CASE STUDY - GERMANY

The following information is based on a response to a survey carried out by the International Transport Forum on innovative policy initiatives within member countries, and countries’ efforts to promote innovation.

1. Briefly describe innovative policy initiatives that your government has succeeded in implementing in the transport sector in recent years. Please take the widest possible definition of innovation, including innovative technologies (e.g. ITS), policies, practices (e.g. new pricing mechanisms), etc.

Reducing the Environmental Impacts of Transport:

- German “Integrated Energy and Climate Package”:
  
The Package, launched by the Federal Government in 2007 to contribute to the 40 % CO2 reduction target by 2020, plays an important role. Within the package, 29 fields of specific policy measures are addressed, among them market incentive programmes on renewable energy and sustainable mobility.

- Railways
  
  - Continuation of the railway reform (regulation, etc.);
  - Sustained funding (based on the Service Level and Funding Agreement, LuFV);
  - Noise protection

The largely completed noise abatement measures in the Middle Rhine Valley show that, for particularly affected locations, noise abatement should be complemented with innovative noise and vibration abatement measures. Such measures include:

  - Low noise protection walls right at the track (at the source of the noise);
  - Low gabion walls at the track;
  - Damping elements (equipping sleepers with sole pads, sub-ballast mats);
  - Rail dampers;
  - Vibration-damping trackbeds.

For steel railway bridges with directly mounted tracks, damping elements and vibration-damping track beds are to be used for noise mitigation purposes.
First pilot sections have been equipped or are being prepared.

- Launch of high-speed links;
- ETCS implementation.

Immediately upgrading all the conventional national train control systems to ETCS is not possible for large railway systems such as the one in Germany - neither with a view to the available capacities nor financially. For the conventional railway system in Germany, this means that, in the first step of the migration, the focus will be on equipping a select few international corridors with ETCS. Providing foreign rolling stock with a corridor with seamless ETCS support is given priority over the simultaneous upgrading of all corridors.

- **Electrification of Drive Trains - two major programmes:**

  - National Innovation Programme on Hydrogen and Fuel Cell Technology (NIP) and “National Development Plan for E-vehicles” within a comprehensive “E-Mobility Programme” stretching over several years. Both are innovation programmes for the preparation for commercialisation and introduction of innovative drive trains and technologies for energy storage (fuel cell, EV) using technological innovations.

  - Second Stimulus Programme, investment to promote innovation in transport, above all fuel cell- and storage technologies as well as hybrid drive trains. It especially focuses on a strategy to build up “model regions” as clusters to foster and gain profound experience with the many aspects concerning e-vehicles.

- **Safety and environmental protection in road traffic:**

  The Federal Ministry of Transport, Building and Urban Affairs is participating in the development and implementation of modern technologies aiming to improve road safety and environmental protection by way of a variety of measures and initiatives:

  - Installing of traffic control systems on motorways to control and improve the flow of traffic;

  - Promoting the use of the traffic information service TMC (Traffic Message Channel);

  - Participating intensively in future-oriented projects within the European Union, such as the ITS-Action Plan, CARS 21 or eCall. Preparations for the implementation on the national level of the automated emergency call system eCall are underway.

  - Promoting the use of modern technology in motor vehicles within the framework of the UNECE:

    o Mandatory fitting of new vehicles with advanced driver assistant systems for the improvement of vehicle safety:

      - Fitting of new passenger cars, heavy goods vehicles, buses and coaches with ESC (dates of introduction laid down in EC Regulation, harmonised technical requirements for passenger cars are laid down in the Global Technical Regulation No. 8 and requirements for heavy goods vehicles, buses and coaches in UNECE Regulation No. 13).
Fitting of heavy goods vehicles, buses and coaches with emergency brake assistance and lane departure warning systems (dates of introduction laid down in EC Regulation, harmonised technical requirements still have to be laid down in a UNECE regulation).

Fitting of passenger cars with a tyre pressure monitoring system (TPMS) (dates of introduction laid down in EC Regulation, harmonised technical requirements still have to be laid down in UNECE Regulation No. 64).

