European Technology Platforms

Moving to Implementation

SECOND STATUS REPORT

May 2006

This report was compiled by a European Commission Inter-Service Group on European Technology Platforms.

Following on from the publication of the reports:

- *"Technology Platforms: from Definition to Implementation of a Common Research Agenda", dated 21 September 2004 - EUR 21265*

- *"Status Report on the Development of Technology Platforms", dated February 2005 – ISBN 92-894-8985-5*

it provides information on the current status and planned future activities of many of the European Technology Platforms, as well as outlining progress on a number of topical horizontal issues at a point when many platforms are preparing to move to the implementation of their Strategic Research Agenda.

The report does not however represent any official position of the European Commission, nor do its contents prejudge any future Commission proposals in the research area or in other areas of Community policy.

EUROPEAN COMMISSION

Directorate-General for Research
Directorate B – Structuring the European Research Area

EUROPEAN COMMISSION

SECOND STATUS REPORT ON EUROPEAN TECHNOLOGY PLATFORMS

"Moving to Implementation"

**Report compiled by
a Commission Inter-Service Group on European Technology Platforms**

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"Moving to Implementation"

1.   INTRODUCTION

Research is key to meeting a broad range of challenges and opportunities that our society faces today in the era of increasing globalisation. Investment in knowledge is a priority to address issues related to economic growth, employment and sustainable development.

The 2005 industrial R&D scoreboard[1] indicates that private investment in R&D in the EU is too low: the top 700 companies outside the EU increase their R&D investment by a much higher percentage than their EU counterparts (about 7% and 0.7% respectively).

EU governments and their leaders have committed themselves to stimulating an increase in investment in research and innovation. Not only should the scale and impact of investment in research be increased for Europe to strengthen its position as a technologically innovative economy, but it is recognised that there is significant added value in coordinating activities at the European, national and regional levels. In bringing together a wide range of public and private stakeholders, European Technology Platforms (ETPs) are set to play a key role in this respect.

The primary objective of an ETP is to boost European industrial competitiveness. It achieves this by defining research and development priorities, timeframes and action plans on a number of strategically important issues where achieving Europe's future growth, competitiveness and sustainability objectives is dependent on major research and technological advances in the medium to long-term. ETPs focus on areas of significant economic impact and high societal relevance where there is strong public interest and scope for genuine value added through a European level response**.**

ETPs bring together a wide range of stakeholders, including key industrial players, small and medium enterprises, the financial world, national and regional public authorities, the research community, universities, non-governmental organisations and civil society. They generally follow a three stage process:

Stakeholders, led by industry, come together to **agree a common vision** for the technology.

Stakeholders **define a Strategic Research Agenda** setting out the necessary medium- to long-term objectives for the technology.

Stakeholders **implement the Strategic Research Agenda** with the mobilisation of significant human and financial resources.

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[1]   http://eu-iriscoreboard.jrc.es/scoreboard_2005.htm

As well as their influence on industrial and research policy, ETPs interact with and have a positive impact on a wide range of other Community policies, including industry, sustainable development, health and transport, as well as on a range of broader societal issues.

In practice, the positive impact of ETPs is even more far-reaching: ETPs can play a role in shaping standards and in creating networks and associations at European, national and regional level; they can provide significant input in identifying and overcoming unnecessary regulatory and administrative barriers to commercialising the results of research in Europe; and they can contribute to the definition of future education and training needs to help ensure the effective implementation of the technologies developed.

2.   STATE OF PLAY

The first European Technology Platforms (ETPs) emerged in 2002-2003. Since then, the concept has been taken up widely and there are now 29 ETPs up and running. These span a wide range of technologies which are key to Europe's future growth and competitiveness objectives.

The European Commission began promoting the concept in 2003 and since then has provided, as appropriate, guidance and support as it sees ETPs as playing an important role in helping to identify new research priorities. Set up as informal discussion networks, primarily upon the initiative of industry, the European Commission encourages this bottom-up, flexible approach to defining medium to long-term research needs. At the same time, the Commission does not "own" ETPs nor is it bound by their results.

The growing importance of ETPs in the European research landscape is reflected by the strong political backing that they have received at the highest level. At the Spring European Council 2005, Heads of Government recognised the role of ETPs in "*strengthening the competitive advantages of the industrial base while ensuring the complementarity of the action at national, trans-national and European level*" [2]. The Competitiveness Council subsequently recognised the potential contribution of ETPs to identifying and addressing regulatory obstacles to new technologies and innovation[3].

The European Parliament has also demonstrated strong support. In this regard, the Committee on Research, Industry and Energy (ITRE) welcomed the concept as an important tool to bring together a range of stakeholders[4].

