



BUY SMART+

Green Procurement in Europe

Procurement and Climate Protection

Guideline for procurement of
Vehicles



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www.buy-smart.info

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1. Introduction

Transport is an indispensable component of our society and of our life. It constitutes an important pillar of our economic wealth. But it should not be ignored that the road traffic in particular contributes significantly to the emission of air pollutants and climate change gases. In spite of constant technical progress, the need for action for more environmental friendly products in the field of freight and passenger transport still remains.



Picture: AboutPixel.de

In the EU, there are about 230 million passenger cars for about 500 million inhabitants. It means about 1 car per two inhabitants. Moreover, in 2006, there were about 32 million goods vehicles (www.cleanvehicle.eu).

In 2009, total passenger transport activities in the EU27 by any motorized means of transport are estimated to have amounted to 6,503 billion pkm or on average 13,063 km per person. This figure includes intra-EU air and sea transport but not transport activities between

the EU and the rest of the world. Passenger cars accounted for 73.5 % of this total, powered two-wheelers for 2.4 %, buses & coaches for 7.8 %, railways for 6.2 % and tram and metro for 1.4 %. Intra-EU air and intra-EU maritime transport contributed 8.0 % and 0.6 % respectively.

In 2009, total goods transport activities in the EU27 are estimated to have amounted to 3,632 billion tkm. This figure includes intra-EU air and sea transport but not transport activities between the EU and the rest of the world. Road transport accounted for 46.6 % of this total, rail for 10.0 %, inland waterways for 3.3 % and oil pipelines for 3.3 %. Intra-EU maritime transport was the second most important mode with a share of 36.8 % while intra-EU air transport only accounted for 0.1 % of the total (www.cleanvehicle.eu).

Challenge N°. 1: Climate protection

Green house gas emissions from transport in EU-27 have been growing constantly for the past 20 years (with a growth from 1990 to 2008 by more than one third¹. 84 % of the GHG emissions is CO₂, the rest is mainly methane and nitrogen oxide (N₂O). GHG emissions from transport currently represent 25 % of total GHG emissions in EU-27. Successful reductions in other sectors are all but swallowed up by transport. About half of these transport-related CO₂-emissions are caused by passenger cars, light utility vehicles, and buses. In Europe every year more than 15 million vehicles are newly registered, 92 % of them in the older EU-15. Improvements in the efficiency of vehicles,

¹ http://ec.europa.eu/transport/publications/statistics/pocketbook-2011_en.htm

as achieved by the car industry in the past, have as yet been neutralised by a higher traffic volume and vehicles' (in some cases substantial) extra equipment and higher motorisation. It is of the utmost importance that the "climate-friendly" technologies available on the market will be taken into consideration during vehicle procurement.

Challenge N°. 2: Air Pollutants

Furthermore, the transport - being the locally most significant cause of pollutant emissions (such as particulate matter) - has a central role to play in the prevention of air pollution. When evaluating the pollutant emissions of vehicles, it has to be taken into consideration that they are emitted at face level – and therefore is not thinned. The traffic in cities causes up to 50 % of the particulate matter emission, although it just reaches 20 % of the total particulate matter emissions. The need for action is also visible in the EU legal frameworks: in the past, the threshold value for particulate matter, according to the European Air Quality Framework Directive 96/62/EC, has frequently been exceeded in many cities in Europe, so that the emissions load shall be reduced by further Clean Air Plans and Action Plans in the future. One important measure in the transport sector is therefore a traffic ban for vehicles with extremely high pollutant emissions in the city centres.

Challenge N°. 3: Noise

Noise is another of the local problems in health and environmental protection. It is disturbing and also poses a risk to health. The main cause for noise in cities is traffic. For instance, around 60 per cent of German citizens are annoyed by road traffic noise. Furthermore, high continuous exposure to road traffic noise above 65 dB(A) during the day or 55dB(A) at night increases the risk of cardiovascular diseases. Around 10 per cent of the population of Berlin is exposed to noise levels that, in the case of continuous exposure, are a potential health hazard².

These numbers prove the necessity for traffic noise reduction. Besides measures in transport planning, such as speed limits at least at night-time, traffic ban for trucks, etc., noise emission reduction at the vehicle itself, e. g. by using low-noise and fuel-saving tyres, can contribute to environmental protection. Heavy utility vehicles definitely cause more noise; therefore they should be considered as a target for noise reduction.

BuySmart+ Guideline

The present BuySmart+ Guidelines provides a summary of options and tools to be used when selecting "clean vehicles".

The procurement of a "clean vehicle fleet" is a decision for:

- Protection of environment and climate

² http://www.stadtentwicklung.berlin.de/verkehr/politik_planung/zahlen_fakten/download/Mobility_en_Chap-2-3.pdf

- Less dependency on fuel prices
- Protection against driving restrictions in city centre air pollution control areas
- A possible step towards setting up an environment-friendly company image
- Economic efficiency.

The guideline is mostly, even though not solely based on the Clean Vehicle Directive and on the EU GPP Toolkit, which set out guidelines for Members States' vehicle green public purchases, and on the GPP Toolkit criteria on vehicles.

