Manual of European Environmental Policy

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This section is the text of the Manual as published in 2012. It is therefore important to note the following:

- The contents have not been updated since 2012 and no guarantee is given of the accuracy of the contents given potential subsequent developments.
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Transport

Summary of the issues

Transport, while of great economic importance, is also the source of significant environmental problems. These arise from the operation of vehicles, the construction, maintenance and presence of infrastructure, the manufacture and disposal of vehicles and their components, and the transportation and extraction of raw materials used in the construction and production stages. Emissions from the transport sector contribute to poor air quality, ozone depletion, acidification and global climate change. The operation of transport is also a principal source of noise in urban areas and areas near major transport infrastructure. Transport's use of primary energy is still increasing steadily, while the environmental implications of the disposal of waste vehicles are also of concern. The construction and existence of transport infrastructure also have significant implications for biodiversity, fragmentation of landscapes and ecosystems, and usage of raw materials. The successive enlargements of the EU in 2004 and 2007 exacerbated these trends, as rising standards of living in many countries led to increased car use and more goods being traded ever further[1].

Emissions represent a challenge for two main environmental policy areas: air quality and climate change. Air quality problems can be attributed to a number of criteria gases including: nitrogen oxides (NO_x), carbon monoxide (CO), partially burnt hydrocarbons (HC), particulate matter, and carbon dioxide (CO_2). While emissions of NO_x, CO, HC and sulphur dioxide (SO_2) contribute to air quality problems such as ozone (smog formation) and acid rain, CO_2 is a key greenhouse gas (GHG) and the leading cause of climate change. (For more background on air quality issues as they relate to transport refer to chapter 2 of this Manual, which includes a summary of legislation primarily aimed at the use of alternative fuel.)

The role of environmental issues as part of transport policy has evolved considerably, particularly with respect to the mitigation of GHGs. Legislation passed with respect to road transport and vehicle emissions performance symbolizes a move away from voluntary measures to real compliance measures for the automotive industry. With the increased prominence of climate change policy in the EU and the need to address GHG emissions across all sectors, emissions from the transport sector have become a key element of climate change and energy policy. On 28 March 2011, the Commission released the Transport 2050 White Paper (COM(2011)144) which stated ambitious plans for increased mobility and reduced transport emissions on a longer time scale. The strategy adopted seeks to transform Europe's transportation system through 40 initiatives over the next decade, covering all urban, inter-city and long distance travel through the implementation of a Single European Transport Area.

General integration of environmental issues into transport policy

The Fifth Environmental Action Programme included transport among the five priority sectors for integration, accepting that ‘the present approach and existing measures are not geared to deal with the expected growth in international competition and the upward trends in Community activity and development which will impose even greater burdens on natural

resources and environment and, ultimately, the quality of life'. The Sixth Environmental Action Programme however, addressed at transport in the context of objectives for two of its thematic areas, climate change and environment and health. Nonetheless, it remains a priority sector within the EU.

As a response to the Fifth Environmental Action Programme, a Green Paper on Sustainable Mobility (COM(92)46) was published which was 'to initiate a public debate on the issue of transport and the environment and the proposed strategy for 'sustainable mobility'. The White Paper on the Future Development of the Common Transport Policy (COM(92)494) that followed mentioned the need for 'complementary measures addressing the demand for transport, particularly that currently satisfied by the private car' to accompany technical and fiscal measures to improve energy efficiency. It was however rather less ambitious in its scope than the Green Paper which preceded it. The Commission also issued a number of other communications on various aspects of transport and environment policy in the 1990s, such as the Green Papers Towards Fair and Efficient Pricing in Transport (COM(95)691) and The Citizens Network (COM(95)601). Sparked by a series of major maritime accidents, the Commission also instigated a programme on marine safety from 1993, which in part addressed general pollution issues.