The concept has also been endorsed by a wide range of experts. The Report of the Independent Expert Group on R&D set-up following the Hampton Court meeting of Heads of Government (the 'Aho Report') identified ETPs as a "*key organisational innovation in the creation and exploitation of innovation-friendly markets*" [5]. It concluded that *"technology platforms form an effective vehicle for the course of action that we propose, allowing flexible use of resources and the opportunity to combine market creation and technological development"*.

The European Research Advisory Board (EURAB) has also given a positive opinion on ETPs, which it sees as a way to help ensure that European investment in R&D produces

[2]   Conclusions of the Spring European Council, 22-23 March 2005 (page 5)
[3]   Conclusions of the 2694th Council meeting, 28-29 November 2005, 14155/05 (Presse 287) (page 11)
[4]   Report on Science and Technology – Guidelines for future EU policy to support research, Committee on Research, Industry and Energy, February 2005, A6-0046/2005 final (page 10)
[5]   Report of the Independent Expert Group on R&D and Innovation appointed following the Hampton Court Summit: 'Creating an Innovative Europe', January 2006 (page 25)

benefits for European citizens, enhances the competitiveness of European companies and increases the impact of the high investment in R&D[6].

The five year assessment of the Sixth Framework Programme endorses the establishment of a limited number of ETPs *"with the objective of establishing European leadership in key emerging technologies, thereby increasing private investment in RTD[7]".*

ETPs have already demonstrated their effectiveness in mobilising all the key players. With some ETPs actively involving up to 200 players, this implies the committed mobilisation of several thousand individuals.

Some 20 ETPs have now published a "Vision" document and the majority have also completed or developed an advanced draft of their Strategic Research Agenda (SRA). These platforms are now preparing to move to the third stage of development – implementation.

The European Commission has taken account of the outputs of their work in developing research policy, including notably when formulating its proposals for the Seventh Framework Programme (FP7) and the associated Specific Programmes. This has been a valuable way of ensuring the industrial relevance of the proposed content of the themes:

> *"The 7th Framework Programme is better tailored to meet industry's needs. Where industrially relevant, the definition of work programmes will draw on the strategic research agendas developed by industry-led technology platforms. These strategic research agendas, presenting the European dimension of research challenges, also influence national research programmes. Furthermore, by always looking at the market potential of new inventions, they help to overcome Europe's weakness in commercialising the results of research.[8]"*

More specifically, the Commission's analysis shows that some 15 SRAs will be covered under a single theme and that a further 10 SRAs will address several research themes[9].

In addition to their influence on setting priorities for Community funded research programmes, ETPs are impacting positively on national and other international research initiatives and are acting as a leverage to private investment in R&D.

3.   TOPICAL HORIZONTAL ISSUES

3.1   Openness and transparency

A strong commitment to openness and transparency is key to the success of a European Technology Platform (ETP). Each platform must have clear "rules of the game" to ensure that it is founded on broadly-based agenda-setting and does not become dominated by narrow industry groupings or other stakeholder lobbies, nor become a "closed shop". The practical implementation of these principles will enhance commitment to and efficiency in implementing Strategic Research Agendas (SRAs) and will increase their impact.

In this regard, in December 2004, during a meeting with the European Commissioner for Science and Research, Mr Janez Potočnik, the industrial leaders of ETPs agreed to

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[6]   European Research Advisory Board (EURAB) Report on European Technology Platforms, January 2004, EURAB 04.010-final (page 1)

[7]   Five-Year Assessment of the European Union Research Framework Programmes (1999-2003), 15 December 2004, page 15

[8]   Communication from the Commission: "Building the European Research Area of Knowledge and Growth", COM(2005)118, 6 April 2005 (page 8)

[9]   25 ETPs were up and running when the Commission formulated its proposal for FP7 of 6 april 2005. There are currently 29 ETPs

implement an unwritten voluntary code of good practice on openness and transparency vis-à-vis all relevant stakeholders including, notably, small and medium enterprises (SMEs) as well as groups representing wider societal interests.

Each ETP is free to decide for itself how to implement these principles in practice and there is clear evidence that concrete measures have been taken to communicate both with stakeholders and with wider society. Actions include:

- Rotation of membership of the Advisory Council

- Regular stakeholder meetings

- Openness to the participation of new stakeholders (in particular SMEs and societal organisations)

- Setting up of a dedicated platform website.

While ETPs are normally led by larger industry, particular attention has been given to ensuring openness towards SMEs. It is important that SMEs are involved from an early stage in order to be aware of and to influence, where appropriate, the content of the SRAs as well as to foster long-term partnerships with other stakeholders involved. However, the real pay-off for SMEs will mainly be later when the R&D is implemented.

