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#### **Other Business – Follow-up of the round table on climate change and transport**

## **Summary Report of the WP.29 Round Table on Climate Change and Transport**

### **Note by the secretariat\***

The text reproduced below, by the secretariat, summarizes the Round Table on Climate Change and Transport which took place in Geneva on 24 June 2010, during the 151<sup>st</sup> session of the World Forum for Harmonization of Vehicle Regulations (WP.29). It is mainly based on ECE/TRANS/WP.29/2010/141 amended as requested by WP.29 at its November session (ECE/TRANS/WP.29/1087, para. 87). The World Forum is expected to consider the follow-up of the Round Table at its March 2011 session.

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\* 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.

## Summary Report of the WP.29 Round Table on Climate Change and Transport

### Contents

<i>Chapter</i>	<i>Page</i>
I. Introduction .....	3
II. Climate Change and Transport .....	4
A. The facts .....	4
B. WP 29 and Actions that relate to Climate Change .....	4
III. Overview of the WP.29 Round Table .....	6
IV. The Proceedings of the Round Table by Presenter	
A. Opening session .....	7
B. Main session:	
Climate change and the environmental impact of transport .....	7
Main session:	
Road vehicles and Climate Change Mitigation .....	9
C. Closing session .....	10
V. Summary of the WP.29 Round Table.....	11
Annex	
WP.29 and a Chronology of CO <sub>2</sub> relevant activities .....	12

## I. Introduction

1. The mandate of the United Nations Economic Commission for Europe (UNECE) is to promote and facilitate economic development in the region and transport is one of the key sectors. It provides mobility and access to basic services, such as health and education for all. It is vital to the well functioning of economies, to the production and distribution of goods as well as to trade and tourism. 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.

2. However, transport has also negative externalities that need to be dealt with: impact on climate change, environmental pollution, noise, accidents and extensive use of resources (i.e. fossil fuels). Therefore, a shift from pure mobility objectives towards sustainable transport objectives is necessary. It is important to consider how to reduce the adverse impacts of future transport systems in order to provide sustainable mobility and economic development without reducing the ability of future generations to meet their own needs.

3. Following a policy presentation on global warming and transport during its November 2008 session, the World Forum for the Harmonization of Vehicle Regulations (WP.29) considered the possibility to organize a substantive round table on this subject concurrent with one of its subsequent sessions. In February 2009, the Inland Transport Committee (ITC) endorsed the idea that WP.29 move forward with the organization of such a Round Table (ECE/TRANS/206, para. 29).

4. The World Forum agreed to organize the Round Table on Climate Change and Transport, in conjunction with its June 2010 session, with the aim of identifying potential scenarios to which the World Forum WP.29 could contribute, in its future work on climate change mitigation and adaptation.

5. The Programme for the Round Table held on June 24, 2010 consisted of three segments: (a) an opening segment with introductory comments provided by the Mr. Ján Kubiš, Executive Secretary of the UNECE, (b) the main session where a series of experts from industry, academia, consumer and environmental organizations as well as specific government and intergovernmental agencies made presentations to provide information and views on various topics relating to the general themes of “Climate change and the environmental impact through transport” and “Road Vehicles and Climate Change Mitigation”, and (c) a closing segment providing a summary of the speakers remarks and comments regarding the issues addressed during the Round Table by Ms. Eva Molnar, Director of the UNECE Transport Division. During the Round Table, presenters addressed not only new fuel/energy efficient and innovative vehicle technologies, but also Intelligent Transport Systems (ITS), inter-modal transport links and inter-sectoral links.

6. The final programme of the Round Table is available as ECE/TRANS/WP.29/2010/91 on the UNECE website at <http://www.unece.org/trans/main/wp29/wp29wgs/wp29gen/gen2010.html>.

7. All background documents, presentations, and, this summary report on the WP.29 Round Table on Climate Change and Transport are available on the UNECE website at [http://www.unece.org/trans/events/ClimateChange\\_Transport.html](http://www.unece.org/trans/events/ClimateChange_Transport.html).