A transport Council integration strategy, adopted in October 1999, implicitly acknowledged the failure of integration attempts to date, stating that the 'indefinite continuation of current trends in the growth of private and commercial road transport and aviation is unsustainable in relation to environmental impacts'. The strategy was widely perceived as being one of the better ones to result from the 'Cardiff process'. It recognized the need for packages of policy measures to influence transport demand and travel behaviour. It called for progress in a number of fields, some of which were a continuation of existing EU policies. These include the implementation of the principle of fair and efficient pricing in order that the costs faced by transport users better reflect infrastructure and environmental costs, the promotion of land-use planning approaches to reduce the need to travel, and the need to improve the balance between, and the integration of, different modes.

A Resolution of April 2001 updated the strategy, confirmed the commitment to move towards sustainable transport and set out the key characteristics of a sustainable transport system. It called on the Commission to undertake work on possible environmental targets for the transport sector and to undertake further analysis taking account of the impacts of EU Enlargement. A 'First Review Report of the Integration of Environmental Aspects and Sustainable Development into Energy and Transport Policy' was produced by the Commission as a staff working paper on 21 March 2001 and forwarded to the Göteborg Summit in June 2001. In December 2002, Council conclusions reaffirmed earlier statements, while identifying GHG emissions, emissions of harmful substances and noise as areas in particular need of further action, and confirming the Decision to implement the operational part of the strategy by the end of 2004 and to review it regularly.

Work on the strategy has been supported by the Joint Expert Group (JEG) on Transport and Environment consisting of one transport and one environment expert from each Member State. The existence and activities of such a group, which pre-dates the Cardiff process, itself marks transport out from other sectors such as agriculture. In September 2000, the JEG produced a strategic review of transport and environment policy, entitled *Recommendations for actions towards sustainable transport*. This evaluated progress to date on the specific commitments set out in the transport strategy. Beyond this, it also applied a systematic

approach to operationalizing the concept of 'environmentally sustainable transport', addressing the various policy measures available and advocating further work by the Commission on objectives and targets. The JEG has responded to the Council's requests for specific analysis, for example on sectoral targets and on changing travel behaviour, and continues to work in support of the strategy priorities, for example in relation to EU Enlargement and sustainability impact assessment.

In 2006, under the auspices of DG Enterprise, a High Level Group was established to investigate the relationship between vehicle Regulation and the competitiveness of the motor industry in Europe – entitled 'Competitive Automobile Regulatory System for the 21st Century' or CARS21[2]. The Group's final report stressed the importance of competitiveness and jobs, and suggested some improvements to the regulatory process, but did not propose a significant scaling back of environmental Regulation. In October 2010, the CARS21 Group was re-launched in response to the Commission's 'EUROPE 2020' Communication (COM(2010)2020). Building on the results of the 2006 CARS process, this High Level Group will be responsible for implementing the EUROPE 2020 flagship initiative on a resource efficient Europe, as well as the key policies outlined in the Communication on clean and energy efficient vehicles (COM(2010)186).

A further distinctive element of the transport Strategy was its early adoption of a system of sustainability indicators. In 1998, at around the same time as the European Council called on the Transport Council to develop an environmental integration strategy, a joint Transport and Environment Council meeting invited the Commission and the EEA to develop a comprehensive set of transport and environment indicators. A set of 31 indicators has subsequently been developed to help measure progress on integration, and to monitor problems, under the framework of the 'TERM' (Transport and Environment Reporting Mechanism) project. A 'zero-version' of the TERM report was presented to the Transport Council in 1999[3]. Annual updates are published, and the first of these in 2001[4] concluding that, in spite of progress in some areas, many of the environmental trends in the transport sector remain adverse. The 2002 report published in December 2002, focused on Accession Countries, and restated much the same conclusions.