It is widely recognised that SMEs can add significant value to the activities of ETPs, but involvement is often hampered due to the difficulty in getting information to them. As such, their involvement can be facilitated through dedicated SME networks. In addition, some countries are setting up national technology platforms in the same fields as the European platforms. As well as providing a channel to relevant public authorities, national platforms facilitate the involvement of SMEs, since it is much easier for SMEs to engage in a platform at national level due to their local knowledge, geographic access, common language, etc.

For its part, the Commission services are encouraging ETPs to ensure that the interests of SMEs are taken on board.

The requirement for openness and transparency should not go so far as to prevent stakeholders joining ETPs or cause them to leave due to any perceived fear of industrial espionage. Therefore, it is recognised that all stakeholders must add value and contribute to the ETP's activities in an appropriate way.

3.2   Increasing awareness

To help ensure that ETPs are fully recognised and reflect future market needs, their objectives and activities should be widely disseminated through an early and active communication policy targeting a broad audience, including stakeholders, policy-makers and the general public. Given that ETPs are intended to cover the full spectrum, from research to commercialisation, it is important that regulators, consumers and other end-users are involved from the outset.

In addition to the actions taken by research organisations, regional groupings, industrial federations, etc., a number of initiatives have been taken with a view to sharing information targeted at specific audiences:

- The industrial leaders of ETPs come together on a regular basis, normally in the presence of the European Commissioner for Science and Research, to discuss key

issues of common importance (e.g. openness and transparency, participation of SMEs, the international dimension, interaction between platforms, financial engineering, etc.).

- The Austrian EU Presidency Conference (Vienna, 4-5 May 2006), organised in conjunction with the European Commission, has the objective of bringing together, for the first time, a broad audience in order to raise awareness on the existence of ETPs, to facilitate wide-ranging networking between stakeholders with a view to promoting cross-platform exchanges of experience and to assess the role of ETPs in boosting European competitiveness and the role of national authorities in this context.

- Since mid-2004, the general aspects of ETPs have been presented at some 115 meetings with the central authorities of individual EU Member States as well as with regional authorities, industrial associations, research associations, advisory bodies (e.g. EURAB), international organisations (e.g. EUREKA), etc. This includes major awareness-raising events on ETPs, attracting several hundreds of participants and organised by individual EU Member States, applicant countries and associated states, in close co-operation with the Commission services. In the newer Member States, awareness of ETPs is not as high as would be desirable and particular efforts are therefore underway to help redress this situation, for example through the organisation of awareness-raising events.

- A dedicated CORDIS web-site on technology platforms has been set up[10] to increase awareness on ETPs amongst a more general audience and to promote overall transparency and openness. For example, the results and proceedings of the three seminars held to date with the industrial leaders of ETPs are available on the CORDIS website.

3.3   Financial engineering

The research defined in Strategic Research Agendas (SRAs) will be implemented by the stakeholders involved. Support can be given through the regular funding schemes for collaborative research of the Framework Programme. However, the Framework Programme is only one source of funding. It is therefore important that ETPs, from an early stage, develop an operational focus that takes account of their financial engineering needs and involves the mobilisation of a range of public and private financing sources including, for example, industry, international, national and regional programmes and the financial markets, especially the European Investment Bank (EIB).

R&D is identified as a priority area in the EIB's Innovation 2010 Initiative (i2i) and the volume of the Bank's lending for research projects has increased considerably since the 1990s. However, resources that can be dedicated to projects with a higher risk profile than the Bank's main lending portfolio remain insufficient. To encourage more private sector finance for RTD, the European Commission and EIB are developing the "Risk-Sharing Finance Facility" (RSFF). This mechanism aims to facilitate access to loan financing for large European R&D projects and is expected to have an important leverage effect on private investment in R&D.

The Structural Funds[11] have also been identified as a potential funding source to support the implementation of SRAs – in particular, but not only, in the new Member States. The

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[10]   http://cordis.europa.eu.int/technology-platforms
[11]   http://europa.eu.int/comm/regional_policy/funds/prord/sf_en.htm

Commission has adopted guidelines on opportunities for investing in R&D and innovation, including in the context of the Structural Funds, and ETPs intend to explore these opportunities further.

3.4   The international dimension

Many countries outside Europe are showing a strong interest in the overall development of ETPs. An exchange of experience on approaches taken in other parts of the world to defining strategic research needs of industry could prove beneficial.

The involvement of third countries in the activities of individual ETPs could also provide significant added value, in particular for those platforms dealing with topics, such as animal and human health or water sanitation, where international cooperation is an important element.

Recognising that Europe is competing fiercely with the rest of the world, ETPs must decide on the extent of their international dimension on a case-by-case basis.

