The European Union Automotive Fuel Economy Policy

1.1 Background[1]

A decade ago, the European Union entered into a series of voluntary agreements with the associations of automobile manufacturers that sell vehicles in the European market to reduce CO_2 tailpipe emissions. These agreements apply to each manufacturer's new vehicle fleet, and set an industry-wide target of 140 grams CO_2 per kilometre (6 l/100km or 39 mpg)[2]. This target was designed to achieve a 25 percent reduction in CO_2 emissions from passenger cars from 1995. The original agreement with the European Car Manufacturers Association (ACEA) had an initial compliance date of 2008, while the Asian manufacturers (represented by South Korean and Japanese associations, KAMA and JAMA) were given until 2009 to comply.

The automakers did not comply with the 2008 target. In 2006, manufacturer-fleet average CO_2 emissions ranged from 142–238 g/km (6.1-10.3 1/100km or 38.5-23 mpg), with an industry-wide average of 160 g/km (6.9 l/100km or 34.2 mpg). By 2008, the passenger vehicle fleet average CO_2 emissions reached 155 g/km (6.7 l/100km or 35.3 mpg) instead of the 140 g/km target (6 l/100km or 39 mpg).

In its 2007 review of the EU CO_2 and cars strategy, the European Commission announced that the EU objective of 120 g CO_2/km (5.2 l/100km or 45.6 mpg) by 2012 would be met through an "integrated approach". In June 2007, the Council of Environment Ministers formally adopted a resolution to approve the shift to mandatory standards and an integrated approach to achieve 120 g/km (5.2 l/100km or 45.6 mpg), with carmakers achieving 130 g/km (5.6 l/100km or 42 mpg) through technical improvements and the remaining 10 g/km coming from complementary measures. Those measures could include efficient tires and air conditioners, tire pressure monitoring systems, gear shift indicators, improvements in light-commercial vehicles, and increased use of bio-fuels. The Council expressed a desire to include a longer-term vehicle emissions target for 2020 within the context of an overall strategy to address climate change.

The Council of Environment Ministers insisted that the regulatory framework should be as competitively neutral as possible. A review of 2006 data on European passenger vehicles and CO_2 emissions reveals a wide range of fleet averages from 142 to 238 g CO_2/km (6.1-10.3 l/100km or 38.5-23 mpg). Several European automakers— Peugeot/Citroen, Fiat, Renault, and Volkswagen— are currently selling vehicles with lower CO_2 emissions in the EU than most Asian manufacturers. This gives these European automakers an advantage in their own market under the forthcoming CO_2 standards. However, two of the three German auto manufacturers—BMW and Daimler— have relatively high CO_2 emissions, while Volkswagen is much closer to the 2006 EU fleet-wide average of 160 g/km (6.9 l/100km or 43.2 mpg). The recent sale of Chrysler has helped Daimler substantially lower its passenger fleet CO_2 emissions.

1.2 The EU Light-Duty Vehicle Fleet

[1] Excerpts from "Passenger Vehicle Greenhouse Gas and Fuel Economy Standards: A Global Update." *The International Council on Clean Transportation,* 2007: 1-35.

[2] Other GHGs were not included in the agreement

Japan and Europe are leading the way on GHG emission reductions and fuel economy improvements in their light-duty vehicle fleets.

In 2006, Europe and Japan had the most stringent fuel economy standards for passenger vehicles in the world, with an estimated 40 mpg (136 gCO_2/km or 5.9 l/100km) for both governments. Europe is expected to lead the world in fuel economy through at least 2015 if not longer, primarily due to the expanded use of efficient diesel engines in its light-duty vehicle fleet. The apparent discrepancy between Europe and Japan's performance on a mpg and grams of CO_2eq/km basis is due to the large numbers of diesel vehicles in the European fleet. Diesel fuel contains about 10 percent more carbon and more energy than gasoline. As a result, the fuel economy of diesel vehicles is augmented by both the energy efficiency and the greater energy content of the fuel when measured using miles per gallon. However, when considered under a GHG-basis, the higher carbon content of the fuel is taken into account and offsets the fuel-related improvement found on a mpg-basis.

The reasons for strong diesel demand are mainly tax incentives (with lower taxes on diesel fuel and lower import taxes on diesel cars in some EU countries), high fuel prices and the superior driving capabilities of diesel engines. Diesel sales had allowed companies to make progress toward the 2008 target of 140 gCO_2/km (6 l/100km or 39 mpg).

