Guidelines for the Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles (Directive 2009/33/EC)

1. Introduction

The Directive on the promotion of clean and energy efficient road transport vehicles, aims to contribute to the EU objectives of increasing energy efficiency in the transport sector and protecting the environment by reducing emissions of carbon dioxide and air pollution from vehicles. These objectives are shared by the UK government. It is intended that the Directive will result in long-term benefits around stimulating the market for cleaner vehicles and helping to create economies of scale in their production thereby lowering the cost of these technologies and facilitating improvements in the emissions performance of the entire vehicle fleet.

1.1 Scope of application

The Regulations apply to contracts for the purchase of road transport vehicles by:

a) public bodies which are “contracting authorities" for the purposes of the Public Contracts Regulations 2006. In practice this group includes central government departments and agencies as well as organisations in the wider public sector, including local authorities, state schools and NHS Trusts

b) a small number of entities which are “utilities” for the purposes of the Public Contracts Regulations 2006; and

c) entities which are required to perform public service obligations under a public service contract (as those terms are defined in Regulation (EC) No 1370/2007) (“public service operators”). This group will primarily be bus operators purchasing vehicles to provide a service under contract with government, and could also include some other private transport companies contracted by the public authority.

The “road transport vehicles” include cars and light commercial vehicles, buses, and commercial vehicles such as trucks or refuse trucks.

1.2 Options for implementation

Organisations required to take into account energy and environmental impacts can now do so in one of three ways. They can either in one of three ways. They can either:

a) Set technical specifications for energy and environmental performance in the documentation for the procurement of road transport vehicles **(option 1);**

b) Include energy and environmental impacts in the purchasing decision by using energy and environmental impacts as award criteria as part of a procurement procedure **(option 2);**

c) Include energy and environmental impacts in the purchasing decision by monetising them in accordance with set methodology provided within the Directive **(option 3).**

The Cleaner Road Transport Vehicles Regulations 2011 implement Directive 2009/33/EC.

1.3 This document

The requirement for contracting authorities or entities to take into account the energy and environmental impacts when procuring road transport vehicles are mandatory. As described in the previous section 1.2, there are three ways of complying. To apply option 3: monetise energy and environmental impacts, your organisation will require technical and economic expertise. As this method is quite rigid and prescriptive in the Directive, we would recommend you follow the text in Article 6 of the Directive directly. (Annex 1 includes a working example of this method.)

This document provides guidance on how to apply the requirement using option 1 (set technical specifications for energy and environmental performance) and could also be used for option 2 (include energy and environmental impacts in award criteria). It provides information and guidance on emissions and carbon performance requirements, for new or used vehicles purchased by contracting authorities and their operators. This document is not mandatory and is for guidance purposes only.

The recommendations are designed to meet current and forthcoming legislative requirements and will be updated over time.

This document also signposts to websites for more information and best practice. Information is also provided on alternative fuels and technologies that could improve emissions performance significantly. Where the benefits of these technologies are not already reflected in the energy consumption and emissions data for the vehicle, (e.g. where they have been retrofitted after vehicle manufacture) it is recommended, that additional points be awarded where real environmental benefits can be demonstrated. Such benefits must, however, be expressed as desirable requirements in the invitation to tender which must also specify the number of points that can be earned in the tender assessment where such an offer is made in tenders received.

The European Commission has also launched a new website to help organisations choose cleaner and energy efficient vehicles: http://www.cleanvehicle.eu/

Also further voluntary, more stringent purchasing recommendations can be found in module 3 of the Green Public Procurement Toolkit at: http://ec.europa.eu/environment/gpp/toolkit_en.htm , for authorities with specific air quality issues.

1.4 Guidance on weightings

The Directive does not specify levels of weighting that should be awarded to the environmental criteria of vehicle performance relative to non-environmental criteria. These weighting levels are entirely at the discretion of the procurer.

It is recommended that weightings are applied appropriately to the circumstances of any specific procurement exercise. For the procurement of passenger cars for example, there is a large choice of energy efficient models available, therefore, it would be suitable to have significant weighting for high fuel economy and low emissions. Equally where authorities are purchasing specialist vehicles, for example ambulances, the weighting would be more likely to reflect the performance and capability requirements for the vehicle purpose, over the environmental criteria.

This flexibility of this Directive therefore allows the authority to set weighting according to its local priorities. For example air quality targets may be a higher priority in the short term then energy efficiency.

All bidders should provide technical sheets and certification documents as is appropriate.

1.5 Fleet assessment

An assessment or fleet audit can be carried out to determine what the fleet requirements are prior to the purchase of new vehicles.

