United Nations ECE/TRANS/WP.29/2010/84

Economic and Social Council

Distr.: General
9 April 2010

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

One-hundred-and-fifty-first session
Geneva, 22–25 June 2010
Item 8.5 of the provisional agenda
Other Business – Round table on climate change and transport

UNECE activities on the reduction of emissions of gaseous pollutants and greenhouse gases in the transport sector

Note by the Secretariat*

The text reproduced below was prepared by the secretariat as a background paper to the brainstorming session which took place during the November 2009 session of the World Forum for Harmonization of Vehicle Regulations (WP.29) with the aim of organizing its forthcoming Round Table on Climate Change and Transport. After its review by the World Forum at its March 2010 session, it was agreed to submit it as a background document for the Round Table on Climate Change and Transport (ECE/TRANS/WP.29/1083, para. 74).

* In accordance with the programme of work of the Inland Transport Committee for 2006–2010 (ECE/TRANS/166/Add.1, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

I. UNECE activities on climate change mitigation and adaptation

1. Today the entire international community shares the concern of global warming, which became an area where the central role of the United Nations is uncontested, as testified by the fact that the Secretary-General has put climate change firmly at the top of the United Nations agenda. It is indeed a monumental challenge confronting humankind in this new century: the imperative need to both mitigate and adapt to climate change will have a major impact on everyday life through changes in consumption and production patterns, which themselves require significant changes in technology, legislation and economic policies. The United Nations Economic Commission for Europe (UNECE) is well-equipped to be a driving force for addressing this challenge in the region and beyond, having a strong mandate and recognized expertise in areas which are crucial for climate change adaptation and mitigation, namely through its environmental conventions, its regulations in vehicle construction, its work in the field of energy efficiency, forestry and timber, and more recently its initiatives to promote green housing as well as to improve the indicators measuring natural capital and sustainable development.

2. Transport plays a major socio-economic role. It provides mobility and accessibility to basic services, such as health and education, for all, including children and the elderly. It is also vital to the well functioning of the economic activities, to the production and distribution of goods as well as to trade. Transport is indispensable to open up and integrate countries and regions, particularly those that are peripheral or landlocked. The transport sector, including the vehicle manufacturing industry and their suppliers, accounts for a large share of the gross domestic product (GDP) in many countries.

3. Sustainable transport development and, in particular, global warming call for internationally harmonized measures and policies to ensure that our transport system provides for personal mobility and serves our people as well as future generations. At the same time, transport must ensure the efficient and secure functioning of our economies and international trade which are the foundations of prosperity, without becoming a burden on humans and the environment.

4. On 28-30 May 2008, transport ministers met in the International Transport Forum (ITF) held in Leipzig (Germany) to discuss the energy and climate change challenges for the transport sector, especially global warming and the emissions of greenhouse gases (GHG). The transport ministers addressed the need of CO_2 abatement and improved fuel efficiency in the transport sector, mainly through:

(a) Innovative engine technologies, advanced engine management systems and efficient vehicle powertrains;

(b) The use of sustainable biofuels not only of the first generation (vegetable oil, biodiesel, bio-alcohols and biogas from sugar plants, crops or animal fats, etc.), but preferably of the second generation (biofuels from biomass, non-food crops including wood) and third generation (biodegradable fuels from algae);

(c) An improved transport infrastructure together with Intelligent Transport Systems (ITS) in order to avoid traffic congestion and to foster the use of intermodal transport (road, rail and waterways);

(d) Consumer information (e.g. campaigns for eco-driving, promotion of public transportation, eco-labelling of vehicles);

(e) Legal instruments (such as tax incentives for low carbon products and processes, taxation of CO_2 intensive products and processes, differentiated road pricing, etc.).

5. In their key messages during the ITF in 2008, transport ministers urged the World Forum for Harmonization of Vehicle Regulations (WP.29) to accelerate the work to develop common methodologies, test cycles and measurement methods for light vehicles, including CO_2 emissions. It is obvious that the World Forum has the expertise to contribute essentially to promote innovative vehicle technologies and also to improve partially market fuel quality (see paras. 3(a) and (b) above).

6. For other measures (para. 3(c), (d) and (e) above), other forums, institution or organizations were invited to do their part in the mitigation of climate change. For instance, the UNECE Working Party on Transport Trends and Economics (WP.5) considered the internalization and possible reduction of external costs of transport activity during its annual sessions in 2008 and 2009 and should revisit this issue in 2010 with a view to arriving at evidence-based conclusions. Such conclusions should identify the socially optimal mechanism for internalizing externalities to enhance the sustainability of transport while addressing the concerns expressed by the road and rail industry representatives during the WP.5 sessions in 2008 and 2009.

7. The transport of chilled and deep-frozen foodstuffs also has an impact on global warming on a number of levels. Firstly, it depends on containers or refrigerated vehicles which are insulated using foams. These foams were traditionally produced using chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) which are greenhouse gases dangerous for the ozone layer and which have been phased out in accordance with the Montreal Protocol. HCFCs will be prohibited in all new equipment after 2009 and there is a ban on the refilling of equipment (including recycled fluids) with HCFCs after the end of 2014. The EU has confirmed its target of a twenty per cent reduction in greenhouse gas emissions by 2020 compared to 1990 levels. Now international negotiations are turning their attention to the phase-out of hydrofluorocarbons (HFCs). In recent years in most, if not all, European countries, insulated foams have been blown with green gases (Pentane C5, N Pentane, Isopentane). Also, the major refrigerated transport equipment builders are already using green gases as the main fluids for their compression cycles (134A, 404A). The refrigerated and chilled transport industry is actively involved in finding new insulating foams and blowing agents that are both safe for the ozone layer and highly effective so that energy can be saved in maintaining the desired temperature. The Working Party on the Transport of Perishable Foodstuffs (WP.11) is following closely developments in this field. It has a standing item on this subject on its agenda and will discuss the possibility of holding a workshop on environmental aspects of the industry in 2010 or 2011. In this regard, WP.11 has recently added to the ATP Handbook[1] details of a procedure for determining the fuel consumption of vehicle-powered refrigeration units, or in other words the increase in diesel engine fuel consumption when the refrigeration unit is running. Energy efficiency is becoming a major concern both because of the scarcity of the primary sources but also because of the harmful CO_2 emissions that are released. In order to save energy, it is essential to measure fuel consumption. The influence of aging on the heat transfer coefficient, or the K value, and its interpretation as well as the acceptance of a rule regarding the frequency of renewals of insulating foams are subject of frequent discussion by WP.11.

[1] "*ATP*" means the Agreement on the International Carriage of Perishable Foodstuffs and on the Special Equipment to be Used for such Carriage, done in Geneva on 1 September 1970.

8. According to the International Panel on Climate Change (IPCC) guidelines[2] for national GHG inventories, the emissions from international aviation and maritime transport are excluded from the transport emissions and are reported separately. Therefore, UNECE is mainly addressing road, rail, inland water and intermodal transport at the pan-European and even global level, especially through its inter-governmental forum and more than fifty international treaties. In this respect, intergovernmental organs in the fields of rail (SC.2), inland water (SC.3) and intermodal transport and logistics (WP.24) work towards the goal of sustainable transport, including the concerns of global warming, by setting international regulations, standards and targets for more efficient, clean, safe and affordable land transport. This work also includes measures to shift traffic, wherever possible, to railways and inland waterways to free up capacity on roads, to tackle congestion and to arrive at a better carbon foot print of land transport in general. However, for most transport operations, lorries are indispensable to ensure terminal hauls and the final distribution of goods, particularly in case of consumer products. Therefore, very often rail and inland waterway transport entails transhipment operations using containers and other intermodal transport units that can be shifted swiftly and safely from one mode to the other.

