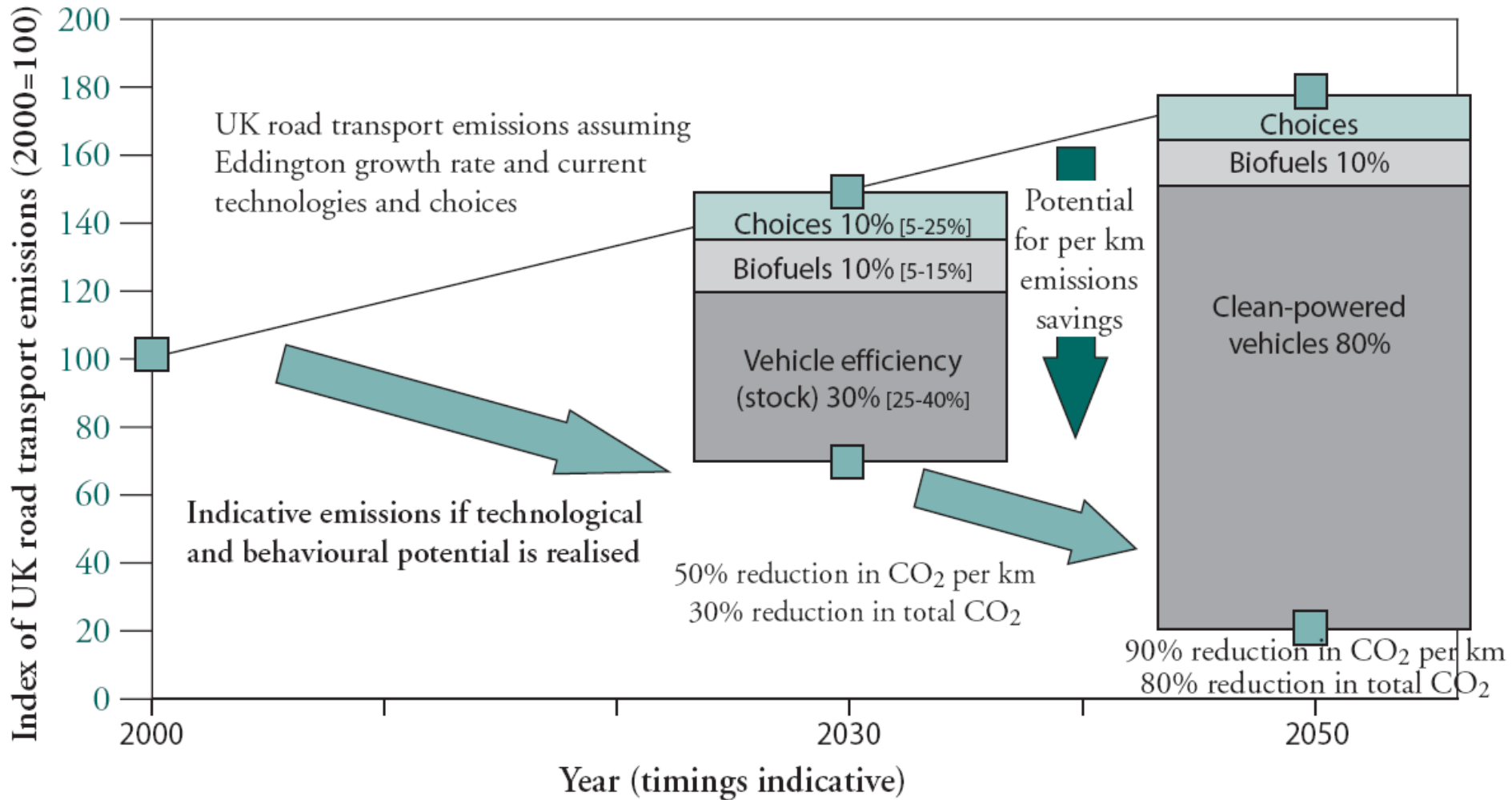


Supplementary Planning Guidance

- Updates the LES Planning Guidance (Defra 2010)
- Low Emission Assessment Methodology (LEAM)
- Potential to integrate with BREEAM
- Low Emission Strategy Mitigation Options
- Low Emission Technology Availability & Applicability
- Suggested approach to Compensation Formula & Tariffs
- Publish on website this month