4.   THE WIDER IMPACT OF EUROPEAN TECHNOLOGY PLATFORMS

As well as the Seventh Framework Programme (FP7) research themes, the work of European Technology Platforms (ETPs) is also impacting positively on several other areas aimed at boosting European research efforts and efficiencies and which are major objectives under FP7.

These include: identifying needs for research infrastructures; defining future education and training needs; strengthening links and complementarities between EU and national policies; and reinforcing synergies with other European research support programmes (e.g. EUREKA). Moreover, ETPs are expected to have a significant influence on setting priorities for private sector, national and other international research investments, thereby helping to ensure complementarity between different funding sources.

4.1   International, national and regional research programmes

In addition to their significant influence on setting priorities for Community funded research programmes, ETPs are impacting positively on other national and regional research initiatives. As such, they are set to play a key role in shaping research and innovation policy.

Public authorities are actively involved in ETPs in their roles as policy-makers and funding agencies, as well as promoters and consumers of technologies. Most Member States are taking steps to raise awareness within their industries, research organisations and academic circles and many have carried out strategic analyses to identify the most important platforms to be targeted. Given the importance of the committed involvement of national authorities, some ETPs have set up Member State "Mirror Groups". Composed of experts nominated by the Member States, Mirror Groups aim to facilitate coordination and provide an effective two-way interface between platforms and complementary activities at a national level.

ETPs can provide a positive contribution to reducing the digital divide between regions and to enhancing networking and the mapping of excellence, as well as to harnessing the strong regional element in the generation of specific knowledge and the market penetration of new technologies. As such, the incorporation of the regional dimension in ETPs is of great importance in order to ensure that new technologies and the resulting socio-eco-

nomic changes, which will typically be located in many different European regions, will not impact disproportionately. In addition, regions can act as intermediaries between platforms and SMEs.

ETPs should not only influence national and regional programmes, but they can also act as key players in enhancing collaboration with international programmes across Europe. This is important in the context of improving the coordination of research in Europe and, ultimately, reaching the Barcelona objective of increasing investment in research[12].

In this context, there is strong political support to enhance synergies between the EUREKA initiative[13] and the Framework Programme. ETPs are proving to be useful tools in reaching this goal and there are many examples of good collaboration, in particular where there is a EUREKA Cluster – a long-term, strategically significant industrial initiative - which addresses a relevant topic, since in these cases EUREKA's participation is facilitated through the existence of an established structure and network.

The European Commission is continuing to work closely with EUREKA and other international, national and regional programmes with a view to further enhancing synergies and, ultimately, shaping European research policy and enhancing the coordination of research efforts across Europe.

4.2   Helping to identify research infrastructures

The European Strategy Forum on Research Infrastructures[14] (ESFRI) was launched in April 2002 to support a coherent approach to policy-making on Research Infrastructures in Europe. ESFRI is developing a European Roadmap to help identify research infrastructures which could be developed or upgraded to support European researchers in conducting leading-edge research. It is expected that the roadmap will be a useful tool for decision-makers to help balance the provision of facilities and assist in long-term budgetary planning.

ESFRI has invited the industrial leaders of ETPs to submit specific ideas on new research infrastructures in their field, thus ensuring that the future needs of the industrial research community are taken into account in the preparation of European policy on research infrastructures and, more specifically, the roadmap. As part of their Strategic Research Agendas (SRAs), several ETPs have already begun to take up this opportunity to play a role in focusing discussions in fields of strategic importance for technological innovation.

4.3   Improving the conditions for innovation

Regulatory and administrative conditions can present a barrier to the successful commercialisation of research results in Europe. As such, independent Innovation Panels have been set up in six sectors (Biotechnology, Energy, Automotive, Aerospace, Information & Communications Technology (ICT) and Textiles) and covering two horizontal areas (high growth companies and eco-innovation). These aim to identify and analyse regulatory and administrative barriers, with a view to improving innovation efficiency in Europe. The panels were set up in the frame of the recently launched Community initiative, Europe IN-NOVA,[15] which deals with the sectoral aspects of innovation.

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[12]   Building the ERA of knowledge for growth, COM(2005) 118 of 06.04.2005
[13]   EUREKA is a pan-European network for market-oriented, industrial R&D (www.eureka.be)
[14]   http://www.cordis.lu/esfri/
[15]   http://www.cordis.lu/innovation/en/policy/europe-innova.htm

ETPs can be an important source of guidance to Innovation Panels in assessing sector performance and identifying drivers and barriers to innovation. ETPs can also play an important role in enabling the panels to address cross-sector collaboration opportunities for European firms, structural characteristics of emerging markets and organisational rigidities that hinder innovation, such as workforce mobility, skills and innovation management.

