THE KNOWING-DOING GAP

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The knowing-doing gap will be discussed through two examples: global warming and transport, and road-traffic safety

WE KNOW…

We know that carbon dioxide (CO_2) and methane are the main contributors to the GHG effect. We also know that most of the global CO_2 emissions are caused by transport and energy. At the same time, however, we know that transport is vital for the economy. The freedom of mobility that modern transport services offer is essential both for quality of life and equity; for equity, because transport brings access to work, education, culture, health and other social services.

Energy efficiency of transport is an important issue for many reasons: not only because of climate change, but also because fuel resources are limited.

In the 1980s and 1990s, changes in transport policies and management were triggered by waves of liberalization in the services sector. This phase of international transport development could be characterized as the competitive path; when the primary focus of both Governments and companies was how to increase competitiveness and stay in business in a liberalized market. Soon after the liberalization process started in the transport sector, growing concern for the environment, first and foremost by Governments, international organizations and regional institutions such as the European Union, gradually shifted national and regional transport policies onto the sustainable development path.

Climate change is today causing even more concern, and as this influences policy, we can see changes in industry behaviour. An example is the International Road Federation's project on monitoring and accounting GHG emissions from road infrastructure, i.e. the redevelopment of a GHG calculator. Consequently, efforts to strike the right balance between the competitive and the sustainable development paths call for new technical and economic solutions. The issues, however, affect fair trade and the fair distribution of responsibilities among the developed and the developing world. Global warming, therefore, is not "just" one among many technical issues, it is also an ethical issue.

How much do the different modes of transport contribute to global warming? According to figures from the International Transport Forum, the main part of transport CO_2 emissions (17 per cent) is shared among road vehicles against one per cent for rail and two per cent for inland and maritime navigation. In Japan, however, about 90 per cent of CO_2 emissions generated by the transport sector are caused by road transportation. The International Organization of Motor Vehicle Manufacturers argues that based on motor fuel sold, the share of road transport is not more than 14 per cent.

Continue as we may to debate the exact figures, the fact nonetheless remains that road transport is the biggest CO_2 producer in land transport. Given its fundamental role in economic development, road freight transport will continue to grow. Understanding future scenarios, therefore, is the starting point for any well-designed policy intervention. In OECD member countries, the share of road transport-related CO_2 is expected to flatten through 2030, whereas in non-OECD countries, particularly Brazil, China and India, it is likely to increase at a formidable speed. The number of cars in the world, currently 770 million, will also increase to around two billion by 2020 and this fleet expansion will take place first of all in the emerging economies. According to the International Energy Agency (IEA) forecast, the scenario for 2006-2030 shows that 83.8 per cent of the 2.5 Gt of CO_2 produced by the transport sector will be in non-OECD countries. Globally, road transport will produce up to 1.8 Gt.

We know that global warming, although frightening, is only one element in the sustainable development of transport. Road safety is similarly one of the negative externalities of transport that needs to be addressed.

We know that the global road safety crisis has not yet been solved effectively. Since the first motor vehicle was put into circulation, around 30 million lives have been lost in accidents. Every year 1.2 million people are killed on the roads and a further 50 million injured. The annual number of road injuries exceeds the number of people diagnosed as HIV positive. At the end of the 1990s, road traffic was the world's ninth biggest cause of death and disability. By 2020 it is estimated that it will be the third main cause if new and improved interventions fail to materialize. The age group most affected is the under 40s. Road traffic injuries are the leading cause of death globally among 15-19 year olds, while for those in the 10-14-year and 20-24-year

age brackets, they are the second leading cause of death. Aside from high-income countries, interventions so far have failed to match the severity of road traffic accidents.

