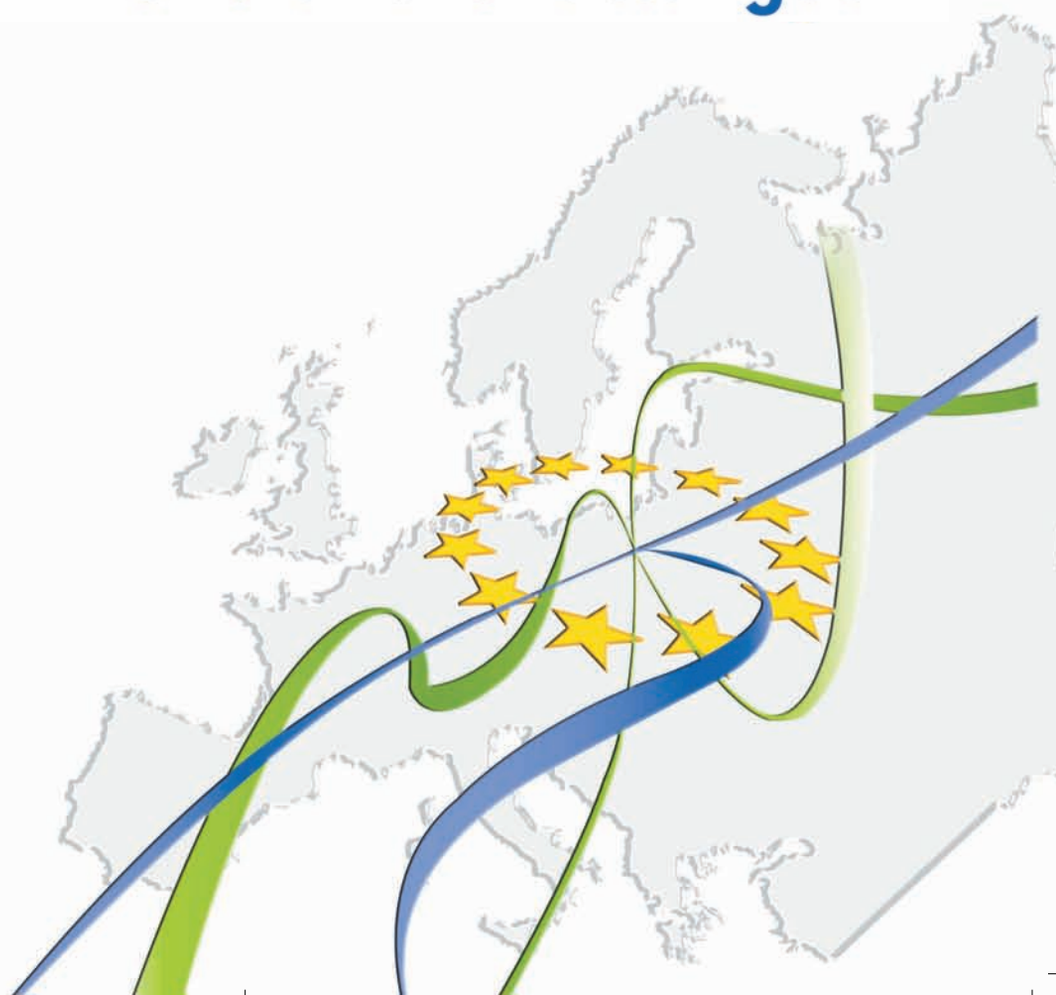
ERTRAC

European Road Transport Research
Advisory Council

Vision 2020 and Challenges



June 2004

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INTRODUCTION

Preamble

Road transport stakeholders

ERTRAC, the European Road Transport Research Advisory Council consisting of high level representatives from all road transport stakeholders, has started the challenging task to define an ambitious yet realistic Vision of an improved European road transport system for 2020 and beyond.

To that effect ERTRAC has started, as one of its main missions, to elaborate a Strategic Research Agenda defining priorities and road maps with the ambition that it will serve as a reference for the definition of future research plans.