Fitting of new motorcycles with ABS (harmonised technical requirements have been determined, mandatory fitting in the EU still has to be laid down in an EC Directive/EC Regulation).

Improving the safety of buses and coaches:

- Mandatory fitting of new buses and coaches with fire detectors in the engine compartment (amendment of UNECE Regulation No. 107).
- Mandatory fitting of new buses and coaches with fire detection systems (amendment of UNECE Regulation No. 107).
- Improving the fire behaviour of the materials used in buses and coaches (amendment of UNECE Regulation No. 108).

Global harmonisation of the requirements for vehicles with electrical drive systems (electric vehicles, hybrid vehicles, fuel cell vehicles) regarding the electrical equipment (amendment of UNECE Regulation No. 100).

**Introduction of European new car CO₂ standards**

This instrument aims at reducing the energy consumption of passenger cars (significant reductions to reach new 95g target for 2020) by legislative measures: The EU New Car CO₂ Regulation agreed in 2008 establishes a long-term framework for action by the industry to develop lower-emission vehicles while taking into consideration the diverse market structures and ensuring fair competitive conditions for car manufacturers across Europe.

**Reformed motor vehicle tax based on CO₂ emissions**

All new vehicles will be under the regime of the new vehicle tax that is based on CO₂ emissions. The reform of the motor vehicle tax which entered into force on 1 July 2009 aims at climate protection, providing an incentive to buy vehicles with lower CO₂ emissions.

**Copenhagen Agreement**

Germany strongly supports a Copenhagen Agreement. It’s aim should be to integrate climate-related targets for the transport sector. This will provide a strong incentive to come up with innovative solutions in shipping and aviation aiming at reducing CO₂ emissions. This will lead to feasible and market-based approaches.
- **Scrappage scheme:**

  The scrappage scheme, part of the Economic Stimulus Package II, was meant to build a strong consumer incentive to buy efficient cars (private consumers received a €2,500 grant when scrapping a vehicle that is at least 9 years old and buying a new model).

- **Start of a National Traffic Noise Mitigation Package in February 2007**

  The package contains a bundle of ongoing and new initiatives to prevent traffic noise and to protect against its impacts, for example by reducing noise emissions from vehicles of all kinds. It also doubles the funds available for noise protection measures to € 50 million annually for federal roads, and €100 million annually for railways and includes a programme for retrofitting the freight car fleet with low-noise brake shoe inserts.

- **Regulation concerning incentives for retrofitting of PM10 filters (since 1 August 2009):**

  This regulation offers a financial incentive (€330) to accelerate the retrofitting of diesel-engine passenger vehicles with PM10 filters in 2009 already. The instrument focuses not only on the reduction of particulate matter emissions, but also on strengthening the demand for PM10 filters. As an alternative, the existing instrument, which allows for a temporary exemption from vehicle tax in the same amount, remains available.

**User Charging:**

- **Introduction of a heavy goods vehicle (HGV) tolling scheme:**

  Since 1 January 2005, HGVs with a maximum permissible weight of 12 tonnes or more using German motorways have had to pay tolls. These tolls are collected according to the actual number of kilometres driven, using a largely automatic free-flow tolling system which combines satellite navigation and mobile communications in an intelligent manner. On 1 January 2009, the tolling scheme was amended. The changes included greater variation by emission category and the consideration of particular abatement equipment when classifying vehicles in toll categories.

  Aims: infrastructure charging based more on the “user pays” principle; sustained transport investment; better environmental control impact of the HGV tolling scheme.