Action for Road Transport

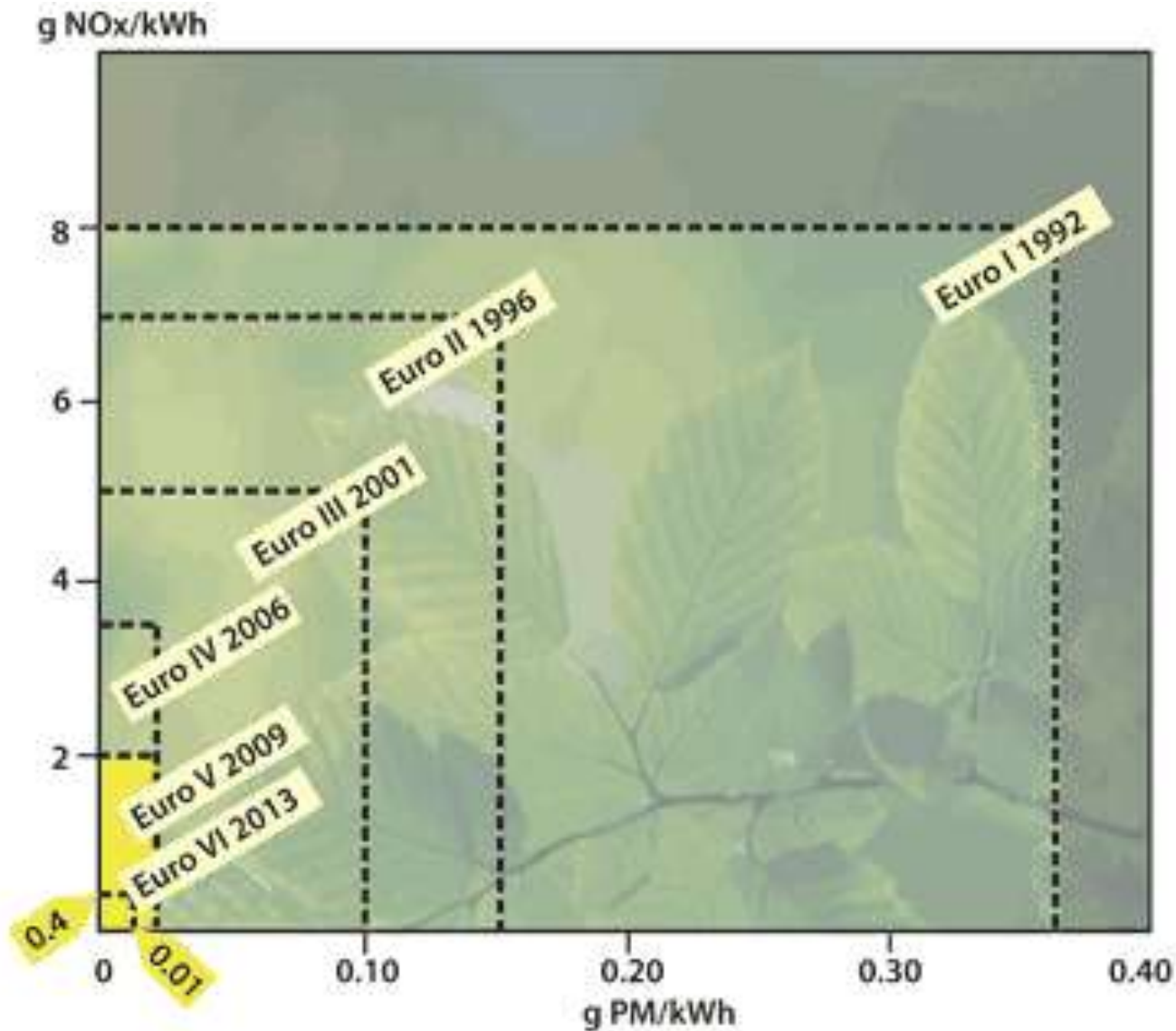


European Emission Standards