In 2005, the TERM report[5] highlighted some important failures in achieving the goals set by the Common Transport Policy, among these the growth of freight transport volumes, in particular road freight, which was not decoupling from GDP levels; the growth in passenger transport volumes, which paralleled economic growth; the growth in air passenger transport, while the share of road and rail remained constant; price structures, although increasingly aligned with external costs levels, were still well below social marginal costs, therefore sustaining transport growth. More recent reports, in 2006[6] and 2007[7] confirmed these trends in the transport sector and reported negative effects on GHG emissions, noise and landscape fragmentation brought by the shift in focus of the mid-term review of the 2001 Transport White Paper (SEC(2006)768), from managing transport demand to addressing negative side effects. In 2007 the TERM report stated that CO_2 emissions from the sector needed to be cut by a further 50 million tonnes (Mt) of CO_2 equivalent over the following decade if the EU wanted to meet its emissions goals by 2020. The Transport 2050 White Paper (COM(2011)144) seeks to cut transport emissions by 60 per cent up to 2050, through initiatives to reduce the use of fossil-fuel powered cars, increase low-carbon aviation fuels and promote rail and waterborne transportation.

The environment-related structural indicators agreed by the Council in December 2001 prior to the Laeken Summit also included two transport indicators out of the seven. These were the transport intensity of the economy (i.e. freight and passenger movement per unit of GDP), and the modal share of the various transport modes. The shortlist of 14 structural indicators used to evaluate progress for the 2004 Spring Summit retained one indicator on the intensity of freight transport.

A revision of the 1992 White Paper on the Common Transport Policy was published (after much delay and revision) in September 2001. This focused strongly on achieving modal shift towards rail and water transport. It also foreshadowed a new policy on alternative fuels for the transport sector, with an initial emphasis on bio-fuels, and the possibility of a voluntary agreement with operators on improving environmental performance in the rail sector. While the Commission continued to focus on modal shift, the Heads of State and Government in the Conclusions of the Gothenburg Summit of June 2001 called for a 'significant decoupling' of transport growth and GDP growth thus raising the profile of environmental issues in the context of the transport sector. Several proposals previewed in the White Paper have been published. A mid-term review of the White Paper was published in 2006, which emphasized the changing context of the European transport sector and placed most of its attention on reinforcing infrastructure; it was heavily criticized by NGOs for apparently dropping the 'significant decoupling' objective and other environmental targets.

In practice, the integration of environmental issues into transport initiatives have met with mixed success. The principal achievement has been the reduction of emissions from individual vehicles, by progressively tightening emission standards and fuel quality standards. However, improvements in vehicle efficiency have not, as yet, resulted in corresponding reductions in total CO_2 emissions, as a result of continuing growth in traffic and congestion. An agreement between the European Commission and car manufacturers was intended to improve fuel efficiency and reduce overall CO_2 emissions from 1999; but early progress faltered in later years and the Commission began developing binding legislation as an alternative approach in 2007. Where there has been progress, this has in any case been overtaken by the continuing rise in road transport levels, which more than doubled in the EU between 1970 and 1997[1] and have continued to rise since then. Consequently, even though emissions from individual vehicles have been declining, exposure to some pollutants, particularly in urban areas, remains high. In order to push the market towards cleaner vehicles, a revised proposal on the promotion of clean and energy efficient road transport vehicles (COM(2007)817) was published by the Commission in December 2007 aimed at introducing operational lifetime costs of energy consumption, CO_2 emissions, and pollutant emissions as award criteria for all public procurement of road transport vehicles.

The growth in road transport levels has been stimulated by increased incomes, the absence of a full internalization of external costs and the increasing length of road networks. There has also been a general inability of other modes of transport to provide users with a competitive level of services to that available by road. The modal share of rail appears to be falling in much of Europe, and the Commission's ongoing efforts to revitalize the sector by opening up rail markets to a range of operators, and to stimulate the market through interoperability (the capability of trains and operators from one national system to run on the infrastructure of another) and intermodality (promoting sites and equipment which facilitate easy transfer of passengers or goods from one mode to another) have met with limited success in the face of strong countervailing trends. The third package of measures to revitalize the rail sector was proposed by the Commission in 2004 and after three years of arduous negotiations, a

conciliation agreement was reached between the Parliament and Council. The package was ultimately adopted in 2007 (Regulation (EC) No 1370/2007) containing three main points: international passenger rail services will be opened up to competition as of 1 January 2010; passengers will enjoy a set of common rights; and train drivers will be required to hold a certificate stating that they meet minimum requirements to travel across countries.