The Department for Transport funds through the Energy Saving Trust a transport advice programme that offers independent advice for organisations. Depending on the size of the fleet, consultancy advice and a green fleet review are available. See the following link for further information: http://www.energysavingtrust.org.uk/business/Business/Transport-in-business/Advice-for-organisations.

1.6 Timing

The consideration of this Directive should be applied when the next procurement exercise is scheduled. There is no requirement for procurements to be brought forward.

1.7 Impacts and costs

An assessment has been made of the costs that may be incurred to implement this Directive. There are a wide range of costs due to the number of options and flexibility the Directive allows. In some cases where authorities already consider energy and environmental impact, the costs will be negligible.

In the short term new energy efficient vehicles may be of a higher cost to purchase, however over the life time of the vehicle due to the fuel savings a large amount of this cost should be recovered.

2. Cars

It is recommended that both petrol and diesel light duty passenger cars, (i.e. classes M1 & N1) should comply with Euro 5 air quality standards. Details can be found under European Regulation EC No.715/2007.

With respect to carbon (CO2) emissions, it is recommended that public authorities have a coherent approach with the central Government target, to procure or contract new passenger cars achieving an average 130 g/km CO2 or lower by 2010/11. This target should be achievable without incurring additional costs, as most manufacturers offer more than one car model that meets this target and a growing number exceed this and are selling cars with CO2 lower than 100g/km in some cases.

CO2 correlates directly with the fuel burned therefore, lower CO2 vehicles will have low fuel consumption and be cheaper to operate. Extra points in a procurement process could be awarded for cars achieving CO2 lower then the target of 130g/km. Lower CO2 should, however, be expressed as a desirable requirement in the invitation to tender which must also specify the number of points that can be earned in the tender assessment where such an offer is made in tenders received.

This central Government target applies to all new passenger cars, through normal fleet replacement, procured by government for administrative purposes from 2010/11. This will in practice cover all vehicles that carry out day to day tasks, registered between 1 April 2010 and 31 March 2011. This target can be equally applied to all car purchases including grey fleet cars.
For more information on low carbon car selection, efficient driving and advice for fleets see the following links:
http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenertravel/Greenercarsanddriving/DG_064428;
http://carfueldata.direct.gov.uk/search-by-fuel-economy.aspx ;and
http://www.energysavingtrust.org.uk/business/Business/Transport-in-business/Advice-for-organisations and

3. Vans & Minibuses

This category includes vehicles designed to carry more than 8 passengers (e.g. minibuses) or goods vehicles up to 3,500 kg gross vehicle weight (including car-derived vans). In type approval terms these are vehicle classes M2 and N1 respectively. It is recommended that they should comply with Euro 5 air quality standards. Details can be found under the European Regulation EC No.715/2007.

Where Euro 5 vehicles are not yet available, then it is recommended Euro 4, as described in Directive 70/220/EEC as amended, vehicles are purchased.

On 11 May 2011 the European Council and Parliament adopted a regulation (EU 510/2011) setting CO_2 emission targets for all new vans registered in the EU. The Regulation means that the average new van sold in the EU in 2017 will be required to emit 175g CO_2/km or less and 147g CO_2/km or less by 2020.

The Department for Transport and Society of Motor Manufacturers & Traders have developed a searchable van CO2 database that will provide further guidance; this is available at: http://vanfueldata.dft.gov.uk/, it provides details on the CO2 emissions for all main models of vans.
Information on best practice, efficient driving and advice for fleets can be found at: http://www.businesslink.gov.uk/bdotg/action/detail?itemId=1082622281&r.i=1083690132&r.t=CAMPAIGN&type=RESOURCES

4. Heavy duty vehicles

This category is for all vehicles over 3,500 kg gross vehicle weight, including vehicles in classes M2, M3, N2, and N3. This will include heavy duty trucks, buses, and waste collection vehicles, both diesel and gas.

Unlike smaller vehicles, air quality emissions standards are set for the engine and not the whole vehicle.

It is recommended vehicles should comply with Euro V emissions as defined in Directive 2005/55/EC, or should hold a valid Euro V Reduced Pollution Certificate (RPC). Further information on RPC can be round at: http://www.businesslink.gov.uk/bdotg/action/layer?lang=en&r.i=1081968378&r.l1=1079068363&r.l2=1086021901&r.l3=1081967657&r.s=m&r.t=RESOURCES&topicId=1081967657

There are currently no carbon emissions standards set for heavy duty engines; however there has been some discussion at European level for possible inclusion of CO2 measures in future.

Where authorities are purchasing or acquiring services for a large number of heavy duty vehicles, it is recommended that an independent fuel consumption/CO2 test be carried out.

Authorities are recommended to request full information on specification of the vehicle; this can be the same information that is required for vehicle type approval. (See section 4.1 below).

Advice on best practice, safe and fuel efficient driving can be found at: http://www.freightbestpractice.org.uk/.