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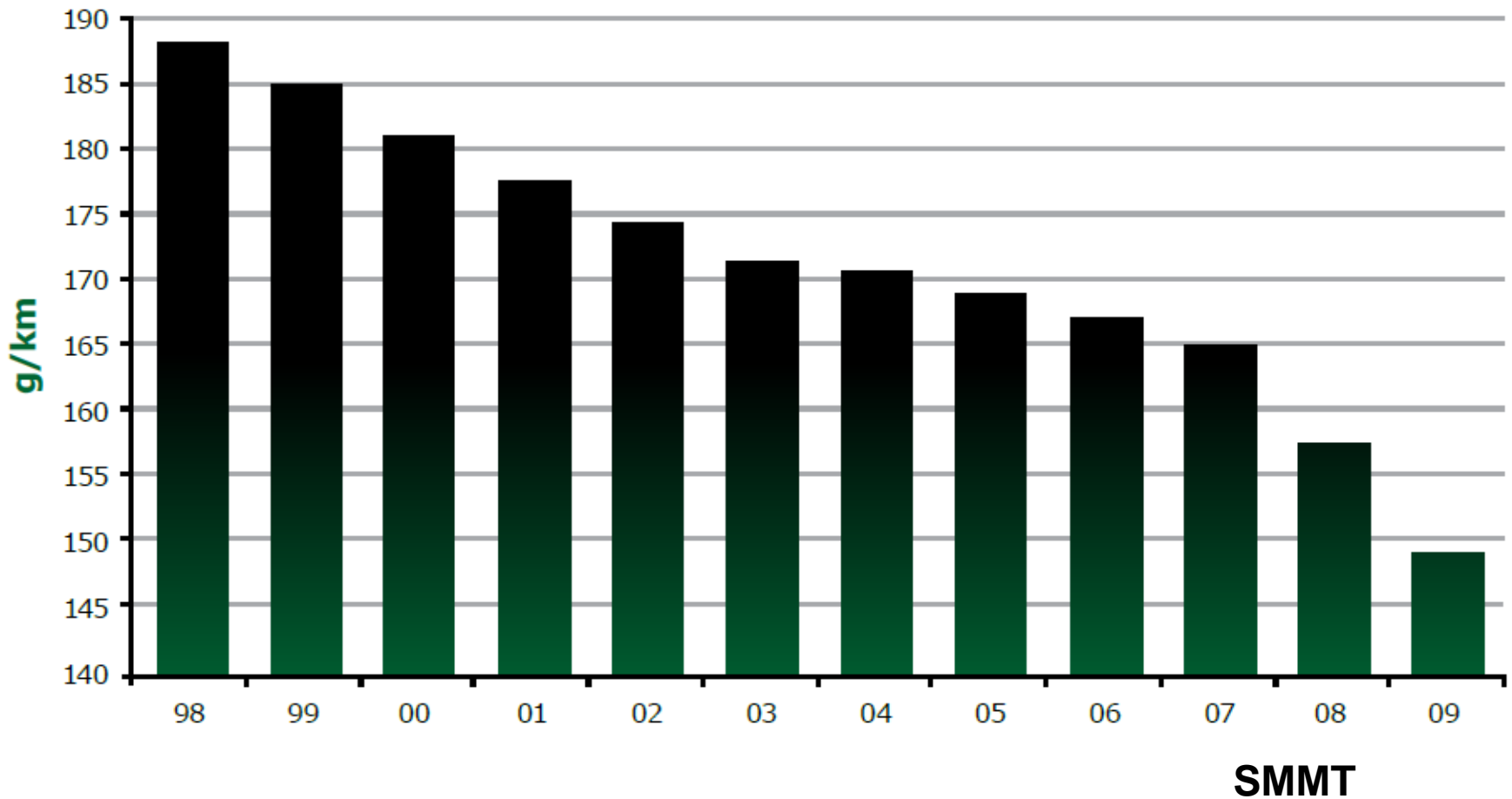