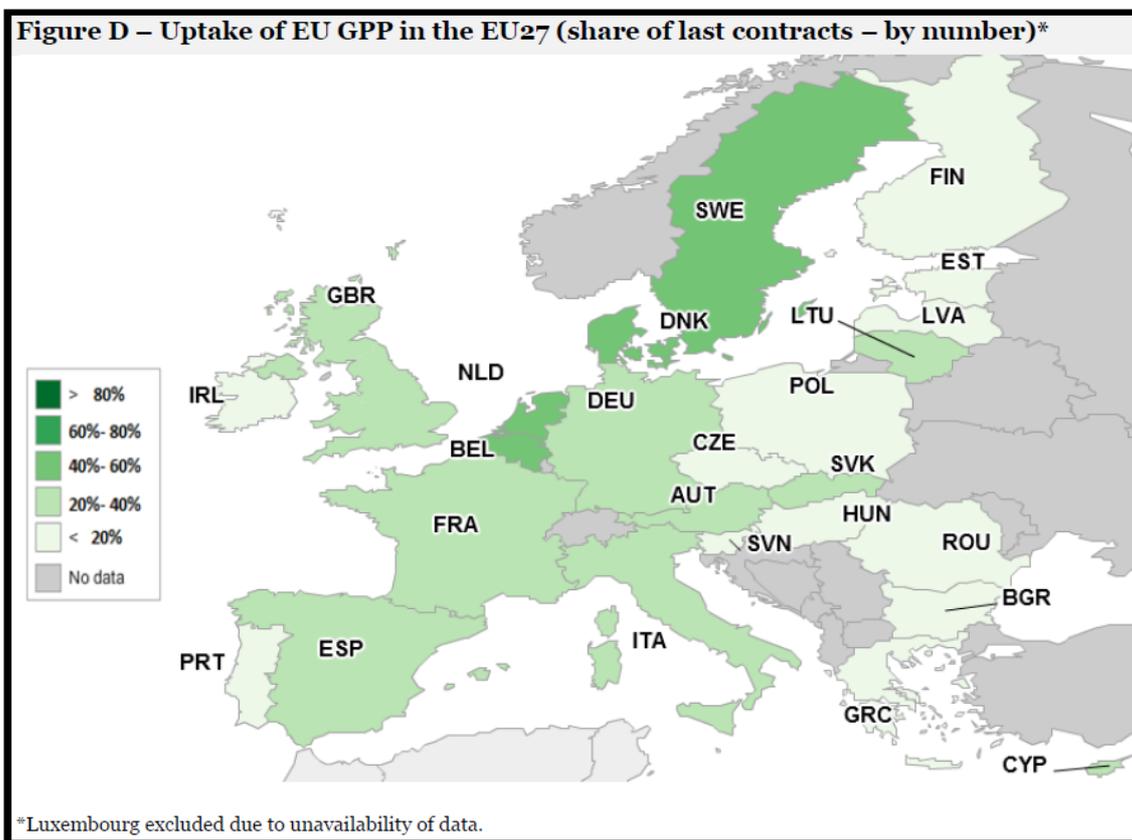
The guideline includes:

- Information on green procurement criteria for clean vehicle fleet
- Introduction of environmental marks and labels as procurement tools
- General tips on procurement and vehicle operation

2. Green procurement

Green Public Procurement (GPP) is defined as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured."

The 20-20-20 EU Energy Policy set the targets to reach 20 % reduction of CO₂-emissions, 20 % reduction of energy consumption, and an increase of renewables in the energy mix with 20 % until 2020. The energy efficiency target is the only non-binding target at EU level and also the one which is unlikely to be achieved by 2020. The latest estimations show that at the current pace of implementation only half of the target will be reached. To support the energy efficiency target the energy service directive 2006/32/EC has been set into force which in Art. 5 requires public purchasers to procure energy efficient products and services.



Source: 2012, CEPS, The uptake of green public procurement in the EU 27

Since then, the European Commission has started several initiatives on GPP. In the year 2008 the goal of 50 % green procurement for the year 2010 has been set in a communication on GPP, the GPP toolkit has been published and several legislative requirements have been set up:

- Regulation No 106/2008: Energy Star Regulation (2008)
- Directive 2009/33/EC: Clean Vehicles Directive (2009)
- Directive 2010/30/EU: Energy Labelling Directive (2010)
- Directive 2010/31/EU: Energy Performance of Buildings Directive (2010)

Also the Europe 2020 strategy has identified public procurement as one of the key means of attaining smart, sustainable and inclusive growth. In October 2011 the EU Commission published the Buying Green Handbook that provides an introduction to GPP.

Procurement has the ideal position in public organisations and private companies to fulfil a pivotal role between suppliers and buyers, when considering suppliers as sources of innovation. Public authorities spend approximately two trillion Euros annually, the equivalent of around 19 % of the EU's gross domestic product. Regular demand for eco-efficient products would motivate suppliers to offer more products and services that comply with modern quality and environmental requirements. For companies, innovation-driven procurement will become one of the key competences to keep the pace of innovation sufficiently high in the ever faster changing world.

Green procurement helps solve environmental issues by reducing toxic and greenhouse gas emissions. By choosing green products and services, less hazardous substances are released and natural resources are conserved. A reduction in the environmental impact generally leads to less damage to health. Procurement is also a powerful instrument that public authorities and companies can use to reduce their CO₂ emissions and advance their climate change objective.

Although they may be more expensive at the time of purchase, environmentally friendly products can also work out cheaper in the long term.

3. Considered products and related criteria

The main criteria stem from the Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles, and from the EU GPP Criteria for Transport.

The **Directive 2009/33/EC on the Promotion of Clean and Energy Efficient Road Transport Vehicles** aims at a broad market introduction of environmentally-friendly vehicles.

It extends to all purchases of road transport vehicles, covering passenger cars (M₁), light commercial vehicles (N₁), heavy goods vehicles (N₂,N₃) and buses (M₂,M₃).

The Directive requires that energy and environmental impacts linked to the operation of vehicles over their whole lifetime are taken into account in purchase decisions. These lifetime impacts of vehicles are to include at least **energy consumption, CO₂emissions and emissions of the regulated pollutants of NO_x, NMHC and particulate matter**. Purchasers may also consider other environmental impacts.

