



DEUFRAKO 1978-2008

**30 ans de coopération franco-allemande dans le domaine de la recherche sur
les transports //**

30 Jahre deutsch-französische Zusammenarbeit in der Verkehrsforschung

Documentation papers of the Event in Dresden

Célébration // Festveranstaltung , Dresden, 16/17 October 2008

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Position paper (English)

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- B: Alternative propulsions for clean vehicles
- C: Management of transport systems

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- A: Intelligent logistic and freight transport
- B: Alternative propulsions for clean vehicles
- C: Management of transport systems

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Impressum

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Introduction

In 1978 the German chancellor Helmut Schmidt and the French President Valéry Giscard d'Estaing decided to establish a French-German cooperation in the frame of transport (DEUFRAKO). The aim was to support the development of high speed train technology in the railways sector. Later on the cooperation was enlarged to topics of freight transport, telematic, urban transport and mobility and also noise reduction. Today this cooperation is based on the whole spectrum of both national transport research programmes. Numerous research projects have been funded and successfully realised in the 30 years history of DEUFRAKO.

The celebration recognized this long lasting cooperation. Therefore have been presented important results of common research projects. The event offered all participants also the possibility to discuss in three thematic workshops essential priorities of future bilateral transport research.

The coordination of DEUFRAKO-activities is on the German side under the responsibility of the Federal Ministry for Economy and Technology and on the French side the Ministry for Ecology, Energy, Sustainable development and Landplanning. The funding of research projects takes place in the frame of each national transport research programme „Mobilität und Verkehrstechnologien“ and „PREDIT 4“.

Programme

Thursday, 16th October 2008

14.00	Welcome and Introduction Siegfried Meuresch, Chief of the transport technology division at the Federal Ministry of Economics and Technology (BMW i)
14.15	The French-German cooperation as a motor of innovation for Europe Gerold Reichle, General director of technology policy (BMW i)
14.30	Sustainable development – a challenge for Europe Michèle Pappalardo General Commissaire for sustainable development in the Ministry for Ecology, Energy, Sustainable development and Landplanning (MEEDDAT)
14.45	Transport research at the Technical University of Dresden Jörg Schütte, Prodekan of the Faculty of transport research „Friedrich List“ of the Technical University of Dresden
15.00	The new German Programme on Transport Research „Mobilität und Verkehrstechnologien“ Tobias Thomae, transport technology division (BMW i) Research in the service for policy consulting Heinrich Nöthe, research director at the federal Ministry of Transport, Building and Urban development (BMVBS)
15.30	Break
16.00	The new French transport research programme „PREDIT 4“ Bernard Duhem, General Secretary of PREDIT The strategy on transport research of the French National Research Agency (ANR) Jacqueline Lecourtier, General director of ANR
16.30	Development and added value of DEUFRAKO in the frame of road safety Ulrich Kreßel, Head of Machine Vision, Daimler
16.50	Success and challenges in the frame of rail research Alain le Guellec, Director of research and innovation, SNCF
17.10	Conclusions from 30 years of DEUFRAKO Siegfried Meuresch, BMW i and Pierre Valla, MEEDDAT
17.30	End of the first day

The official presentations given in Dresden

All Powerpoint presentation are available at www.deufrako.org

- [Transport Research at TU Dresden, Jörg Schütte](#)
- [The new German Transport Research Programme Mobility and Transport Technologies, Tobias Thomae](#)
- [Research for scientific Policy Advice, Heinrich Nöthe](#)
- [The new French Transport Research Programme Predit 4, Bernard Duhem](#)
- [The Transport Research Strategy of ANR, Ludovic Valadier](#)
- [Developments and Added Value of DEUFRAKO in the Field of Road Safety, Ulrich Kressel](#)
- [Successes and Challenges in the Field of Rail Research, Alain Le Guellec](#)
- [WS A Intelligent Logistics and Freight Transport, Felix Fiseni](#)
- [WS A Intelligent Logistics and Freight Transport, Olivier Maurel](#)
- [WS B Alternative Propulsion Systems for clean Vehicles, Bernhard Koonen](#)
- [WS B Alternative Propulsion Systems for clean Vehicles, Jean Delsey](#)
- [WS C Management of Transport Systems, Magnus Lamp](#)
- [WS C Management of Transport Systems, Fleur Breuillin](#)

**Position Paper on the Transport Research Programmes
“Predit” and “Mobilität und Verkehrstechnologien”
for the Preparation of the Thematic Sessions**

General remarks on DEUFRAKO

DEUFRAKO is a framework for French-German cooperation in publicly funded surface transport research. Mainly dedicated to rail transport for the first 20 years, it is now potentially opened to all topics included in the two national programmes, Predit in France, "Mobilität und Verkehrstechnologien" in Germany. In Germany, DEUFRAKO is mainly funded by the Federal Ministry of Economics and Technology (BMWi), in France by the ministries and agencies acting in Predit (ministry of sustainable development, ministry of industry, ANR, Ademe, Oséo).