9. Efficient and well coordinated terminal and transhipment operations are therefore indispensable to ensure the competitiveness of intermodal transport operations vis-à-vis pure road haulages. To make sure that intermodal transport solutions are applicable within total logistics and transport chains, Governments have the responsibility to establish the necessary framework conditions that set a level playing field among all actors and modes of transport involved. This would allow the industry to establish and operate seamless intermodal transport operations that are economically viable and ecologically sustainable. Efficient intermodal transport operations are often only feasible beyond distances of 300-500 km. Thus, international cooperation and harmonized transport policies are required. At the pan-European level, UNECE is the only inter-governmental organization that contributes to internationally harmonized solutions in the field of intermodal transport infrastructures, technical minimum standards and service benchmarks. UNECE has negotiated a pan-European network of important road-rail-inland water transport lines (AGTC Agreement and its Protocol) and provides a forum for Governments and industry experts to review the latest policy, legal and technical developments in reducing CO_2 emissions, to exchange best practices and to prepare policy guidance.

10. UNECE conferences, workshops and studies undertaken within the Transport, Health and Environment Pan-European Programme (THE PEP) provide for a constant exchange of best practices in sustainable transport policies among UNECE member States and address the transport, environment and health challenges in an integrated and holistic manner. At the Third High-level Meeting on Transport, Health and Environment in January 2009, Governments, adopting the Amsterdam Declaration, gave renewed political impetus to THE PEP and agreed specifically to reduce emissions of transport-related greenhouse gases, air pollutants and noise. This should be achieved by supporting a shift in the vehicle fleet towards zero or low-emission vehicles and fuels based on renewable energy, by promoting a shift towards clean transport modes and by fostering electric mobility as well as eco-driving.[3] THE PEP has already supported several measures to reduce CO_2 emissions in transport.

11. Several other conferences have been organized worldwide to discuss the global warming and transport nexus. Among them, an International Symposium on a global approach to automotive fuel economy was held in Paris on 15–16 May 2008, which had

[2] IPCC guidelines available at: http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html.

[3] An example of golden rules for eco-driving as well as additional information on this subject can be found on the website http://www.ecodrive.org/.

been organized by the International Energy Agency (IEA) in cooperation with ITF, the FIA Foundation for the Automobile and Society and United Nations Environment Programme (UNEP). The first global transport ministerial conference, the International Transport Forum held in Leipzig (Germany) 28-30 May 2008 addressed (as mentioned in paras. 3-4 above) the energy and climate change challenges for the transport sector, with specific attention to global warming and the GHG emissions. The Ministerial Conference on Global Environment and Energy in Transport (MEET) in Tokyo in January 2009 continued the debate at political level and adopted a declaration that, for the purpose of reducing GHG emissions, calls for countries to improve fuel/energy efficiency in the transport sector by the introduction of fuel efficiency or GHG emission standards and by improving motor vehicle components and fuel quality through UNECE/WP.29.

12. Recently, the UNECE Transport Division launched a new website[4] on "Global warming and transport", listing a large number of its current activities and measures on climate change mitigation and adaptation, especially with regard to the reduction of CO_2 emissions in the transport sector.

II. The World Forum for Harmonization of Vehicle Regulations

13. Road transport has implications on safety, environment and energy consumption. In order to minimize the negative impact in those areas, transport requires regulation by Governments. In the past, Governments regulated this impact on the basis of national legislation, but quickly realized that it was crucial to constantly update regulations in order to internationally harmonize prescriptions to facilitate international transport and trade of vehicles and to update these requirements regularly in order to cover new technologies. Under the supervision of the Inland Transport Committee (ITC), the UNECE World Forum on the Harmonization of Vehicle Regulations (WP.29) provides such actions to develop and adapt to the technical progress such worldwide harmonized regulations which are aimed at protecting the environment, promoting the energy efficiency, improving safety and anti-theft performance of new vehicle as well as providing uniform conditions for periodical technical inspections of vehicles in use. WP.29 is the unique global forum where worldwide harmonized vehicle regulations are developed. As a regulatory body, its responsibility for "greening the transport sector" is therefore huge. By developing performance requirements for innovative vehicle technologies (such as environmentally friendly vehicles) as well as conditions for their mutual recognition, the World Forum contributes considerably to the quick introduction of such vehicle technologies into the global market.

14. Fifty-three Countries (including the European Union) are Contracting Parties to at least one of the two United Nations Agreements on Vehicle Regulations (1958 and 1998 Agreements)[5] and apply the Vehicle Regulations adopted by the World Forum (WP.29). These countries, representing the five Continents (almost all the European countries, United States of America, Canada, Japan, China, India, Korea, Thailand, Malaysia, Australia, New

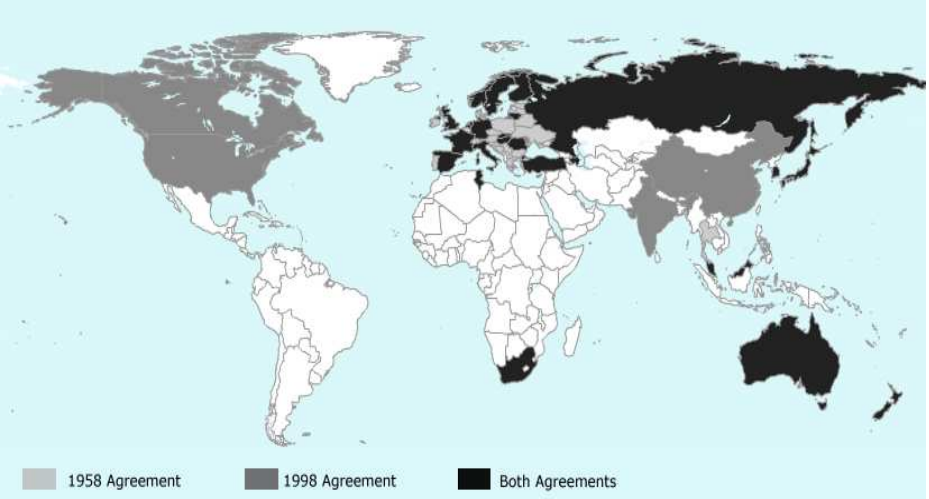
4 See http://www.unece.org/trans/theme_global_warm.html.

5 The World Forum WP.29 administers the following 3 Agreements:
The 1958 Agreement concerning the Adoption of Uniform Technical Prescriptions for Wheeled Vehicles, Equipment and Parts which can be fitted and / or be used on Wheeled Vehicles and the Conditions for Reciprocal Recognition of Approvals Granted on the Basis of these Prescriptions, 1958;
The 1997 Agreement concerning the Adoption of Uniform Conditions for Periodical Technical Inspections (PTI) of Wheeled Vehicles and the Reciprocal Recognition of Such Inspections, 1997;
The 1998 Agreement concerning the Establishing of Global Technical Regulations (gtr) for Wheeled Vehicles, Equipment and Parts which can be fitted and / or be used on Wheeled Vehicles, 1998.

Zealand, South Africa, etc.), manufacture more than eighty per cent of vehicles worldwide. Other countries (Egypt, Vietnam, Philippines, Cambodia, Argentina, Brazil, Mexico, the Community of the Arab Gulf Countries, the Southern African Developing Community (SADC), the South East Asian Nations (ASEAN), Egypt, some South-American countries etc.) are either in the process of acceding to the 1958 and 1998 Agreements or have shown interest in acceding to them. Some of them participate, as observers, in the World Forum.