Two options are offered to meet the requirements: setting technical specifications for energy and environmental performance, or including energy and environmental impacts as award criteria in the purchasing procedure.

The Directive further defines **common rules for calculating the lifetime costs** linked to the operation of vehicles which are to be followed when monetising the impacts. This internalisation of external costs into new vehicle procurements will improve the contribution of the transport sector to the environment, climate and energy policies of the Community by reducing energy consumption, CO₂ emissions and pollutant emissions.

According to the Directive, the **operational lifetime cost of the energy consumption** of a vehicle shall be calculated using the following methodology:

- The fuel consumption per kilometre of a vehicle shall be counted in units of energy consumption per kilometre whether this is given directly, which is the case for instance for electrical cars, or not. Where the fuel consumption is given in different units, it shall be converted into energy consumption per kilometre, using the conversion factors as set out in Table 1 below,
- a single monetary value per unit of energy shall be used. This single value shall be the lower of the cost per unit of energy of petrol or diesel before tax when used as a transport fuel,
- operational lifetime cost of the energy consumption of a vehicle shall be calculated by multiplying the lifetime mileage by the energy consumption per kilometre, and by the cost per unit of energy according to the above points.

The **operational lifetime cost for the CO₂ emissions** of a vehicle shall be calculated by multiplying the lifetime mileage by the CO₂ emissions in kilograms per kilometre, and by the cost per kilogram taken from the range as set out in Table 2 below.

The **operational lifetime cost for the pollutant emissions** of a vehicle shall be calculated by adding up the operational lifetime costs for emissions of NO_x, NMHC and particulate matter. The operational lifetime cost for each pollutant shall be calculated by multiplying the lifetime mileage by the emissions in grams per kilometre and by the respective cost per gram (the cost shall be taken from the Community averaged values – shown in Table 2 below).

Contracting authorities, contracting entities and operators may apply higher costs provided these costs do not exceed the relevant values set out in Table 2 multiplied by a factor of 2.

The following tables are exempted from the Directive, showing the common grounds for calculation of lifetime operation and environmental costs, as specified above.

Data for the calculation of operational lifetime costs of road transport vehicles
Table 1: Energy content of motor fuels

Fuel	Energy content
Diesel	36 MJ/litre
Petrol	32 MJ/litre
Natural Gas/Biogas	33-38 MJ/Nm ³
Liquefied Petroleum Gas (LPG)	24 MJ/litre
Ethanol	21 MJ/litre
Biodiesel	33 MJ/litre
Emulsion fuel	32 MJ/litre
Hydrogen	11 MJ/Nm ³

Table 2: Cost for emissions in road transport (in 2007 prices)

CO ₂	NO _x	NMHC	Particulate matter
0,03-0,04 EUR/kg	0,0044 EUR/g	0,001 EUR/g	0,087 EUR/g

Table 3: Lifetime mileage of road transport vehicles

Vehicle category (M and N categories as defined in Directive 2007/46/EC)	Lifetime mileage
Passenger cars (M ₁)	200 000 km
Light commercial vehicles (N ₁)	250 000 km
Heavy goods vehicles (N ₂ , N ₃)	1 000 000 km
Buses (M ₂ , M ₃)	800 000 km

The following table shows an example of calculation of operational costs according to the Directive – example of four different passenger cars with diesel motor in EURO 5 standard:

<i>Parameters of passenger cars with diesel motor in EURO 5 standard</i>					<i>Prices</i>		
Fuel	l/100 km	4,8	5,2	5,6	5,9	1,6	EUR/l
CO₂	g/km	130	140	150	160	0,03	EUR/kg
NO_x	g/km	0,18	0,18	0,18	0,18	0,0044	EUR/g
NMHC	g/km	0	0	0	0	0,001	EUR/g
PM	g/km	0,005	0,005	0,005	0,005	0,087	EUR/g
Lifetime mileage	ths. km	200	200	200	200		
Costs of fuel	EUR	15 360	16 640	17 920	18 880		
Costs of CO₂ emissions	EUR	780	840	900	960		
Costs of other emissions	EUR	245	245	245	245		
Total costs	EUR	16 385	17 725	19 065	20 085		

The table shows that almost 4 000 EUR can be saved in lifetime costs purchasing a car with fuel consumption lower by 1 litre/100 km. Of course the calculation largely depends on the prices of fuel.

The **EU GPP Criteria for Transport** provide specific criteria to be included in green purchases of vehicles. The document states that the criteria are complimentary and should be “read in conjunction with” the Directive 2009/33/EC; however, the categorization of vehicles in the GPP Toolkit is slightly different compared to the Directive: passenger cars and light duty vehicles, public transport vehicles and services and waste collection trucks and services³.

The document further refers to the life-time cost calculations, as previewed in the Directive as well as in tools such as www.cleanvehicle.eu.

The Criteria are divided into two main groups: the core criteria, which address the key environmental impacts and only require only minimum additional verification and costs, and comprehensive criteria, which enable purchase of the best environmental products in the market.

In the following text, the main principles of the EU GPP Criteria for Transport are presented; full text can be downloaded at http://ec.europa.eu/environment/gpp/toolkit_en.htm.

Passenger cars and light duty vehicles

In 1996, the EU’s Member States and the European Parliament approved a ‘Community Strategy to reduce CO₂ emissions from passenger cars’. The strategy’s objective was to reduce the average CO₂ emissions of newly sold passenger cars in the EU to 120 g per kilometre by 2005, or 2010 at the latest. These targets are currently met only by small or the most energy efficient cars (in e.g. Tipten database).

The requirements for CO₂ emissions for the passenger cars and light duty vehicles as defined in the EU GPP Toolkit are presented in the following table. In general, the comprehensive criteria are about 15 – 25 % stricter than the *core criteria*.