5. THE FUTURE DEVELOPMENT AND ROLE OF EUROPEAN TECHNOLOGY PLATFORMS

The three-stage process of development followed by European Technology Platforms (ETPs) has proven to be an effective and appropriate model to elaborate a common vision and research agenda for the technologies concerned. While many of the well-established platforms are ready to implement their Strategic Research Agendas (SRAs), initiatives are continuing to emerge in new areas.

5.1 The development of European Technology Platforms during the implementation phase

The initiative to set up an ETP comes from industry and platforms are developed entirely by their stakeholders. The Commission believes strongly in their potential to contribute to the knowledge economy and will, where appropriate, provide support.

Therefore, under the Seventh Framework Programme, ETPs will continue to define their own operational modalities and activities and the Commission services will maintain their role of facilitation and encouragement. For the implementation of their SRAs, platforms will be eligible for financial support through the regular funding schemes. The Commission will also to continue to facilitate the coordination and the sharing of best practice on key issues such as openness and transparency, SME participation and third country involvement, financial engineering and cross-platforms interaction, for example through communication activities and the organisation of inter-platform meetings.

5.2 Advising on evolving European research priorities

The Seventh Framework Programme will be implemented through the Specific Programmes and the more detailed Work Programmes, prepared on an annual basis, defining topics on which proposals will be invited. As part of this process, ETPs could play a role in providing inputs to the Commission services on the priorities for the Work Programmes, complementing other sources of advice. Such inputs should follow from consultation within the ETPs and be undertaken in a transparent way; they should draw on the monitoring of the implementation of their SRAs and any updates or revisions to SRAs. This will help to ensure that the Framework Programme continues to take account of the evolving needs and priorities of ETPs so that it can continue to play an appropriate role in supporting the implementation of SRAs.

5.3 Emerging cases

When the concept of ETPs was put forward, it was intended that initiatives would be set up in certain key areas where European industrial competitiveness is at stake. Since then, ideas and initiatives for establishing ETPs are continuing to emerge in new fields. It is

expected that new proposals will continue to emerge, in particular as the Seventh Framework Programme progresses and as the concept becomes better known by industry, researchers and other stakeholders.

It is therefore important to ensure that any new ETP initiative fits with the concept, which is now well-established, and with the actions already in progress. It should also be considered that some topics, whilst of recognised importance, may not justify the setting up of a dedicated ETP, either because they may overlap with existing platforms, remain vague in concept or address issues which are more horizontal in nature and are of relevance to a wide range of issues.

Furthermore, given their objective of improving coordination in the currently fragmented research landscape in Europe, it would clearly be counterproductive to encourage a proliferation of platforms.

This does not exclude that the model and approach developed by ETPs could be used in other areas where stakeholder groupings have been set up to address specific issues. It should be emphasised that input to the work programmes of the Seventh Framework Programme is by no means limited to ETPs and projects set up in the frame of an ETP are not given priority funding.

The Commission services have prepared guidelines to enable stakeholders to assess whether new initiatives fit the well-defined concept of an ETP in terms of:

- objectives and impacts

- organisational structure and players involved

- deliverables and resources.

This allows stakeholders to assess whether the setting up of a dedicated ETP is appropriate. Where the concept does not fit with these criteria or is considered not to be mature enough, alternatives can be considered, including possible cooperation or merging/integration with an existing ETP.

6. STRUCTURE OF THE INDIVIDUAL STATUS REPORTS

Detailed information on the 29 European Technology Platforms (ETPs) which are currently up and running are included in Annex 1. These have been drawn up by the Commission services concerned, in close collaboration with the key stakeholders in the individual ETPs.

These focus on the steps that ETPs are planning to take to move from definition to implementation.

7. CONCLUDING REMARKS

As a key driver for economic growth, employment and sustainable development, investment in knowledge is a priority for the EU in addressing the challenges and opportunities of globalisation. This is recognised by Member States and there is strong momentum behind increased investment in research and innovation.

European Technology Platforms (ETPs) are actively bringing together stakeholders to define common and ambitious Strategic Research Agendas (SRAs) in strategically impor-

tant areas. As such, they are set to play a key role in structuring the European Research and Innovation Area and in demonstrating the added value of cooperation.

Through their SRAs, ETPs are providing an input to the development of European research policy. In addition to their input in the formulation of the Seventh Framework Programme, they are playing a role in shaping national, regional and other international research priorities, as well as private sector programmes.

While their fundamental objective is to boost European industrial competitiveness, they are having a far-reaching impact on a wide range of other Community policies and are expected to play an important role in overcoming regulatory and administrative barriers to research and development in Europe.