On April 23, 2009, the European Parliament and the Council approved regulations setting a target of 130 g/km (5.6 l/100km or 42 mpg) for the average emissions of new cars to be phased-in by 2015. A longer-term target of 95 g/km (4.1 l/100km or 57.6 mpg) has been established for 2020; the modalities for reaching this target and the aspects of its implementation will have to be defined in a review to be completed no later than the beginning of 2013. The emission targets have to be met by each car manufacturer for the count as zero emission vehicles (upstream electricity production emissions are not counted). In addition, electric vehicles are given super credits through 2015, by which electric vehicles are counted as 3.5 cars with zero emissions in 2013, as 2.5 cars in 2014, and as 1.5 cars in 2015.

For a more detailed discussion on France's vehicle fleet and national standards, click here.

1.3 Status of LDV fleet fuel consumption/CO_2 emissions

The European Union is a technology leader just as is the U.S. There are significant differences in the two fleets, however. The European fleet is about 50% diesel, which allows the EU to achieve a lower fuel consumption standard. Diesel sales in the U.S. are about 0.5%. Another significant difference is that in the U.S., only about 7% of the cars are equipped with manual transmissions, with the rest being automatic or continuously variable transmissions. In the EU, manual transmissions dominate with a market share of about 80%, although automatic transmissions are increasing, as well as automated manual transmissions and dual clutch transmissions.

The overarching problem as identified in the earlier Communications is that existing policies to reduce CO2 emissions and improve the fuel efficiency of new cars sold in the EU have not been able to deliver the progress needed for reaching the long-standing EU objective of an average new light duty vehicles fleet CO2 emission of 120 g/km. Therefore, mandatory standards have been put in place.

2.0 Regulatory Policies

2.1 National Standard

On April 23, 2009, the EU passed a law requiring the motor vehicle fleet to average 120 g/km (5.2 l/100km or 45.6 mpg) by 2012. The regulation puts in place a requirement for the vehicle fleet to achieve a level of 130 g/km (5.6 l/100km or 42 mpg) in 2012, which will be complemented by a corresponding reduction of 10 g/km as part of the Community's integrated approach. These include 1) setting minimum efficiency requirements for air-conditioning systems; 2) the compulsory fitting of accurate tire pressure monitoring systems; 3) setting maximum tire rolling resistance limits in the EU for tires fitted on passenger cars and light commercial vehicles; 4) the use of gear shift indicators, taking into account the extent to which such devices are used by consumers in real driving conditions; and 5) increased use of bio fuels maximizing environmental performance.

In 2012, 65% of each manufacturer's newly registered cars must comply on average with the limit value (the limit curve is designed to allow heavier vehicles higher emissions while lighter cars could have lower emissions as long as the average is met) to meet a curve set by the legislation. This will rise to 75% in 2013, 80% in 2014, and 100% from 2015 onwards.

The Commission has encouraged the member countries of the EU to pursue taxation policies to promote the purchase of fuel efficient vehicles throughout the EU (COM (2005) 261). Taxes differentiated over the whole range of cars on the market, so as to gradually induce a switch towards relatively less emitting cars, would be an efficient way to reduce compliance costs for manufacturers.

The law also sets a target of 95 g/km (4.1 l/100km or 57.6 mpg) for the vehicle fleet in 2020 and later model years. The aspects of its implementation including the excess emissions premium will have to be defined in a review to be completed no later than the beginning of 2013.

2.2 Import restrictions

New Vehicles

Many of the EU countries produce vehicles for internal use and export them as well. As one of the leading manufacturing centers of cars and light trucks in the world, there is a healthy market for new cars that are distributed to North America, South America, Asia, Africa and many other countries throughout the world. Europe is the leader in many technology developments, particularly the development of pedestrian safety issues.

The EU has now put in place mandatory CO_2 requirements for manufacturers and more and more of the requirements on new cars are being formed at the EU level, rather than in individual countries.

Second Hand

There are no restrictions on the sale of second hand vehicles in the EU. There are buy-back programs where cars older than 10 years old are taken in and a bonus given to the owner to purchase a new, more efficient car.