Figure 1

Geographical extension of the 1958 and 1998 Agreements on construction of vehicles, administered by WP.29



III. Structure and mandate of the World Forum WP.29

15. The World Forum is administering two parallel agreements regarding uniform technical provisions on the construction of vehicles, i.e. the 1958 Agreement and the 1998 (Global) Agreement as well as the 1997 Agreement on the periodical technical inspections (PTI) of vehicles in use.[5]

16. The global technical regulations (gtrs) under the 1998 Agreement have technical requirements regarding safety, environmental protection, energy efficiency and anti-theft performance of motor vehicles and their trailers as well as, wherever appropriate, performance requirements which have to be demonstrated. At the present time, eleven gtrs are established into the Global Registry and thirty-one Contracting Parties (CP) acceded to the Agreement (Australia, Azerbaijan, Canada, China, Cyprus, European Union, France, Finland, Germany, Hungary, India, Italy, Japan, Lithuania, Luxembourg, Malaysia, Netherlands, Norway, Republic of Korea, Republic of Moldova, Romania, Russian Federation, Slovakia, New Zealand, South Africa, Spain, Sweden, Tunisia, Turkey, United Kingdom and United States of America).

17. The Regulations annexed to the 1958 Agreement have, in addition to the technical and performance requirements, also administrative provisions (such as the type approval procedure including the markings, the Conformity of Production (COP) procedure) as well as the mutual recognition of type approvals. At the present time, 127 Regulations are annexed to the 1958 Agreement and forty-eight CP acceded to the Agreement (Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, European Union, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malaysia, Malta,

Montenegro, Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, The former Yugoslav Republic of Macedonia, Tunisia, Turkey, Ukraine and United Kingdom).

18. As a general rule by the World Forum WP.29, the provisions of the regulations under both Agreements (gtrs under the 1998 Agreement and Regulations annexed to the 1958 Agreement) are always kept in line.

19. Contracting Parties to the Agreements may/shall transpose the regulations into their national/regional legislation in order to make the provisions of the regulation mandatory on their territory.

20. The following international organizations participate on a regular basis in the activities of WP.29:

Council of the European Union, European Commission/European Union (EU), European Free Trade Association (EFTA), International Energy Agency (IEA), International Transport Forum (ITF), United Nations Environment Programme (UNEP).

21. More than forty non-governmental organizations participate on a regular basis in the activities of the World Forum:

American Motorcyclist Association (AMA), Association for Emissions Control by Catalyst (AECC), Association of European Wheel Manufacturers (EUWA), Bureau international permanent des associations de vendeurs et rechapeurs de pneumatiques (BIPAVER), Committee for European Construction Equipment (CECE), Consumers International (CI), Engine Manufacturers Association (EMA), European Association of Automobile Suppliers (CLEPA), European Association of Internal Combustion Engine Manufacturers (EUROMOT), European Automobile Manufacturers Association (ACEA), European Committee of Associations of Manufacturers of Agricultural Machinery (CEMA), European Enhanced Vehicle-safety Committee (EEVC), European Federation for Transport and Environment, European Garage Equipment Association (EGEA), European Insurance Committee (CEA), European Liquefied Petroleum Gas Association (AEGPL), European Natural Gas Vehicle Association (ENGVA), European Tyre and Rim Technical Organization (ETRTO), Federation of European Manufacturers of Friction Materials (FEMFM), Federation of European Motorcyclists Associations (FEMA), the Foundation for the Automobile and Society (FIA Foundation), International Association of Natural Gas Vehicles (IANGV), International Confederation of Associations of Experts and Consultants (CIDADEC), International Electrotechnical Commission (IEC), International Motor Vehicle Inspection Committee (CITA), International Motorcycle Manufacturers Association (IMMA), International Organization for Standardization (ISO), International Organization of Motor Vehicle Manufacturers (OICA), International Petroleum Industry Environmental Conservation Association (IPIECA), International Road Federation (IRF), International Road Transport Union (IRU), International Union of Public Transport (UITP), Liaison Committee of the Body and Trailer Building Industry (CLCCR), Motor and Equipment Manufacturers Association (MEMA), National Federation of the Blind (NFB), Natural Gas Vehicles Association Europe (NGVA Europe), Retread Manufacturers Association (RMA), Society of Automotive Engineers (SAE International), Specialty Equipment Market Association (SEMA), Standardization Organization for Gulf Cooperation Council (GSO), Technical Committee of Petroleum Additive Manufacturers in Europe (ATC/CEFIC), The Oil Companies European Organization for Environment, Health and Safety (CONCAWE), Union of Technical Assistance for Motor Vehicle and Road Traffic (UNATAC), Working Party “Brussels 1952” (GTB), World Economic Forum (WEF), World Road Association (PIARC).

IV. A possible strategy to reduce the transport CO_2 emissions

22. At its session in June 2008, WP.29 had already noted the ITF key messages as well as the results of the recent International Symposium on a global approach to automotive fuel economy, which was held in Paris from 15 to 16 May 2008 and had been organized by IEA in cooperation with ITF, the FIA Foundation for the Automobile and Society and UNEP. At its November 2008 session, WP.29 outlined that, with regard to the abatement of global warming and the reduction of CO_2 emissions, a possible strategy for the transport sector could be:

(a) a short-term objective through an improved energy efficiency and the use of sustainable biofuels (2015);

(b) a midterm objective with the development and introduction into the market of plug-in hybrid vehicles (2020-2025), and;

(c) a long-term objective with development and introduction into the market of electric, hydrogen and fuel cell vehicles (2030-2040).

23. This strategy would shift the automotive sector from the use of fossil energy to the use of hydrogen and electric energy. For the effectiveness of that integrated strategy, the energy sector has to ensure the sustainable and cost-effective generation of electricity and production of hydrogen.

24. With regard to "Inland transport"[6], the Ministerial Conference on Global Environment and Energy in Transport (MEET)[7] in Tokyo in January 2009 adopted a declaration that encourages countries to reduce GHG emissions by:

(a) Improving fuel/energy efficiency of motor vehicles, railways, and domestic aircraft and ships, through approaches such as: introducing fuel efficiency or GHG emission standards and improving vehicle components, noting IEA's energy efficiency policy recommendations and its development of energy efficiency indicators; strengthening international cooperation to develop and harmonize procedures for testing fuel efficiency or measuring GHG emissions through the UNECE/WP.29 and other regional or international forums; and facilitating, as appropriate, the introduction of energy-saving equipment and advanced technologies into ports and other transport facilities;

(b) Using strategic transport policies to reduce emissions, such as coordination of transport planning with urban spatial planning to realize, where applicable, more compact urban forms, transport demand management, enhanced modal integration, improvement of road and railway networks, and promotion of non-motorized means of travel; and

(c) Facilitating behavioral changes, including eco-driving, the use of public transport, and, where applicable, modal shifts, taking the environmental impacts of each mode into consideration.

25. Furthermore, MEET agreed on the need to limit or reduce air pollutant emissions from inland transport, recognizing the fact that some countries have significantly reduced

[6] "*Inland transport*" refers to transport activities excluding international aviation and shipping.