Disability adjusted life years (DALYs) lost due to traffic accidents

1998 Disease or injury - global	2020 Disease or injury – global	2020 Disease or injury in developing countries
1. Lower respiratory infection	1. Ischaemic heart disease	
2. HIV/AIDS	2. Unipolar major depression	2. Road traffic injuries
3. Perinatal conditions	3. Road traffic injuries	
4. Diarrhoeal diseases	4. Cerebrovascular disease	
5. Unipolar major depression	5. Chronic obstructivepulmonary disease	
6. Ischaemic heart disease	6. Lower respiratory infections	
7. Cerebrovascular disease	7. Tuberculosis	
8. Malaria	8. War	
9. Road traffic injuries	9. Diarrhoeal diseases	
10. Chronic obstructive pulmonary disease	10. HIV/AIDS	

Source: World Bank and WHO.

We know that transport-policy interventions can handle the environmental, social and safety externalities of transport effectively. Best practices can be found in countries that set an example in "greening" transport, improving road safety, etc. In addition, innovations, particularly in the field of Intelligent Transport Systems, can speed up the process of interventions and can produce faster results.

OUR KNOWLEDGE IS LIMITED, BUT SUFFICIENT FOR ACTION…

All this knowledge is, of course, limited compared with what needs to be known. Many leading assessments suggest that advances in vehicle technology will result in incremental improvements only. However, as attention and action so far have been focused on local pollutants, it seems premature to draw this kind of conclusion. At the turn of the 1980s and 1990s, the environmental crisis in transport led to several agreements and regulations. For instance, the World Forum for Harmonization of Vehicle Regulations (Working Party.29) devoted its mandate to establishing a global process for the worldwide harmonization of technical requirements regarding safety, environmental protection and security of motor vehicles and trailers. These requirements also include specifications to improve the energy efficiency of motor vehicles.

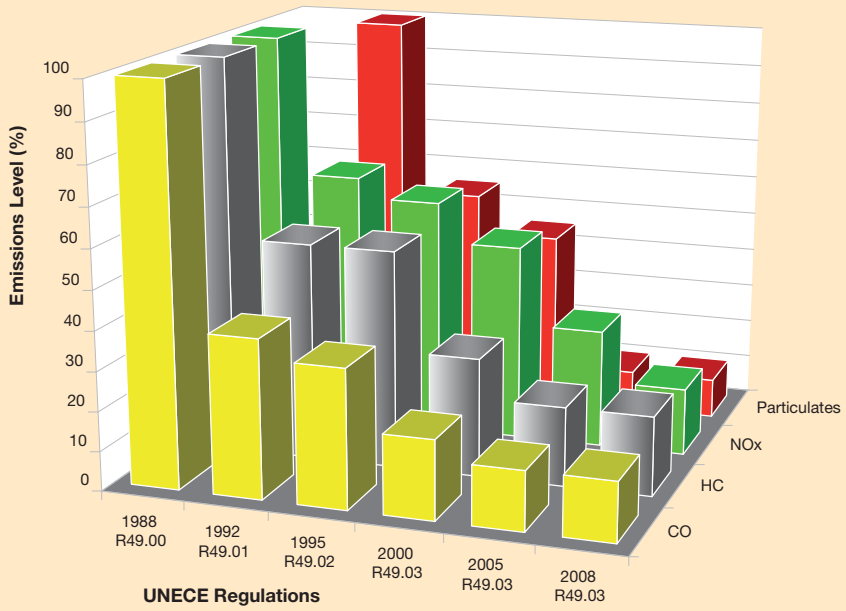
The World Forum has already adopted a number of UNECE regulations, which were annexed to the 1958 Agreement[43] on limiting the emissions of pollutants (CO, HC, NOx and particulates), e.g. from motorcycle engines, from heavy-duty vehicle engines, and from non-road mobile machinery (including engines for the propulsion of locomotives and ships, as well as for agricultural and forestry tractors). These regulations are constantly being adapted to take into account the latest developments in engine technology.