The very fact that 29 platforms have brought together a wide range of stakeholders, across Europe and in some cases beyond, to develop a common vision on the technology concerned and to elaborate an SRA setting out the medium to long-term objectives represents, in itself, a significant achievement.

Now that the majority of these platforms are ready to begin implementing their SRAs, several new challenges lie ahead. The momentum is there and it is vital that this is maintained. To support ETPs in addressing these challenging issues, exchanges between platforms on best practices are important on a general level, but also between specific platforms to encourage an efficient use of resources and to avoid overlap, as well as to ensure focus on the core objectives of each platform.

To achieve the visions agreed on within the platforms, all relevant stakeholders must continue to work together with the dynamism and enthusiasm that has been evident so far.

The Commission, for its part, sees ETPs as a valuable tool for turning knowledge into growth.

ANNEX

Detailed Status Reports on Individual European Technology Platforms

**New technologies leading to radical change in a sector,
if developed and deployed appropriately and in time:**

**Reconciliation of different policy objectives with a view
to sustainable development**

**New technology based public goods or services with high entry barriers,
uncertain profitability, but high economic and social potential**

**Ensuring the development of the necessary technology breakthroughs
to keep at the leading edge of technologies in high-technology sectors
which have significant strategic and economic importance for Europe**

New technologies applied to traditional industrial sectors

The European Hydrogen and Fuel Cell Technology Platform (HFP)

Web-site: www.HFPeurope.org

Technology Platform Secretariat
Mr Alfons Westgeest, secretariat@HFPeurope.org, Tel: +32 2 774 96 52

Commission services contact
Mr Bill Borthwick, William.borthwick@cec.eu.int, DG Research, J2 'Energy Production and Distribution Systems'

Vision Documents
- Hydrogen Energy and Fuel Cells – A Vision for Our Future (June 2003):
http://www.europa.eu.int/comm/research/energy/pdf/hlg_vision_report_en.pdf

- Strategic Overview Document
http://www.HFPeurope.org/hfp/keydocs

Platform launch date: December 2003
Overall Policy Objective

The European Hydrogen & Fuel Cell Technology Platform was set up in 2003 with the aim of facilitating and accelerating the development and deployment of cost-competitive, world-class European hydrogen and fuel cell based energy systems and component technologies for applications in transport, stationary and portable power. Such systems will be key tools in the future for fulfilling the European energy policy's objectives of reduced greenhouse gas emissions and improved security of supply.

Strategic Research Agenda: Final - March 2005
http://www.HTFeurope.org/hfp/keydocs

Executive Summary

The Strategic Research Agenda (SRA) provides a strategic outline for a realistic research programme to stimulate investment in research, mobilize stakeholders and ensure that European competencies are at the forefront of science & technology worldwide. It provides a prioritised 10-year research programme, a mid-term strategy until 2030 and a long-term strategic outlook until 2050. It takes into account the need for closing the loop between R&D and demonstration, and recommends appropriate funding mechanisms and actions at the different levels of the community (EU, national, regional).

Taking a medium and long-term outlook (2030 to 2050)

In the medium term (2030), it is expected that a significant fraction of all hydrogen will still be produced from fossil fuels. On-site hydrogen production will play a significant role until pipeline transportation penetrates mass markets. Fuel cell systems will provide the means to utilize the different fuels in the energy market by that time with high efficiency and thus significantly reduce carbon dioxide emissions.

Fuel cells for transport, stationary and portable applications will be mature technologies produced at competitive costs. Fuel flexible fuel cells, hydrogen turbines and combustion engines are expected to be widely available and to serve key markets. Small and medium-sized enterprises (SMEs), in particular, should benefit from this development, provided that the development of mass-market applications receives adequate support. By 2050, Hydrogen will be one of the three energy vectors, besides electric power and liquid biofuels. It can realistically be expected to serve as a major transport fuel for vehicles, with a share of up to 50%. Hydrogen can be stored very effectively and offers great flexibility with respect to primary energy over time, as the general infrastructure is not affected by the primary energy input

The six key areas of research

The SRA identifies six key areas for research as follows.

1) Hydrogen production
Hydrogen production is considered crucial for the development of the entire sector. Based on fossil fuels hydrogen production is already a mature technology for the chemical industry, which can provide hydrogen for an emerging fuel cell sector. In order to provide hydrogen in the long term, increasingly

'carbon-dioxide-free' investigation of new production methods from renewables and nuclear power is important.

2) Hydrogen storage and distribution
Research has already qualified gaseous and liquid hydrogen as the main candidates for transport applications. Basic research is strongly recommended for new storage principles. It is advised that an incipient hydrogen pipeline infrastructure be set-up by a number of local hydrogen supply clusters, which can be interconnected later. The focus should be on component development for infrastructure at the end-user side, as well as transmission and distribution.