## **II. Climate Change and Transport**

### **A. The facts**

8. The inland transport sector is the fastest growing source of global greenhouse gas (GHG) emissions and road transport is responsible for about 80 per cent of all transport related energy consumption (Organization for Economic Cooperation and Development, 2008). Fossil fuel combustion is the main contributor to air pollution and GHG emissions, especially carbon dioxide (CO<sub>2</sub>). Particularly in emerging economies, vehicle ownership is expected to increase largely within the next decades and technological advances are unlikely to offset that increase in CO<sub>2</sub> emissions in the transport sector.

9. The first assessment report of the Intergovernmental Panel on Climate Change (IPCC) was completed in 1990, and served as the basis of the United Nations Framework Convention on Climate Change (UNFCCC). The report mentioned that emissions resulting from human activities substantially increase the atmospheric concentrations of greenhouse gases, resulting on average in an additional warming of the Earth's surface and that CO<sub>2</sub> has been responsible for over half the enhanced greenhouse effect. The panel predicted that under a "business as usual" (BAU) scenario, global mean temperature will increase by about 0.3 °C per decade during the twenty-first century. The objective of UNFCCC is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (man-made) interference with the climate system.

### **B. WP.29 and Actions that relate to Climate Change**

10. The development of worldwide harmonized technical provisions aim to reduce trade barriers and quickly introduce innovative engine technologies and efficient powertrains for greener vehicles into the global market.

11. In this respect, the World Forum WP.29 and its subsidiary Working Parties have already considered a large number of issues regarding the energy efficiency of the vehicle fleet, such as:

(a) innovative vehicle technologies, i.e. provisions for Environmentally Friendly Vehicles (EFV) such as Hybrid Electric Vehicles (HEV), 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);

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

(d) use of other alternative fuels such as liquefied petroleum gas (LPG), compressed natural gas (CNG) and biofuels (liquid and gaseous);

(e) development of quality specifications for market fuels related to the vehicle emission levels and engine technology type;

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

(g) development of driver assisting features, such as Intelligent Transport Systems (ITS), intelligent Information and Communication Technologies (ICT) to prevent traffic congestion.

12. The most important achievements of the World Forum WP.29 abating CO<sub>2</sub> emissions are listed in the annex to this conclusion document.

13. Within the World Forum, the following ongoing activities of its Working Groups consider subjects related to the reduction of CO<sub>2</sub> emissions:

(a) Worldwide harmonized Light vehicles emissions Test procedure (WLTP): following detailed consideration in 2010 of a roadmap for the development of WLTP, the World Forum mandated an informal group to start work on the elaboration of new emissions test cycles and procedures for light vehicles with regard to the measurement of fuel and energy consumption, the emissions of gaseous air pollutants (NO<sub>x</sub>, CO, HC), particles and particulates. This new test procedure will better reflect the real world conditions of vehicle operation.

(b) Mobile Air Conditioner Test Procedure (MACTP): in 2010, the World Forum set up an informal working group to develop, in parallel with the ongoing work on the WLTP, a new test procedure to evaluate the energy efficiency of Mobile Air Conditioner (MAC) systems for motor vehicles.

(c) Heavy Duty Hybrids: in 2010, the World Forum set up a working group to develop new test procedures for the measurement of emissions of air pollutants and CO<sub>2</sub> from engines used for the propulsion of commercial vehicles equipped with a hybrid electric powertrain.

(d) Hydrogen and Fuel Cell Vehicles (HFCV): in 2005, the World Forum set up an informal working group to develop and establish a global technical regulation (gtr) on HFCV that attains equivalent levels of safety as those for conventional gasoline powered vehicles, without any restrictions for future innovative technologies. While focused on addressing safety issues, the establishment of the gtr could ultimately serve to promote the broader market introduction of these advanced technology vehicles.