**Infrastructure:**

- **Transport Infrastructure Financing Company (VIFG):**

  In October 2003, the VIFG was established on the basis of the Transport Infrastructure Financing Company Act (VIFGG), with the Federal Government as its sole owner. The VIFG distributes the funds generated under the HGV tolling scheme in accordance with the Toll Act (ABMG) to fund transport infrastructure measures of the Federal Government (road, rail, waterway). The transparency thus achieved with regard to the use of funds generated under the HGV tolling scheme contributes to the general acceptance of this scheme (“user pays” principle). Moreover, the VIFG performs functions in connection with the preparation, execution and management of private sector projects in the field of transport infrastructure (PPP).
• **A models (PPP):**

With the introduction of a distance-related HGV toll (2005), operator models (public-private partnerships) for the widening of motorway sections by adding lanes (A model) have become possible. In May 2007, the first concession was awarded to a private concessionaire. The concessionaires recoup their cost for the project from the distance-related HGV tolls collected on the motorway sections they widened and that they operate and finance; if necessary, start-up funding is provided in addition.

• **Additional investment in the transport sector**

Increase from approx. € 9 billion in 2005 to approx. € 12 billion each in 2009 and 2010 using additional funds from HGV vehicle tolls and the Economic Stimulus Packages I and II.

This aims at reducing the delays in the maintenance of transport routes; major bottlenecks in the rail, road and waterways network will be removed. Additionally, it creates jobs and public demand. Since 2007, an accelerated planning law has been speeding up planning procedures (time saving of nearly two years). Above all, public procurement procedures have been simplified.

**Intermodalism:**

• **“Freight Transport and Logistics Masterplan”:**

In July 2008, the Federal Government adopted a comprehensive strategic transport policy plan of action. The Freight Transport and Logistics Masterplan, which was developed in collaboration with the transport industry and shippers and with support from the academic community, focuses on the following objectives, in particular:

- Making the freight transport system more efficient;
- Making better use of all transport infrastructure;
- Reducing the number of unnecessary journeys while ensuring mobility;
- Upgrading transport arteries and hubs in a targeted manner;
- Shifting more of the rising volume of traffic to environmentally friendly modes of transport, such as the railways and waterways;
- Making transport more environmentally friendly and reducing its climate change impact;
- Improving working conditions and training in the freight transport industry.

**Integrated transport policy:**

With its integrated transport policy strategy, the Federal Government banks on a comprehensive policy that aims to optimise the overall transport system, and that combines not only the shaping and funding of transport infrastructure, but also all other areas of transport policy, such as regulatory policy and innovation policy, to form an overall approach. Each mode of transport should make its contribution towards tackling the forecast traffic growth in accordance with its individual strengths.
Research:

- Research

Within the framework of its departmental research, the Federal Ministry of Transport, Building and Urban Affairs focuses on promoting innovative solutions to problems. Solutions that have demonstrated their effectiveness in single instances (e.g. in model projects or in best practice models) are thus supervised until they are fully functional and/or reach commercial maturity.

The policy makers are aided by high-quality, knowledge-based consulting, and advice is provided for the successful implementation of innovations.

Programmes at the interface between departmental research and the promotion of research also address specific issues in the fields of invention and innovation:

- Urban Transport Research Programme;
- Competition for the promotion of innovative mobility concepts;
- Research projects within the framework of the National Cycling Plan;
- Pilot scheme Innovative Public Cycle Rental Systems;
- Financial assistance programme for building research;
- Hydrogen/fuel cell initiative/electric mobility;
- Electric mobility pilot regions;
- Innovative noise mitigation measures in rail transport;
- E-ticketing;
- Meta platform for traffic information;
- Environmentally friendly engines for inland waterway vessels;
- Innovation programme Science meets Business.

The Federal Ministry of Transport, Building and Urban Affairs has set up an Internet-based research information system to present the results. The system provides decision-makers with preprocessed research knowledge.

What initiative(s) does your country have to promote innovation in the transport sector? Are these initiatives part of a larger effort to promote innovation across the economy? Please provide any additional material you have regarding these initiatives, including websites, reports, etc.

- The Federal Ministry of Transport, Building and Urban Affairs specifies its research requirements in its annual Integrated Overall Research Programme. The research contracts awarded on the basis of this programme provide a constant influx of innovative problem-solving approaches.