4.1 Type Approval

Certain categories of new vehicle are currently required to have government approval for the whole vehicle before they are registered and placed on sale. This is being extended to cover extra vehicle categories by October 2014.

During the transition period some manufacturers will opt to gain approval and others will not. Some manufacturers will obtain EC Whole Vehicle Type Approval (EC WVTA) whilst others will gain national approval.

A new vehicle with a valid type approval will comply with all road vehicle regulations, including noise and tailpipe emissions, applicable to that category of

vehicle on the date it was registered. However, for vehicles not required to have type approval and not in possession of type approval, it should not be assumed that the vehicle does not comply with a particular requirement. Instead the manufacturer should be contacted for more information.

The 'V5C' Registration Certificate issued by DVLA for every registered vehicle will contain enough information to ascertain the emissions standard that the vehicle complies with, and in some cases also the noise standard it complies with. For brand new vehicles that are not yet registered, the Certificate of Conformity (CoC) (if applicable) will contain this information. Until October 2014 not all new vehicles will be required to have a CoC.

Type approval only applies to the vehicle before it is registered. Sometimes vehicles are converted to run on alternative fuels after registration. Our recommendation would be to purchase a vehicle that was converted before registration, to ensure it has been assessed against the correct standards.

The rules on type approval are complex. More information can be found at http://www.dft.gov.uk/topics/vehicles/ecwvta/ or on the VCA (Vehicle Certification Agency) website: http://www.vca.gov.uk/vehicletype/index.asp

4.2 Specialist Vehicles

Specialist vehicles such as Ambulances or mini buses adapted to carry less abled passengers are also subject to specific type approval requirements due to the importance of the type of work they carry out. As a general guideline, the base vehicle should comply with the recommended performance standards provided in this document; details on system performance should be available from the VCA. It is recognised that in the case of some specialist vehicles, data for emissions and CO2 emissions is unavailable. Testing to obtain this data could be requested from the vehicle supplier if the size of procurement is substantial and this would be cost effective.

For further information and definitions vehicles, please see type approval regulations Directive 2007/46/EC.

5. Alternative Fuels and Technologies

Alternative fuels and technologies have a role to play in reducing carbon and air quality emissions from road transport. Some high level information is provided below, however, to determine if a particular fuel or technology could be suitable for fleet operation, organisations may wish a Green Fleet Review to be carried out to assess operational performance and requirements:
http://www.energysavingtrust.org.uk/business/Business/Transport-in-business

5.1 Alternative Fuels

Liquefied petroleum gas (LPG) can be suitable for smaller vehicles such as cars and light vans that have high mileage or operate predominantly in urban or semi urban operation. LPG offers better air quality emissions than diesel (similar to petrol), and better CO2 emissions than petrol (but not quite as good as diesel).

Natural gas (CNG- Compressed Natural Gas) can be an option for goods vehicles with depot-based refuelling sites. CNG also offers better air quality emissions than diesel (similar to petrol), and better CO2 emissions than petrol, but not as good as diesel yet.

Biogas is produced from organic materials are broken down by a microbiological activity to produce methane. CO2 well to wheel benefit can be significant from bio waste, however the availability of this fuel is limited.

Biodiesel can be used at 5% in existing diesel engines with no need for modification. Higher blends may be able to be used in some vehicles, possibly with limited modifications, but could affect the vehicle's warranty. For all blends consult the vehicle manufacturer.

Bioethanol is produced by the fermentation of starch, sugar and cellulose plants. Then used as a blend with, or as a direct substitute for petrol. A 5% blend in petrol can be used in all existing petrol vehicles. For all blends consult the vehicle manufacturer.

Flex-fuel vehicles are available which are capable of operating on any blend of petrol and ethanol up to 85% ethanol.

Biofuels have the potential to offer considerable CO2 savings. However there are concerns that certain biofuels can increase net green house gas emissions due to direct and indirect effects of their production, so it is important to ensure they are produced sustainably. More information can be found on the DfT website, http://www.dft.gov.uk/topics/sustainable/biofuels/

Hydrogen with a fuel cell is currently only used in prototype vehicles – these vehicles produce no pollution at the tailpipe. However there may be high emissions associated with producing the hydrogen depending on the method used. Fuel cells vehicles are not yet commercially available.

5.2 Alternative Technologies

All-electric or battery electric vehicles (EV or BEV) are powered entirely by a re-chargeable battery and when charged from the electricity grid produces zero emissions at tailpipe, life cycle emissions can be measured taking into account the energy production and renewable sources. On a lifecycle basis, taking into account emissions from power generation (based on DEFRA figures) suggests in 2010 electric vehicles will be up to 40% lower in CO2 emissions over a petrol equivalent. Electric vehicles are generally suitable for operating in urban or semi urban, stop/start operation.