As can be seen in figure 1, the levels of pollutant emissions from heavy-duty vehicle engines have decreased considerably. Local pollutants are 10 times lower today than in 1990. On the basis of these regulations, the World Forum has already established, under the 1998 Agreement,[44] new worldwide harmonized emission test procedures for engines of motorcycles and heavy-duty vehicles, including on-board diagnostic (OBD) systems.

[43] *Agreementconcerningtheadoptionofuniformtechnicalprescriptionsforwheeledvehicles,equipmentandpartswhichcanbefittedand/orbeusedonwheeledvehiclesandtheconditions for reciprocal recognition of approvals granted on the basis of these prescriptions, done at Geneva on 20 March 1958, modified in 1995.*

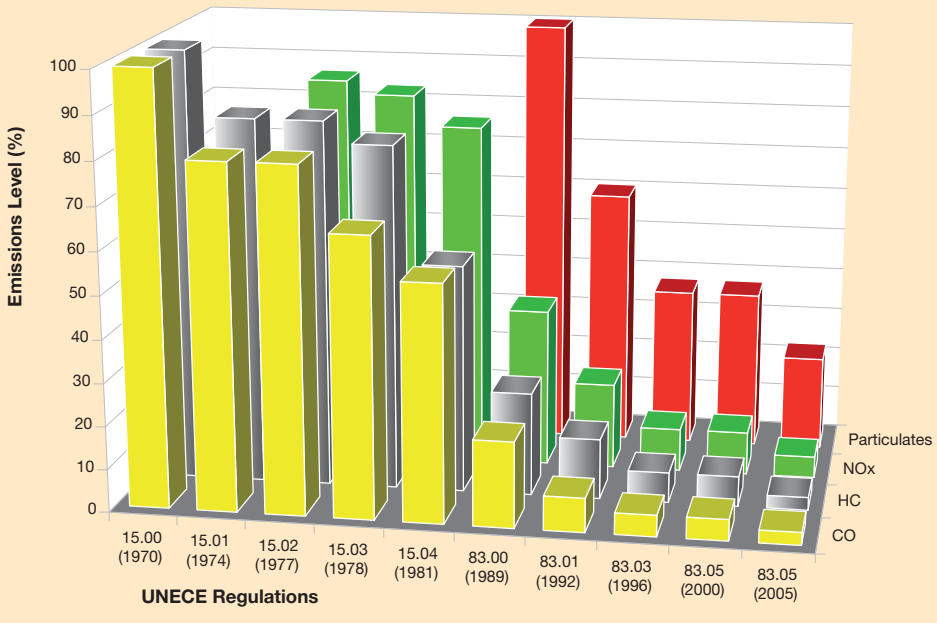
[44] *Agreementconcerningtheestablishingofglobaltechnicalregulationsforwheeledvehicles,equipmentandpartswhichcanbefittedand/orbeusedonwheeledvehicles,doneatGenevaon 25 June 1998.*

Figure 1 Emission limits for heavy transport vehicles



For passenger cars too, the World Forum has adopted regulations for the emissions of gaseous pollutants and particulates. Figure 2 shows that there has also been an abatement of 95-97 per cent in emission limits. Today, passenger cars are 20 times less polluting than they were 30 years ago.

Figure 2 Evolution of emissions of M1 vehicles in Europe



No doubt, results achieved by the "greening" of vehicles are significant. This can make us confident that improvements in CO_2 emissions may lead to more than incremental changes. What needs to be done is already under way in the framework of the World Harmonization Forum:

- Worldwide harmonized emission test procedures for the emissions of pollutants from light vehicles, including the measurement of GHG CO_2 emissions. Once this is completed, it will be possible to agree on CO_2 reduction targets for vehicles, similar to what was achieved for local pollutants;
- Recommendations for market fuel quality, including biofuels (second generation), based on a consensus among government officials and representatives of the automotive and the fuel industries that major improvements cannot be achieved through vehicles only;
- Regulations for environmentally friendly vehicles (such as hybrid, electric, hydrogen and fuel cell vehicles). However, alternative vehicles may not take a significant market share in the next 20 years. From the perspective of global warming, the use of electric cars would only push the problem from the transport sector to the energy sector.