- Through its policy areas, the Federal Ministry of Transport, Building and Urban Affairs is, moreover, involved in overreaching strategies and programmes such as the Federal Government’s High-Tech Strategy and the Transport Research Programme.
• Selection of websites:
  - www.mobilitaet21.de
  - www.eticket-deutschland.de
  - www.fops.de
  - www.fis.de

• The Federal Government Fuel Strategy:
  As part of the National Sustainable Development Strategy, the Federal Ministry of Transport, Building and Urban Affairs has presented a strategy concept for the time horizon up to 2020 on the basis of a matrix process conducted by experts and in the light of international developments, the “Federal Government Fuel Strategy”. This supports the launch of fuels from alternative/renewable energy sources and innovative powertrain technologies, which, from a current perspective, are deemed economically and ecologically sound in the long term in Germany. This particularly applies to the increasing use of competitive, alternative fuels and the introduction of new, innovative powertrain systems. These may significantly stimulate innovation, new technologies and employment.

• National High-Tech Strategy and Master Plan on Environmental Technology:
  The Federal Government launched a National High-Tech-Strategy already in 2006 to support the development of innovative environmental technologies and products, and to develop lead markets. This Strategy was set up as overall strategy on innovation policy to promote systematic research in Germany in various fields such as climate change, use of natural resources and energy, mobility, cross-cutting technology (e.g. nanotechnology, biotechnology). To further stimulate eco-innovations, a Masterplan on Environmental Technology was set up by the Federal Government at the end of 2008 to bundle different policy measures in the field of research/innovation policy and environmental policy such as eco-design, technology procurement and market diffusion programmes for eco-innovations.

• NIP - National Development Plan for Electric Mobility
  See also answer to question 3.

• VIFG
  The VIFG regularly organises a „PPP Discussion Group“ in which the Federal Ministry of Transport, Building and Urban Affairs participates. Here experts discuss areas where there are problems and approaches for their resolution with the aim of promoting Private Public Partnership procurement. VIFG additionally initiated another discussion group with the Network Partnership “PPP for Local Roads”. Moreover, the VIFG actively supports the Federal Ministry of Transport, Building and Urban Affairs with the invitations to tender and the contract negotiations in connection with the A models. For more information visit www.vifg.de.

Railways

Provision of financial assistance for noise mitigation measures and ETCS implementation under the Federal Railway Infrastructure Upgrading Act and based on budgetary law.
2. What are the specific objectives of these initiatives? (e.g. Do they focus on certain challenges, such as climate change or safety, or on certain modes? Do they take a wider approach focusing on all of the challenges faced by transport?)

- The initiatives in general focus on a sustainable transport policy with the aim of ensuring affordable mobility in the long run. Some of these initiatives pursue a specific approach (e.g. electric mobility with a view to climate friendliness; “e-ticketing” with a view to the use of public transport); others, such as “Mobility 21” pursue a broader strategy, providing an impetus and ideas for sustainable mobility in the 21st century.

- The purpose of the Federal Government's fuel strategy is to concentrate resources on promising alternatives and to accelerate their development. This is also the focus of the Federal Government’s future package of measures. The Federal Government is a protagonist in terms of pushing forward promising fuels and power trains. Technology, transport and research policies can only achieve maximum effect jointly. This particularly applies to interaction between industry and politics. A successful example of this is the multi-system approach of the Transport Energy Strategy (TES) in which, besides the Federal Government as a moderator, the automotive industry and the energy supply industry discuss central topics surrounding resource consumption and climate change in the motor traffic sector.

- The NIP and the model regions (e-vehicles) focus on the promotion of market preparation. The objective is to develop viable market products from hydrogen and fuel cell technology research and development projects.

- The research funds are thus not only an investment in a clean environment, but also help to create sustainable jobs in Germany. It can be observed that, in addition, a lot of co-benefits can be achieved such as air quality improvement, energy savings, economic efficiency, and safety.