A plug-in hybrid electric vehicle (PHEV) is powered in part by a re-chargeable battery and in part by a conventional internal combustion engine using petrol or diesel. PHEV's could potentially operate in all-electric mode for extended ranges (e.g. domestic commuting journeys) while retaining a conventional petrol or diesel

engine for longer journeys. These are not presently available but the first PHEVs are expected to be introduced shortly.

Conventional **hybrid electric vehicles (HEV)** such as the Toyota Prius combine conventional internal combustion engine with an on-board energy storage system to achieve improved fuel economy.

Reduction in CO2 from PHEV and HEVs occurs when operating them in urban and semi urban conditions.

Electric and Hybrid electric vehicle performance can be very much dependent on the driving conditions, environment and driving style of the driver. These factors should be taken into account when assessing suitability for operation.

Further information and Government support on certain greener fuels for cars can be found at:
http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenertravel/Greenercarsanddriving/DG_191580

6. Driver Aids and Measures

How the vehicle is operated and maintained will have an effect on the actual emissions the vehicle produces. This section refers to aids and other measures that can be implemented to encourage more efficient operation. Extra points in a procurement process could be awarded for the presence of these aid and measures, however they are only beneficial if they are acted upon and maintained regularly.

6.1 Gear Shift Indicators (GSI)

Gear-shift indicators are designed signal to the driver when to change gear at the optimum moment. By moving more swiftly through the gears can reduce fuel consumption by avoiding unnecessarily high engine speed. The system may also decrease wear on engine and transmission components.

6.2 Air Conditioning Gases

It is recommended that all air conditioning systems fitted to cars and car-derived vans should be type approved to EU Directive 2006/40/EC.
Further information on Global Warming Potential can be found at:
http://www.grida.no/climate/ipcc_tar/wg1/248.htm#tab67.

6.3 Tyre Pressure Monitoring System

Tyre pressure monitoring equipment can be fitted to measure and alert the driver to changes in tyre pressure and temperature. The onus then falls on the driver or workshop to ensure the necessary action is taken.

6.4 On-going maintenance

Commitment for requirements on items such as the use of low viscosity engine lubricants, low noise and low rolling resistant tyres should be signed up to as part of the maintenance/driver contract. Guidance on criteria for these can be found at:
http://ec.europa.eu/environment/gpp/pdf/toolkit/transport_GPP_product_sheet.pdf

6.5 Smart driving

To raise awareness and participation of the driver smarter driving courses and travel tips can be implemented. The following links have more information:
http://www.rospa.com/drivertraining/courses/
http://www.energysavingtrust.org.uk/Travel.

Annex 1

Option 3 methodology & example

In the Directive, Option 3 requires taking environmental impacts into account is to monetise them using methodology provided by the European Commission (EC). The values to be used in assessing the environmental impacts of each vehicle are provided along with the energy content of fuel to be assumed and the mileage over which to appraise the vehicles. The methodology also specifies that fuel costs should be valued using the pre tax cost per litre. These inputs are shown below in table 1:

Table 1: EC Data inputs

Energy content of fuels (MJ/litre)	
Diesel	36
Petrol	32
Emissions Values (2007 prices)	
CO2 (cents/kg)	3 to 4
NOx (cents/g)	0.44
NMHC (cents/g)	0.1
PM (cents/g)	8.7
Lifetime mileage (km)	
Cars	200,000
Light commercial	250,000
HGV	1,000,000
Buses	800,000

These inputs are then used to value the whole-life costs of the vehicles an authority is considering purchasing by applying them to the relevant emission data provided by the manufacturers. It is assumed that vehicles remain on the road for an average of 13 years. Table 2 below shows a comparison of one possible

scenario where an authority may consider switching to diesel. In this example the diesel does not offer a benefit over the petrol vehicle over its lifetime although the cost difference has fallen from £600 based on purchase price alone to just £5 after taking account of whole-life costs.

Table 2: Sample vehicle comparison (figures have been rounded)

	Vehicle A - 1.6 Petrol	Vehicle B - 1.7 Diesel
List Price	£10,700	£11,300
Fuel consumption (combined l/100km)	6.5	5
Energy use (MJ/km)	2.08	1.80
Total fuel cost	£4,700	£3,950
Total lifetime costs without env. Impacts	**£15,400**	**£15,250**
CO2 (g/km)	156	135
Total cost of CO2	£850	£740
NOx (g/km)	0.03	0.199
Total cost of NOx emissions	£20	£140
NMHC (g/km)	0.083	0
Total cost of NMHC emissions	£15	£0
PM (g/km)	0	0.012
Total cost of PM emissions	£0	£160
Total lifetime costs	**£16,285**	**£16,290**