In contrast, short sea shipping has grown in step with road transport and even outpaced it, and the Commission's efforts to facilitate this mode have been rather more successful. The latest major package of freight transport measures was launched in 2007 (COM(2007)607), COM(2007)608), as was a new Communication on ports policy (COM(2007)616).

Demand for air transport has been increasing for similar reasons to road, with numbers of air passenger-kilometres growing by more than 200 per cent between 1980 and 1996[8], and continuing to grow at 5 per cent or more per annum since[9]. Deregulation of the civil aviation sector is the central plank of the common transport policy in this area, under the general heading of 'Open Skies'. This has encouraged a progressive breakup of the old system of 'national carriers' in Europe and the entry of new operators into the market, leading to much freer competition and hence lower prices and a steep increase in air travel. In December 1999, the Commission published a Communication setting out its basic programme for air transport and the environment for the years 2000 to 2005 (COM(1999)640). After much debate, the Commission published a proposal in 2006 to include aviation in the EU Emissions Trading Scheme (see below). In 2007 the European Union launched the 'Clean Sky' initiative, a public/private partnership involving European aircraft industries and research centres, helping to fund green aeronautic technology to cut aircraft noise and CO_2 emissions by half and NO_x by 80 per cent by 2020.

A Directive was adopted in 2003, to promote the use of biofuels in transport. This endorses the setting of national targets consistent with the reference value of 5.75 per cent, for the use of biofuels by 2010 for transport purposes. The Renewable Energy Action Plans of Member States indicate that biofuels will account for approximately 9 per cent of total European fuel use by 2020[13].

Following the 2001 Transport White Paper, an expected Commission Communication on the pricing of transport infrastructure was drafted, but failed to appear after it was substantially watered down in the course of its inter-service consultation. The Commission only published a proposal to revise the so-called 'Eurovignette' Directive (1999/62/EC) in 2003 (a Directive related to the charging of Heavy Goods Vehicles) which proved controversial. Eventually a revised Directive (2006/38/EC) was adopted in 2006, giving Member States a very limited scope for charges to reflect environmental externalities, but requiring the Commission to develop a methodology to allow externality costs for all modes to be calculated and applied. Further research was commissioned and a consultation held in 2007 on this. The Green Paper on urban mobility (COM(2007)551) published in September 2007 proposed the enlargement of the scope of the 'Eurovignette Directive' by introducing an urban dimension, including vehicles and infrastructure, linked to the development of an harmonized methodology to calculate external costs from transport.

The Green Paper launched a consultation which ended in March 2008. The European Commission adopted the Action Plan on urban mobility on 30 September 2009 (MEMO/09/424, 30/09/2009). It proposes twenty measures to encourage and help local, regional and national authorities in achieving their goals for sustainable urban mobility. The

actions are being launched over the four years following the Action Plan's adoption. The European Commission will conduct a review of the implementation of the Action Plan in the year 2012, and will assess the need for further action.

The revised 'Eurovignette' Directive was finally adopted and published on 6 August 2010 (Directive 2010/40/EU). The Directive establishes a framework to support the **coordinated** and coherent deployment and use of Intelligent Transport Systems (ITS). It provides for the development of specifications for actions within priority areas and the development, where appropriate, of necessary standards. The following are identified as priority areas for the development and use of specifications and standards:

- Optimal use of road, traffic and travel data.
- Continuity of traffic and freight management ITS services.
- ITS road safety and security applications.
- Linking the vehicle with the transport infrastructure.