(e) Electric Safety (ELSA): in 2007, the World Forum set up a working group to prepare, as a first phase, an amendment to Regulation No. 100. This amendment, adopted by WP.29 in March 2010, applies to all categories of vehicles with an electric power train and supplements the Regulation with additional provisions regarding protection against electric shocks (high voltage) during the normal use of the vehicle. The working group continued to develop, as a second phase, specifications to protect the occupants of vehicles with an electric powertrain against electric shocks in case of frontal or lateral collisions (i.e. these amendments to Regulations Nos. 12, 94 and 95 were adopted by WP.29 at its November 2010 session).

(f) Fuel Quality: in 2007, the World Forum showed the close link between market fuel quality and emissions of pollutants from motor vehicles. It recognized that further reduction of emissions required that cleaner fuel be available to consumers. The lack of harmonized fuel quality requirements was seen to hamper the development of new vehicle technologies (e.g. aftertreatment systems, catalytic converter, particle filter). For that reason, the World Forum was urged to develop such uniform provisions for cleaner market fuels and, therefore, set up a specific expert group to develop recommendations for market fuel quality. A first set of specifications is expected to be finalized by mid-2011.

(g) Environmentally Friendly Vehicles (EFV): at the third EFV conference held in Dresden (2007), the World Forum WP.29 agreed to establish a new informal group on EFV to ensure close cooperation with the organizers of future EFV conferences aimed at the following achievements:

- (i) Status report regarding the set goals;
- (ii) Exchange of experiences regarding ongoing measures for promoting and facilitating the introduction of EFVs into the market;
- (iii) Exchange of experiences and analysis regarding the legal and economic framework.

14. Following the fourth EFV Conference in New Delhi (November 2009), the EFV informal group considered, under the chairmanship of India, a holistic approach for evaluating EFVs, based on parameters such as CO<sub>2</sub> emissions, noise level, gaseous pollutants, the recyclability and type of fuels. According to the integrated well-to-wheel approach as considered in the feasibility study prior to the conference in New Delhi, further analysis is needed concerning the purpose and target group of the future EFV concept. The EFV group continues to evaluate the potential for detailing a definition and criteria for assessing environmentally friendly vehicles. Detailed information on these parameters is available at: [www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/efv07.html](http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/efv07.html).

15. The World Forum continues to address the energy efficiency of new motor vehicles in the context of technical regulations. There are important efforts to mitigate climate change. However, it is clear that the construction of vehicles cannot be the only solution to reduce CO<sub>2</sub> emissions in the transport sector. Thus, technical regulations and emission measurement procedures need to be further developed, taking into account the introduction and deployment of new and innovative propulsion technologies as well as a broader use of alternative fuels.

### **III. Overview of the WP.29 Round Table**

16. There was clear consensus among the presenters, representing scientists, policy-makers, engineers and business leaders from the automotive industry that concerted action is needed to address climate change through the reduction of greenhouse gas emissions.

17. Stakeholders discussed strategies that should be addressed in the short-term within the inland transport realm, including:

- (a) improved energy efficiency of all inland transport modes;
- (b) a broader use of sustainable biofuels and hydrogen, as well as a sustainable generation of electricity;
- (c) a better traffic flow and transport infrastructure, including intermodal transport, to avoid congestion;
- (d) a broader information campaign and in-depth education on measures to reduce CO<sub>2</sub> emissions.

18. In the long-term, there should be a shift in the automotive sector from the use of fossil energy to innovative propulsion systems, alternative energy sources and integration of less energy demanding technologies. It was recognized that this shift alone will not solve the problem, if the production of hydrogen and the generation of electricity is not also sustainable.

19. It was noted that the effectiveness of an integrated approach for green vehicles depends on the energy sector ensuring the sustainable and cost-effective generation of electricity and production of hydrogen. Electricity distributors will need to develop a more sustainable electricity offering and adapt to the new users with the possibility of slow and fast recharging of electric vehicles. It is believed that for a faster market penetration of electric, hydrogen and fuel cell vehicles, it is important to set up an infrastructure for instant recharging packs (exchange of electric batteries) for electric vehicles and for safe refuelling of vehicles with fluid and compressed hydrogen.