Vehicle type	Core criteria CO ₂ g/km	Comprehensive criteria CO ₂ g/km
Mini	110	90
Small	120	100
Compact	130	110
Mid	150	130
Large	170	150
High/Exclusive	270	200
Offroad/Family Wagon	210	170

³ Services are mentioned for cases in which the vehicles are not owned by the organization, but rather transport services (public bus, waste collection, etc.) are purchased.

Small vans	150	130
Other vans	220	180

Note: Regulation 443/2009/EC setting emission performance standards for new passenger cars requires that new passenger cars follow limits on CO₂ emissions by 2015. From 2016, the limits are to be further tightened. The limits are determined according to specific vehicle mass (in kg). Example of the limits is given in table below (corresponding roughly to vehicle types mini, small and high/exclusive):

Car mass [kg]	Limit for CO ₂ emissions [g/km]
1200	122
1700	145
2200	168

Interestingly, the GPP Toolkit criteria are stricter for small cars but seem to be less strict for bigger/exclusive cars. From 2020 the target set by the regulation is average emissions for the new car fleet of **95 g CO₂/km**, therefore at level of today's comprehensive criteria for the smallest cars.

The EU GPP Toolkit for passenger cars further requires to comply with EURO 5 (core criteria) or EURO 6 (comprehensive) standards (defined in Regulation 692/2008/EC) and to provide information and instruction for eco-driving.

In addition, *comprehensive criteria* include qualitative aspects such as monitoring systems and displays for tyre pressure, fuel consumption or gear shift indicators – these all contribute to lower fuel consumption.

Comprehensive criteria further address vehicle tyres noise and rolling resistance and air-conditioning gases, which must have a total Global Warming Potential (GWP) ≤ 150.

Additional points can be awarded for e.g. use of alternative fuels (including hybrid systems) or better parameters than are set in core and comprehensive criteria.

Public transport vehicles (bus procurement)

As the basic rule (*core criteria*) the procured public transport vehicles (buses) need to meet standards of **enhanced environmentally friendly vehicle (EEV)**, which are defined in Directive 2005/55/EC and consist of environmental criteria such as NO_x, CO, NHMC, PM and other emissions.

To meet the *comprehensive criteria*, the buses have to comply with the EURO VI standard for emissions (as defined in Commission Regulation 582/2011/EU) as well as with other requirements, such as

- location of exhaust pipe (on other side than passenger door),
- use of lubricant oils (low viscosity engine lubricant oils with e.g. share of biodegradable substances and carbon content from renewable raw materials), and
- maximum rolling resistance value and tyre label (defining rolling noise) are prescribed.

Additional points can be awarded for e.g. use of alternative fuels (including hybrid systems), lower noise emission levels than required by law, tyre pressure monitoring system or air conditioning gases with GWP lower than 2500 in 100 year time horizon. Extra points are awarded for using recycled or renewable materials in the vehicle or having a start and stop system⁴.

Similar criteria as for direct purchase are required for provision of public transport (bus) services. In addition to the core, comprehensive and award criteria, the GPP Toolkit provides contract performance clauses such as reporting on fuel consumption, training of drivers and proper disposal of lubricant oils and tyres.

Waste collection trucks

The criteria for waste collection trucks are very similar to the ones for buses. The difference is mainly in lower importance to air conditioning, given the operation of the trucks (usually night or early morning and possible air conditioning only driver's cabin) and exclusion of GWP.

Furthermore, CO₂ emissions requirements are not defined given the variation in size and usage patterns of the vehicles.

Core criteria for waste collection trucks entail:

- EEV standards for emissions
- Noise emissions below 102 dB (A) including any compaction equipment (measures as to Directive 2000/14/EC)

Comprehensive criteria cover:

- Meeting EURO VI standards for emissions
- Noise emissions below 102 dB (A)

⁴ Such system automatically shuts down and restarts the internal combustion engine. This reduces the fuel consumption and CO₂ emissions because it decreases the time the engine spends idling.

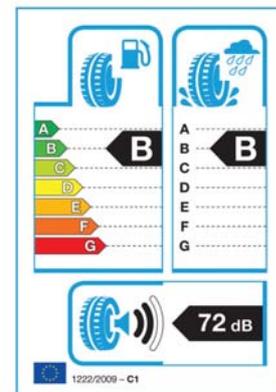
- Pollutant emissions (of CO, HC and NO_x and PM) of separate engines for auxiliary units
- Rolling resistance and rolling noise of tyres

Similarly to public transport vehicles, there are specific contract performance clauses for provision of waste collection services (otherwise for services the core and comprehensive criteria are the same). The clauses entail for instance reporting on fuel consumption, training of drivers and proper disposal of lubricant oils and tyres.

Grading of tyres

Tyres are responsible **for 20 to 30 % of vehicles' fuel consumption**. The purchase of good quality tyres therefore allows fuel consumption to be reduced considerably and consequently less CO₂ to be reduced⁵.

That is the reason why from November 2012, energy labelling of tyres is to be applied (following Regulations 1222/2009/EC and 1235/2011/EU). It concerns tyres that are typically mounted on passenger vehicles and light and heavy-weight commercial vehicles.



The label provides information on **tyres' rolling resistance (fuel efficiency), wet grip performance and external rolling noise**. Rolling resistance and wet grip performance are rated from A (best) to G (worst). For instance the difference between energy efficiency class E and A of the fuel efficiency is almost 40 %!

Information may be provided for many tyres before November 2012.

⁵ http://europa.eu/legislation_summaries/energy/energy_efficiency/en0005_en.htm

4. Relevant environmental labels

In many fields, environmental marks and labels now provide the consumer or procurer with support in making an environmentally sound procurement decision. The idea is simple: the published, comparable product information support the procurer when making the procurement decision. The cumulative procurement decisions of all consumers then provide an incentive for the suppliers, for example to produce more environmentally sound products.