In Dresden, 30 years of this cooperation will be celebrated. Three thematic sessions should give ideas for topics and projects in:

- Logistics and freight transport,
- Alternative propulsion systems for clean vehicles,
- Management of transport systems

General remarks on „Mobilität und Verkehrstechnologien“

The current, third transport research programme has been christened "Mobility and Transport Technologies". This distinguishes it from earlier programmes and places its focus squarely on the fostering of technology. Currently pressing issues and emerging challenges relating to land-based transport are tackled with a view to seeking a solution through the concerted efforts of industry and science. The programme forms part of the Federal Government's High-Tech Strategy, and implements its underlying principles in the area of transport. It incorporates all of the general conditions necessary for innovation, and provides particular support for strategic partnerships between industry and science to develop new technologies.

This programme and the associated funding structure have been defined by various government departments, under the auspices of the Federal Ministry of Economics and Technology. As such, it constitutes an official programme of the Federal Government.

The technology component of the programme is based on the following three pillars:

- A) Intelligent logistics
- B) Mobility of people in the 21st century
- C) Intelligent infrastructure

Research and technological innovation in these areas have particular potential to provide solutions for a more efficient use of the various modes of transport, the reduction of dependency on fossil fuels, the adaptation of transport systems in preparation for demographic change, and the further tightening of road safety with assistance systems to provide technical information.

The programme will be funded by the federal budget. The funds allocated will be used both for project funding and to finance contract/departamental research. Public funding will also be allocated to the institutional transport research carried out by the German Aerospace Center (DLR) under this program.

The German transport research programme is coordinated with Community research funding within the European Union. National and European Community funding complement one another, with the EU funding

programmes focussing mainly on specifically European objectives. In accordance with the subsidiarity principle, European funding is intended to build on and enhance national programmes.

Bilateral and multilateral alliances based on national transport research programmes have been established as best practice for many years.

General remarks on “Predit 4” (2008-2012)

Predit is a frame for coordination of different state funders of research and innovation. A five years agreement is signed by ministers of ecology, energy, sustainable development and landplanning (MEEDDAT), of research (MESR), of industry (MinEIE), and presidents of three national agencies: ADEME (energy and environment), ANR (basic and cooperative research), OSEO (industrial innovation). Coordination is managed by a general secretary based in MEEDDAT/directory for research).

This programme funds research for public policies as well as technology and services.

Six priorities of Predit 4:

- Energy and environment
- Quality of transport systems
- Mobility in urban regions
- Logistics and freight transport
- Competitiveness of the transport industry
- Transport policies

Resulting projects are funded by ANR, OSEO, Ministry of Industry (mainly technology), ADEME (technology and policies), MEEDDAT (technology, policy and services).

GERMAN CONTRIBUTIONS

1. Overview of the results of „Mobilität und Verkehr“ (2000-2007)

The aim of the research programme „Mobilität und Verkehr“ was to improve the premises for traffic innovations and to upgrade the corresponding technological progress sustainably. Besides several sub-programmes related public transport like “Mobility in conurbations” or “Low noise traffic”, funding announcements with main focus on freight transport have been carried out: “Flexible Transportketten” (1997-2001), “Optimale Transporte in der Kreislaufwirtschaft” (2000-2005), “Europäischer Schienengüterverkehr 2010” (2001-2005), and “Intelligente Logistik im Güter- und Wirtschaftsverkehr” (since 2006). The successful results of these sub-programmes can be illustrated by the following remarks:

With just 16 demonstration projects, the programme “Flexible Transportketten” induced 150 Mio. Lkw*km/a, that could be changed from road to rail or waterway respectively, could be avoided within the road traffic. In relation to the very specific branch of the programme “Optimale Transporte in der Kreislaufwirtschaft”, similar figures could be reached with an avoidance of 20,8 Mio. Lkw*km/a. In both programmes, a high potential of innovation was achieved, for technological projects as well as for logistical ones. So, specific boxes with greater flexibility in time and improved safety features have been developed for a better exchange between road and rail; within the information technology, the main focus was to improve simulation models for traffic analysis and forecast, and developing planning systems for goods/vehicle disposition and for route planning. Also, cooperative solutions between shippers and carriers produced new distribution structures and at least more effective transports.

2. The priorities of “Mobilität und Verkehrstechnologien”

The logistics industry has developed to one of the important branches of industry with a high growth and innovation potential for new, future jobs. The importance of the logistics grew continually for many years and demonstrates today the third-biggest industry after the trade and the automobile industry according to turnover as well as to employment.

With the most strongly climbing foreign trade of all European countries, the goods-exchange and the goods-traffic will increase rapidly in the next years. However, already today the capacity bottlenecks appear especially in the seaports, on the main railroads as well as on the roads in conurbations at rush hour times.