20. It was generally advocated that the World Forum should continue with its work programme on the worldwide harmonization of vehicle regulations, taking into account the need to continuously adapt to technical progress and to include new performance requirements for innovative technologies.

## **IV. The Proceedings of the Round Table by Presenter**

### **A. Opening session**

21. Mr. Ján Kubiš, Executive Secretary of the UNECE, welcomed the participants to the Round Table and underlined the importance of transport and its socio-economic role. It provides mobility and accessibility to basic services, such as health and education, for all. It is also vital to the well functioning of 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. He also underlined the high importance of the World Forum's activities in the global harmonization of vehicle regulations.

22. However, transport is linked to negative externalities that need to be dealt with: environmental pollution, accidents and extensive use of fossil fuels. There is need for a shift from pure mobility objectives towards sustainable transport objectives. Future transport systems must provide sustainable mobility and economic development without reducing the ability of future generations to meet their own needs. Mr. Kubiš welcomed the decision of the World Forum to organize the Round Table on Climate Change and Transport and to address not only new fuel efficient and innovative vehicle technologies including Intelligent Transport Systems, but also inter-modal transport and inter-sectoral links.

### **B. Main session**

#### **1. Climate change and the environmental impact of transport**

23. Mr. Dirk Inger (Germany) presented the important role of the World Forum and gave an overview of the current and future activities of the World Forum to reduce CO<sub>2</sub> emissions by road vehicles. Referring to the discussion of WP.29 at its November 2008 session on abating climate change and the reduction of CO<sub>2</sub> emissions, he recalled that a possible strategy for the inland 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).

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

25. Mr. Lee Schipper (Stanford University) presented scenarios for future CO<sub>2</sub> emissions in transportation and the future role of the car for sustainable mobility. He outlined the links between transport and CO<sub>2</sub> emissions and listed the needs and co-benefits of a future sustainable transport policy by:

(a) Avoiding traffic congestion and CO<sub>2</sub> intensive development through better urban planning and development;

(b) Shifting CO<sub>2</sub> intensive transport modes to low-carbon ones through improved public transport systems; and

(c) Improving the technologies used on transport modes through innovative technologies such as energy efficient vehicles, low carbon fuels, intelligent transport systems, etc.

26. In this respect, Mr. Schipper outlined the challenge for developed countries and presented key messages for developed and emerging economies.

27. Mr. Martin Magold (UNECE), on behalf of Mr. Robert Thaler (Austria), presented further sustainable transport solutions and more energy efficient transport means which are promoted by the UNECE through the activities and partnerships in ‘The Transport, Health and Environment Pan-European Programme’ (THE-PEP), by fostering the introduction of eco-driving into professional driver training or by promoting human-powered mobility such as cycling and walking as environmentally friendly modes of transport which reduce urban congestion and contribute to public health. THE-PEP launched projects to:

(a) set up tools and methods for an economic evaluation of transport-related health effects;

(b) exchange knowledge and information on how to shift transport demand towards sustainable mobility;

(c) provide guidance for policy integration of safe and healthy modes of transport.

28. Mr. Pierpaolo Cazzola (International Energy Agency) outlined the analysis of transport and low-carbon scenarios by his organization. In his key messages, he confirmed that a reduction of the GHG emissions by 50 per cent in 2050 is feasible, if:

(a) Governments adapt their national policies to the international recommendations for climate change mitigation and adaptation;

(b) The switch to low-carbon technologies is rapid.

29. To achieve this goal, the key steps for the transport sector are improved fuel efficiency, increased electrification of vehicles, alternative fuels and sustainable biofuels as well as a major change in driver/consumer's behaviour and transport logistics including modal shifts.