[7] Ministers and relevant Representatives from: Australia; Brunei Darussalam; Cambodia; Canada; France; Germany; India; Indonesia; Italy; Japan; Lao People's Democratic Republic; Myanmar; Philippines; Republic of Korea; Russian Federation; Singapore; Thailand; United Kingdom; United States of America; Vietnam, and the European Commission.

air pollutants such as carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), sulfur oxide (SOx) and particulate matters (PM), and, in addition to the aforementioned measures, encourage countries to:

(a) Review and strengthen, as necessary, their regulations on exhaust emissions from motor vehicles, railway locomotives and ships, both for new and in-use vehicles; and promote both low sulfur diesel and gasoline accordingly;

(b) Strengthen international cooperation to develop and harmonize procedures for testing exhaust emissions through the UNECE/WP.29 and other regional or international forums; and

(c) Work to incentivize the production and use of environmentally friendly vehicles (EFV) and clean fuels, and to promote public transport.

26. At its sixty-third session, held in Geneva on 31 March 2009, the UNECE welcomed, during its a high-level segment on climate change mitigation and adaptation, the consideration by WP.29 of specific market fuel quality requirements that could be a step forward towards further reduction of vehicle emission levels in a comprehensive global framework, based on harmonized and technologically neutral regulations.

27. It is also a common understanding that there is a need to increase the capacity of countries by linking and mainstreaming UNECE work to other international agendas, and to focus on those areas where positive results can be achieved:

(a) The Millennium Development Goals (MDG), in particular MDG 7 to ensure environmental sustainability;

(b) The Kyoto Protocol;

(c) Draft resolution of the United Nations General Assembly A/C.2/62/L.38, titled “Protection of global climate for present and future generations of mankind”;

(d) United Nations Framework Convention on Climate Change (UNFCCC).

V. Activities of the World Forum on fuel efficiency and quality, and on innovative technologies to further reduce emissions of gaseous pollutants and CO_2

28. The activities of the World Forum are focussed on active safety (i.e. crash-avoidance) and passive safety (i.e. crash-worthiness) of road vehicles as well as on the environmental protection and general safety issues. Road vehicles means two- and three-wheeled vehicles, passenger cars, buses and coaches, light and heavy duty vehicles, agricultural and forestry tractors as well as non-road mobile machinery.

29. The World Forum has already developed more than 140 regulations and rules on vehicles. These regulations and rules are performance oriented and continuously adapted to technical progress.

30. In order to perform these tasks, the World Forum has six permanent subsidiary Working Parties. The Working Parties on lighting and light-signalling (GRE) and on braking and running gear (GRRF) are working on subjects to avoid vehicle crashes. The Working Party on Passive Safety (GRSP) is working on crash-worthiness issues. The Working Parties on Noise (GRB) and on Pollution and Energy (GRPE) are working on environmental issues, especially on the reduction of engine emissions of gaseous pollutants and of vehicle noise levels. The Working Party on General Safety Provisions (GRSG) is

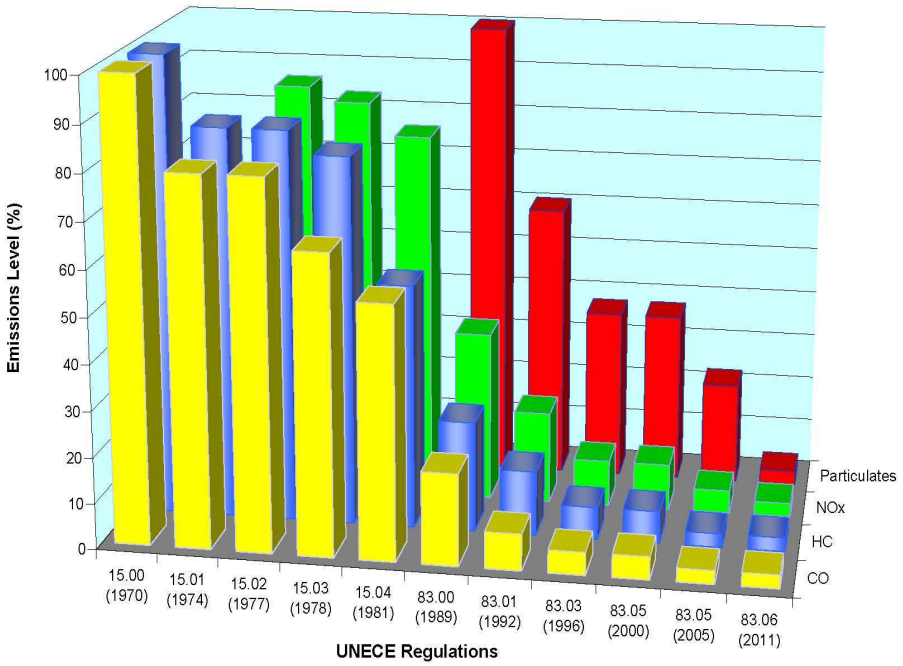
considering general safety issues. Under these six permanent Working Parties, more than 30 informal groups have been established as expert groups with a time-limited mandate (2 years) to work on specific subjects.

31. More than 2000 experts from the whole world participate on a regular basis in their meetings: governmental experts representing the Contracting Parties to the Agreements, experts from the above mentioned Non-Governmental Organizations (NGOs) representing e.g. the automotive industry or their suppliers, vehicle drivers or other road users. Participants may submit draft proposals on specific subjects. However, members from NGOs have a consultative status only. Thus, the final decision on the adoption of a proposal for a regulation or an amendment to an existing regulation lies only with governmental representatives of the Contracting Parties to the Agreement concerned.

32. In the framework of the 1958 Agreement the World Forum has developed several UN Regulations limiting the maximum admissible level of vehicle emissions for various gaseous pollutants (CO, HC, NOx) and particulate matters.[8] The successive amendments of these UN Regulations have resulted in substantial abatements, of 95-97 per cent, of the emission limits of CO, HC and NOx for new private passenger cars as compared with the limits established in the 1970s (see Figure 2). This means that the latest emission limits established by UN Regulations for these pollutants are today more than twenty times lower than those established thirty years ago. Similarly, the amendments to the relevant UN Regulations have reduced emission limits of particulates by over ninety per cent as compared with those established in 1990, which means that the latest limits approved are over ten times lower than those in 1990.

[8] Exhaust gas emissions of vehicles fall into the two main categories of greenhouse gases (CO2) and pollutants (CO, HC, Nox, PM):
Carbon Dioxide (CO2), which is inevitably produced when burning a fuel which contains carbon (as all petroleum products do). CO_2 is not an air pollutant *per se*, but a greenhouse gas and, therefore, contributes to global warming. The reduction of CO_2 emissions in the transport sector can only be achieved by reducing the combustion of fossil fuels, either by improving the energy efficiency of vehicles and their engines or by using low-carbon fuels (i.e. alternative fuels including sustainable biofuels) or other energies (e.g. use of hydrogen and fuel cell vehicles or electric vehicles) in their propulsion system, or a combination of all.
Carbon Monoxide (CO), which is the product of incomplete combustion. CO reduces the ability of blood to carry oxygen. It is dangerous to the people with heart disease and, in high concentrations, it is poisonous. Thus, CO is a gaseous pollutant which can be reduced by a more efficient combustion in vehicle engines (so that CO_2 is produced instead of CO) and further reduced after its combustion by an oxidizing process in a catalytic converter. [$2xCO + O_2 = 2xCO_2$]
Hydrocarbons (HC), also known as "Volatile Organic Compounds (VOC)", are made up of unburned or partially burned fuel. As they are toxic, they can harm people by causing liver damage and even cancer. HC are a major contributor to "photochemical smog" in certain climatic conditions. They can also be reduced by a more efficient combustion in the engine and further reduced after its combustion by an oxidizing process in a catalytic converter. [$4H_xC_y + (x+4y)O_2 = 2xH_2O + 4yCO_2$]
Nitrogen Oxides (NOx) are generated when nitrogen N_2 in the air (78 per cent N_2, 21 per cent O_2) reacts with oxygen O_2 at high temperature and pressure in engine combustion chamber. NOx can be an irritant to the lungs and is a precursor to "photochemical smog" and acid rain. It cannot be removed by oxidation (like CO and HC), but the opposite process, i.e. the removal of oxygen. This "reduction" process is necessary to convert NOx back to nitrogen and oxygen. The exhaust gas recirculation and selective catalytic reduction have significantly reduced NOx emissions by vehicle engines.
Particulate Matters (PM) are very small particles (micrometer size range), mostly of un-burnt carbon. PM cause respiratory health effects in humans and animals. Improvements of vehicle injection, combustion process and vehicle particle filters have significantly reduced PM emissions.