- VIFG: Discussion groups and information events aim to further increase the popularity of PPP procurement. PPP projects aim to achieve a timely upgrading of motorway sections, higher efficiency based on the lifecycle approach (construction, operation, maintenance and financing from one source) and the resulting optimised sharing of risks between public and private partners. The main objective is thus the reduction of the total lifecycle costs of a project and the associated relief for the public budget. Furthermore, the VIFG contributes to ensuring that the toll revenue is used for the intended purposes in accordance with the Toll Act (ABMG). It ensures transparency in the use of the generated toll revenue. To achieve this, it can rely on multi-annual funding as well as on the balancing of funds across different modes of transport.

- The objectives of the numerous measures and projects in road transport are highly diverse:
  
  - The promotion of modern vehicle technologies, for instance, aims at improving road safety as well as at the protection of vehicle occupants. At the same time, it seeks to boost the efficiency of mobility to facilitate a better flow of traffic and less congestion. The results are reductions in fuel consumption and emissions.
  
  - The promotion of research in the field of new drive systems and fuels aims not only to reduce fuel consumption, but also to evaluate the potential of new types of fuel. This is intended to ensure the long-term availability of a high level of mobility as a prerequisite for economic prosperity.
Road safety programmes seek to (further) develop target-group specific measures to improve road safety for all road users. Thanks to its effective road safety activities that are based on the latest scientific findings, Germany now ranks among the top five nations in the European Union.

Railway sector

Enhancing the capacity of the rail transport system, interoperability across Europe, improving environmental friendliness (reduction of noise and diesel emissions), raising acceptance levels among people living in the vicinity of railway lines.

3. Please describe the funding arrangements associated with your efforts to promote innovation in transport:

- The departmental research of the Federal Ministry for Transport, Building and Urban Affairs and the research promotion activities of the Federal Ministry of Economics and Technology are carried out within the scope of the funds provided from the federal budget.

- As part of its Economic Stimulus Packages I and II to tackle the global economic crisis, the Federal Government has committed to increasing investment, not only in transport but also in education, research and innovations, among other things.

  - Economic Stimulus Package I topped up the innovation loan schemes of the state-owned KfW bank.

  - Economic Stimulus Package II will see further funds invested in education, research and innovations over the period from 2009 to 2010. The German government invests in particular € 500 million from 2009 - 2010 (finalisation of projects by 2011) for innovation in transport, above all fuel cell- and storage technologies as well as hybrid drive trains. The Federal Ministry of Transport, Building and Urban Affairs focuses in particular on the promotion of “cluster regions e-vehicles”, the formation of a battery test centre, and hydrogen filling stations.

- The National Hydrogen and Fuel Cell Technology Innovation Program (NIP) is part of the high-tech strategy for Germany and ties in with the Federal Government Fuel Strategy. The National Innovation Programme provides a common framework for numerous hydrogen and fuel cell research projects conducted by academic institutions and the industry. The public-private partnership (PPP) is scheduled to run for 10 years. Over this period, the Federal Government will provide € 500 million, with the industry contributing at least the same amount to the project. For more information visit http://www.bmvbs.de/-2110.960602/National-Hydrogen-and-Fuel-Cel.htm.

General remarks:

- Applied research is based on a (at least) two phased-structure: the phase of market preparation (NIP, Economic Stimulus Package II) will be followed by the phase of market introduction. The aim is to have 1 million e-vehicles and 500,000 fuel-cell vehicles on the road until 2020, and to build up an infrastructure for EVs.

- The funding arrangements must be in line with and defined within the framework of the EU State Aid obligations to avoid market distortion.

- The VIFG was set up to administer the toll revenues and is itself funded by them.
Railways

For investment in the field of noise mitigation (refurbishment and innovative measures) as well as for the implementation of ETCS, federal railways receive financial assistance from the federal budget. To this end, agreements are concluded on the basis of funding guidelines.

4. What is the lead ministry or agency for your efforts to promote innovation in transport?

The Federal Ministry of Transport, Building and Urban Affairs in its function as the ministry responsible for transport, the Federal Ministry of Economics and Technology in its function as the ministry responsible for technology, the Federal Ministry of Education and Research in its function as the ministry responsible for the promotion of research.