## **2. Road Vehicles and Climate Change Mitigation**

30. Mr. Dave McCurdy (International Organization of Motor Vehicle Manufacturers (OICA)) highlighted in his presentation that there is no single solution for the abatement of

climate change. To be successful in the ambitious goal of reducing inland transport CO<sub>2</sub> emissions, he underlined that a policy framework must be built on the following elements:

- (a) Policies should be technology neutral, consistent and long-term oriented in order to provide predictability and adequate lead-time;
- (b) Costs of carbon-reduction measures by Governments should be transparent;
- (c) Best practices and successful measures to reduce CO<sub>2</sub> emissions must be shared; and
- (d) Successful policies should integrate innovative vehicle technologies, fuels, transport infrastructure, and consumers.

31. Mr. McCurdy concluded that sustainable mobility depends on collaboration between the automotive industry, Governments, energy providers and consumers through an integrated approach.

32. Mr. Ivan Hodac (OICA and European Motor Vehicle Manufacturers Association (ACEA)) reported on the current major trends the automotive industry and their significance. He also called for an integrated approach taking into account new vehicle technologies, fuels and energies as well as eco-driving, CO<sub>2</sub> based taxation, transport infrastructure and logistics. He stated that the different transport modes are complementary and need to reduce its CO<sub>2</sub> emissions. Therefore, all modes should work in close cooperation to make the best use of each technology. Sustainable mobility requires a supportive policy framework based on the integrated approach and leadership with a clear commitment to manufacturing.

33. Mr. Lars Holmqvist (European Association of Automobile Suppliers (CLEPA)) supported the need for an integrated approach. He listed in his presentation the constraints in developing future environmentally friendly vehicles:

- (a) Limited range of on-board energy storage systems; and
- (b) Affordability and safety of new vehicle technologies.

34. On the need to lead the development towards sustainable mobility, Mr. Holmqvist called for international level action to find an agreement on environmental regulations and to coordinate the global use of energy resources and strategic raw material.

35. Mrs. Susan Prikallidas (Fédération Internationale de l'Automobile (FIA)) showed the vehicle users' perspectives and solutions on road vehicles contribution to climate change mitigation. From the users' perspective, the following combined progressive measures should be addressed:

- (a) Vehicles technologies: Necessity to enhance technological innovation and ensure a rapid introduction into the market of new energy efficient vehicles technologies supported by new worldwide harmonized test cycles for the emissions of pollutants including energy consumption;
- (b) Fiscal incentives: Financial incentives for EFV and goal oriented taxation for vehicles should underpin the development of CO<sub>2</sub> efficient technologies, clean fuels and smart transport infrastructures; and
- (c) Infrastructure and mobility planning: Improved road infrastructure, optimized traffic management and an integrated mobility planning should reduce traffic congestion and remove bottlenecks and missing links in transport infrastructure.

36. Mrs. Prikallidas underlined that campaigns on fuel efficient driver behaviour and on-board driver information (gear-shift indicators) can result in a prompt gain in fuel efficiency and in the reduction of CO<sub>2</sub> emissions.

37. Mr. Jos Dings (Transport and Environment (T&E)) highlighted the important role of transport for economic growth, but stressed the need to advance with a "green transport policy" enhancing a low-carbon and public transport. To achieve this goal:

- (a) Transport vehicles must become energy efficient and, for the transparency of consumers, clearly labelled;
- (b) Emission test cycles for vehicles should urgently be revised to take into account fuel consumption and CO<sub>2</sub> emissions;
- (c) Fuels should be taxed according to their carbon intensity; and
- (d) National taxation systems should be totally or partially based on fuel consumption or CO<sub>2</sub> emissions instead of the vehicle ownership.

### **C. Closing session**

38. In the closing session Ms. Eva Molnar, Director of the UNECE Transport Division, recalled that the main objective of the Round Table was to identify potential scenarios and the main activities to which the World Forum WP.29 could contribute in its future work aimed at climate change mitigation and adaptation. She provided a summary of the presenters' remarks and comments. Referring to the large number of activities by the World Forum on the energy efficiency of the future vehicle fleet, she acknowledged the huge work already done by WP.29. In addition to the commitment by WP.29 to further develop environment friendly vehicles, Ms. Molnar concluded on the need:

- (a) to further develop Intelligent Transport Systems (ITS) and to foster its broader use by drivers to avoid traffic congestion;
- (b) to address inter-modal transport links to improve the modal shifting especially of freight transport;
- (c) to consider the need for inter-sectoral actions such as the sustainable generation of electricity and production of hydrogen;
- (c) to foster urban planning and transport infrastructures with respect to sustainable mobility; and
- (d) for Governments to review their transport and energy policies towards a sustainable mobility.