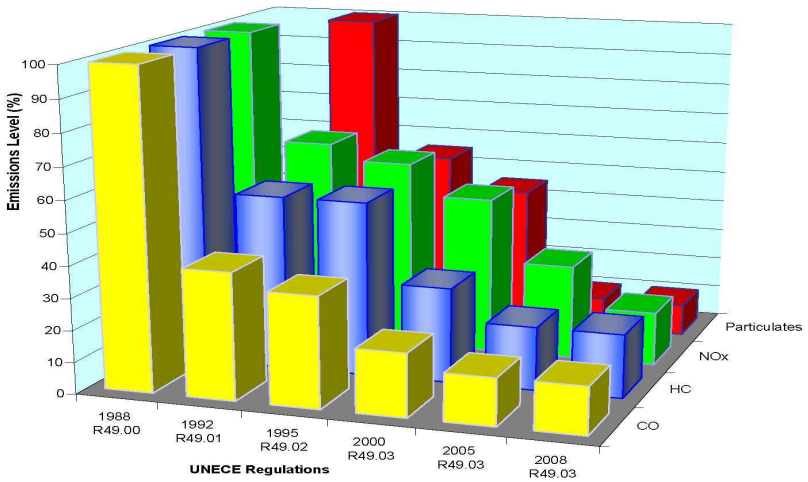
Figure 2
Evolution of emission limits of passenger cars



33. Currently, the World Forum is considering a proposal by the European Commission to further reduce, by September 2011, the limit values of the above-mentioned pollutants, especially the emissions of particles by more than eighty per cent. These new limit values will not only have to be fulfilled, as it is still the case today, by diesel engines but also by petrol engines.

34. The emission limits for heavy duty vehicles have also been abated although with lower percentages and work is under way to abate them further (see Figure below).

Figure 3
Evolution of emission limits of heavy duty vehicles



35. With regard to the reduction of GHG emissions (especially CO_2) in the transport sector, the World Forum and its subsidiary Working Parties consider or have already considered a large number of measures to improve the energy efficiency of the vehicle fleet, especially:

(a) Support of innovative vehicle technologies, i.e. Environmentally Friendly Vehicles (EFV), Plug-in Hybrid Electric Vehicles (PHEV), Hydrogen and Fuel Cell Vehicles (HFCV), Electric Vehicles (EV), etc.

(b) Advanced engine management systems (e.g. stop and go function, gearshift and eco-drive indicators) and engine emission control devices (e.g. on-board diagnostic systems, particle filter; catalytic converter);

(c) Efficient vehicle powertrains (e.g. low friction components, tyres with low rolling resistance, tyre pressure monitoring systems);

(d) Use of other alternative energy sources such as liquefied petroleum gas (LPG), compressed natural gas (CNG) and sustainable biofuels (liquid and gaseous);

(e) Development of quality specifications for market fuels in relation with the vehicle emission levels and engine technology type;

(f) Installation on vehicles of electric devices with a low energy consumption to reduce the energy consumption (e.g. headlamps with Light Emitting Diode (LED) technologies);

(g) Development of Intelligent Transport Systems (ITS) and intelligent Information and Communication Technologies (ICT) in order to avoid traffic congestion and driver assisting features.

36. The table annexed to this document only lists the most important activities of the World Forum specifically related to emissions of pollutants and CO_2, energy efficiency, fuel efficiency and quality as well as innovative technologies of vehicle engines and powertrains.

37. Following a policy debate on global warming and transport during its November 2008 session, the World Forum WP.29 considered the possibility to organise a substantive round table on this subject, back-to-back with one of its forthcoming sessions. In February 2009, the Inland Transport Committee (ITC) endorsed the activities of WP.29 on market fuel quality standards and the organization of such a Round Table. At its March 2009 session, the World Forum WP.29 agreed to hold the "Round Table on Climate Change and Transport" in Geneva, in conjunction with its June 2010 session (see ECE/TRANS/WP.29/1068, para. 2; ECE/TRANS/WP.29/1070, para. 77; ECE/TRANS/WP.29/1072, paras. 3).

38. During its November 2009 session, the World Forum WP.29 held a brainstorming session for the organization of that Round Table. On the basis of informal document No. WP.29-149-02, the World Forum agreed in principle with the proposed programme (see report ECE/TRANS/WP.29/1079, paras. 78-80). With regard to expected results of its Round Table, the World Forum preferred to identify, instead of a WP.29 strategy, potential scenarios for which WP.29 could contribute with its future work programme to climate change mitigation and adaptation. It was also agreed that the expected scenarios would subsequently be adopted by WP.29 at its November 2010 session.

39. The World Forum welcomed the documentation provided by the secretariat regarding a literature review (ECE/TRANS/WP.29/2010/46) and "who does what" in the field of inland transport and climate change (ECE/TRANS/WP.29/2010/47) as well as

detailed information on UNECE activities on the reduction of emissions of gaseous pollutants and greenhouse gases in the transport sector, reproduced in this document.

40. The secretariat was requested to identify potential speakers for that important event and to present the final programme at the March 2010 session for consideration and adoption by WP.29 (see informal document No. WP.29-150-03).

41. In this respect, the Round Table is planed to take place in Geneva, on 24 June 2010 (starting at 2.30 p.m. and concluding at 6 p.m.). The Round Table was recommended to consist of three sessions, the final content of which is subject to the forthcoming WP.29 session in March 2010:

(a) *Introductory session*: opening the Round Table, underlining the link between economical growth and transport, and the need for an integrated approach and giving an overview of the relevant work of the Inland Transport Committee and its subsidiary bodies, particularly of the World Forum WP.29;

(b) *Main session*: considering the potential of measures for climate change mitigation and adaptation in transport in liaison with requirements towards the energy sector, as well as the implications on paradigm changes in environment, land-use and housing policies;

(c) *Conclusion session*: summary of the debate identifying recommendations for effective measures, not only linked to vehicle technologies, but to broader transport policy considerations as well as recommendations for the follow-up of the Round Table.

Annex

Activities of the World Forum related to emissions of pollutants and CO_2, energy efficiency, fuel efficiency and quality as well as innovative technologies of vehicle engines and powertrains

Note: In this table, the references to existing websites reflect the current situation, but are continuously updated according the progress of work.