The Federal Ministry of Economics and Technology (BMWi) faced those challenges and started a new research sub-programme in 2006: “Intelligent Logistics”. The goal is to keep alive the international competitiveness of the logistics by the use of innovative and intelligent solutions as well as to develop it further on. In consequence of this pre-programme, the demand for a broader scope of research in logistics could be deduced and was placed as a first column in the new R&D programme “Mobilität und Verkehrstechnologien”. New ideas for rail, truck and inland navigation as well as their network must be realized faster. For goods traffic on road but also on rail, security, energy, fuel consumption, environmental protection, economic viability and capacity utilization are still central questions. New drive and vehicle concepts for the decrease of energy consumption as well as the adaptation to logistical requests are essential starting points for research and development-activities.

The fields of future R&D-activities in the programme column “Intelligent Logistics” are:

- **Reduction of bottlenecks in cargo handling hubs**
(Cargo handling technologies and automation)
- **Optimisation of transport by cooperation and networking**
(Information and communication technologies, avoiding empty drives, diminishing of detours, intermodal transport)
- **Safety-related requests for logistics must be held payable**
(electronic seal, global satellite navigation system Galileo)

FRENCH CONTRIBUTIONS

1. Overview of the results of Predit 3

In the domain of freight transportation, the situation is characterized by a huge share for the road transport, inland and on an international basis. This is not new, but the decline of the rail is a tendency that is going on, in spite of several actions planned during the Predit 3's period by the legacy company, and due mainly to a voluntary plan to get rid of non competitive traffic. The increase of waterways was significant, mainly thanks to an increase in container activity.

The results of the two groups that worked respectively on knowledge and technology can be shortly described:

- new concepts appeared in city logistics, thanks to a lot of experiments coupled with new technologies (clean vehicles, light vehicles for dense parts of cities) and new organisation (platforms for of different types in different places of agglomerations, named ELU for "Logistic urban spaces"). A national program for city logistics started in 1993 is still linked to the Predit.
- a good activity for knowledge about industrial organisation and logistics, trying to know if public policies could help improving these organisations in a more sustainable way, in order to decrease the demand for transport or to develop integrated, safer, *greener* and *smarter* transport systems. Collaboration among firms, with the help of new business rules management systems, was seen as a model for the next future.
- In the field of technologies for rail and intermodal transport, we focused on all the parameters that could improve the capacity of the infrastructure. ITS research involving road and waterways have been launched with the aim to securing the transport and improving its efficiency. Dangerous goods were the main market sectors we dealt with.

2. Predit 4 programme

Logistics and freight transport will be one of the six topics that will structure Predit 4. It is clearly hoped that the context of climate change will help research and innovation drastically. The new political support that raised through the large debate called "Le Grenelle de l'environnement" gives rise to a roadmap including research guidelines. Besides, with the important increase of container traffic in ports we have to face congestion problems and that should put the stress upon change in modal shift and upon making more attractive combined railway and waterways transport systems.

Predit activities should concern the following main topics keeping in mind the 2050 target which is defined by a low emission production and transport system (1/4 of 1990 CO₂ emission)

- keep improving city logistics, in terms of vehicles and organisation ;
- raise concepts, and experiment for a future high capacity combined transport which could cope with road competition in term of door to door travelling time, reliability and price : long trains, new wagons, automatisations of intermodal transfers...
- improve the organisation of logistics in favour of the decrease of the transport demand through cooperation: mutual grouping-degrouping, new technological platforms for cooperation between companies.
- improve the security of a green supply chain.

II. Alternative Propulsions for Clean Vehicles

GERMAN CONTRIBUTIONS

1. Overview of the results of „Mobilität und Verkehr“ (2000-2007)

The R&D programme “Mobilität und Verkehr” focussed on three research networks dealing with a careful treatment of health, environment and resources.

Within the network “Minimalemission”, circa twenty-five collaborative projects have been launched, focussing on technological development for the reduction of nitrogen oxides, particles and carbon dioxide. These projects laid the foundations for the current use of particle filters and after-treatment systems for nitrogen oxides (SCR, Add Blue). Furthermore, they created the groundwork for the network “Hybridkonzepte” which was launched in 2005 and led to the formulation of strategies and development of technology concepts. The objective of the network “Leiser Verkehr” is a mitigation of traffic noise on road and rail.

The objective of the network “Hybridkonzepte” is the further development of core components of the hybrid power train as well as the application oriented development and integration of functional modules. Moreover, the components of the hybrid technology and their interaction within the overall system must be optimised with regard to vehicle size and application. Only in this manner it is possible to achieve the maximum potential of energy conservation while at the same time realising the highest level of customer benefit.