5. What other public entities are involved and what are their roles?

Normally, the German federal states (due to the federal architecture of Germany, the federal states can carry out their own research projects or execute projects cooperatively) but also subordinate authorities in their function as ministerial research institutions, e.g. the Federal Highway Research Institute for road transport-related issues, the Federal Maritime and Hydrographic Agency for new maritime technologies, among other things.

The VIFG regularly organises a „PPP Discussion Group“ in which the Federal Ministry of Transport, Building and Urban Affairs participates. Here experts regularly discuss areas where there are problems and possible solutions to promote PPP procurement in the transport sector. VIFG additionally initiated another discussion group with the Network Partnership “PPP for Local Roads”. The VIFG is a member of the Roads Working Group within the federal PPP network (successor of the Federal PPP Network of Excellence) and is responsible for verifying the suitability and efficiency of PPP models on behalf of the Federal Ministry of Transport, Building and Urban Affairs. Moreover, it actively supports the Federal Ministry of Transport, Building and Urban Affairs in the tendering and awarding processes for federal trunk road construction projects.

6. What other partners are involved (e.g. the private sector, universities, states/provinces, etc.)?

- Universities as contractors for research projects;
- Private sector companies as project coordinators;
- EU Member States as participants in the coordination of EU research programmes;
- Trade associations;
- The entire railway industry sector, technical universities.

7. What international partnerships are involved in this?

- There is international cooperation on many different levels within the framework of the European Union, the UNECE and other international associations.

8. Please provide a summary of any results or outcomes already achieved as a result of your efforts to promote innovation in transport?

- Insights gained through departmental research for decision-making purposes, on the technical and political level, are made available on a regular basis. Thus, such insights are becoming part of innovative approaches that aim to achieve transport-related objectives in an environmentally compatible manner.
**Example of HGV tolls (see question 1.1):**

The HGV tolling scheme supports the efforts being made by operators to further enhance efficiency and to use vehicles that are more environmentally friendly.

The positive trend towards a more efficient use of transport capacity (for instance through additional efforts such as the acquisition of backloads) has thus continued on the whole. In addition, there has been an increase in loaded kilometres’ share of total vehicle mileage.

The toll scheme is having a positive environmental impact in the field of vehicle fleet renewal. Thus, there is a continuous fall in tolled mileage of the most-polluting vehicles, while the share of tolled kilometres of cleaner HGVs is rising, which is good news. The proportion of Euro 2 vehicles fell from over 30% in 2005 to under 6% in January 2009. Over the same period, the proportion of Euro 5 vehicles rose from under 1% to almost 44%.

The amendments to the Toll Level Regulations, which entered into force on 1 January 2009, almost doubled the range between the lowest and highest tolls according to emission category, and this will provide a further impetus to this effect.

**Example of model regions for e-vehicles:**

The activities within the German model regions for e-vehicles are to initially focus on selected clusters. They will then be gradually extended and interlinked, both within the model regions and nationwide. Since the model regions have been designated, stakeholders with different perspectives have come together in a way that would not have been possible without this competitive process, not only creating synergies but also providing the prerequisites for the required “winds of change”. This supports a common understanding of the necessities and barriers connected with the subject and provides an “early warning” regarding new issues.

The clusters, moreover, provide co-benefits such as discussions about reasonable framework conditions for mobile energy supplies of the future, energy saving, energy use and supply chains.

This raises public awareness and heightens the media profile within the regions keeping in mind realistic schedules for “market-readiness”.

**Example of new EU Directive for renewable energies:**

Germany strongly supported the EU Directive for renewable energies including a 10% renewable target in transport by 2020. This provides a strong incentive for alternative and sustainable fuels from renewables. At the same time, it is a clear market signal for sustainable production on the national, EU and international level.