Within the priority areas the following are the priority actions for the development and use of specifications and standards:

- The provision of EU-wide multimodal travel information services.
- The provision of EU-wide real-time traffic information services.
- Data and procedures for the provision, where possible, of road safety related minimum universal traffic information free of charge to users.
- The harmonised provision for an interoperable EU-wide eCall.
- The provision of information services for safe and secure parking places for trucks and commercial vehicles.
- The provision of reservation services for safe and secure parking places for trucks and commercial vehicles.

In October 2010, European Transport Ministers voted in favour of a proposal to allow Member States to add additional external 'costs' to the Eurovignette Directive, such as a levy on Heavy Good Vehicle emissions and noise pollution. However, many environmental groups believe that the environmental aspects are not strong enough effectively to account for damage by heavy goods vehicles, and Member States are divided on the issue

Among efforts to strengthen European growth and competitiveness, in line with the Lisbon Process, the TEN-T network was to be boosted by the European Growth Initiative through the Quick-start Programme, but with reference to environmental standards for individual infrastructure projects. In addition, the TEN-T network was meant to establish an integrated transportation network across the EU that would consider prospects for inter-modal shifts capable of reducing both greenhouse gases and criteria gases. The Commission stated that 'preference should be given to projects offering strong environmental benefits. For example, projects linked to supporting a hydrogen economy, or shifting traffic from road to rail or from road to the sea' (COM(2003)690). According to the TEN-INVEST study, around half of total TEN investments 1996–2001 in EU15 were in rail, with an increasing tendency over the period. The share is projected to increase to 53 per cent on average in the period 2002–2010, or higher when all EU25 are included[10] . In 2004, the TEN-STAC[11] study developed several scenarios of implementation of TEN-T projects and consequent modal shift to rail.

On the basis of this study, the ex ante evaluation of the TEN-T Multi Annual Programme for 2007–2013[12] found that modal shift from road and air to rail under all the scenarios leads to a reduction of NO_x and CO_2 emissions, but not of particulate emissions owing to increased use of diesel locomotives and inland shipping. There has however, been ongoing scrutiny on the part of environmental NGOs which claim that the planning of infrastructure projects does not adequately consider their potential impacts on the environment. Recent work related to the allocation EU structural funds, as part of the EU budget review, indicates that the development of transport infrastructure projects should consider the impact of increased vehicular emissions resulting from the expansion of road transport infrastructure, or emissions from flights as part of planned airport expansion.

In February 2009, the Commission issued a Green Paper on the future of TEN-T policy (COM(2009)44) which was followed by the required necessary consultation (. This policy review was to form the basis of a potential White Paper which, according to DGMOVE, but this has not yet been published. Nevertheless, guidelines related to the establishment of a trans-European network were published in July 2010 (Decision 661/2010/EU).

Reducing greenhouse gases from the transport sector

Policy to regulate emissions from transport has been influenced by international developments. This has been an issue particularly for the aviation and shipping sectors, but not for land transport. (The Decision to include aviation as part of the European Union's Emissions Trading Scheme (EU-ETS), can be attributed in part to proceedings of the International Civil Aviation Organization (ICAO). The inclusion of aviation into national emissions trading schemes was discussed as of 2004. As a result of the negotiations held as part of the 15th Conference of the Parties in Copenhagen (hereafter referred to as COP15) in December of 2009, there was a broad consensus among negotiators that ICAO and the International Maritime Organization (IMO) would need to take further action although no Decision was reached on the need to cap emissions from bunker fuels or the need potentially to levy them. It is possible that both sectors could be addressed through an international move to address emissions reductions on the basis of sectoral baselines. It is also possible that all three sectors would be addressed through Nationally Appropriate Mitigation Actions (NAMAs) and would be subject to independent, third-party verification. NAMAs are national strategies that outline plans to mitigate GHG emissions. They were a product of the COP15 UNFCCC negotiations in Copenhagen, 2009.