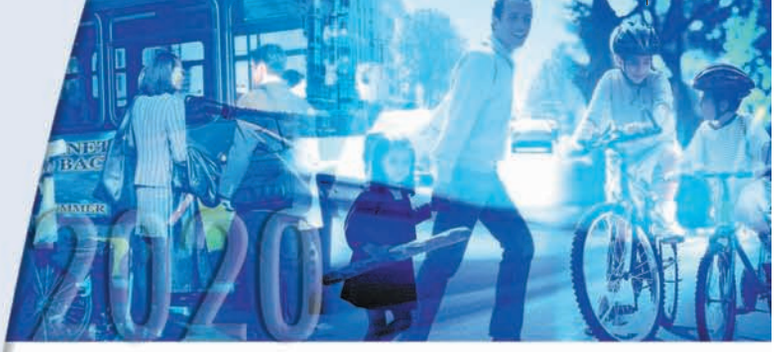
Research activities

ERTRAC has brought around the same table all road transport stakeholders in order to define the necessary research activities which would result in a better future characterised by more efficient energy use, security of energy supply, better air quality and environment, enhanced safety and security and easier mobility. A major focus will also be placed on the competitiveness of the road transport system's industry and services.

This process will provide the transport sector with the right framework so as to contribute to the Union's goal "...to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion".

Vision 2020

This initial ERTRAC publication reflects a consensus on the Vision 2020 and a summary of ERTRAC's work as it stands today. The Strategic Research Agenda with detailed definition of future research activities, priorities and road maps will be part of subsequent publications.



The Road Transport Sector, a Major Contributor to the Economy with an Important Societal Mission

Contribution to economic prosperity

Road transport fulfils a major role in the European economy and society, involving a wide range of industries and services from vehicle manufacturers and suppliers to infrastructure builders, services, energy and research providers, public authorities, insurance and rental companies and many others. Road transport, together with the other modes of transport, provides indispensable mobility for all citizens and goods and contributes to the economic prosperity in Europe.

Social, regional and economic cohesion

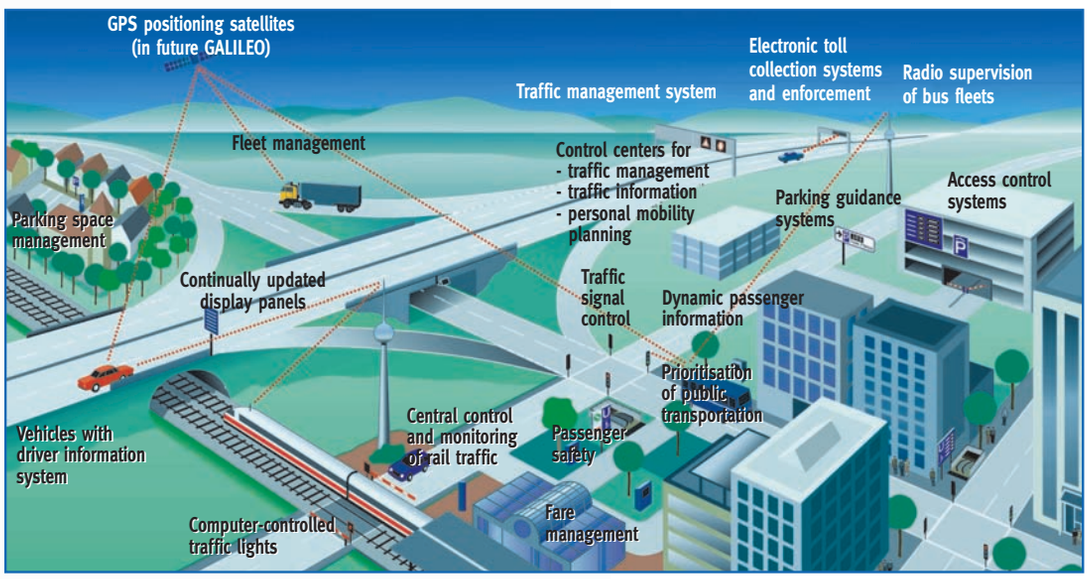
It has a major impact on our daily lives, providing a major source of employment, a carrier for economic activities, inter-urban mobility and links between urban functions. Transport infrastructure considerably reduces the geographical isolation of peripheral regions. It is a key factor to social, regional and economic cohesion, including the development of scarcely populated areas. However, the impact of road transport on the environment and health remains a major challenge in many aspects.

Importance to Europe:

- Employment for more than 14 million people;
- 11% of the gross national product;
- R&D investment of 19 billion €/yr by automotive and supply industries.