Europe is the source of second hand cars for much of the rest of the world. Cars are exported from Europe to South America, Asia, Africa, and Australia and Oceana, as well as distribution in the other European countries.

2.3 Technology mandates/targets

Europe has been a leader in automotive technology, particularly the advancement of diesel engines. While the U.S. lagged with about 0.1% of the market being diesel, Europe was heavily into diesels and has increased diesel share because of the Kyoto accord. Because of the heavy reliance on diesel, European manufacturers have developed technology to reduce emissions and improve the fuel efficiency of the diesel engine. Now it can be said that diesels achieve about 30% better efficiency than gasoline engines and can meet the same criteria pollutants.

With the CO_2 95 g/km target for 2020, European manufacturers must continue to advance technology across all fuel types to achieve this level of CO_2 emissions. The industry is pursuing electric motors, hybrid drive trains, hydrogen fuelled vehicles and biofuels.

There is no technology mandate, per se, in Europe, but manufacturers are pursuing all of the options.

3.0 Fiscal Measures and Economic Instruments

3.1 Fuel Taxes

Fuel taxes vary from country to country in the EU. Following are a few examples of the taxes found in some of the EU countries:

- Fuel taxes in Germany are €0.4704 per litre for ultra-low sulphur Diesel and €0.6545 per litre for conventional unleaded petrol, plus Value Added Tax (19%) on the fuel itself and the Fuel Tax. That adds up to prices of €1.03 per litre for ultra-low sulphur Diesel and €1.22 per litre (approximately USD 6.28 per US gallon) for unleaded petrol (March 2009).

- The sale of fuels in the Netherlands is levied with an excise tax. The 2007 fuel tax was € 0.684 per litre or $ 3.5 per gallon. On top of that is 19% VAT over the entire fuel price,

making the Dutch taxes one of the highest in the world. In total, taxes account for 68.84% of the total price of petrol and 56.55% of the total price of diesel.

- Even though Norway is the third largest oil exporter, the fuel is heavily taxed. The fuel tax for regular fuel pumps (gas stations) in Norway contributed to 63% of the fuel price in 2007 (The tax was USD 1.42 per litre 95 RON petrol). The government refers to the tax as environmental tax on fuels. The tax is subject to much controversy and debate in Norway, especially since Norway has a widespread population and lack of public transportation in rural areas. In 2008 the coalition government of Norway further increased the tax for petrol and diesel.

3.2 Fee-bate

France has enacted a bonus-malus system, which is essentially a feebate system for cars. More efficient cars receive a bonus when purchased, while inefficient cars receive a penalty when purchased. Details of this system and other penalties and taxes for the purchase of cars can be found **here** [Vehicle Taxes and Incentives].

3.3 Buy-back

Some of the EU countries initiated programs to get older cars off the road in return for the consumer buying a more efficient vehicle. A few programs of this type are listed below:

- The scrappage program of France was introduced on January 19, 2009. The old car would need to be older than 10 years and the new car would need to meet a particular CO_2 emission standard. It starts with €1000 for a car which emits a maximum of 160 g/km.
- In Italy, there was a scrappage program from January 1, 2007, to December 31, 2008, that allowed for €700 plus a tax rebate. A new scrappage program is in place in 2009. New cars must comply at minimum with Euro 4 and emit a maximum of 130 g/km (diesel) or 140 g/km (other fuels) of CO_2. Scrapping incentive for cars is €1,500 but can be combined with purchase incentive of €1,500 for a new car running on CNG, electricity or hydrogen (increased to €3,000 if it emits exactly 120 g/km and to €3,500 if it emits less than 120 g/km) The purchase incentive for a new car running on LPG is €1,500, which is increased to €2,000 if the car emits less than 120 g/km. This can also be combined with the scrapping incentive.

3.4 Penalties

A robust compliance mechanism is necessary to ensure that the targets set in the proposed regulation are met. The regulation on CO_2 and cars sets a penalty mechanism based on excess emission payments. If a manufacturer fails to meet its target in a given calendar year, it will be required to pay an excess emissions premium. The premium has been designed so that it will be paid for each gram per kilometre (g/km) by which the average car sold by the manufacturer in that year is above the target, times the number of vehicles sold by the manufacturer. A

premium of €20 per g/km has been proposed in the first year (2012), rising to €35 in 2013, €60 in 2014, and €95 in 2015 and thereafter. It is expected that most manufacturers will meet their target set by the legislation and so that they will not have to pay significant penalties.