3) Stationary applications
Stationary applications can rely on natural gas for a long time and are not dependent on a hydrogen infrastructure. Decentralised reforming of natural gas is an important part of fuel cell technology for decentralised power generation. The main application will be residential cogeneration and district cogeneration in the 100 kW range for the near and medium term but units in the MW range are envisaged in the longer term.

4) Transport applications
As transport applications can substantially deliver on goals to reduce CO2, alleviate dependence on oil and improve fuel economy, they have been the major driver for hydrogen & fuel cell technology for the past 15 years and remain the single most important application.

5) Portable applications
Portable consumer devices (lap-tops, phones, portable tools) is a sector of huge economic significance. Portable applications will help proliferate fuel cells via early market entry and create an early industry, consisting largely of SMEs.

6) Socio-economic research
This area is of great importance but the budget to be allocated would be relatively limited, since no cost-intensive experiments, verification or demonstrations are required.

Budget/Financing
The budgetary implications of introducing hydrogen as an energy carrier are immense (capital investment in the order of hundreds of billions of euros over a 20-30 year timescale). It is envisaged that the total budget required for Research& Development and deployment will amount to some tens of billions of euros. To put required funding levels in perspective, US and Japanese public R&D spending is currently running at around $250-300m per year, with a rising trend. The EU and Member States will have to match this in order to stay competitive. China is reportedly spending in excess of $100m per year, which is comparable to the Framework Programme spending

Deployment Strategy: Final – March 2005; Progress Report - November 2005
http://www.HTFeurope.org/hfp/keydocs

Executive Summary

The Deployment Strategy (DS) addresses the technical, socio-economic and political challenges of deploying world-class, competitive, hydrogen technology & fuel cell applications (transport, stationary and portable), the scale and the scope of the task, and recommended courses of actions. It has been complemented by a Progress Report, which details the roadmap models for the next 15 years (timeframe 2005-2020).

The DS expects fuel cells in portable applications (computers, generators) to have achieved established market status by 2020. The market for stationary fuel cells will still be growing and road transport applications will be at the threshold of mass-market rollout.

By 2050, conventional oil supply is unlikely to be able to meet demand. The transition process towards hydrogen therefore needs to be initiated without delay.

The figure below outlines the scheme for successful deployment of hydrogen and fuel cell technologies as foreseen in the Deployment Strategy:
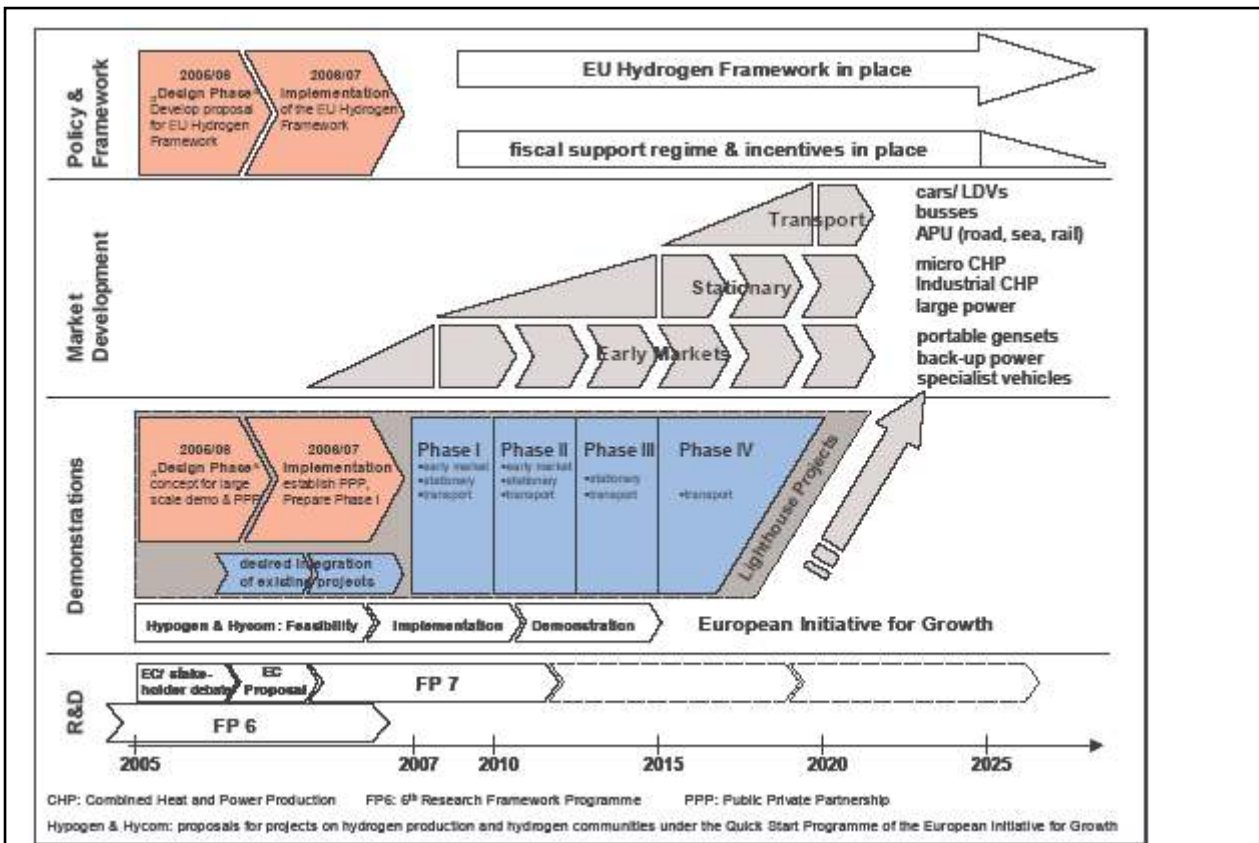
Fig. 1 Roadmap for the deployment strategy of hydrogen & fuel cell technologies