In the vehicle sector, an efficiency label similar to the well established for electrical appliances (e.g. A+ refrigerator) has only been introduced on national level and voluntary basis, because too large differences do exist concerning the comparability between various vehicles.

4.1 EU Exhaust Emission Standards for Motor Vehicles

Website: <http://ec.europa.eu/environment/air/transport/road.htm>

Target:

The exhaust emission standard is not an environmental label in the strictest sense, but it requires the compliance with the established air pollutant threshold values for new vehicles.

Product/service group:

All passenger cars, heavy goods vehicles, buses, motorcycles and mopeds

Awarding Institution & criteria:

The threshold values according to the European exhaust emission standard apply to the air pollutants carbon monoxide (CO), nitrogen oxide (NO_x), all hydrocarbons (HC), and particulate matter (PM). The threshold values vary according to engine type and vehicle type, and are constantly revised. Since January 1st, 2005, the EURO 4 standard applies throughout Europe (EC directive 98/69/EC), and is mandatory for all newly purchased **light-duty vehicles**. The new standard known as Euro 5 applies as of 1 September 2009 for the approval of vehicles and as of 1 January 2011 for the registration and sale of new types of cars and vans sold in the EU market. The main effect of Euro 5 is to reduce the emission of particulate matter from diesel cars from 25mg/km to 5mg/km. Euro 6 is scheduled to enter into force in January 2014 and will mainly reduce the emissions of NO_x from diesel cars further, from 180mg/km to 80mg/km.

For **heavy-duty vehicles**, the Commission's proposal for a regulation on a new norm called Euro VI was adopted in June 2009. It is aimed at reducing emissions of nitrogen oxides and particulate matters from trucks and buses as of January 2013. The Euro VI proposal lays down common EU rules on heavy motor vehicles and their engines with regard to pollutant emissions. In particular, the proposal foresees a reduction of 80% in nitrogen oxides (NO_x) and 66% in particulate matter (PM) emissions compared to the Euro V stage limits.

To verify the compliance with the exhaust emission standard, the emissions of each new vehicle model are measured according to a standardised testing procedure.

Relevance on the market:

The current exhaust emission standard is statutory for new vehicles. The threshold values for EURO 6 will apply to motor vehicles from 2014.

4.2 European Fuel Economy Label

Target:

The European fuel economy label provides the consumer with information about the fuel consumption and CO₂ emissions of passenger cars.

Product/service group:

All passenger cars

Awarding Institution & criteria:

The European fuel economy label is based on the European directives 93/116/EC and 1999/94/EC. The directives state that the minimum of information which must be indicated for all passenger cars comprises the basic specifications (brand, model, cubic capacity, etc.), the fuel consumption in l/100 km for inner-city driving, extra-city driving, and for a combination of both, as well as the CO₂ emissions of the combined driving cycle. Car dealers must make this information available to the customer in an information table, which can be compiled individually. In addition, further information has to be made available to potential customers, such as comparison values for the indicated consumption values or recommendations for efficient driving practice.

Relevance on the market:

Although the efficiency of vehicles has improved by over 25 % in the past 30 years, real savings in consumption per vehicle have only been achieved to a limited extent. The trend towards higher motorisation, or towards more equipment for comfort and safety, more or less neutralises the increases in efficiency. The European fuel economy label should stem this trend, and by means of the consumers' market power, achieve the objective of an average of 120g/km CO₂ emissions for the European passenger car fleet.

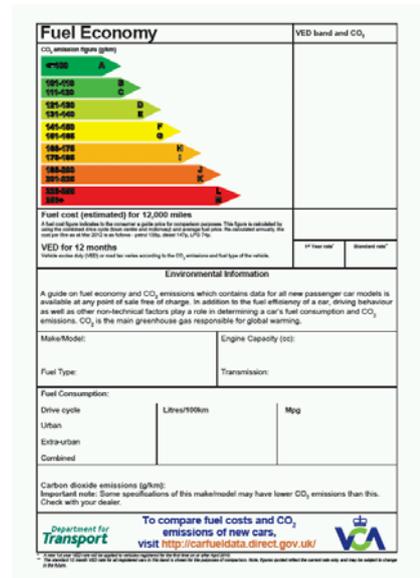
Example

The Label is not harmonized across states yet but countries can implement national labelling systems in form of energy labels.

For instance in the United Kingdom, new car fuel economy label was launched in July 2005. It is an absolute type of label in which the energy classes do not respect the vehicle type but only absolute CO₂ emissions per km.

The energy label is backed by the UK Department of Transport and apart from CO₂ emissions of the given car (presented as a number and a range represented by the given “energy class”), it provides information on the estimated fuel cost of the car on display, the fuel consumption and some characteristics of the car.

More on the label can be found for example at <http://www.dft.gov.uk/vca/fcb/new-car-fuel-consump.asp>



5. Practical instructions for green procurement and use phase

In 2004, the Council and the European Parliament adopted two directives aimed at clarifying, simplifying and modernising existing European legislation on public procurement.

- Directive 2004/18/EC covers public works contracts, public supply contracts and public service contracts.
- Directive 2004/17/EC covers the procurement procedures of entities operating in the water, energy, transport and postal services sectors.

The Directives thus offer a number of opportunities for GPP to be implemented, throughout the contract award process:

- the inclusion of environmental requirements in technical specifications (Article 23(3)b);
- the use of eco-labels (Article 23(6));
- setting social and environmental conditions for the performance of contracts (Article 26);
- requiring economic operators to demonstrate they have met their environmental obligations (Article 27);
- requiring economic operators to demonstrate they can perform a contract in accordance with environmental management measures (Articles 48(2)f and 50); and
- applying award criteria based on environmental characteristics (Article 53).