The United Kingdom, through the 'Climate Change Act' , set legally binding targets to reduce carbon emissions, making it the first in the world to do so – by at least 26% by 2020 and 80% by 2050.[3] Transport sector emissions will be a large part of this target, considering emissions from road vehicles account for 19% of the UK's domestic CO2.[4]

3.5 Other tax instruments

Many of the EU countries have various tax schemes in place to encourage the purchase of low CO_2 emitting vehicles. These are laid out in another document that can be found **here**. [LINK TO: EU- Overview of CO_2 Taxes]

3.6 Registration fees

Registration fees are handled by the countries in the EU, although a common EU registration program was introduced. The common EU format was introduced by Council Regulation (EC) No 2411/98 of 3 November 1998 and entered into force on the 11 November 1998. It was based on a model registration plate which several member states had introduced.

The European Commission on 5 July 2005 presented a proposal for a Directive (COM/2005/261/FINAL; press release IP/2005/839; and frequently asked questions MEMO/05/236) that would require Member States to re-structure their passenger car taxation systems. The Commission's passenger car tax proposal contains three elements:

- Abolition of car registration taxes over a transitional period of five to ten years.
- A system whereby a Member State would be required to refund a portion of registration tax, pending its abolition, where a passenger car that is registered in that Member State is subsequently exported or permanently transferred to another Member State.
- The introduction of a CO_2 element into the tax base of both annual circulation taxes and registration taxes.

The Netherlands and Portugal have introduced differentiations into their car registration taxes to encourage car buyers to opt for the cleanest car models. In the Netherlands, the new registration taxes, payable when a car is sold to its first buyer, can earn the owner of a hybrid a discount of up to €6000. Austria has had a registration tax based on fuel consumption for several years.

[3] "Ultra-low carbon vehicles in the UK." *HM Government, Department for Transport,* 2009. Accessible at http://www.dft.gov.uk/adobepdf/187604/ultralowcarbonvehicle.pdf
[4] "Ultra-low carbon vehicles in the UK." *HM Government, Department for Transport,* 2009. Accessible at http://www.dft.gov.uk/adobepdf/187604/ultralowcarbonvehicle.pdf

3.7 R&D[5]

The Green Car Initiative, a part of the European economic recovery plan, aims to allocate €5 billion (US$6.7 billion) through a Public Private Partnership to bolster innovation in the automotive sector and sustain its focus on environmental progress. The initiative complements the European Clean Transport Facility which, through the European Investment Bank, serves to provide more immediate financial relief to the sector.

The Green Car Initiative concentrates on long-term R&D, largely combining existing projects under a clear policy focus and underlining the importance of a joint approach between industries and policy makers. The CLEPA and EUCAR document is intended to harmonize the R&D directions and priorities of the auto industry, and then to communicate these to relevant authorities and bodies at national and EU level and to other key partners.

The R&D is structured into four major areas:

- **Mobility and Transport** - deploying information and communication technologies (ICT) and Intelligent Transport Systems (ITS) for traffic and transport management, involving vehicles as well as route planning.
- **Energy and Environment** - exploring primary energy sources which are renewable, secure, sufficient and environmentally compatible; the electrification of vehicles and the road transport system as a whole; lightweight structures and new vehicle concepts for high energy-efficiency.
- **Safety** - ensuring safety of new vehicle concepts and types; development of cooperative systems for efficiency and safety based on communication between vehicles and infrastructure.
- **Affordability and Competitiveness** -achieving green objectives at an affordable level, taking into account the availability and use of raw and rare materials; (energy-) efficiency of production processes; handling of alternative materials; use of virtual tools.

Under the Energy and Environment category, CLEPA and EUCAR call for a major focus on the electrification of the vehicle, including work on hybrid, plug-in, electric drive, hydrogen and fuel cell vehicles. Among the specified research needs in this particular area are:

- Energy storage systems. Two major technology paths should be followed: Battery systems for vehicle applications based on further improvement of Lithium-ion-based battery cell chemistry and technology; and basic research on new open cell systems technology (post Lithium-ion battery cells) for highest energy density focusing on electrochemistry of battery cells and storage capacitors (packaging, crashworthiness, durability, reliability, adoption to different vehicle concepts) with an appropriate level of safety.