2. The priorities of “Mobilität und Verkehrstechnologien”

The development of future modes and systems of transport will need to take greater account of the potential effects on the environment. The following measures and strategies are currently being pursued:

Alternative power train technologies and fuels

The development of innovative power trains has to consider a significant reduction of CO₂ emissions. In addition to the ongoing enhancement of combustion-engine technology, the launch of cars with hybrid and/or electric drives marks a significant step into the direction of alternative drive systems. Hybrid drives combine a combustion engine and an electric motor, and thus also the advantages of both drive types, such as high range, fast refuelling, recuperation of braking energy etc.

The ability of these types of power trains to achieve sustainable market penetration depends to a large degree on whether they manage to reduce energy consumption in everyday use by close to 30% compared with conventional drives. Future research in this area will therefore focus on the enhancement of the core components as well as the application-driven development and integration of new functional modules. The solutions developed must have results that can be demonstrated in practice so as to prove the potential savings in terms of fuel consumption.

The research and development of specific solutions for vehicles (passenger cars and commercial vehicles) is required in the following areas:

- electric propulsion engines
- transmission and drive variants
- electric energy stores for mobile applications
- control units and converters
- energy and drive management
- standardisation and modularisation of the complete drive system

New materials and processes in automotive and engine technology

The use of new materials and processes can significantly increase the efficiency of conventional drives. A study by EUCAR/CONCAVE predicts that the efficiency of diesel engines could potentially be improved by between 16% and 34% between 2002 and 2020. The increase could be between 13% and 24% for petrol engines. The new EU directive on the environment envisages that, by 2012, the average CO₂ emission level of newly licensed private cars in the EU will not exceed 120 g/km. The Euro 5 standards, which are set to come into force as of 2009, will see the introduction of further restrictions of emissions from petrol and diesel cars. New manufacturing processes and combustion systems, fuel injection technology, friction optimisation, and resilient materials to meet increased requirements for pressure and temperature resistance all offer

additional potential for increasing fuel efficiency and reducing emissions of greenhouse gases.

FRENCH CONTRIBUTIONS

1. Overview of the results of Predit 3

In the area of clean and energy-saving vehicles, financial support to laboratories and industry was mainly oriented towards one of the following research areas:

- Internal combustion engine (ICE)
Based on the idea that ICE will continue to play a major role during the next 10 to 20 years, Rand D works were supported on the increase of the thermodynamic efficiency, reduction of the so-called " local " pollution (including noise) and also the improvement of the efficiency of different depolluting devices on the exhaust line
- Use of alternative fuels
The goal was to reduce the dependency towards oil supply and CO2 emission. A few research studies were supported on methane dedicated engines as well as on biofuel optimised ones
- Hybrid and electric vehicles

They are considered to be the "clean" vehicles for tomorrow. Many studies were devoted in Predit 3. Power units and energy storage devices were the main topics together with "stop-and-start" units for micro-hybridisation

Tests of electrical vehicles included in commercial fleets (French Post administration, French national electricity supplier...) were also supported in order to improve knowledge about the specific problems related to electric vehicles (battery behaviour, maintenance, availability...)

A lot was done, globally in Predit 3, for clean technology progress - 140 million euros of public funding over the 6-year programme. This does not include fuel cell technology, which is dealt with by another programme (PanH, including non transport applications and CO2 storage), considering that it was too long term for Predit and that the deployment will probably start with housing.

As for electric cars, France had a disappointing experience in the 1990's (involving our two major car companies) due mainly to reliability problems, cost of the batteries and the absence of a real market. Consequently one idea, in Predit 3, was that, the second generation of electric cars would start with vehicles for fleets in large companies and administrations.

About hybrid technologies, it was not intended to promote, through R&D, one technology or another (plug-in hybrid for example), which is the role of companies more than state, but to push the different elements: stop and start, breaking energy recovering, energy management.

2. Predit 4 programme

A large political support to CO2 issues came out of the Grenelle de l'environnement, and, due also to fossil energy prices, the growth of alternative drive train in the market is now clearly expected. A specific R&D funding plan is ready to be launched, dedicated to hybrid and pure electric technologies. It is intended to lead to some ten demonstrators covering different types of vehicles : passenger car, light trucks, buses. Public funded research is expected, in France, to help lowering costs of technology, while increasing its reliability, so to make possible the spread of hybrid and electric cars. Parallel to these demonstrators, research will have to be maintained on the main basic topics: energy storage, electric motors, energy management, reduction of energy demand, from auxiliaries for example. Considering hybrid technology, in addition to the previous topics, downsizing of the combustion engine and the global architecture will remain very active topics.

GERMAN CONTRIBUTIONS

1. Overview of the results of „Mobilität und Verkehr“ (2000-2007)

The R&D activities of “Mobility and Transport” contributed in different research fields and different modes to the management of transportation systems:

Within the framework of the initiative “Intelligenter Verkehr und nutzergerechte Technik (Intelligent Traffic and User-compatible Technologies, INVENT)”, 23 partners from industry and the research community demonstrated innovative technologies necessary for the establishment of an intelligent road traffic network. INVENT was comprised of three projects – each with a series of sub-projects – dedicated to driver assistance and active safety, traffic management and logistics.