EU policy on energy and climate change can be divided into two overall categories: policy aimed at sectors under the EU-ETS, and those comprising what are known as the ‘non-traded sectors’. Emissions from the non-traded sectors including transport, housing, agriculture and waste will be cut by 10 per cent from 2005 levels by 2020 (See: http://ec.europa.eu/environment/climat/climate_action.html). With respect to the non-traded sectors, land transport represents a significant percentage of the overall emissions profile for the EU. While aviation has already been included under the EU-ETS, discussion of climate change policy as it relates to shipping is still very much in its infancy.

Aviation

Aviation is the only transport sub-sector to be included in the EU-ETS thus far. Directive 2008/101/EC was adopted in November of 2008 and includes the following key issues:

- The scope of the scheme and the timing of compliance. All flights departing from and arriving at EU aerodromes will be covered under the scheme by 2012, while all EU domestic flights will be covered as of 2011.
- Exemptions for smaller airlines and flights associated with government service or the military.
- A methodology for the free allocation of credits up until 2012 and the subsequent auctioning of credits as of 2013.
- Technical requirements associated with the monitoring, reporting and verification of emissions. These indicate how emissions from flights will be measured on the basis of distance, mass, and volume of fuel.
- A methodology for determining which airline is responsible for the flight's emissions. (The issue of shared ownership of emissions from individual flights is complicated by co-sharing arrangements in the aviation sector).

The inclusion of aviation into the EU-ETS has faced numerous challenges. Determining flight distance, and attributing emissions to specific airlines, has been complicated by the involvement of numerous airlines in different flight segments and the challenge of determining what constitutes an actual single flight with respect to stopovers. The idea that flights departing and landing within the EU will be covered within the scheme, combined with the added emissions from increased distance, may mean that international hubs will be located outside the EU in order to shorten flight journeys and decrease total emissions attributed to individual airlines under the EU-ETS.

A methodology to determine how international airlines flying in and out of the EU would be attributed to different Member States, has been defined as part of Commission Regulation (EU) No 394/2011 of 20 April 2011 amending Regulation (EC) No 748/2009 on the list of aircraft operators that performed an aviation activity listed in Annex I to Directive 2003/87/EC on or after 1 January 2006 specifying the administering Member State for each aircraft operator as regards the expansion of the Union emission trading scheme to EEA-EFTA Countries.

In addition, the level of historical emissions for the entire sector in the EU has been determined based on a methodology outlined in Commission Decision 2011/149/EU of 7 March 2011 on historical aviation emissions pursuant to Article 3c(4) of Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community. This methodology has determined that emissions for the entire sector total approximately 219,476,343 tonnes of CO_2 equivalent.

Aircraft operators participating in the scheme receive a certain percentage of this emissions total in the form of European Union Allowances representing “free allocation”. The amount of free allocation decreases from 100 per cent in 2012, the year they enter the scheme, to 85 per cent throughout the third phase of the scheme (2007-2013). The calculation of free allocation is based on a predetermined benchmark; airlines receive a pre-determined amount of EUAs based on their tonne kilometre performance (combined weight and distance flown). This benchmark was further refined in Commission Decision 2011/638/EU, published in September of 2011.

The American Transport Association, who opposed inclusion of non-EU airlines in part on this basis, launched a legal challenge to inclusion of aviation in the EU-ETS. As part of court ruling C-366/10, issued 21.12.2011, the European Court of Justice ruled that Directive

2008/101 which requires aviation activities to be included in that scheme from 1 January 2012, was valid. The judges found that the EU is not bound by the Chicago Convention, as it is not a party of this Convention. On the Kyoto Protocol, the Court found that the parties to the protocol may comply with their obligations in the manner and at the speed upon which they agree and that, in particular, the obligation to pursue limitation or reduction of emissions of certain greenhouse gases from aviation fuels, working through the International Civil Aviation Organisation (ICAO), is not unconditional and sufficiently precise to be capable of being relied upon. The Court also responded to the assertion that the emissions trading scheme constitutes a tax, fee or charge on fuel in breach of the Open Skies Agreement.