The Ministerial Declaration of the International Transport Forum on transport and energy, which took place in 2008 to discuss the issues of global warming and transport, acknowledged the above-mentioned activities of the World Harmonization Forum and asked Forum participants to make every effort to accelerate the work.

The participants were of the opinion that policy packages are needed to respond to individual situations. To combat climate change, they suggested that transport policy measures could include:

- Improved organization and telematics to optimize inter-linkages of individual modes;
- More effective use of rail, inland waterway and short sea shipping for freight transport;
- Strengthened promotion of public transport, rail and non-motorized means of travel, such as walking and cycling, especially in cities, where the majority of the world's population live;
- More efficient logistics concepts;
- Continued efforts to better integrate land use and transport planning and policy;
- Enhanced efforts to manage travel demand, reduce congestion and pay for externalities.

From the global picture and the broad transport policy solutions, Governments will need to make assessments of their national transport sector. To identify the right policy package, they will need to know the nature of their transport sector's CO_2 production, underpinned by more accurate figures. However, the calculation methods used are either for quick and broad indicators or of rather microscopic scale, e.g. looking at the environmental impact (local pollutants, GHGs, etc.) of investment projects broken down to specific infrastructure sections. New solutions are already on the horizon, particularly to make assessments for cities. There is still a knowledge gap on how to make a reliable analysis of the transportation sector at large, with modal and regional breakdown. The joint UNDA project proposal by the five regional commissions of the United Nations aims at bridging this gap. As part of this project, a two- to three-year research programme would be launched to develop common guidelines for a sector-level, in-depth assessment of CO_2 production by transport in a specific country. A decision-making tool would be created, more precisely an assessment and monitoring tool for the most effective policy measures to achieve these targets.

Similar knowledge gaps in road safety at national level are already being eliminated through the UNDA target-setting project on road traffic casualty reduction[45]. The overarching objective of this project is to assist low and middle income countries in developing regional and national road traffic casualty reduction targets – an approach which has proved effective in several high-income countries – and to provide them with examples of good road-safety practices to help them achieve the selected targets by 2015. In particular, the project informs low and middle income countries about interventions and road safety practices that have brought significant reductions in road traffic injuries and fatalities. These include programmes to address drinking and driving, wearing helmets and seatbelts, speeding, etc. The project is implemented by the five regional commissions, in cooperation with other international organizations and non-governmental organizations (NGOs) active in the field of road safety. UNECE is the manager of the project at the global level and is coordinating its implementation. Project results will contribute to the global debate at the Road Safety Conference that is being organized by the Russian Federation in November 2009.

Notwithstanding the shortcomings in our current knowledge, we know enough to take action. But action remains sporadic and does not always live up to expectations. The speed of knowledge transfer has played a crucial role throughout history.

[45] *UNDA Project on Improving Global Road Safety: setting regional and national road traffic casualty reduction targets.*

In the ancient Greek polis, knowledge centres were strong and famous. They endowed upcoming generations with the basic mathematical laws; for example, through the works of Pythagoras and Thales. Their knowledge, however, did not get disseminated in their contemporary societies. With regard to technology transfer, the well-known difference between the United States of America and the Soviet Union was the time it took to apply a military technological innovation to the civil economy. This was also one of the reasons for differences in economic competitiveness. So we can see how the speed of knowledge dissemination can determine the fate of countries.

Similarly, the knowing-doing gap on how to ensure sustainable development on Earth can determine our future. However, it will not be at a national or regional scale, but global.

BRIDGING THE KNOWING-DOING GAP

Thus, the UNECE Transport Division and its working parties could play a double role as an accelerator in closing the knowing-doing gap and as a facilitator of action in addition to continuing its specific legal and regulatory work.