The central objective of the projects funded within the initiative “Verkehrsmanagement 2010 (Traffic Management 2010)” was the development and demonstration of innovative methods in the area of traffic engineering and control. New methods for e. g. traffic data derived from GSM Networks and their potential for traffic management purposes were tested. Other projects showed the common development and implementation of interurban traffic management strategies and their communication towards the user. The potential of those measures under real traffic conditions was predicted on a model basis and sometimes even evaluated.

The design and optimisation of the interfaces between different modes of transport and between different transport organisations was an important field of research. Projects were performed in order to pave the way for successful implementation of the nation-wide electronic schedule information system DELFI. The initiative “Personennahverkehr für die Region (Regional Public Transportation)” demonstrated approaches for a better efficiency and quality of public passenger transportation outside of the large centers of population – in rural regions as well as in small and medium-sized communities. Other essential tasks included research aimed at making public transportation more attractive, for example by developing and implementing electronic fare management systems on a standardised basis (VDV-Kernapplikation).

Another research focus concerned the further development and application of information technologies which allow (partial) automation of rail traffic in order to free-up staff for tasks more directly related to passengers. The emphasis has been on systems for the automated control of railway traffic on densely travelled routes. The development of systems for intelligent train monitoring and platform monitoring was performed in various research projects.

2. The priorities of “Mobilität und Verkehrstechnologien”

Highly developed transport systems have become an essential component of modern societies. Not only private transport by car and high-capacity local public transport systems, but also high-speed rail have become an indispensable part of our daily lives. The ability to meet a range of commercial, professional and recreational mobility requirements is key to ensuring economic growth and prosperity, and for removing any barriers to participation in all areas of social life. Safety is the fundamental overall-requirement which has to be ensured for established and for innovative transport systems operated under full capacity as well as in rural road networks. The use of innovative technologies for the management of transport systems is a key challenge to achieve these goals.

We need new, integrated door-to-door transport solutions to guarantee accessibility, in particular for senior citizens or persons with reduced mobility. Tighter integration of different services and modes of transport is essential, if this objective is to be achieved. Different modes of transport must be combined to produce solutions where the unavoidable interfaces and barriers are barely noticed by the end user. This model's only chance of success depends on a seamless technical, operational and organisational integration of public and private transport. The ultimate goal here is the creation of a financially viable, integrated, barrier-free transport system that will cover as much of the country as possible. This will also involve a cost-driven modification of the density of local public transport services in the face of falling demand, in particular in rural areas. Appropriate, flexible solutions, involving small vehicles and new modes of utilisation and operation, can potentially preserve the quality standards of the services provided at reduced costs. Research and

development is required to formulate concepts and criteria that will allow for reliable planning of public transport services and their financially viable evolution. These concepts could be put to the test in pilot projects. In this context, particular support will be provided for technological developments to enable a nationwide implementation of electronic fare management based on the core application of the German Association of Transport Operators (VDV) and its transferability to other areas of use.

The "car of the future" will provide active assistance in hazardous situations. The development of safety technologies (for example, to provide assistance during congestion or at intersections, or automatic guidance systems) that build on existing principles constitutes an important objective of this research programme. The underlying aim is to develop systems that can lessen the consequences of accidents, or even avoid accidents altogether. Appropriate information and communication technologies, issues relating to liability and individual patterns of behaviour will all be of significance in this regard.

Collaboration and communication both among vehicles (V2V) and between vehicles and an intelligent infrastructure (V2I) are key requirements for innovation in traffic management. Driver assistance systems providing information about other vehicles and the current section of road should also be able to help drivers adapt their driving to the situation at hand, thereby increasing road capacity and reducing traffic disruption from accidents. Examples of situations where such technology could be used include the "zipper rule" used for merging traffic, lane-specific flexible speed harmonisation, and assisted passage through road works on motorways. First Results from the ongoing project "Adaptive und Kooperative Technologien für den Intelligenten Verkehr (AKTIV)" are encouraging and will be fostered in the upcoming initiative. "Sichere Intelligente Mobilität – Testfeld Deutschland (SIM-TD)". SIM-TD will provide a regional test field, which allows the operation and evaluation of new V2I communication based applications in a real traffic environment. In urban areas, it is intended to work towards achieving the vision of a dynamic "green wave" by coordinating traffic lights in a way that assists drivers to regulate their own speeds.

High safety standards have already been attained in the area of rail transport. However, in Europe in particular, rail transport is experiencing a critical phase of development. New safety requirements arise when, for example, the operational control systems of two different countries have to be linked up to ensure integrated, cross-border transport. High-speed transport solutions also entail specific safety requirements. The need to reach a consensus between countries with different national safety philosophies constitutes a particular challenge, given that the consensus may have serious economic implications for the countries involved.