1	*WLTP*	*Worldwide harmonized Light vehicles Test Procedures*
	Goal:	Develop new emissions test cycles and procedures for light vehicles with regard to the emissions of gaseous pollutants (NOx, CO, HC) and particles, including CO_2.
	Timeline:	Establishing a gtr on the WLTP emission test cycle and procedure by 2014. Further development of additional test cycles for low temperature and high altitude, durability and in-service conformity by 2018, including off-cycle emissions, mobile air conditioner, if feasible. Correlation tests and definition of reference fuels as well as emission limit values by 2022.
	Status:	Detailed preparatory work had been finalized by the Working Party on Pollution and Energy (GRPE) in a roadmap for the development of the WLTP gtr for gaseous emissions of pollutants and particles, including CO_2. In June 2009, WP.29 considered that roadmap and recommended that GRPE should start, as soon as possible, the work on the development of the WLTP gtr.
	Remark:	The technical co-sponsors of the WLTP gtr are the European Union, Japan and the United States of America. The GRPE informal group on WLTP is chaired by France. More information can be found at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/wltp04.html in GRPE report ECE/TRANS/WP.29/GRPE/58, paras. 26-32 available at: http://www.unece.org/trans/doc/2010/wp29grpe/ECE-TRANS-WP29-GRPE-59e.pdf as well as in WP.29 reports ECE/TRANS/WP.29/1077, paras. 104 and 105 at: http://www.unece.org/trans/doc/2009/wp29/ECE-TRANS-WP29-1077e.pdf and ECE/TRANS/WP.29/1079, para. 112 at: http://www.unece.org/trans/doc/2009/wp29/ECE-TRANS-WP29-1079e.pdf
2	*WHDC*	*Worldwide harmonized Heavy-Duty emission Certification procedure (gtr No. 4)*
	Goal:	To develop a new test procedure for the emissions of gaseous pollutants (NO_x, CO, HC) and particles from heavy-duty vehicle engines.
	Timeline:	This gtr was established on 15 November 2006. Gtr No. 4 is available at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29glob_registry.html The time schedule for the insertion of performance requirements has still to be defined.

	Status:	Recently, this gtr was fully harmonized (except the option for reference fuels). GRPE is expected to resume, in 2010, its work on the elaboration of limit values for the gaseous pollutants (NO_x, CO, HC, particles) in parallel with the Euro VI limit values. The provisions of the equivalent Regulation No. 49 were aligned with those of this gtr.
	Remark:	Technical sponsor of gtr No. 4 is the European Union. The GRPE informal group on WHDC is chaired by the European Commission. More information can be found at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/whdc_minutes.html
3	*WMTC*	*Worldwide harmonized Motorcycle emission Test Cycle (gtr No. 2)*
	Goal:	To develop a new test procedure for emissions of gaseous pollutants from motorcycle engines, including the measurement method for CO_2 emissions (in g/km).
	Timeline:	This gtr was established on 22 June 2005. Gtr No. 2 is available at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29glob_registry.html It does not yet include limit values for the gaseous pollutants (NO_x, CO, HC). A proposal for the insertion of performance requirements is expected to be adopted in 2010.
	Status:	The work on the insertion of limit values for the gaseous pollutants was finalized by GRPE in June 2009. WP.29 is expected to consider a proposal for limit values in March or June 2010. The provisions of Regulation No. 40 have still to be aligned with those of the gtr.
	Remark:	Technical sponsor of this gtr is Germany. More information can be found on: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/grperep.html
4	*NRMM*	*Engine exhaust emission test protocol for Non-Road Mobile Machinery (gtr No. 11)*
	Goal:	To develop new worldwide harmonized provisions for the measurement of emissions of gaseous pollutants (NO_x, CO, HC, particles) from Non-Road Mobile Machinery (NRMM) engines.
	Timeline:	The gtr on the NRMM was established in the Global Registry in November 2009 on the basis of: http://www.unece.org/trans/doc/2009/wp29/ECE-TRANS-WP29-2009-120e.pdf http://www.unece.org/trans/doc/2009/wp29/ECE-TRANS-WP29-2009-121e.pdf.
	Status:	At its June 2009 session, GRPE finalized the draft gtr on NRMM emissions (without performance requirements). WP.29 considered and adopted the proposals at its November 2009 session. Gtr No. 11 will be made available at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29glob_registry.html CP have now to initiate, at a national or regional level, the process to transpose the gtr into their national or regional legislation.
	Remark:	NRMM engines means combustion engines intended to be fitted on agricultural or forestry tractors and machineries as well as on locomotives, vessels and ships. The technical sponsor of the NRMM gtr is the European Union. The informal group on NRMM concluded its work. For more information, see: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/nrmm_mtng_minutes.html

5	*OCE*	*Off-Cycle Emissions for heavy-duty vehicles (gtr No. 10)*
	Goal:	To develop, in addition to the normal emission test cycle for heavy-duty vehicles (WHDC), further specifications for OBD systems especially regarding the adherence to a Not-to-exceed (NTE) protocol to ensure that emission limits are met in use, not only under normal conditions, but under a wide range of operating conditions (e.g. low temperatures, high altitude, etc.).
	Timeline:	This gtr was established as gtr No. 10 on 24 June 2009. Gtr No. 10 is available at http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29glob_registry.htm.
	Status:	At its June 2009 session, WP.29 agreed to establish into the Global Registry the draft gtr on OCE. CP have now to initiate, at a national or regional level, the process to transpose the gtr into their national or regional legislation.
	Remark:	The technical sponsor of the OCE gtr is the United States of America. The informal group on OCE concluded its work. More information can be found at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/oce.html
6	*WWH-OBD*	*World-Wide harmonized Heavy duty On-Board Diagnostics (gtr No. 5)*
	Goal:	To develop harmonized prescriptions for On-Board Diagnostics (OBD), which are used on light-duty and heavy-duty vehicles, in order to ensure in their daily service proper engine performance and to assist in malfunction diagnostics and repair.
	Timeline:	This gtr was established on 15 November 2006. Gtr No. 5 is available at http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/wp29glob_registry.htm. The prescriptions for light-duty vehicles have not yet been included into gtr No. 5.
	Status:	The provisions of the equivalent Regulation No. 49 were aligned with those of this gtr.
	Remark:	The technical sponsor of this gtr was the United States of America. More information can be found under WWH-OBD at the GRPE website: http://www.unece.org/trans/main/wp29/meeting_docs_grpe.html
7	*PMP*	*Particulate Measurement Programme*
	Goal:	To develop new test protocols, with instrumentation, to assess and control nano-particle emissions from (a) light duty vehicles and from (b) heavy-duty vehicle engines within the range of 10 to 500 nm (with respect to health effects).
	Timeline:	(a) The PM measurement procedure for light-duty vehicles has been finalized in 2008 and was incorporated into Regulation No. 83 (per Suppl.7 to 05 series, see: http://www.unece.org/trans/main/wp29/wp29regs/r083r3a2e.pdf). (b) The PM measurement procedure for heavy-duty vehicles is expected to be finalized by the end of 2010.
	Status:	(a) The new PM measurement procedure for light-duty vehicles improved the former particle mass measurement procedure and incorporated a new one for particle numbering. GRPE continue its work to further improve the calibration and the accuracy of that measurement method. (b) With regard to the PM measurement procedure for heavy-duty vehicles, the validation exercise was recently concluded. In this respect, GRPE considered at its January 2010 session the draft report on this validation exercise as well as a first proposal for amendments to Regulation No. 49.