Road transport (for additional information see section on CO_2 from passenger cars)

While it has taken some time to establish a clear set of mitigation measures for the road transport sector, some initiatives have been undertaken by industry. The car manufacturing industry has been heavily involved in the design of a vehicle emissions performance standard. In 1995, the European Automobile Manufacturers' Association (EAMA) initiated a voluntary industry commitment which looked to improve customer information and the promotion of fuel-efficient cars through the use of fiscal instruments such as taxation. In 1998, the EAMA made a further commitment to reduce average emissions from new cars sold to 140 g CO_2/km by 2008 (through voluntary agreements with the ACEA (European Car Manufacturers Association), the JAMA (Japanese Automotive Manufacturers Association), and the KAMA (Korean Automotive Manufacturers Association)). The agreements were in place until 2009.

The adoption of two legally binding measures offers the potential to achieve real reductions in the road transport sector. These measures include: Directive 2009/30/EC on reducing GHG emissions from transport fuels, and Regulation (EC) No 443/2009 on setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles. The conclusion of the legislation on vehicle emission performance is perhaps even more positive in terms of concrete action, as it implies that legislation will be uniformly applied across all Member States. Directive 2009/30/EC will require transposition at the Member State level.

Directive 2009/30/EC sets a binding target for the reduction of life cycle GHG emissions. Member States will require fuel suppliers to reduce life cycle GHG emissions per unit of energy from fuel and energy supplied by up to 10 per cent by 31 December 2020. 'Life cycle GHG emissions' means all net emissions of CO_2, CH_4 and N_2O that can be assigned to the fuel or energy supplied. This includes emissions from the extraction or cultivation of fuel sources (emissions associated with land use change), transport and distribution, processing and combustion. Given that this definition encompasses bio-fuels, this Directive may limit the use of bio-fuels to meet the target outlined in the Climate and Renewable Energy package. The acceptability of bio-fuels in the context of this Directive will depend largely on the conclusion of the applicable sustainability criteria.

Regulation (EC) No 443/2009 involves setting new CO_2 emissions performance requirements for new passenger cars. Car manufacturers must ensure that their average annual CO_2 emissions do not exceed 130 g CO_2E/km. Manufacturers' average emissions are determined based on a proportion of their new passenger cars registered that year; this proportion has been mandated at 65 per cent in 2012, rising to 100 per cent by 2015. If targets are exceeded

manufacturers must pay an excess emissions premium. The legislation also outlines a longer term target of 95 g CO_2E/km set for 2020. This overall goal of 130 g CO_2E/km encompasses a number of policies, a target which is also quantified in terms of a gCO_2E/km vehicle emissions performance target. This Regulation is part of an integrated approach to ensure that emissions from light-duty vehicles do not exceed 120 g CO_2Eg/km by 2012. Overall, these policies are expected to result in a 19 per cent reduction of carbon dioxide by 2012.

In summary, the 2012 120 g CO_2E/km target encapsulates a number of different measures including: vehicle efficiency improvements, the use of bio-fuels, efficiency standards for air-conditioning systems, compulsory fitting of accurate tyre pressure monitoring systems, setting maximum tyre rolling resistance limits in the EU for tyres fitted on passenger cars and light commercial vehicles, the use of gear shift indicators (taking into account the extent to which such devices are used by consumers in real driving conditions), and fuel efficiency standards for light-commercial vehicles (vans) with the objective of reaching 175 g CO_2E/km by 2012 and 160 g CO_2E /km by 2015.