The basic principles of free movement of goods, services, capital and people are set out in the Treaties⁶, along with a prohibition on discrimination based on nationality. From these basic principles a number of more specific principles applicable in the field of procurement have been developed, primarily through the case law of the European Court of Justice. These are the principles of transparency, equal treatment, proportionality and mutual recognition.

It is important to note that these principles are of broader application than the Directives - procedures which are excluded from or fall below the thresholds for application of the Directives must still be awarded in accordance with the principles. Public authorities need to observe these principles when implementing GPP, as in all areas of procurement.

A number of resources for GP implementation can be accessed from the EU GPP website: http://ec.europa.eu/environment/gpp/index_en.htm

The Buying Green Handbook from October 2011 can be downloaded here: http://ec.europa.eu/environment/gpp/buying_handbook_en.htm

⁶ The Treaty on the Functioning of the European Union, the Treaty on the European Union and, formerly, the Treaty establishing the European Community.

5.1 Practical procurement instructions

Step 1: Get support

It is advisable to implement a green procurement policy for your institution or company before the actual procurement procedure begins. The procurement directives should also comprise the evaluation basis of the most economic offer with the calculation of life cycle costs. Choose a green title to communicate the policy to your staff and the outside world.

Step 2: Assess your actual needs

Here the necessity of the procurement and its complexity are examined. Thereby, possible alternatives to the purchase of the product e. g. the repair of old devices or leasing of a new product as well as measures to improve efficiency and synergy of environmental friendly aspects, are examined. A critical and exact demand analysis is one of the most important steps for an environmental friendly procurement.

Step 3: Define the subject matter

The subject matter of a contract relates to the product, service or work you want to procure. Purchasers are free to define an environmentally friendly product or performance-based product definition. Describe your needs in a functional manner so as not to exclude alternatives.

Step 4: Define technical specifications

Technical specifications describe the contract to the market and constitute minimum compliance criteria. Apply environmental criteria to save resources and energy as well as to reduce waste and pollution.

The GPP Toolkit is one of the key tools used to implement GPP (http://ec.europa.eu/environment/gpp/first_set_en.htm)

The GPP toolkit proposes two categories of criteria for each sector covered:

- The core criteria are those suitable for use by any contracting authority across the Member States and address the key environmental impacts. They are designed to be used with minimum additional verification effort or cost increases.
- The comprehensive criteria are for those who wish to purchase the best environmental products available on the market. These may require additional verification effort or a slight increase in cost compared to other products with the same functionality.

In each category there are minimum compliance criteria and award criteria offered:

a) Minimum compliance criteria: These criteria will be included in the performance specifications and must be fulfilled by the service or product supplier (e. g. the maximum capacity of the electrical equipment). A non-fulfilment of a mandatory criterion excludes the offer from the call for tenders. This procedure demands strict compliance with central environmental criteria.

b) Optional award criteria: These criteria are evaluated with the help of points and considered in relation to other awarding criteria during the awarding process. The total score of the optional criteria (altogether 100 % is possible) represents the degree of compliance with environmental characteristics such as recycling ability or energy efficiency. They enter the offer evaluation depending on the assigned importance of these criteria. Thus, economic and environmental interests can be weighted accordingly. These criteria are described in step 5.

In principle environmental interests can have a strong impact even without the compliance with mandatory criteria, if they are evaluated with a high score as optional criteria. Thus devices, which do not fulfil a certain criterion, have a chance to be considered, as long as the sum of the environmental characteristics convinces.

Following product groups are covered by the GPP toolkit:

Copying and graphic paper	Windows, Glazed Doors and Skylights
Cleaning products and services	Thermal insulation
Office IT equipment	Hard floor-coverings
Construction	Wall Panels
Transport	Combine Heat and Power (CHP)
Furniture	Road construction and traffic signs
Electricity	Street lighting and traffic signals
Food and Catering services	Mobile phones
Textiles	Indoor lighting
Gardening products and services	

Another helpful tool are Eco-labels– both to develop specifications or criteria and to verify the compliance of products and services with these standards. There are many different kinds of eco-labels, for example those which address a single issue such as the Energy Star label or those which cover multiple criteria. It is important to note that it is not allowed to use the labels in the procurement process but the criteria in the label can be used (European Court of Justice on 10 May 2012, Case C 368/10).

Step 5: Define award criteria

Determine award criteria, e.g. better eco-efficiency, and their weighting when evaluating the tenders. The award criteria must relate to the subject matter of the contract. Describe how you will calculate the life cycle cost and how it will be weighted.

Life Cycle Costing

The cost efficiency of an offer does not only depend on the purchasing price, but also on the operating costs. For the comparison of the offers the purchasing, operating and disposal costs are evaluated over the expected useful lifetime (life cycle costs).

Calculation tools are provided for each product to compare the cost-efficiency of the offers. The following factors have to be considered if energy-related environmental interests are included in the calculations:

- Providers must guarantee the maximum level of power and energy consumption for the calculation.
- Factors such as yearly utilisation periods in different operating modes should be realistically measured and empirically secured if possible.
- Technical measures to reduce the energy consumption should be considered if possible e.g. energy management in PCs and auto power off function.

Step 6: Set contract performance clauses

Use contract performance clauses as a way of setting further relevant energy efficiency/environmental conditions for the green contract.

Step 7: Award the contract

From all offers fulfilling the technical specifications, the contract will be awarded to the “the economically most advantageous tender” based on the results from the Buy Smart+ life cycle cost calculation tool and degree of compliance with award criteria.