Sustainable development and growth

Road transport plays a key role in ensuring sustainable development and growth in Europe in economical, social and environmental terms. To satisfy this role, meeting all future challenges and still improving competitiveness, the European road transport sector needs continuous progress through an integrated system approach of all related areas. To be effective, an appropriate coordination framework is required to align public and private resources in support of the necessary research and development activities.



Courtesy Siemens AG

A Framework for Supporting a Common Vision and Strategic Research Objectives

High level consensus

Road transport presents Europe with a number of challenges and opportunities that have to be met and exploited for the benefit of all citizens.

To reflect the importance of research expenditure for industry and governments, a high level consensus for research has been developed. It is aligned with the European Council conclusions of Lisbon 2000, "***The Union has the strategic goal to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion***" and that of Gothenburg, "***The European Council invites industry to take part in the development and wider use of environmentally friendly technologies in sectors such as energy and transport***".

Increased investment

Increased investment in research is key to the realisation of the Lisbon and Gothenburg objectives and in line with the Council decision of Barcelona in 2002 to promote R&D and innovation by increasing funding up to 3% of GDP by 2010.

New form of cooperation

Harnessing the full potential of this political initiative to the benefit of all road transport users requires a new form of cooperation. This has already commenced through the creation of an Advisory Council for road transport research to better guide research for more targeted, efficient and effective use of research resources.

Responding to these challenges through a new form of cooperation, the Vision and Research Agenda are established taking into account the needs of the citizens and society. They will serve as a guide for the relevant public and private stakeholders.

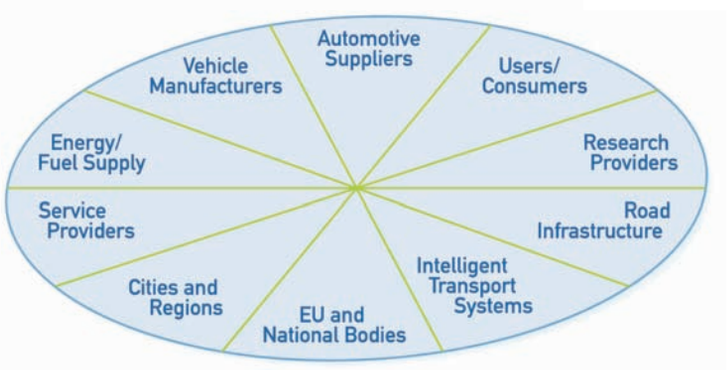
A NEW FORM OF COOPERATION FOR ROAD TRANSPORT RESEARCH

Develop a shared vision

The European Road Transport Research Advisory Council (ERTRAC) was launched on June 25, 2003 in order to develop a shared vision to mobilize all stakeholders and prevent unnecessary fragmentation and duplication of research efforts.

High level representatives

ERTRAC members are high level representatives from all road transport sectors including consumers, vehicle manufacturers, component suppliers, road infrastructure operators and developers, service providers, energy suppliers, research organizations, cities and regions as well as public authorities at both European Union and national level.



The ERTRAC Plenary is the forum for discussion for all stakeholders through input from the high level representatives. Under the Plenary, the Support Group is a management level working body that coordinates the overall activities and implements the Plenary decisions. The Work Group carries out specific requests and supports the overall objectives of ERTRAC by organising the contributions and support from experts and all of the various stakeholders for the development of the Strategic Research Agenda.

Mission

The ERTRAC mission is to:

- Provide a strategic vision for the road transport sector, with respect to research and development;
- Define strategies and roadmaps to achieve this vision through the formulation and maintenance of a Strategic Research Agenda and technical annexes;
- Stimulate increased, effective, public and private investment in road transport research and development, including potential joint public-private partnerships;
- Contribute to improving co-operation between the European, national, regional and private research and development actions on road transport;
- Enhance the networking and clustering of Europe's research and development capacity;
- Promote European commitment to research and technological development ensuring Europe as an attractive region for researchers.

ERTRAC provides a platform for the stakeholders to develop a Vision and a Strategic Research Agenda (SRA) for the long term future of the road transport system. ERTRAC will identify the priority research areas, promote and stimulate the deployment and implementation of the SRA in order to achieve the goals of this vision. ERTRAC also establishes appropriate links with other initiatives for future road transport, like the "European Hydrogen and Fuel Cell Technology Platform" and the "*e*Safety Forum".