According to the legislation, an emission performance standard will provide more flexibility than national reduction targets. In coming up with a performance standard, the Regulation will have to account for market imperfection and competition among auto manufacturers while ensuring a certain amount of policy predictability. The target has been defined according to the utility of cars on a linear basis. This is done on the basis of mass, and on the basis of footprint (track width times wheelbase). The standards apply to new passenger cars registered in the Community for the first time. The average specific emissions for new cars registered in the Community for which an automotive manufacturer is responsible do not exceed the overall average emissions for the group of newly registered vehicles.

Regulation (EC) No 443/2009 establishes a flexible legislative framework allowing for the integration of implementing regulation. There are four key pieces of implementing legislation: Commission Implementing Regulation (EU) No 725/2011 of 25 July 2011 and Regulation (EU) No 510/2011. Regulation (EU) No 725/2011, establishes a procedure for the approval and certification of innovative technologies for reducing CO_2 emissions from passenger cars while Regulation (EU) No 510/2011, sets emission performance standards for new light commercial vehicles as part of the Union's integrated approach to reduce CO_2 emissions from light-duty vehicles. Commission implementing Decision 2011/878/EU, published in December 2011, outlines a number of default values related to vehicular emissions performance. These values facilitate the implementation of Regulation (EC) No 443/2009 and will aid the Commission in confirming whether auto manufacturers have exceeded imposed emissions targets, and will need to pay premiums. A method to collect these premiums is outlined in Commission implementing Decision 2012/100/EU, published in February, 2012.

Legislation in relation to the development of an intelligent transport system (ITS) is currently in the process of adoption (proposed as COM(2008)887) The implementation of an ITS will typically involve making sure that motorists have access to the right type of information in relation to traffic, road safety, and parking places for trucks and commercial vehicles. Provided the Council and the European Parliament agree on the Directive following the second reading of the legislation (which has yet to take place), all the relevant initiatives falling under the aegis of the Directive will be implemented by 2014 (see COM(2010251).

The Commission's Transport 2050 Road Map (COM(2011)144) seeks to phase out completely fossil-fuel powered cars in urban environments and shift 50 per cent of inter-city road transportation to rail and water based transportation by 2050.

Future initiatives: the importance of shipping

A communication released by the European Commission in January of 2009 outlined a number of potential initiatives that could be used to address the mitigation of GHGs from the shipping sector (COM(2009)8). In addition to promoting the issue as part of the COP15 negotiations, the Commission proposed consideration of the following policies and mitigation strategies:

- The potential for market mechanisms such as emissions trading to mitigate GHG emissions from ships.
- Continued cooperation with the IMO to monitor the discussion of GHG emissions from ships.
- The potential to offer alternative fuels in ports such as the use of port-side electricity.
- The development of policies that will encourage the development of energy efficient ships.

While shipping has been a topic of discussion among officials at the European Commission with respect to inclusion in the EU-ETS, there are numerous challenges to overcome particularly in terms of attributing emissions from ships to particular nations.

Policy implementation barriers

The policy implementation barriers differ for aviation, shipping and road transport. As noted above, reducing emissions from aviation may prove difficult should airline operators choose to shorten the distances flow into Europe by relocating the bulk of their business to hubs outside the EU. With the integration of aviation into the EU-ETS, there is the tremendous potential for gaming at the international level. For shipping, the potential to include it in the EU-ETS may be equally complicated by the difficulty in attributing emissions from ships to specific countries.

With respect to land transport, it is possible that the methodology used to determine vehicle emissions performance will create an uneven playing field for the automotive industry. Manufacturers that have typically produced certain vehicle types (i.e. heavier vehicles with wider tyre width); will be more severely penalized than those who produce smaller more fuel efficient vehicles. Given the application of the legislation to new vehicles manufactured within the EU, there may be a disincentive for new investment in the automotive industry in Europe for certain types of vehicles. At the same time, while it addresses the issue of vehicle emissions performance, it does not address the issue of driving behaviour and the increased demand for personal vehicle use. Until individuals reduce personal vehicle use, the number of vehicles found on European roads may continue to increase; it is unclear whether the emissions performance legislation will be able to offset this trend.

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