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Average new car CO₂ emissions





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Low Emission Vehicle Demonstrations



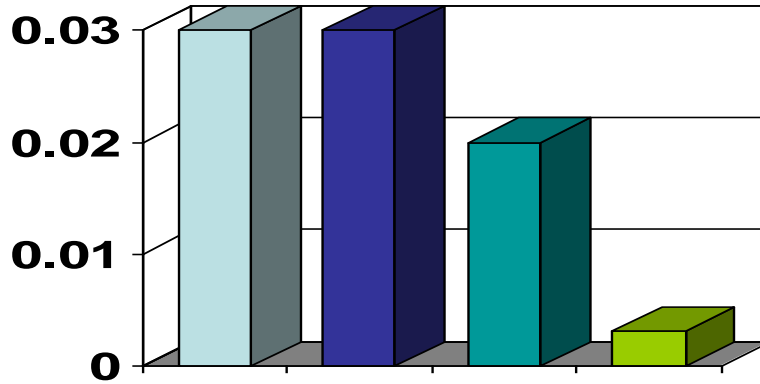
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Particulate
emissions
g/kWh
(ETC)

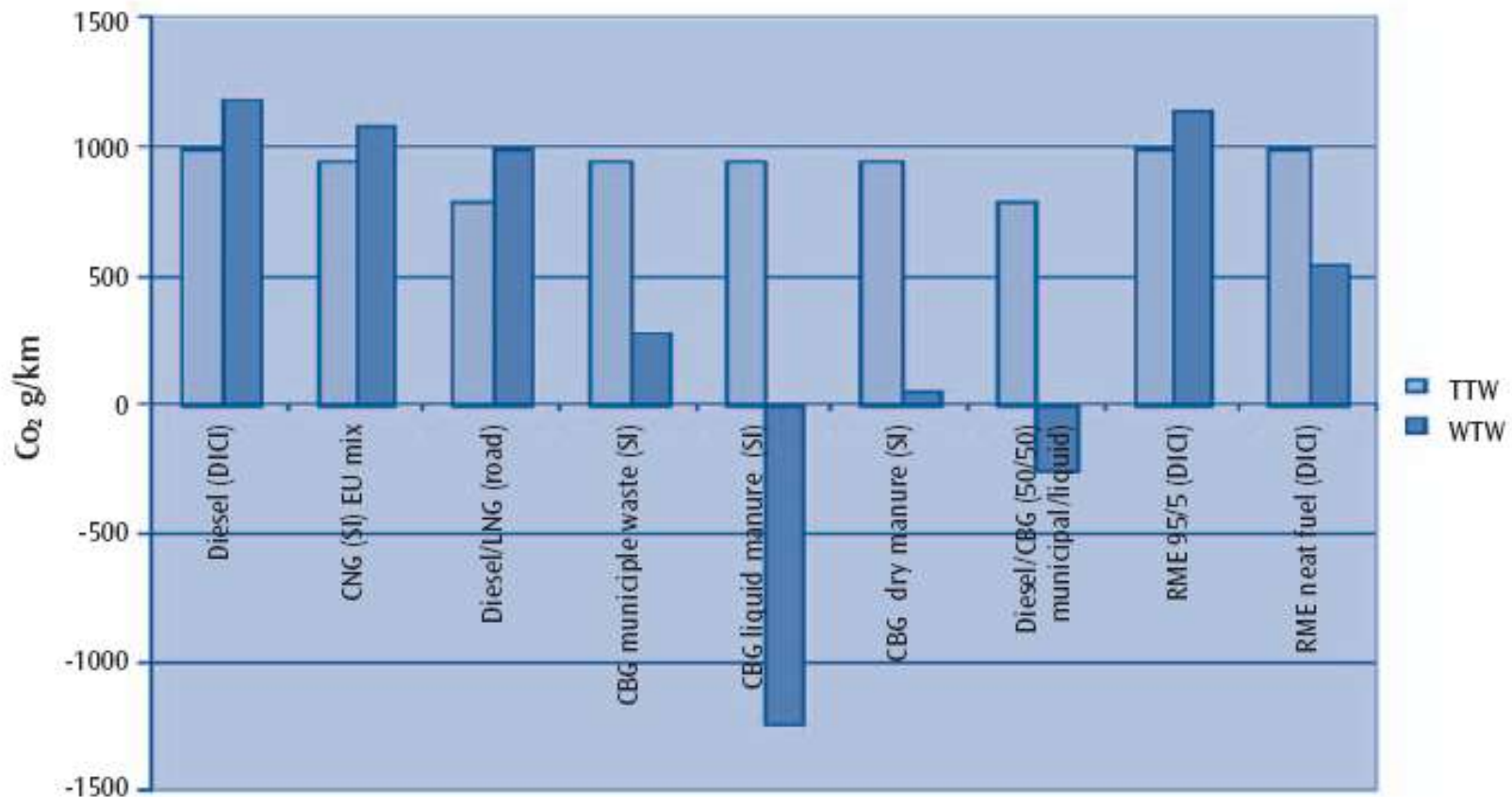


Greenwich





Figure 4.3: Greenhouse Gas Emissions for 2002 Generic 38 tonne Heavy Goods Vehicle



Procurement Guidance

- Best Practice Guidance on the use of public sector procurement to reduce road transport emissions
- Working Group includes:
YPO, Leeds CC, Sheffield CC, Greenwich, Sefton, City, York, TfL & GLA
- Procurement Frameworks, Green Procurement Policies, Sustainable Tender Evaluation, Leasing Innovation, Forward Commitment, Full Life Cycle Costs, Eco-labelling etc
- EU Cleaner Vehicle Directive & Lifetime Costs
- Cleaner Road Transport Vehicle Regulations 2010
- Draft Guidance March 2011 & Public Consultation Summer 2011



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Lifetime Cost Calculator

Type of Fuel

Fuel consumption

Diesel, petrol, LPG, ethanol, biodiesel, emulsion fuel: l/100km.
Natural gas or hydrogen gas: Nm³/100km

Liquid hydrogen: l/100km or kg/100km ; Electricity: kWh/100km

Fuel Consumption

CO₂ Emissions (g/km)

Pollutant emissions

(g/km or g/kWh)
If input is in g/kWh, g/km is calculated on the basis of input for fuel consumption

NO_x (Nitrous oxides)

PM (Particulate Matter)

NMHC (Non-methane hydrocarbons)

Reference fuel

(petrol or diesel, cost before tax)

Reference Fuel

Cost of Reference Fuel (€/l)

Cost of CO₂ (€/t)

Range 30-40€/t, Default 30€/t

Cost of Vehicle (€)

Lifetime Mileage (km)

Default values

Directorate-General
for Energy
and Transport



Results of Lifetime Costs

Energy consumption

#VALUE!

CO₂ emissions

#VALUE!

Pollutant emissions

#VALUE!