FRENCH CONTRIBUTIONS

1. Overview of the results of Predit 3

Road safety was one of the two major issues of Predit 3, in line with significant measures of public policies towards the reduction of the number of fatalities and injured people on the road. Research was oriented towards vulnerable users (mainly pedestrians and two-wheelers), driver assistance systems (through on-board or in-vehicle information, and communication between vehicles and infrastructure, e. g. Safemap), health (medicines, drugs, sleepiness, attention, but also epidemiology.), and guided transportation (e. g. ROSA). Research has also been conducted in the domains of legal aspects, urbanism, public policies, or education.

Due to this focus, traffic management was left a bit behind. It came back during the last two years through a global effort for ITS applications in transport. New technologies are available today (GPS and nomadic) that should give opportunities to improve real time traffic management. Besides, new policies of the government (e. g. sustainable development: pollution, energy consumption, etc.) strengthen the need for an optimisation of traffic management.

In terms of services for passengers' mobility, research was oriented towards topics that may be minor ones in terms of users concerned, but are important when considering the regulation of the global system and accessibility: cycling, parking policies, car sharing, inter modal platforms.

2. Predit 4 programme

Quality of transportation systems will be one of the six topics structuring Predit 4. Key words for this global approach of quality will be: safety and security, traffic management, reliability on the one hand, accessibility for disabled people, comfort, ergonomics, answers to aging population on the other hand.

Transport management in Predit 4 should then be first concerned by safety, traffic management and reliability.

Research about road safety should be continued, in particular in the domains of driving assistance systems (and communications between vehicles and infrastructure), robustness components, vulnerable users (pedestrians and two-wheelers, but also bicycles), health, urbanism, but also economics and juridics for a better implementation of technological solutions.

For what concerns traffic management, research should take care of more general issues. That are sustainable development (optimisation of the infrastructures to limit pollution and noise, energy consumption), road safety (a better traffic both to limit congestion and to favour "calm driving"), mobility (because congestion is an obstacle to mobility), and the need for user-oriented services (through real time information). Research should be carried out in the domains of data (use of new data collection means and quality / integrity of data), traffic modelling (time to destination, environmental impacts, energy consumption, behaviour patterns), traffic management (traffic optimisation, regulation), communications and ITS (cooperative systems V2I, V2V, localisation, guidance, geographical information), real time information (taking into account other transportation modes), evaluation and experimentations, deployment (towards normalisation).

Reliability is going to be an increasing research thematic in Predit 4. First, it should address questions linked to liability of technological systems and their components, to ensure a possible deployment to solutions for road safety or traffic management, for example. Secondly, an important aspect there should be the availability of rail transport in urban regions. Due to demand resulting of the urban sprawl of the last decades and strong policies launched by regional authorities (that are now responsible for passengers rail transport in regions), traffic is increasing rapidly (8% per year) and the way to assume this increase in the next decades is not clear. This topic can be extended to all kinds of public transport, that will be more and more used due to energy prices and environmental policies.

As long as mobility in urban regions will also be one of the six priorities of the programme, transport management will also be concerned through urban peripheries: how can we improve accessibility in these low density areas that do not rely only on individual car? What kind of services, probably different from those in dense areas, and who will pay for them? Information technology should help, but also research on global systems as for example in the EU new programme "European bus system for the future" (EBSF).

The research in Predit 4 should address different questions linked to accessibility: accessibility in terms of persons (for elderly or impaired people, with questions of ergonomics and comfort), in terms of geographics (the different possibilities for people to move through public transportation, through car sharing, bicycling, etc.), and in terms of economics (access to transportation systems for poor people, coherence of prices among different transportation systems).

MINUTES OF THE THEMATIC WORKSHOPS

17th of October 2008, Dresden

Minutes of the workshop “Intelligent Logistics and Freight Transport”

This workshop was moderated by Wolfgang Höfs, European Commission and Eric Louette, French Ministry of Ecology.

The presentation of the German research programme was done by Felix Fiseni, TÜV Rheinland and the French one by Olivier Maurel, I-Log. (see position paper)

Results of the discussion in the workshop

I. The starting position

The research communities on freight transport in France and Germany

The discussion started with general remarks about the differences in the French and German research area of freight transport. In the past, the German research programme was more focussing on this topic than the French Predit, due to the important presence of research unities in Germany. Today this topic is a priority in both national programmes Predit 4 and “Mobilität und Verkehrstechnologien”. A lot of projects composed of academia and industry had been realised with success in the frame of the European research framework programme. But Europe needs more scientific expertise on the freight issue, so that there is still a lot of work.