[5] Excerpted from http://www.greencarcongress.com/2009/05/clepa-eucar-20090507.html

- New vehicle concepts required for electric propulsion technologies, e.g. using in-wheel motors.
- Solution for electric vehicle integration issues: Energy management based on models of the vehicle power architecture, thermal management for efficiency improvements and long lifetime of components and for energy efficiency of climate controls.
- Functional architecture, position and standardization of interfaces for power and data, distributed x-by-wire systems and design rules for the plug-in electrified vehicle and its structural architecture matching new requirements and fail-safe aspects.
- Key components for hybrid, electrical drive and fuel cell systems: Advanced electric motors, brakes, suspensions and recuperation technologies, improved power electronics (inverters, converters), mechanical or thermal energy recovery systems, components for the management of power flow, battery management systems (including development of load cycles for lifetime estimations, and operation strategies for combined storage), range extenders, and interfaces for power and data c Efficiency improvements of all auxiliaries and sub-systems which consume electrical energy in the vehicle including, for example, alternative solutions for heating and air-conditioning.
- Energy charging systems: on-line information systems (geographical location of charging systems, availability of connectors for energy charging, price of energy, eventually battery swapping; automatic energy measuring and debiting systems, interoperability vehicle – charging systems (standardization, data/energy automatically exchanged) and bi-directional capabilities, risk analysis and R&D on the boundaries of different charging schemes.
- Vehicle to/from driver information, support and command systems (vehicle status monitoring systems e.g. energy status, driver support and command systems for optimized energy use and recuperation, ADAS efficient driving e.g. for dynamic traffic and of route planning.
- Testing and validation of plug-in and electric vehicles.
- Secondary research on electro-magnetic compatibility, user acceptance, business models, standardization requiring demonstrations, validations and field tests.
- Communication inside the vehicle.

The priorities in this area also include work on renewable/alternative fuels and related drivetrains. Research here is aiming at the diversification of energy sources and at finding the optimum combination of drive train and energy carrier, e.g. renewable materials, hydrogen, biomass-to-liquid and electricity. Identified R&D needs include:

- Development of CO_2-neutral fuels from renewable materials (biogas/biomethane, hydrotreated vegetable oil, biomass-to-liquid, bio-diesel, first and second generation ethanol, hydrogen, electricity, etc.) and strategies for their use (no adverse effects for food and feed production and markets).

- Scenarios for alternative fuels and strategies for market introduction: alternative fuels versus conventional (balance, feedstock availability, conversion blending technologies), infrastructure, new biomass based compounds, oxygenated, etc.
- Optimization of powertrains for alternative fuels: gasoline for alcohol fuels / blends, diesel for 2nd generation, CNG/biomethane.
- Preparation of specifications of alternative fuels: impact on engine performance (degradation potentials), exhaust composition, future emissions.
- Processes to convert a broad spectrum of primary energy carriers from several basic sources into a limited number of energy carriers suited for the transport system.
- Assessment of climate and energy impact: Well-to-wheel analysis for various fuel options and drive trains, life-cycle assessment for finding the optimum combination of drivetrain and energy carrier, e.g. renewable materials, hydrogen, biomass-to-liquid and electricity, simulation packages for CO_2 indicators of various types of commercial vehicles.

The document also identifies technological innovations of the internal combustion engine and exhaust systems as important short-term paths towards fuel savings. R&D needs seen in this area include further improvement of conventional powertrains; optimization of the overall system ("efficient engines - efficient fuels"); optimization of the vehicle regarding energy management, energy recuperation, light weight structures (high-strength steel, aluminium, plastics, compound materials); and alternative power for auxiliaries.

The European Green Car Initiative aims to sustain progress towards a breakthrough in the use of renewable and non-polluting sources of energy, road safety and traffic fluidity. The initiative covers passenger cars as well as trucks and buses and transport systems, intelligent infrastructure and the availability of a fuelling and/or charging infrastructure.

Funding will be spread over four years. €1 billion (from a total of €5 billion) will come from the existing EU 7th Framework Program for R&D funding and includes €500 million to be financed by the industry. The remaining €4 billion will become available in EIB loans to individual projects from manufacturers and suppliers.