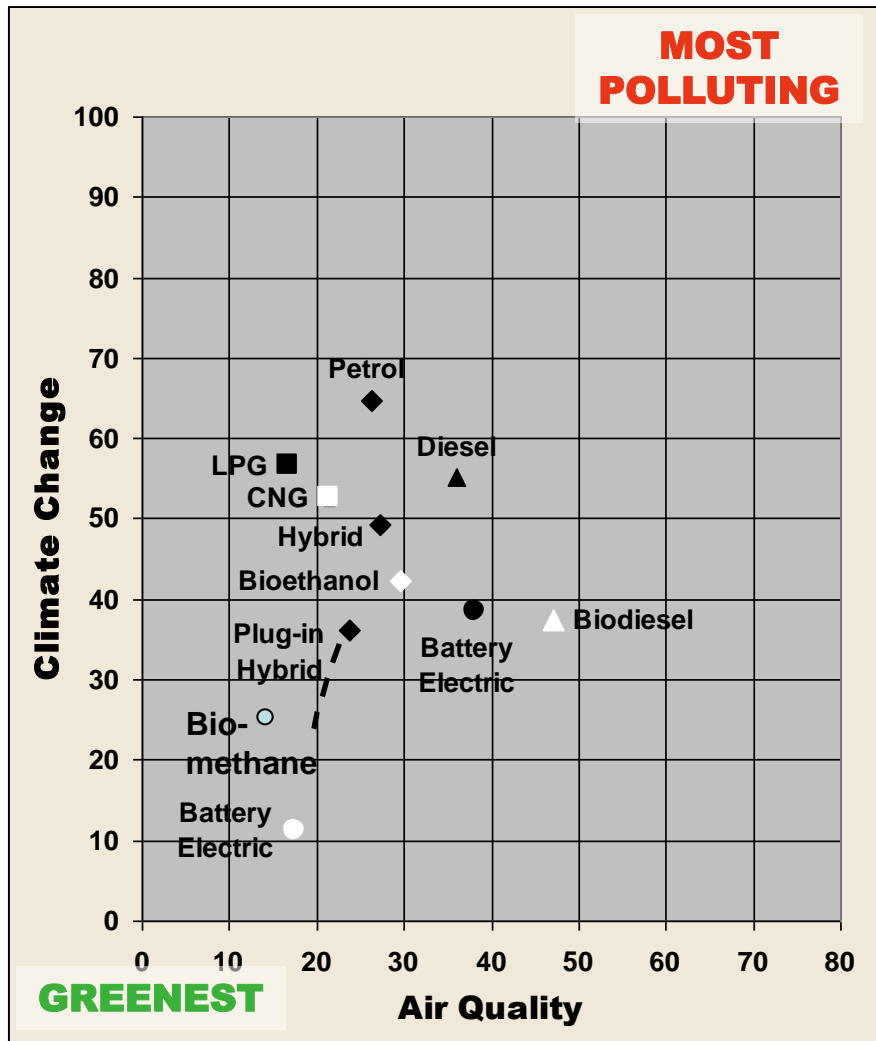
Total Operational Lifetime Costs:

#VALUE!

Total Lifetime Costs + Cost of Vehicle

#VALUE!

Camden Green Vehicle Policy



Key Results From Two Studies

- Electric vehicles largest emissions reductions when using renewable electricity
- Vehicle size influences emissions
- Bio-methane cleanest burning fuel and lowest life cycle environmental impact
- Bio-diesel produced from waste oil second best performing biofuel
- Bio-diesel reduces PM emissions but slightly increases in NOx
- Bio-ethanol from cereals - increase in aldehyde emissions, life cycle CO₂ can be high depending on cultivation & production method



Camden Green Vehicle Policy Development

Clean Vehicles & Target Dates

- 1) Electric
- 2) Plug-in hybrid
- 3) Bio-methane fitted with hybrid assist
- 4) Bio-methane
- 5) Compressed Natural Gas/Liquid Natural Gas fitted with hybrid assist
- 6) Bi-fuel Liquid Petroleum Gas fitted with hybrid assist
- 7) Compressed Natural Gas/Liquid Natural Gas
- 8) Bi-fuel Liquid Petroleum Gas
- 9) Petrol Hybrid
- 10) Diesel Hybrid
- 11) Bio-diesel produced from used cooking oil
- 12) Bio-diesel produced from virgin plant oil
- 13) Bio-ethanol
- 14) Ultra low sulphur petrol
- 15) Ultra low sulphur diesel