In DEUFRAKO, first efforts on freight transport research were done in the years 1998-2002 by opening a freight transport group which was composed of experts from research and operators. At this time it was difficult to find corresponding partners on the other national side to realise good projects, focussing on practical and market orientation. Therefore projects have to be mostly composed of industry and operators, plus some scientific experts. This supports the development of suitable R&D communities. In France, the focus is more on the academic components in freight projects. In 2002 the first DEUFRAKO call “Green Freight Transport Corridors (GFTC)” was launched.

The added value of DEUFRAKO

The most successful DEUFRAKO projects were done in the past on the development of norms and standards. DEUFRAKO should continue this way in order to promote the European harmonisation and represent France and German interests.

The added value of DEUFRAKO is also part of the set-up of common project consortia.

Industrialised system of logistics in Europe

It has to be taken into account that a working freight systems is based on economic clusters. Therefore is very important to create trust between forwarders, because the technical issue is rather not the problem. And logistic needs to be payable (example the US-American ATLF a industrial network of forwarders Advanced Truck Load Firms).

II. The discussed thematic topics for new cooperation

Railway freight corridors

Due to the increasing of road transport, the foreseen collapse on our roads has to be avoided. Therefore the discussion turned around the need for a project on a rail freight corridor from Spain to Germany. French industry partners are urgently needed for the realisation of this corridor. The problems with rail research infrastructures particularly in France are on the way to be solved. Another problem for this corridor is the complex infrastructure in Spain. An interesting example for working corridors is the new railway line from Germany to Shanghai which takes 17 days instead of 4 week by ship, which started recently.

Another interesting subject would be a French-German corridor and CIS countries with defined consolidation point in Germany, France and Poland.

These are many ideas that require the involvement of further countries besides DE and FR.

Masterplan Logistics

The German government has recognised that logistic is one of the major economy pillars in the future. All the forecasts confirm a doubling of the freight transport in the coming years. In Germany, good experience was done with their Masterplan Logistik. They proposed the French side to join into a cooperation on the frame of this plan led by the German ministry of Transports (BMVBS).

Affordable Transport

Another challenge is to develop technology at an affordable cost. New technology needs to be implemented by the operators and therefore it shall not be too expensive.

Other interesting topics

- Intervention Freight Corridors. Spain – France – Germany
- Standard development should be a focus in DEUFRAKO as it was a success story
- Cross-border effect on long trains
- High-speed freight transport
- CO2 reduction will be very important for future R&D cooperation between DE and FR.
- IT plays an important role in an efficient transport system

Conclusions (presented to the assembly)

Main thematic issues

- Modal Shift from Road to Rail
- Differing research landscapes
- Set-up of consortia in logistic projects
- Set-up of French-German standards
- Missing Freight Corridors links
- High-speed freight transport / trains
- Industrialisation of logistics
- Impact of ICT

Essential results of the workshop

- Identification of next steps:
- Support for cooperation
- Efficiency of transport
- Carbon footprint

This workshop was moderated by Francois Badin, IFP and Eberhard Hipp, MAN. The presentation of the German research programme was done by Berhard Koonen, TÜV Rheinland and the French one by Jean Delsey, INRETS.

Results of the discussion in the workshop

I. Starting point

From the two introductory presentations, it appears that the German and French concerns about the future automotive technologies are quite similar. Both research programmes can be divided in two main parts :

- increase of the efficiency of thermal engines and of depollution devices in order to obtain better environmental performances. In both countries, it is established that thermal engines should continue to play a major role for road vehicles in the next period of time.
- development of innovative alternative vehicles, hybrid, plug in hybrid and electric. The main issue is the problem of energy storage. Specific electric and electronic components are also needed.

Despite this common point of view, a major element cannot be hidden: the economic and technical competition between the French and German car builders. In order to be efficient and successful, any cooperation action between the two countries must be aware of this reality.

Cooperation on technological components is preferred with regards to cooperation on complete systems such as for example a vehicle.

II. The discussed thematic topics for new cooperation

Taking into account these starting points, the following topics were suggested among others for future collaborative studies:

Definition of common standards

One of the main objectives of the French-German cooperation in the frame of DEUFRAKO is the preparation of common standards, leading to European harmonisation. For alternative propulsion the necessity for common standards is mainly in the field of storage (battery voltage, dimensions, testing procedures...) and specific infrastructures (battery charging stations and connections). It is an important issue to define European standards as soon as possible, otherwise Japanese or American ones will fast dominate the World market. This is also important in the frame of electrical and hybrid vehicles research.

Energy storage

As mentioned above, energy storage is the main issue for the fast development of electric and plug-in hybrid vehicles. Lithium based batteries are markedly more efficient than the former systems but progresses are still necessary in terms of performances, cost, safety and management. Therefore intensive works must be engaged for improving existing batteries but also for testing new concepts, particularly new electrode materials. Supercapacities also need intensive R&D works as they are more efficient than batteries for some duties.