	Remark:	The informal group on PMP is chaired by the United Kingdom. More recent information can be found at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/pmp25.html
8	*FQ*	*Fuel Quality*
	Goal:	To develop recommendations on market fuel quality to enable that vehicles, which were tested in conformity with the United Nations regulations or other equivalent regulations and using specific reference fuels for the tests, use in their daily service fuels with specific characteristics relating to the vehicle emission levels and engine technology type. In this respect, the recommendations contribute to environmental protection, specifically to the reduction of air pollution.
	Timeline:	GRPE is expected to finalize a first set of recommendations (solving the technical concerns) by the end of 2010. The completion of the full set of recommendations is a huge task, which timeline is still under consideration.
	Status:	The WP.29 Round Table on Fuel Quality, held on 15 November 2007, showed that there is a close link between the market fuel quality and the emissions of pollutants from motor vehicles. It was recognized that a further reduction of emissions through more stringent emission regulations requires more advanced emission control technologies, which drives the crucial need for improved fuel quality. GRPE set up an informal group on Fuel Quality (FQ) and to proceed in a two-step approach to develop: (a) first the specifications for parameters which influence emission control devices (i.e. solving the technical concerns), and, (b) if agreeable by the oil industry, specifications for parameters which influence the engine tailpipe emissions (i.e. addressing health risks) at a further step (subject to the confirmation by WP.29 of the extension of the informal group's mandate). GRPE is expected to consider in 2010 a first set of fuel quality parameters (ranges or limit values for the content of lead, sulphur, benzene, metallic additives etc.) deemed necessary to enable the corresponding motor vehicle emission levels starting from EURO 2 up to EURO 5, if possible. GRPE also agreed that this exercise could be carried out for liquid fuels (gasoline and diesel, including biofuels) and, subsequently, for gaseous fuels (including biogases).
	Remark:	The informal group on FQ is chaired by France. For more information see: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/fq05.html
9	*EFV*	*Environmentally Friendly Vehicles*
	Goal:	(a) To continue a fruitful cooperation between WP.29 and future international conferences on Environmentally Friendly Vehicles (EFV) and to foster the development and introduction of EFVs as well as renewable fuels. (b) To review, in a short term view, the feasibility of the proposed EFV concept (evaluation method, integrated approach).
	Timeline:	The GRB/GRPE informal group work in parallel to the international EFV conferences, held every two year.

	Status:	Following the positive outcome of the EFV conferences in Tokyo (2003) and Birmingham (2005), it was decided at the third EFV conference in Dresden (2007) to develop a close cooperation with the World Forum WP.29 and its subsidiary bodies, especially with GRPE and GRB, and to establish a new informal group on Environmentally Friendly Vehicles. Future EFV conferences will focus on: (a) Status report regarding the set goals; (b) Exchange of experiences regarding ongoing measures for promoting and facilitating the introduction into the market of EFVs; (c) Exchange of experiences and analysis regarding the legal and economic framework; (d) Regular status report to the G8-Leaders (according to the decision at Heiligendamm/Germany). With regard to the feasibility statement for the development of a methodology to evaluate EFV, GRPE agreed *that, from a procedural point of view, the development of a harmonized EFV concept was feasible.* The fourth EFV Conference was held in New Delhi (India) on 23-24 November 2009. The conference welcomed the feasibility study and endorsed the work done by WP.29. *As an outcome of that conference, a conclusion paper was generated to provide political* guidance for the EFV informal group with regard to development of future EFV concepts.
	Remark:	It was agreed that the next EFV Conference will be organized by the United States of America for 2012. As usually, the organizing country of the EFV conference will chair the EFV informal group (Germany 2008-2009, India 2010-2011, USA 2012-2013). The presentations and the conclusion paper of the EFV conference in Dresden are available on the website: www.bmvbs.de and those of New Delhi at: www.4efv.in More information about the EFV informal group can be found at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/efv05.html
10	*HFCV*	*Hydrogen and Fuel Cell Vehicles*
	Goal:	To develop and establish a global technical regulation (gtr) on Hydrogen and Fuel Cell Vehicles (HFCV) that attains equivalent levels of safety as those for conventional gasoline powered vehicles, without any restriction for future innovative technologies. In addition, all aspects regarding the environmental protection are considered under the development of the new gtr or as amendments to existing gtrs.
	Timeline:	Establish by the end of 2010 a gtr for the safety of hydrogen-powered vehicles based on a component level, subsystems, and whole vehicle crash test approach. Beyond 2010, the gtr will be amended to include crash test requirements for HFCV regarding whole vehicle crash testing for fuel system integrity, based on research results and taking into account the latest status of technologies.
	Status:	In June 2005, WP.29 considered a roadmap for the development of a gtr for HFCV and agreed to set up an informal group on HFCV. In order to address adequately safety and environmental provisions, it was agreed to set up two subgroups to address environmental issues (SGE under GRPE) and safety concerns, including crashworthiness (SGS under GRSP). Three main areas are under consideration: fuel system, electrical safety and hydrogen storage system. The gtr will cover, in the first step, passenger cars with fuel cells (FC) or internal combustion engines (ICE), or engines using compressed gaseous hydrogen (CGH2) or liquid hydrogen (LH2). For crash testing, it is planed to develop new provisions for a maximum allowable level of hydrogen leakage and to specify in the gtr that each CP can use, in a first step, its existing national crash tests.

	Remark:	The technical sponsors of the HFCV gtr are Germany, Japan and the United States of America. The GRPE informal group on HFCV is chaired by Germany. See: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grsp/sgs_8.html http://www.unece.org/trans/main/wp29/wp29wgs/wp29grsp/elsa_7.html http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/grpehfcv-sge04.html
11	*GFV*	*Gaseous-Fuelled Vehicles*
	Goal:	To foster vehicles using Liquid Petroleum Gas (LPG) or Compressed Natural Gas (CNG) as an alternative fuel in their propulsion system as well as to evaluate regulatory requirements regarding the use of LPG and CNG components and systems on vehicles, with the aim to adapt existing Regulations to technical progress and to consider the performance requirements, taking into account new technologies.
	Timeline:	The GFV mandate was extended by a 2 years period until the end of 2011.
	Status:	The GRPE informal group made good progress and has prepared a number of amendments to existing Regulations. At the present time, the group considers, among others, new provisions for methane and non-methane hydrocarbons.
	Remark:	The informal group on GFV is chaired by the Netherlands. For more information see: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/gfv08.html
12	*HEV*	*Hybrid-Electric Vehicles*
	Goal:	To develop new provisions for HEV with regard to the measurement of the fuel consumption and CO_2 emissions, electric energy consumption and to prepare the corresponding amendments to the existing Regulations.
	Timeline:	Concluded in 2004 and included in Regulations Nos. 83 and 101 available at: http://www.unece.org/trans/main/wp29/wp29regs/r083r3e.pdf http://www.unece.org/trans/main/wp29/wp29regs101-120.html
	Status:	The provisions of the corresponding Regulations have been updated with the requirements for HEV. CP have already transposed them into their national/regional legislation by applying the amended Regulations.
	Remark:	More information can be found on: http://www.unece.org/trans/main/wp29/wp29regs.html