VISION AND CHALLENGES FOR 2020 AND BEYOND

An integrated system

In the future, road transport will remain an essential component of economic sustainability and social cohesion. Road transport must be seen as part of an integrated system with seamless links and the best possible balance with respect to other transport modes.

Sustainable development

Growth in a competitive economy and the preservation of quality of life, environment, resources and rational use of space has to comply with the principles of sustainable development and will require efforts in the design, maintenance and operation of the road networks, environmentally friendly vehicles and intermodal solutions.

Research is crucial for the competitiveness of the road transport industries and services. Growing economic activity resulting from enlargement will require sustainable responses, as well as reliable and flexible solutions. Research will have to consider social trends and people's perceptions and preferences.

Co-ordinated R&D

Achieving and maintaining global industry leadership through co-ordinated R&D is a key challenge. The European industry should be able to attract the best skills and offer training and interesting career opportunities. Co-ordination between research, education and training is therefore necessary.

The future trends and challenges to achieve the Vision for the year 2020 and beyond are presented under the four following themes:

- Mobility of People and Transport of Goods;
- Safety and Security;
- Environment, Energy and Resources;
- Design and Production Systems.

Mobility of People and Transport of Goods

Despite efforts to rationalise the need for transport, growth in the demand for mobility of people and goods is still expected by the horizon of 2020. Forecasts for 2010 expect a 26% increase in terms of vehicle-kilometers and a 24% increase in terms of passenger-kilometers for EU15, compared to the year 1998. With respect to goods transport, the trend provides an even bigger challenge to sustainable development, as forecasts expect an increase by 38% for 2010. About half of this growth is expected to be within the new EU member states. The development of decentralised economic activities will require an efficient, flexible and intermodal transport system.

Demographic trends of an increasingly ageing population will create new mobility patterns and needs, as well as a strong demand for a seamless, flexible, more attractive and user-friendly mobility system. This will be achieved through better information and integration between all modes of collective and individual private transport (including walking and cycling), as well as through better land use planning.

With the coordinated support and commitment of the relevant stakeholders, by 2020 significant progress will have been made.

Road Transport in 2020
ENHANCED MOBILITY, OPTIMISED AND EFFICIENT SEAMLESS SYSTEM

Major Aspects of this Vision:

- People of all ages, incomes and physical abilities have ready access to convenient transportation thanks to a combination of collective transport and private vehicles within a better-integrated intermodal framework. If economically viable, new transport concepts shall be exploited where appropriate.
- The infrastructure network has been optimised through continuous investment. It is regularly monitored, upgraded and maintained to consistently high standards. It is used more efficiently, therefore optimising user services. Development of the infrastructure is supported by effective research in new materials and technologies.
- Traffic is smoother. Road networks are efficiently utilized and fully interoperable across Europe allowing seamless connections of road transport with other transport modes.
- Goods transport and logistics use the road and other modal infrastructure efficiently for urban deliveries or long-distance hauling.
- Land-use developments are better integrated with transport planning in order to eliminate unnecessary demand for transport and parking.
- A range of appropriate technical and policy measures are in place to manage mobility demand. They complement optimisation of the capacity utilisation of the road network and enhance quality of life.
- Real time traffic and road data are available in an integrated information infrastructure to assist traffic management and to improve network management so as to enable people to make informed decisions.
- Interchanges between transportation modes provide the consumer with new features and services, including information and communication systems. These interchanges also fulfil economical and social dimensions.
- The available road space is used efficiently to support mobility needs of both people and goods through appropriate technology and policy measures.
- New approaches to the road transport system design are minimising the aesthetic impacts on communities.

Safety and Security

Safety and security are growing concerns for the whole society. All levels of decision making have developed ambitious policies to reduce the risks associated with transport. These policies address issues concerning all road vehicles and related technology, enforcement, legislation, behaviour, infrastructure and intelligent traffic systems. Measures will be sought for a major reduction of fatalities and severe injuries beyond the objectives of the "WHITE PAPER European transport policy for 2010: time to decide". These measures will also reduce incident-related delays and enhance journey time reliability.