**VIFG:**

The Transport Infrastructure Financing Company has become a recognised centre of excellence for the field of infrastructure. Thanks to a VIFG-developed financial management system that includes monitoring and controlling, a high level of transparency and efficient payment transactions are ensured in the distribution of toll revenues. Apart from distributing toll revenues, it supports the Federal Ministry of Transport, Building and Urban Affairs in preparing and carrying out PPP projects (invitations to tender and contract negotiations). In this field, it promotes the exchange of experience between interested institutions and persons from the public and the private sector and academia by means of conducting regular discussion groups; it is a member of the federal PPP network (successor of the Federal PPP Network of Excellence) and participates in developing legislative proposals.
A models:
The four pilot projects of the first set of projects (in May 2007, the concession for the first A model project in Germany started on the A 8 between Augsburg and Munich) up to now have been running smoothly and successfully. They showed that the project structure of the A model is being accepted by the construction industry and by banks; in addition, necessary competencies have been developed. On 26 June 2008, eight further federal motorway projects were announced, two of which are already in the awarding process. The actual success of the projects with a view to gains in efficiency can only be assessed after the contract period; the results of the economic efficiency analyses are, however, promising.

1. The HGV tolling scheme has been running smoothly and successfully for more than 5 years now. During recent years, approximately € 750 million have been invested in facilities for road transport telematics. Thus, approximately 2,500 km of carriageway are now equipped with route control facilities. Moreover, approximately 2,500 km of the network can be controlled via network control facilities, and on 210 km of carriageway, the hard shoulders can be made available for temporary use.

2. Steady reduction of the number of road fatalities. Germany ranks among the top EU nations in the field of road safety.

3. Reduction of fuel consumption and CO2 emissions. According to the Association of the German Automobile Industry (VDA), fuel consumption of new vehicles has declined by over 40 % since the end of the seventies. Over the period from 1990 to 2005 alone, fuel consumption was reduced by 25 % (VDA annual report 2009, p. 142). This is accompanied by a reduction in CO2 emissions. Despite the continuous increase in the number of cars over the recent decades, the German automobile industry managed to achieve a trend reversal in 1999. Since that time, CO2 emissions have been on the decline (VDA annual report 2009, p. 59).

4. Making Germany and Europe an even more attractive place for business by developing new, future-oriented technologies, and thereby securing and creating jobs.

For the railway sector, see answer to question 1.

9. Please describe the performance indicators or measurements that you use to evaluate the outcomes of your efforts to promote innovation. Please attach more detailed documents on this issue, if they are available.

- Research projects undergo performance monitoring, i.e. their results are assessed with a view to their technical benefits.

- Since the Ministry annually provides a new edition of its Integrated Overall Research Programme, which is updated as required, political and technical topicality is ensured.

- There are different, tailor-made instruments to evaluate the outcomes of innovative programmes, e.g.:
  - NIP: The National Development Plan is one of the cornerstones for the evaluation of the programme’s outcome.
  - National Sustainability Development Strategy of the German Government: The ministries employ the management concept of sustainability in the assessment and development of measures in their areas of responsibility. This concept includes the following three elements:
Management rules of sustainability: concrete goals and guiding principles, clear responsibilities;

Indicators and goals: pre-defined indicators as milestones for measuring progress and success;

Monitoring process: progress reports published every four years (indicator report of the Federal Statistical Office and a report by the German Government on the strategy itself, analysing, on a regular basis, the status quo and including goals not yet achieved). The public is comprehensively involved in the preparation of the progress reports at an early stage. In addition, the various ministries represented in the State Secretaries’ Committee on Sustainable Development regularly report on current sustainability issues in their own fields of business/activity. The German Council for Sustainable Development advises the Federal Government and develops contributions to the further development of the strategy for sustainable development. www.bundesregierung.de/Webs/Breg/nachhaltigkeit/Content/_Anlagen/nachhaltigkeitsmanagement.property=publicationFile.pdf.

As part of the National Sustainable Development Strategy, the Federal Ministry of Transport, Building and Urban Affairs has presented a strategy concept for the time horizon up to 2020 on the basis of a matrix process conducted by experts and in the light of international developments, the “Federal Government Fuel Strategy”.