5.2 Practical procurement instructions for vehicles

When launching green procurement procedure, the first question to ask is On EU level, the Clean Vehicle Portal (www.cleanvehicle.eu) is a new web-database which aims to ensure a level of demand for clean and energy-efficient road transport vehicles and encourage manufacturers to invest in development of vehicles with low energy consumption, CO₂ emissions and pollutant emissions.

Based on Regulation 443/2009/ES (Art. 8) European Commission and Member states provide a yearly updated register of models of cars and their CO₂ emissions (and other aspects such as eco-innovation, etc.).

Here below are several steps to be considered when purchasing vehicles⁷:

⁷ This section is based on

1) Is the car needed?

Before purchasing a car, one should definitely give a thought to whether the car is actually needed. For less frequent travelling or short distances, car sharing and car pooling can be an option as well as use of public transport.

Similarly to buying new refrigerator or washing machine, think about the model and size of the car that you really need. As a general rule, smaller cars and cars with smaller engines are more fuel efficient.

2) Find out about fuel efficiency and environmental aspects

“Buying the most fuel efficient car in its class could save you up to three months’ worth of fuel per year. The fuel economy of similar sized cars using the same type of fuel can vary by as much as 45 per cent.” (Direct.gov.uk)

Calculate operation lifetime costs of the vehicles using methods for calculation described in the Clean Vehicles Directive (2009/33/EC) comprising of fuel costs, costs of externalities connected with CO₂ emissions and costs of externalities connected with NO_x, NHMC and particulate matter. The directive then defines in its annexes the average values to be used in calculations, see example of comparative calculation in section 3 of this document.

3) Which fuel?

There are several options for passenger cars regarding type of fuel. Here below, the main characteristics classic fuel vehicles (petrol and diesel), natural gas motors, hybrid cars and electric cars are provided, mainly based on Topten information.

Petrol or diesel motors:

A diesel motor is more efficient than a petrol motor but it emits far more substances harmful to human health than the petrol motor. Compared with petrol motors the diesel motors emit carcinogenic soot particles and up to six times more harmful nitrogen oxides, therefore opting for diesel motors, those should have particle filter.

Diesel engines give off more air pollutants like nitrogen oxides (NO_x) and particulates (soot). These can lead to poor air quality, particularly in towns and cities, and be harmful to health.

Some new diesel cars come fitted with a DPF (diesel particulate filter), which reduces these pol-

http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenertravel/Greenercarsanddriving/DG_064428 and www.topten.eu.

lutants. If you don't have a DPF, ask your garage about getting one fitted.

Diesel cars meeting the Euro 5 and Euro 6 standards will produce fewer pollutants (the 'Choose a high Euro number' paragraph gives more details). If you are buying a diesel car, consider one that meets these more demanding standards.

If you drive more in town, where air quality is a consideration, a petrol engine may be a good choice. If you do a lot of long distance or motorway driving, consider a diesel engine for fuel efficiency and lower CO₂ emissions.

Natural gas motors:

The main advantages of the gas are the lower CO₂-emissions compared to petrol or diesel motors. Overall the harmful impacts on the environment of natural gas is around 50% lower than those of petrol and even 70% less than those of diesel.

Hybrid motors:

Vehicles with hybrid motors are working with two engines: a combustion and electric engine. They are fuel-efficient and emit less harmful substances. At low speeds hybrid cars are run by their electric engine; only when higher power is needed the combustion engine is switched on. When driving downhill the combustion engine is turned off and the electric engine serves as a generator, charging the batteries and at the same time decelerating the car.

Electric motors:

Electric cars don't emit neither waste gas, nor noise when in use. Instead waste gas and CO₂ are emitted where the electricity is produced. If the car's batteries are charged with 'green electricity' from renewable resources such as water, wind or solar power, electric motors are more environmentally compatible than fuel or diesel motors. However, when the batteries are charged with the average European power mix CO₂ emissions of 130g/km have to be assumed – more than modern combustion engines are emitting.

4) Consider pollutant emissions (look at EURO numbers)

All new cars have to meet 'Euro' standards (see e.g. <http://ec.europa.eu/enterprise/sectors/automotive/environment/> for more details). These standards set limits for emissions such as NO_x (nitrogen oxides) or particulate matter. In general, the higher the Euro number, the better the environmental aspects of the car.

From 2011, all new cars will have to meet Euro 5 standards. Among others the standard makes the introduction of particle filters for diesel cars obligatory. From September 2015, new cars will have to meet Euro 6. However, some cars meet Euro 6 standards already now and therefore look for these cars in your purchases. For trucks, analogous standards (EURO VI) are in place

5.3 Practical tips for use phase

The practical tips for use phase are of technical as well as behavioural nature. The tips are rather straightforward and can be summarized in the following basic principles:⁸

Tyre pressure and quality

Check tyre pressures frequently at least once a month and before driving at high speed. Under-inflated tyres create more resistance, making your engine work harder. This can increase your fuel consumption by up to 3 %.

Adjusting your tyres regularly can help your car use less fuel and could increase the life of the tyres. Check the energy labels for tyres for tyres' rolling resistance (fuel efficiency), wet grip performance and external rolling noise.

Some tyres are designed to reduce resistance between the tyre and the road surface (known as 'rolling resistance'). Low rolling resistance tyres help to reduce fuel consumption and CO₂ emissions.

Low Viscosity Oil (High lubricity Oil)

The most important function of low viscosity oil in an engine is the reduction of internal friction, i.e. its lubricating function. Motor oils are categorised according to their viscosity at cold start and at high motor temperature by means of the SAE (Society of Automotive Engineers) system. Oils with SAE viscosity grades 0W30 and 5W30 guarantee the best lubrication function due to their viscosity properties. For this reason, they are described as high lubricity oils. Conventional motor oils (15W40, 10W40) cannot achieve this level of viscosity, due to the blending properties of their mineral base oils. High lubricity oils are somewhat more expensive, but cause fuel consumption to decrease by around 3 %, so the investment is also financially rewarding after a period of time.