Field tests of new vehicles

Before spreading on a large scale new types and concepts of cars or trucks, testing these vehicles in actual working conditions during a sufficient period of time is essential to obtain guarantees on the reliability, efficiency and social acceptance. Tests both in France and Germany are complementary as they are source of information on a trans-national basis which are necessary in the frame of the European market

Recovery of thermal energy in internal combustion engine (ICE) vehicles

Because of the low efficiency of ICE, a lot of heat is lost, primarily through exhaust gases. Techniques are being developed to recover this energy. The most effective one seems to be the thermoelectrical generation. But efficiency is still low and basic research works are needed to improve markedly these generators (materials with high thermoelectrical coefficient).

Alternative propulsions for railways application

More efficient and cleaner propulsion solutions are needed for railways engines dedicated to non-electrified networks. Different solutions can be studied: improved thermal engines, hybrid architectures, fuel cell generators... French-German cooperation on railways research is a major concern of DEUFRAKO and it has been fruitful as the partners know well each other.

III. How to go further in DEUFRAKO?

The most efficient instrument would be the organisation of a common French-German call on these topics. But the group also discussed the organisation of French-German Seminars or Experts round tables to exchange about new topics.

Conclusions (presented in plenary session)

Project ideas on the following topics

- Demonstrators and field tests
- Wide spreading of demonstration results
- Develop new electric machines and high power electronic converters (DC/AC and DC/DC)
- Develop component integration (machine and electronic) and thermal behaviour
- Develop energy management considering vehicle drive train and infrastructures (ZEV areas, charging possibilities, traffic...)
- Power supply, battery charging infrastructures
- Standardisation of components
- Energetic efficiency
- Human factors regarding the purchase of vehicles
- Well to wheels efficiency and Life Cycle Cost analysis
- Alternative energies and energy scenarios
- Challenging goals for vehicle energy efficiency
- Forward looking driving (taking into account the vehicle) ??
- Local nuisances reduction (pollutant and noise)
- Small particles measurements
- Thermal engine waste recovery (turbo streaming, Rankine cycle, thermoelectricity)

Minutes of the workshop “Management of transport systems”

This workshop was moderated by Guy Bourgeois, INRETS and Markus Friedrich, University of Stuttgart. The presentation of the German research programme was done by Magnus Lamp, TÜV Rheinland and Fleur Breuillin, French Ministry of Ecology.

I. The starting point

At the beginning the group analysed the different topics in the frame of the item “Management of Transport Systems”. Traffic Management means short term control measures which influence transport supply and travel. Transport System Management includes long- and short-term measures which influence transport supply and travel demand in such a way that the positive impacts of transport are maximized and the negative impacts of transport are minimized. The demand in such a way that the traffic flow is optimal.

II. The discussed thematic topics for new cooperation

“Seamless travel”

The Vision of this topic is to develop systems that inform and orient the transport user at every time and everywhere. This Seamless travel will be connected to intermodal information services. The nowadays existing problem is that content and services is coming in various forms.

In the frame of French-German cooperation, the best cooperation would be in organising round tables with strategic discussions and exchange of experience on both sides.

“Green cities”

This topics is an overall focus, where the European experience can be exported to e.g. growing conurbations on Arabian peninsula. The identify potentials for a more efficient city (link between housing and transport). Here can be the comparison of French & German pilot cities have an enormous added value for DEUFRAKO. The lack of data, common methods for data collection is a still existing challenge in the French-German research cooperation.

“Travel Time Information”

Working on travel times information on trip is very important in the moment. France and Germany should develop methods for estimation, quality and communication towards car drivers / users. Here a DEUFRAKO project dedicated to scientific exchange in the field of travel time estimation would be very useful.

“Potential of cycling”

New French approaches for urban mobility with the use of bicycles and “intermodality between bicycle and public transport” could be interesting topics for DEUFRAKO.

The E-bikes „pedelec“ experience in Stuttgart and new approaches in Parisian “velib” project can be taken as principal data basins for research on behaviour of users of urban bicycle-mobility. Comparable The accessibility for bicycling in the work of urban planning or transport planning has to be include in the work.

“Urban rail”

An interesting subject for a future DEUFRAKO cooperation could be the research on support for the driver of urban rail transports about energy consumption, irregular situations, education, assistance.

The use of limited rail infrastructure in cities could be more efficient.

“Driver assistance systems”

As standardisation is in general a main priority for DEUFRAKO in the frame of driver assistance systems, the standardisation and certification (ADAS) could be very useful for future European harmonisation.

The work on legal aspects in this topic and the juristic comparison is fruitful field of cooperation, which has just started.

Conclusions

- Field tests are a good tool for improving French German cooperation
- Interlinking of existing approaches
- Reasonable sized, target-oriented projects
- Preparation of common positions for European standardisation

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