The competitiveness and attractiveness of road transport requires increasingly high standards of safety with specific emphasis placed on vulnerable road users. Continuous effort is necessary through appropriate research and development actions to achieve a long term vision.

Road Transport in 2020

SAFE AND SECURE ROAD TRANSPORT SYSTEM

Major Aspects of this Vision:

- The road infrastructure is easily understood by all road users and designed to minimise road user mistakes. It limits the consequences of driver errors.
- Roads and infrastructures, including road markings, are built, upgraded, maintained and inspected according to high safety standards and procedures.
- Integrated vehicle safety systems are further developed to prevent accidents and mitigate their effects. They greatly improve the driver's control of the vehicle. Nevertheless, the driver always remains in control.
- Intelligent roads and intelligent vehicle systems interact and communicate with the driver. The systems provide guidance, warn of danger and enable safe driving behaviour.
- Vehicle-to-vehicle compatibility is enhanced, to favour traffic safety in areas with high density of road users.
- Vehicles and infrastructure are minimising the impact on the most vulnerable road users, in particular pedestrians and cyclists.
- The inappropriate use of powered vehicles in sensitive parts of urban areas is restricted.
- The road system is continuously monitored to ensure that high safety standards are maintained.
- Continuous and attractive training and safety awareness programs reach all road users, in particular during early education at school.
- Effective enforcement methods for enhanced road safety (e.g. for speed limits, seat belt use, influence of alcohol or drugs while driving) are available.
- An agreed methodology for gathering and analyzing accident causation data is in place. The data is available for necessary, in-depth accident investigation.
- Safety challenges from new fuels and energy sources are addressed through standards, design practices and operating procedures.
- Databases are used to help enforcement of traffic regulations and assess the nature and magnitude of security problems across boarders without impinging unacceptably upon the liberties and the privacy of citizens.
- Respecting the right of privacy for citizens, vehicles are equipped with theft deterrent systems, vehicle tracking technology and personal safety systems such as those based on biometrics.
- Freight security is improved by advanced tracking and monitoring technologies such as load identification.
- Response scenarios for emergency rescues and evacuations, post-accident treatment are enhanced as are countermeasures against illegal operations such as hijackings and vandalism. Optimised cooperation and performance between the police, authorities, fire brigades and rescue teams supports this task.

Environment, Energy and Resources

Environment, energy and resources are a major pillar of a sustainable transport system. The key challenge is to meet the future energy demand of road transport while reducing its contribution to the global greenhouse gas emissions. The citizens' growing concerns about the environment, their health and quality of life have resulted in policy measures and the development of new environmentally friendly technologies and fuels.

The vision is that, towards 2020, the deployment of such technologies within a well integrated and effective policy framework has brought significant improvements in the security of energy supply and progressing towards environmental sustainability.

Effective, well coordinated research and development by the road transport stakeholders will lead to the emergence of a range of new technologies and a fast evolution of existing technologies by 2020.

Road Transport in 2020

CLEANER, QUIETER AND MORE ENERGY EFFICIENT ROAD TRANSPORT SYSTEM

Major Aspects of this Vision:

- Greenhouse gas emissions and energy use from individual vehicles have been substantially reduced thanks to a wider use of highly fuel-efficient vehicles and increasing use of improved conventional, renewable and alternative low carbon fuels where beneficial to the environment. Efforts are continuing to achieve further improvements in the longer term.
- Renewable and alternative low-carbon fuels together with advanced vehicle powertrains begin contributing to environmental improvement and security of energy supply. Their large-scale availability and distribution infrastructure is still a challenge in 2020.
- The transport system has become more efficient minimising road traffic congestion contributing greatly to reducing the energy consumption of individual road vehicles.
- Emissions other than CO_2 from new road vehicles, including two-wheelers, over their entire life cycle are at levels that have negligible impact on air quality.
- Noise from the road traffic system has been reduced. Noise levels are appropriate to individual locations including quiet zones.
- Vehicle manufacturing systems and road construction and maintenance processes are designed to maximise the extent of recycling. Advanced technologies allow a substantially more efficient use of resources and energy.
- Road transport energy use and resources approach sustainable levels.
- Due to new cleaning and protection technologies, the impact from surface runoff on water quality is minimal.
- New approaches to the road transport system are minimising environmental impacts on communities and natural habitats.