## **V. Summary of the WP 29 Round Table**

39. The WP.29 Round Table on Climate Change and Transport was held in Geneva on 24 June 2010. A number of excellent and informative presentations were made by representatives of the main stakeholders involved in transport. A large number of suggestions for possible measures to reduce inland transport CO<sub>2</sub> emissions and, thus, contribute to climate change mitigation were provided by the presenters.

40. Many of the presentations highlighted the need for an effective integrated approach by all stakeholders involved, i.e. the international and intergovernmental organizations, the Governments, the automotive industry and their suppliers, road-users, operators, consumers, researchers, journalists as well as the energy suppliers.

41. The World Forum will continue its work:

- (a) to foster more energy efficient, cleaner and safer vehicles and

(b) to look for opportunities to work with all stakeholders in developing technical regulations that will serve as the foundation for reducing greenhouse gases and increasing fuel/energy efficiency from vehicles.

42. All background documents, presentations and related documentation can be consulted on the UNECE website at:

[www.unece.org/trans/events/ClimateChange\\_Transport.html](http://www.unece.org/trans/events/ClimateChange_Transport.html)

## Annex

### WP.29 and a Chronology of CO<sub>2</sub> relevant activities

1. The World Forum WP.29 adopted a number of UNECE Regulations to limit the emissions of pollutants (carbon-monoxide (CO), hydro-carbons (HC), nitrogen-oxides (NOx), particles and particulates) from motorcycle engines (Regulation No. 40), from combustion engines of four-wheeled vehicles (the so-called Euro levels for commercial vehicles in Regulation No. 49 and for passenger cars in Regulation No. 83) as well as from tractors and non-road mobile machinery (Regulation No. 96). Since 1970, a substantial abatement of more than 95 per cent in emission limits (more than 20 times lower than those established 40 years ago). Regarding particulate emissions, the levels are now much lower than those initially set up in 1990. These were large steps forward to cleaner vehicle engines and the World Forum progresses to “green” road vehicles.
2. The World Forum and in particular its subsidiary Working Party on Pollution and Energy (GRPE) work on further reducing the emissions of the above mentioned gaseous pollutants as well as issues related to the fuel/energy consumption and CO<sub>2</sub> emissions of vehicles.
3. CO<sub>2</sub> is a greenhouse gas (GHG) and must be considered in discussions on climate change mitigation. The World Forum has, already in 1997, adopted Regulation No. 101 for the determination of the fuel/energy consumption and CO<sub>2</sub> emissions of vehicle or their engines. However, the provisions were limited to the measurement procedure only.
4. The World Forum has undertaken a large number of measures and established Regulations for the use of alternative energy sources such as liquefied petroleum gas (LPG with Regulation No. 67 in 1987), compressed natural gas (CNG with Regulation No. 110 in 2000) and specific LPG and CNG retrofit systems (with Regulation No. 115 in 2003).
5. Furthermore, the World Forum adopted a number of amendments to the above mentioned UNECE Regulations to type approve electric vehicles (with Regulation No. 100 in 1996), hybrid electric vehicles (in 2004) and, more recently, for the plug-in hybrid electric vehicles (in 2008). Furthermore, the provisions of Regulation No. 83 have been updated (in 2008) to allow the use of biofuels.
6. The World Forum demonstrated in 2007 that there is a close link between market fuel quality and the emissions of pollutants from motor vehicles. It recognized that further reduction of emissions through more stringent emission regulations required more advanced emission control technologies, which drives the crucial need for appropriate fuels to be available on the market for consumers. To this aim, the World Forum set up an informal group to develop recommendations on market fuel quality enabling technologies essential to reducing pollutants, which would ensure that a vehicle tested in conformity with the United Nations regulations and using specific reference fuels for the tests, would achieve the same level of reductions in use and avoid degrading the emission control devices (e.g. catalytic converters, particle filters).
7. Other innovative technologies such as hydrogen and fuel cell vehicles are still under consideration within the World Forum. In this respect, experts of the Working Party on Passive Safety (GRSP) recently developed safety provisions for all specific components, their installation on vehicles as well as their crashworthiness. With regard to the safety of hydrogen and fuel cell vehicles, a first set of amendments to existing regulations had been finalized in 2010 to prevent passengers of such vehicles from electric shocks not only in the