2009/10	2010/11	2011/12	2012/13
15% from options 1-4	20% from options 1-4	25% from options 1-4	30% from options 1-4
70% from options 5-10	65% from options 5-10	65% from options 5-10	60% from options 5-10
15% from options 11-15	15% from options 11-15	10% from options 11-15	10% from options 11-15

Example European Emission Standards

	2009/10	2010/11	2011/12	2012/13
Passenger cars/light commercial (<3.5T)				
Euro 4	100%	75%		
Euro 5		25%	75%	50%
Euro 6			25%	50%

Clean Vehicle Fuel & Technology Hierarchy

Low Emission Toolkit

- Defra AQ Grant and Greenwich s106 funds
- Contract with TTR, CERC and RPS
- Now finalising the 'Beta Version'

TECHNOLOGY
GUIDANCE

FLEET TOOL

**DEVELOPMENT
TOOL**

TECHNOLOGY GUIDANCE



Vehicle select

VEHICLE SELECT

Filter selection by:

Drive train:

Category:

Fuel:

Size:

Particle traço:

Registration year:

Euro class:

Select Vehicle

- Small car, <1.4 l, Full Hybrid, Petrol
- Small car, 1.4-2 l, Full Hybrid, Petrol
- Small car, >2.0 l, Full Hybrid, Petrol
- Large car, All, Full Hybrid, Petrol
- LGV <1.3 t, All, Full Hybrid, Petrol
- LGV 1.3-1.8 t, All, Full Hybrid, Petrol
- LGV >1.8 t, All, Full Hybrid, Petrol
- Small car, <1.4 l, Mild Hybrid, Petrol
- Small car, 1.4-2 l, Mild Hybrid, Petrol
- Small car, >2.0 l, Mild Hybrid, Petrol

Select Cancel

Comparison of new technology vehicles

Select data to view: Linear Log

Return to input

- Small car, <1.4 l, Full Hybrid, Petrol
- Small car, 1.4-2 l, Internal Comb. Borehole
- Small car, 1.4-2 l, Stop-start Petrol
- Small car, 1.4-2 l, Internal Comb. Euro 4/5 Diesel

B30 HGV

Low Emission Strategies

Overview: 30% biodiesel in a conventional diesel engine vehicle.

- Technological Maturity:** The technology is widespread, and has reached mass scale exploitation.
- Co-Benefits:** lower polluting if spilled, reduced shelf-life.
- Practicability:** There are few, but plural manufacturers for this vehicle type. Few or no specific / additional safety implications compared to standard vehicles. There are few public refueling stations, operators will require their own depot to refuel vehicles. Fuel is available for depot delivery.

	Per km	Annual
GHG (g) (WTW)	816.00	4632040
NO _x (g)	0.0876	106076
PM (g)	0.0287	1288
Capex (£ per veh)	-	48000
Maintenance (£)	0.1268-0.0268	2872-4630
Refueling Infrastructure (Total Cost in £) (Cost per veh in £)	476.000-412.000 (40.000)	440.000-3220.000 (40.000)

Annual figures are derived from a 40,000 km fleet. Annual figures are based on 50,000 km/a.