Competitive Design and Production Systems

Many challenges face Europe's road transport related industries in order to remain competitive within European and global markets. Infrastructures must be upgraded or built to meet increasing needs for efficient and safe transport. Original equipment manufacturers and suppliers must meet consumer demands that require deployment of the latest technologies and manufacturing techniques. The horizon of 2020 foresees a competitive position which must be maintained within an environment of ever faster model changes and the integration of a variety of new technologies and fuels.

Future success will depend on the adaptability of the industry and its uptake of new innovations and best practices. Technological advances have to be implemented across all stages of the product cycle in ways that maximise the benefits to consumers and to society as a whole.

Structured support for the development of technologies and processes is a key issue, for example in the development and integration of Information and Communication Technologies (ICT) and Intelligent Transport System (ITS) solutions. New technologies for vehicle and engine construction, new production processes, reduced production costs, better identification of consumer needs will be required. End-of-life strategies for vehicles, materials and infrastructure will increasingly provide opportunities for economic activity that will support more sustainable transport development and economic growth.

The long-term competitiveness of industries in the road transport sector and related service providers is essential for employment. For the transport sector relatively high proportions of these jobs are in the research area and effective investment in European research is required.

Road Transport in 2020

HIGHLY COMPETITIVE AND SUSTAINABLE SYSTEMS FOR PRODUCTS AND SERVICES

Major Aspects of this Vision:

- Transport and infrastructures industries to a high degree use new management, production and design systems to satisfy the increased demand for sustainable mobility while at the same time maximising the benefits to society and increasing the choice available to end-users.
- Vehicles and infrastructure have increased quality and are more efficient over their lifetimes because they are developed with an integrated view of road infrastructure, components, materials and fuels.
- Vehicles and road infrastructure are designed to minimise their environmental impact. An accurate Life Cycle Analysis allows clean production and a high recycling rate. Recycling is an economic success.
- The system for supplying parts, manufacturing vehicles and delivering them to consumers causes minimum environmental damage while remaining flexible to respond to consumer needs, including time to market, price and reduced maintenance.
- The information systems of vehicles and roads are robust and open which means they can be updated or individualised as new features are developed.
- Enabling technologies such as lightweight materials, electronic systems, information and communication technologies and nanotechnologies allow the industry to meet engineering goals at acceptable cost and strengthen its competitiveness.
- The transport infrastructure asset is managed through the use of performance models and optimization tools.
- Innovative construction and strengthening techniques for bridges and other structures are established to support rapid construction, long life service ability, low maintenance costs and recyclability.
- Modularity for pavement allows parts of the pavement (e.g. surface courses) to be developed on short time scales without detriment to other, often longer-lasting parts of the pavement.
- The transport industry will have the right framework as to contribute to the Union's goal "…to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion"

STRUCTURE AND CONTENT OF THE 2020 VISION AND STRATEGIC RESEARCH AGENDA

With the inputs from its stakeholders and invited road transport experts, ERTRAC develops the Strategic Research Agenda for the next decades. It will be periodically updated and the progress of the corresponding research and development will be monitored.

Both the Vision 2020 and the Strategic Research Agenda are organised around four main streams of actions corresponding to the Vision and challenges:

The Strategic Research Agenda follows the principles of sustainable development considering with equal importance the societal, environmental and economic elements. It aims to contribute to the development of new technologies which should provide:

- Improved quality of life of European society (e.g. better mobility, safety, security);
- Environmental improvements (e.g. reduced green house gases, emissions, noise, better use of resources, recycling);
- Economic improvements (e.g. increased competitiveness, employment and growth).

All stakeholders and their organisations will contribute to the definition and promotion of an open, broad and consensus-based plan for European road transport research that optimises the European research potential.

REALISING THE 2020 VISION AND IMPLEMENTING THE STRATEGIC RESEARCH AGENDA

The stakeholders of ERTRAC support the development of a Strategic Research Agenda and the vision expressed in this document.

The Strategic Research Agenda will be specifically developed to support the continuous refinement, update and achievement of this vision and will serve as a reference for the definition of future research plans. Achievement of the vision might require different efforts from the member states.

Given the importance of the challenges facing the European society and economy in terms of competitiveness and sustainability of its way of life, they agree to continue to work together within the frame of ERTRAC.

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