10. What are the principal means by which your agency keeps track of new innovations and trends in transport?

- There are a variety of different, sometimes interlinked sources of information, including:
  - Talks / strategic alliances between politics, industry, organisations and research (on a national level, within the EU, on an international level);
  - Exchange with colleagues;
  - Focusing on existing structures or, if necessary, (new) platforms (e.g. model regions e-vehicles) and/or supporting agencies and structures (e.g. NOW GmbH, DBFZ, Logistics Council Germany (LCG)) in exchanging and developing knowledge in new areas. General remark: however, there is generally great reluctance to create new intergovernmental or central structures in addition to existing structures; priority is given to bilateral organisations between Member States, tailored to individual cases.
  - Close links to stakeholders from the sciences, the automotive industry, the supplier industry, the board of academic advisers to the Federal Minister of Transport as well as the German Advisory Council on Global Change (WBGU); the German Council for Sustainable Development and environmental agencies are also important as well as EU/international contacts (e.g. MEET-conference).
Other platforms and bilateral exchanges (e.g. the GCSFP - German Chinese Sustainable Fuel Partnership, the Indo-German Joint Working Group on Automotive Sector, the UK-German exchange programme),

Polls, surveys and independent research projects.

- Principle means in this respect are for example the following:
  
  **Applied research: Market Preparation Programme**

  - National Hydrogen and Fuel Cell Technology Innovation Programme (NIP): Promotion of applied research on drive train systems and stationary energy systems using hydrogen and fuel cell technologies in cooperation with the industry (Public Private Partnership - PPP) as part of the high-tech-strategy for Germany (www.bmvbs.de, www.now-gmbh.de).

  - Foundation of the German Biomass Research Centre (DBFZ) in February 2008 in the field of biomass potentials and regional planning (www.dbfz.de/).

  - Use of test vehicles in day-to-day operation, in cooperation with German automobile manufacturers.

  - Research projects in the field of noise protection, air pollution control, nature conservation and landscape protection as well as water and soil protection at the roadside.

- **Initiatives, model projects and pilot projects:**

  - The Clean-Tech Initiative Eastern Germany, as the key instrument for creating and securing viable jobs in the new federal states in accordance with the “strengthening strengths” philosophy: an even stronger interlinking of the mobility, urban design and development of Eastern Germany, development of integrated concepts to further promote Clean-Tech in the new federal states (www.bmvbs.de).

  - Model project “Demographic change - A region gets ready for the future” - extension of the project carried out in two Eastern German regions (2007-2009) to include two regions in the old federal states in 2009.

  - Recommendations for the Safety Audit of Roads; conducting conferences such as the eSafety Conference in 2007; promotion of projects such as “Safe, intelligent mobility - Germany as a test site” (SIM-TD). SIM-TD is a project for the development of a technology for wireless vehicle-to-vehicle communication and the communication between vehicles and an “intelligent” transport infrastructure. The project is intended to lay the political and economic foundations for vehicle-to-vehicle networking. As part of a field trial, up to 400 vehicles will be equipped with the communications technology required to communicate with the more than 200 available road side units.

- **Development of road safety programmes.**

  - Submission of proposals at EU level, e.g. regarding the development of the 4th EU Action Programme for Road Safety by the European Commission or regarding the promotion of innovative vehicle systems.
- Monitoring

  - Climate Monitoring: National Climate Data Centre, Global Precipitation Climatology Centre, Satellite Centre for Climate Monitoring and Maritime Data Centre (each centre operated by the German Meteorological Service) ([www.dwd.de](http://www.dwd.de)).

  - The VIFG, in its function as centre of excellence, analyses the experience gained in the field of PPP and draws conclusions for consideration in future projects. Experiences from abroad that are related to PPP or new funding approaches are also analysed and considered with a view to their applicability to Germany.

The task requires comprehensive information and assessment on all levels (state, railway undertakings). Example: market observation (“EU Rail Market Monitoring Scheme“).