FLEET TOOL



Modeling selection: Current situation With replacements

Start year: 2018 Final year: 2020

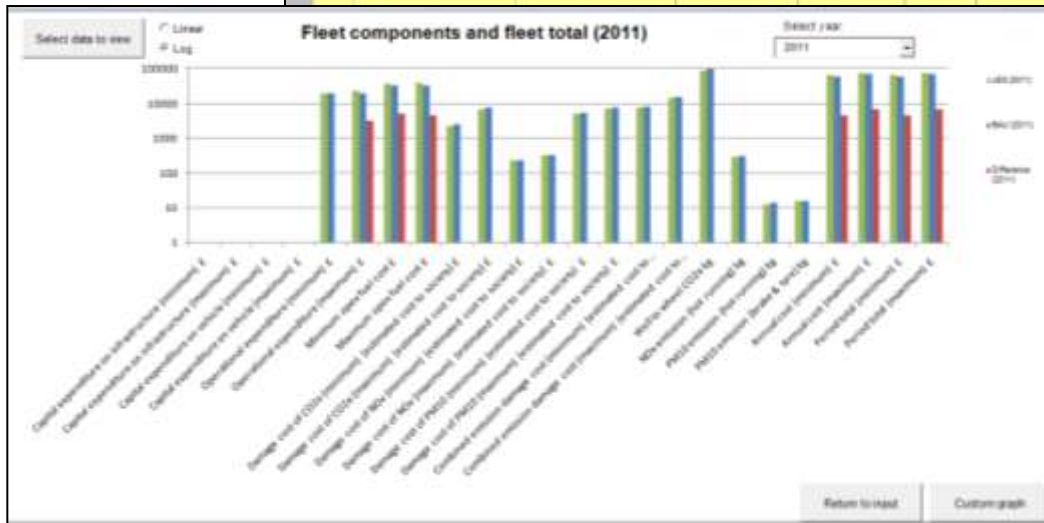
Year dependent replacement Constant replacement rate Replace at age: 10 years

Region of the country: London / central Type of town/city: Predominant journey type: Urban

Electric charging points: None Biomethane infrastructure: None

Buttons: Add / modify / delete vehicle, Add custom vehicle, Clear all, Output graph by vehicle, Custom graph, Add infrastructure, Operational aspects data, View defaults

USER INPUT	ORIGINAL VEHICLE					
	Particle trap	Registration year	Euro class	Operational aspects	BAU replacement	Replace by vehicle
	No	2000	Euro 5B		EURO class replacement	LGV 1.3-1.8 t/L1 Comb. JP



DEVELOPMENT TOOL

No.	Component name	Predominant journey type	Development type
1	Shopping Centre	Urban	Non-residential

Return to input View planning measures View travel plans

Measure type	Sub-category	Use
Vehicle substitution / deployment	Fleet/Pool cars	<input type="checkbox"/>
	Service fleet	<input checked="" type="checkbox"/>
	Public transport fleet	<input checked="" type="checkbox"/>
Specify impact		
Fleet transformation incentives	Site based-low emission zone	<input type="checkbox"/>
	Emission based parking allocation	<input checked="" type="checkbox"/>
Specify impact		
Provision of low emission infrastructure	Electric charging points	<input checked="" type="checkbox"/>
	Biomethane infrastructure	<input type="checkbox"/>
Car clubs	Standard car club	<input type="checkbox"/>
	Low emission car club	<input type="checkbox"/>
User-based charging	Congestion charging	<input type="checkbox"/>
	Emission based parking charges	<input type="checkbox"/>
	Emission based user charging	<input type="checkbox"/>
Travel plans	Parking restraint	<input checked="" type="checkbox"/>
	Parking charges	<input type="checkbox"/>
	Cash-out for not using parking space	<input type="checkbox"/>
	Car sharing	<input type="checkbox"/>
	Public transport	<input type="checkbox"/>
	Walking	<input type="checkbox"/>
	Cycling	<input type="checkbox"/>
	Local recruitment and/or relocation package	<input type="checkbox"/>
	Personalized travel planning	<input type="checkbox"/>
	Home working	<input type="checkbox"/>

Modify overall travel plan

Define development

Review baseline emissions

Select planning measures

Compare scenarios

Number of planning measures