13	*PHEV*	*Plug-in Hybrid-Electric Vehicles*
	Goal:	To better reflect in the existing Regulations Nos. 83 and 101 the environmental benefits of hybrid vehicle based on plug-in hybrid concepts.
	Timeline:	Concluded in 2008
	Status:	The provisions of the corresponding Regulations have been updated with the requirements for PHEV. Most CP have already transposed them into their national/regional legislation by applying the amended Regulations.
	Remark:	More information can be found at: http://www.unece.org/trans/main/wp29/wp29regs.html
14	*EV*	*Electric Vehicles (Regulation No. 100)*
	Goal:	To enlarge the scope of Regulation No. 100 to all categories of vehicles with an electric power train (specific requirements for the construction, functional safety and hydrogen emission) with additional provisions regarding the protection against electric (high voltage) shocks during the normal use of such vehicle.
	Timeline:	WP.29 is expected to consider and adopt a final proposal for amendments in 2010.
	Status:	The GRSP informal group on Electric Safety (ELSA) has prepared, in a first phase, an amendment to existing Regulation No. 100 for consideration by WP.29 in March 2010. The ELSA informal group will, in a second phase, to develop specifications to protect the occupants of vehicles with an electric powertrain against electric shocks in case of frontal or lateral collisions (e.g. amendments to Regulations Nos. 94 and 95).
	Remark:	More information can be found at: http://www.unece.org/trans/main/wp29/wp29regs81-100.html http://www.unece.org/trans/main/wp29/wp29wgs/wp29grsp/elsa_7.html
15	*CO_2*	*Fuel consumption, CO_2 emissions and electric energy consumption (Regulation No. 101)*
	Goal:	To set up a Regulation for the measurement of the fuel consumption and CO_2 emissions of light vehicles (of categories M_1 and N_1) as well as the electric energy consumption of electric and hybrid electric vehicles.
	Timeline:	Concluded in 2004
	Status:	The provisions of the corresponding Regulations have been updated with the requirements for fuel consumption and CO_2 emissions (without any limit values) of vehicle engines as well as the electric energy consumption, for the purpose of consumer information. CP have transposed them into their national/regional legislation by applying the Regulation.
	Remark:	More information can be found at: http://www.unece.org/trans/main/wp29/wp29regs101-120.html
16	*ITS*	*Intelligent Transport Systems*
	Goal:	To set up the information basis on which a new gtr on Intelligent Transport Systems (ITS) could be developed in a long-term view. In this respect, a common understanding of driver assistance systems should be developed, taking into account the latest information on technology trends.
	Timeline:	WP.29 is reviewing this activity every second year.

	Status:	WP.29 organized a Round Table on "Intelligent Transport Systems" which was held in Geneva on 18 February 2004 in conjunction with the sixty-fifth session of the Inland Transport Committee (ITC). It was recommended to focus the topics of the round-table on vehicle-based systems only and to establish, under WP.29, an informal working group on ITS. The informal group is considering different types of assistance with regard to human processing and driving conditions and possible follow-up to the driver as an information, as a warning or, in certain pre-crash conditions, as control function, if necessary. Such Intelligent Transport Systems can also interact between vehicles and road infrastructures. The goal of such ITS is to identify and manage the traffic flow in order to reduce or even avoid traffic congestion and road accidents. For this purpose, the World Forum set up an informal group on ITS to develop harmonized provisions for such intelligent vehicle systems as well as intelligent traffic information and communication technologies. The informal group meets at least once a year. Currently, GRRF is considering such innovative technologies, specifically Advanced Emergency Braking Systems (AEBS) and Lane Departure Warning (LDW) systems.
	Remark:	The informal group on ITS is co-chaired by Japan and the United Kingdom. For more information, see: http://www.unece.org/trans/main/itc/itcrt_its.html or http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/genits18.html
17	*RR*	*Reduction of the Rolling Resistance of pneumatic tyres*
	Goal:	To develop new provisions for the indication by the tyre manufacturers of the tyre rolling resistance coefficient in the type approval communication. This will allow approval authorities to collect data on tyre rolling resistance coefficients and enable them to consider, at a later time point, the possible introduction into the corresponding Regulations of limit values for rolling resistance. In a long-term view, the new provisions will contribute to environmental protection, specifically to the reduction of fuel consumption of vehicles by a reduced rolling resistance of vehicle tyres.
	Timeline:	By 2012 at latest
	Status:	For the purpose of rolling resistance, GRB is considering at its February 2010 session to revise the tyre family definition as it is different from that used for rolling noise and wet grip adhesion. Furthermore, the title and the scope of Regulation No. 117 have to be adapted. In this respect, the European Commission is preparing, jointly with the experts from ETRTO, a proposal for amendments to Regulation No. 117 for consideration at the next GRB session in September 2009.
	Remark:	More information can be found at: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grb/grbrep.html
18	*RB*	*Regenerative Braking (Regulations Nos. 13 and 13-H)*
	Goal:	To develop electric regenerative braking systems able to recover the vehicle braking energy.
	Timeline:	Concluded in 2008 and included in Regulations Nos. 13 and 13-H available at: http://www.unece.org/trans/main/wp29/wp29regs/r013hr1e.pdf http://www.unece.org/trans/main/wp29/wp29regs/r013r6e.pdf
	Status:	The provisions of the Regulations have been updated with the new requirements. CP transpose them into national/regional legislation by applying the amended Regulations.
	Remark:	More information can be found at: http://www.unece.org/trans/main/wp29/wp29regs1-20.html

19	*TPMS*	*Tyre Pressure Monitoring Systems (Regulation No. 64)*
	Goal:	To develop new harmonized provisions for Tyre Pressure Monitoring Systems (TPMS) in order to (a) ensure the correct inflation of tyres fitted on vehicles and, thus, (b) to improve vehicle safety and an improved energy efficiency by reducing the rolling resistance.
	Timeline:	GRRF agreed on the proposal at its September 2009.
	Status:	At its November 2009 session, WP.29 adopted the proposal on the basis of document: http://www.unece.org/trans/doc/2009/wp29/ECE-TRANS-WP29-2009-129e.pdf.
	Remark:	The informal group on TPMS concluded its task. For more information see: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grrf/grrf-inftpm5.html
20	*LED*	*Headlamps with Light Emitting Diode technologies*
	Goal:	To improve the active safety and energy efficiency of vehicle headlamps by developing new provisions for the installation on vehicles of much more energy efficient lighting devices based on Light-Emitting Diode (LED) technologies.
	Timeline:	Provisions for LED headlamps were concluded in 2008 and inserted into Regulation No. 112: http://www.unece.org/trans/main/wp29/wp29regs/r112r1a3e.pdf Technical provisions for LED light sources are currently under development.
	Status:	With regard to the LED headlamps, the corresponding Regulations have been updated and are already in force. In March 2010, WP.29 is expected to consider and adopt a new Regulation on LED light sources for lighting and light-signalling devices.
	Remark:	Such LED light sources can be used in headlamps, the dedicated Daytime Running Lamps (DRL) and in light-signalling devices. Thus, the introduction into the market of such LED light sources will further reduce the consumption of energy.
21	*MAC*	*Mobile Air Conditioning systems*
	Goal:	To develop, in parallel with the ongoing work on the Worldwide harmonized Light vehicle emissions Test Procedures (WLTP), a new test procedure to evaluate the energy efficiency of such MAC systems for motor vehicles.
	Status:	The informal group on MAC was established by GRPE at its January 2010 session and will soon start its work under the chairmanship of the European Commission.
22	*HD-HEV*	*Heavy Duty Hybrid Electric Vehicles*
	Goal:	To develop, in relation with the ongoing work on gtr No. 4 on WHDC, new emission test procedures for engines used for the propulsion of trucks equipped with a hybrid electric powertrain.
	Status:	The informal group on HD-HEV was established by GRPE at its January 2010 session, subject to the consent of WP.29 at its March 2010 session and to the commitment of CP to ensure the technical sponsorship.
23	*REC*	*Retrofit Emission Control devices*
	Goal:	To harmonize the requirements for emission control devices produced for the replacement of such devices in vehicles already in use.

	Status:	The informal group on REC was established by GRPE at its January 2010 session (subject to the consent of WP.29 at its March 2010 session) and will soon start its work under the chairmanship of the Netherlands.