daily use of such vehicles but also in frontal and lateral collisions. The experts continue to consider further improvement on fire risks of vehicles equipped with electric batteries.

8. As an outcome of the third Conference on Environmentally Friendly Vehicles (EFV) held in Dresden (Germany), the World Forum decided in 2008 to set up under GRPE an informal group on this subject. The informal group on EFV held a number of meetings and agreed on the need to consider an integrated approach on the basis of a well-to-wheel analysis, when evaluating the entire lifecycle of the vehicle with regard to the emissions of gaseous and particulate pollutants, CO<sub>2</sub> as well as noise (under Working Party on Noise (GRB)). Thus, the production and distribution of fuels (well-to-tank), the energy efficiency of vehicles (tank-to-wheel) as well as the recyclability and the final disposal of vehicles after their use are under consideration.

9. The World Forum established, in March 2008, a GRPE informal group on worldwide light vehicle emission test procedures (WLTP) to establish a global technical regulation on the measurement of air pollutants including CO<sub>2</sub> emissions. According to the road map to develop such a regulation, the experts are expected to finalize the draft regulation on WLTP by 2014. The expert groups will also consider the introduction of other innovative engine technologies and energy efficient powertrains, such as intelligent engine management systems (e.g. stop and go function), the eco-driving function or gear-shift indicator, etc.

10. GRB works mainly on further noise reduction by road vehicles (Regulations Nos. 41 and 51). The World Forum has established a new noise measurement method for motor vehicles and is now considering establishing new limit values for this new testing method. GRB considers similar proposals for a new measurement method for two- and three-wheelers. The noise emitted by vehicles equipped with a "classical" combustion engine provides very useful information to pedestrians and other road users on the presence of one or more vehicles, their approximate speed, whether the vehicle is accelerating or decelerating, etc. Recently, GRB considered the risks of "silent vehicles" such as electric vehicles that do not emit noises due to the absence of a combustion engine. While such vehicles constitute a key contribution to reducing carbon emissions and rising consumer awareness about climate change, they may prove to be an additional risk for pedestrians and other road users, especially visually impaired people. Upon the request of GRB, the World Forum decided in March 2009 to establish a working group to develop new provisions for the installation of sound devices on silent vehicles that would provide this sound information.

11. In 2007, the World Forum established Regulation No. 117 on tyre rolling noise and wet grip adhesion. Recently, an amendment to this Regulation had been adopted to insert a new test method for the measurement of the tyre rolling resistance. These provisions are aimed at promoting tyres with a low rolling resistance. The World Forum also adopted a proposal to fit new vehicles with tyre pressure monitoring systems (TPMS) to ensure the correct inflation of tyres fitted on vehicles. This will improve not only vehicle safety but also improve the energy efficiency by reducing the rolling resistance.

13. Other subsidiary bodies to WP.29 consider a number of measures to improve the energy efficiency of vehicles. For example, experts consider a multitude of intelligent transport systems (ITS) linked to innovative vehicles technologies such as driver assistant systems or smart traffic management systems to avoid e.g. traffic congestion. Furthermore, experts consider a number of possible measures to reduce energy consumption of electric vehicle equipment (e.g. LED lighting devices) and the vehicle weight (i.e. materials, down sizing).