At the country level, the United Kingdom has, as of 2010, already committed around £400 million in support to encourage development and uptake of ultra-low carbon vehicles, along with a £2.3bn package of support for the automotive sector to support its long-term goal of becoming a low carbon industry.[6]

The UK Department for Transport has set out a 3 stage plan to make the shift to low carbon vehicles. In the short term (over the next 5 years) there will be incremental improvements to efficiency of new cars, increased take-up of new model hybrids, interested cities and regions developing electric vehicle charging infrastructure solutions to provide a 'core' of electric car cities. In the medium term (5-10 years) the UK will continue its efficiency of new cars and up-

[6] "Ultra-low carbon vehicles in the UK." *HM Government, Department for Transport,* 2009. Available on-line (http://www.dft.gov.uk/adobepdf/187604/ultralowcarbonvehicle.pdf)

take of new model hybrids, along with increased coverage of electric vehicle charging infrastructure, which will enable a wider use of ultra-low carbon vehicles and their large-scale production. In the long term (10 years +) combinations of hybrid vehicles, downsized power trains, and lightweight vehicles will become dominant, with the continued rollout of a vast charging infrastructure, and the mass market development of ultra-low carbon vehicles leading to significant market penetration.[7]

4.0 Traffic Control Measures

4.1 Priority lanes

N/A

4.2 Parking

Sweden has a significant program on clean vehicles and as part of that provides free parking for EVs and other clean vehicles. This saves about $70 a month in parking fees for those who own the clean vehicles.

Promoting the use of clean and energy efficient cars is a hot issue for many cities. A new model with differentiated parking fees will be introduced in Graz, Austria. Studies have indicated that reduced parking fees can be a strong incentive for choosing alternative-fuel vehicles. The system will be based on a new law requiring cars sold in Austria to indicate average CO_2-emissons. Small and/or low emission vehicles will be allowed to park at a reduced fee and electric cars free of charge. Ticket machines will be installed or modified to allow variable tariffs. An innovative way of payment based on mobile phones will also be tested.

A new parking fee system with zones has cut down traffic in Pécs, Hungary, inner-city. The zone system makes parking the center expensive. More people now use public transport and the environmental, living and working conditions have improved.

It used to be impossible to park in the whole city centre of Pécs. People coming to work in the centre parked their cars and left them there for the whole day. During daytime, car-drivers tried to find free space – without result – and the city centre was always full with cars looking for parking space. This resulted in unnecessary congestion, emissions of green house gases and other pollutants. Since parking was free, no income was generated.

The parking system has been completely revised. Parking tickets machines have been purchased and the city is now divided into four parking zones:

- red zone for the core of the inner city = expensive parking with limited parking time
- blue zone adjacent to the red zone = moderately priced parking
- yellow zone for the distant parts of the city centre = rather low parking fee

[7] "Ultra-low carbon vehicles in the UK." *HM Government, Department for Transport,* 2009. Available on-line (http://www.dft.gov.uk/adobepdf/187604/ultralowcarbonvehicle.pdf)

- green zone for outside the city centre = free parking

4.3 Road pricing

Below are a few examples of congestion pricing in the EU:

- The London congestion charge is a fee for some motorists travelling within those parts of London designated as the Congestion Charge Zone (CCZ). The main objectives of this charge are to reduce congestion, and to raise funds for investment in London's transport system. The zone came into operation in parts of Central London on 17 February 2003 and it was extended into parts of West London on 19 February 2007. Although not the first scheme of its kind in the United Kingdom, it was the largest when it was introduced, and it remains one of the largest in the world. Worldwide, several cities have referenced the London scheme when considering their own possible schemes. A payment of £8 is required for each day a vehicle enters or travels within the zone between 7am and 6pm (Monday-Friday only); a fine of between £60 and £180 is imposed for non-payment.

- The Ecopass program is a traffic pollution charge implemented in Milan, Italy, as an urban toll for some motorists traveling within a designated traffic restricted zone or ZTL (Italian: *Zone a Traffico Limitato*), corresponding to the central Cerchia dei Bastioni area and encircling around 8.2 km^2. The Ecopass was implemented as a one-year trial program on January 2, 2008, and later extended until December 31, 2009. A public consultation was planned to be conducted early in 2009 to decide if the charge becomes permanent. The primary purpose of program is to reduce traffic and air pollution, it is based on a fee structure according to the vehicle's engine emission standards and to use the funds raised through the charge to finance public transportation projects, cycle paths and green vehicles. This program is similar to the congestion pricing programs implemented in London and Stockholm, but actually corresponds to a variation of these pricing schemes as only vehicles with high-polluting engines entering the ZTL are charged, and the ones with older most polluting engines are banned.