Regular service for vehicles

Well-maintained cars in good condition tend to run more efficiently. Check how often your car should be serviced by looking in the owner's manual or contacting the vehicle manufacturer.

While driving your car

The vehicle's fuel consumption cannot only be reduced by technical measures, but also depends on the individual use behaviour and the driving style. Thus, with fuel-saving driving practices, such as shifting into high gear early, and looking ahead, it is possible to achieve savings of up to 25 %

⁸ Using information from www.ecodrive.org, <http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenertravel/index.htm> and www.topten.eu

per vehicle, compared to current consumption.

Some practical tips for eco-driving are:

- **Drive smoothly and anticipate the traffic flow**

Anticipate traffic flow and maintain a steady speed at low RPM. Smooth driving with steady speed saves a lot of fuel compared to the same average speed, but with sequences of acceleration and braking. Unnecessary speed peaks and abrupt braking do not only waste fuel, but also raise the stress level while driving and causing additional safety risks.

Drive at an appropriate speed – keeping the speed limits helps save on fuel and helps to maintain the traffic flow. Direct.gov.uk estimates that driving at 80 km/hour instead of 120 km/hour can save up to 25 % of fuel.

- **Shift up early**

Driving with high or even medium engine RPM always consumes more fuel than driving at low RPM at whatever speed. Shift to higher gear at approximately 2 000 rpm (or 2500 rpm for petrol cars). However, do not forget to shift down a gear at the right time too – if the car is “struggling”, it will also use more fuel.

- **Do not waste fuel**

If you are likely to be at a standstill for more than 3 minutes, switch off the engine. Keeping the engine running means wasting your fuel.

- **Do not overuse air conditioning**

Using air conditioning and electrical devices like mobile phone chargers increases your fuel consumption. The manufacturers themselves estimate the additional consumption to be 0.6 l/100 km for air-conditioning. In city traffic, this figure can also be considerably higher. Thus, if it is impossible to avoid this equipment altogether, the air conditioning system should be used sparingly.

Try using the fresh air vent to keep cool and park in the shade on a sunny day. This will keep your car cooler inside and stop fuel evaporating from the engine and fuel tank.

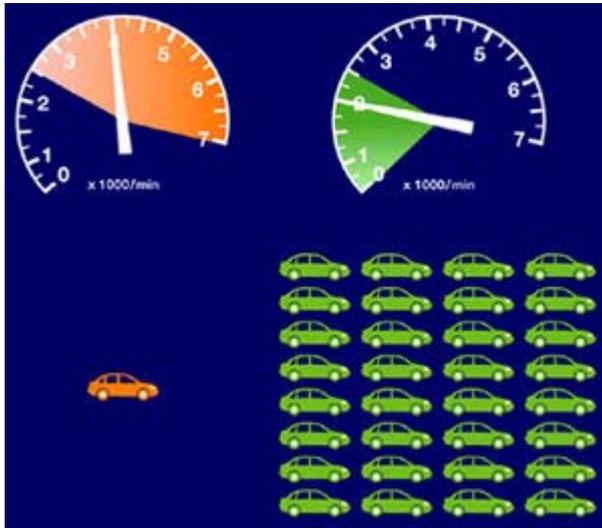
Benefits of Eco-driving

The main **benefits of eco driving**, as summarized by the project EcoWill, are:

- **Fuel Consumption and Climate Protection**

According to project EcoWill, eco-driving trainings can reduce fuel consumption by 20% directly after training and by about 5% in the long run. However, it could be up to 12 % in inner-city traffic. Other sources (direct.gov.uk) state that up to **one month fuel costs** can be saved by eco-driving!

- Local Environment and Health
One vehicle travelling with 4000 rpm produces the same amount of noise as 32 vehicles travelling at the same speed with only 2000 rpm.



(Source: www.ecodrive.org)

- Costs and Safety
Eco driving can save around 6 % of fuel costs and decrease the accidents and related costs by 25 – 30 %.

Do not forget that the most ecological driving is not driving. So consider driving less and use other means of transport such as walking, cycling and public transport!

Nearly a quarter of all car trips are below two miles, a distance you can cycle in less than 15 minutes. Cycling and walking distances under two miles could help you get fitter and save you money in fuel (direct.gov.uk)

6. List of abbreviations

CO	Carbon monoxide
CO ₂	Carbon dioxide
EC	European Communities
EU	European Union
GWP	Global Warming Potential
HC	Hydrocarbons
NHMC	non-methane hydrocarbons
NO _x	Nitrogen oxides
PM	Particulate Matter
rpm	Revolutions per minute

7. References

Clean Vehicle Directive: DIRECTIVE 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles

GPP Toolkit for vehicles, http://ec.europa.eu/environment/gpp/toolkit_en.htm

Clean Vehicles portal

www.cleanvehicle.eu

Euro 5 and Euro 6 Standards

http://ec.europa.eu/enterprise/sectors/automotive/environment/euro5/index_en.htm

EURO VI Standards

http://ec.europa.eu/enterprise/sectors/automotive/environment/eurovi/index_en.htm

EC Transport & Environment, <http://ec.europa.eu/environment/air/transport/road.htm>

Labelling of tyres

http://europa.eu/legislation_summaries/energy/energy_efficiency/en0005_en.htm

EcoWill, www.Ecodrive.org

Topten, www.topten.eu

Greener cars and driving

<http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenertravel/Greenercarsanddriving/index.htm>