- The Stockholm congestion tax, also found referred to as the Stockholm congestion charge, is a congestion pricing system implemented as a tax which is levied on most vehicles entering and exiting central Stockholm, Sweden. The congestion tax was implemented on a permanent basis on August 1, 2007, after a seven-month trial period between January 3, 2006 and July 31, 2006. The primary purpose of the congestion tax is to reduce traffic congestion and improve the environmental situation in central Stockholm. The funds collected will be used for new road constructions in and around Stockholm. A referendum was held in September 2006 a couple months after the end of the trial period. In the referendum the residents of Stockholm municipality voted yes and in 14 other municipalities voted no to implement it permanently. On October 1, 2006, the leaders of the winning parties in the 2006 general election, declared they would implement the Stockholm congestion tax permanently. The parliament approved this on June 20, 2007, and the congestion tax came into effect on August 1, 2007. The

amount of tax payable depends on what time of the day a motorist enters or exits the congestion tax area. There is no charge on Saturdays, Sundays, public holidays or the day before public holidays, nor during nights (18:30 – 06:29), nor during the month of July. The maximum amount of tax per vehicle per day is 60 SEK (6.34 EUR, 9.85 USD).

5.0 Information

5.1 Labeling

Directive 1999/94/EC stipulates that a fuel economy label must be attached to the windscreen of all new passenger cars at the point of sale. This label must be clearly visible and meet certain requirements set out in Annex I. In particular, it must contain an estimate of fuel consumption, expressed in liters per 100 kilometers or in kilometers per liter (or in miles per gallon), and of CO_2 emissions.

The Directive requires the prohibition of any marking relating to fuel consumption which does not comply with the above provisions and which might cause confusion.

5.2 Public info

EU Directive 1999/94/EC (as amended by 2003/73/EC) requires new car fuel consumption and CO_2 emissions data to be made freely available to consumers. Car dealers are required to have a label showing the fuel consumption and CO_2 emissions of each different model on display.

Fuel consumption figures will be expressed both in litres per 100 kilometres (l/100 km) and in miles per gallon (mpg). The label will list the figures achieved in urban, extra-urban and combined conditions separately. Dealers have the option to produce a new "comparative" label. The new label shows the mandatory Fuel Consumption and CO_2 figures mentioned previously, alongside information about the appropriate VED band for the vehicle.

The directive also requires manufacturers to include fuel consumption and CO_2 emissions data in all brochures and printed advertisements, provided that the literature relates to a specific model of car. These requirements were implemented into UK law by The Passenger Car (Fuel Consumption and CO_2 emissions Information) Regulations 2001, which came into force on the 21st of November 2001.

5.3 Industry reporting

N/A

The text above is a summary and synthesis of the following sources:

An, Feng and Amanda Sauer. "Comparison of Passenger Vehicle Fuel Economy and Greenhouse Gas Emission Standards Around the World." *Pew Center of Global Climate Change* (2004): 1-36.

An, Feng, et al. "Passenger Vehicle Greenhouse Gas and Fuel Economy Standards: A Global Update." *The International Council on Clean Transport* (2007): 1-36.
Fulton, L. "International Comparison of Light-duty Vehicle Fuel Economy and Related Characteristics." *International Energy Agency Working Paper Series* (2010): 1-70.

COMMISSION STAFF WORKING DOCUMENT - *IMPACT ASSESSMENT*
Accompanying document to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL; Setting emission performance standards for new light commercial vehicles as part of the Community's integrated approach to reduce CO2 emissions from light-duty vehicles

COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT - Results of the review of the Community Strategy to reduce CO_2 emissions from passenger cars and light-commercial vehicles

"Passenger Vehicle Greenhouse Gas and Fuel Economy Standards: A Global Update." *The International Council on Clean Transportation*, 2007: 1-35.

REGULATION (EC) No 443/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 Setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO2 emissions from light-duty vehicles, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32009R0443:en:NOT

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