Next Steps:

Pursuant to the adoption of the final SRA and DS Reports, the HFP has now created an **Implementation Panel**.

This panel's mission will be to advance mature concepts and implementable actions for integrated research, development, demonstration and subsequent deployment of hydrogen and fuel cell technologies. It will prioritise actions with demonstrable mid- to long-term commercial and environmental potential, initiate supporting activities necessary to foster market entry by 2010 - 2015, consistent with the Hydrogen and Fuel Cell Technology Platform Strategic Overview 2005, with the view of significantly impacting EU and Member State/Regional policies for industry, energy and the environment.

The Implementation Panel will pave the way for a possible **Joint Technology Initiative (JTI) on Hydrogen and Fuel Cells**. The HFP is coordinating stakeholders' discussions on this JTI within its Advisory Council and within an ad hoc Working Group. By November 2005, more than 100 stakeholders have sent letters to Commissioners Potočnik, Piebalgs and Barrot as well as to the Technology Platform's Secretariat[1] to show their interest to become members of a JTI on hydrogen and fuel cells technologies. It is expected that the Panel will deliver a Scoping Report by February 2006 and an Integrated Implementation Strategy by June 2006, which would serve as an Action Plan for the JTI.

The Initiative Groups of the Platform are also working on ad hoc actions and analysis for the business and development field, the education and training and public awareness as well as codes and standards.

Furthermore, the HFP is continuously working on promoting hydrogen and fuel cells technologies via for example the organization of the **Technical Review Days event in December 2005**, where the hydrogen and fuel cells technologies projects financed by the 6th Framework Programme were reviewed and via the planning of the **Year 2006 General Assembly and Exhibition**, to be held at the beginning of October 2006.

ENIAC - European Nanoelectronics Initiative Advisory Council

Technology Platform Contact
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Vision Document
Vision 2020 Nanoelectronics at the centre of change

Platform launch date: June 2004

Overall Policy Objective
ENIAC has the following main objectives:
* To master the revolutionary transition from Microelectronics to Nanoelectronics
* To make the 2020 Information Society technologically feasible and economically affordable
* To drive and coordinate public and industrial research activities in Nanoelectronics, through the Strategic Research Agenda

This will contribute to:
* Serve the future demands of European society
* Increase high-skilled employment
* Reinforce competitiveness of European industry
* Secure global leadership in high-tech research

Strategic Research Agenda
First Full Edition – November 2005

Executive Summary
The semiconductors industry and its suppliers are the cornerstone of today's high-tech economy. Representing a worldwide sales value of 250 billion euro in 2004, the sector supported a global market of more than 6 trillion euro in terms of electronic systems and services, with applications ranging from transportation to health care, and from general broadcasting to electronic banking. The shift from the past era of microelectronics where devices were measured in micrometers to the new era of nanoelectronics with dimensions a thousand times smaller will make the sector even more pervasive than it is today. It will not only expand the pervasiveness of silicon solutions, making them small enough, light enough and cheap enough to build into just about anything. It will give next-generation products totally new capabilities that will elevate the Information and Communication Technology society to unprecedented levels, and it will enable Europe to realize its vision of Ambient Intelligence, living environments that are aware of our presence and responsive to our needs.

In the world of Ambient Intelligence, ENIAC has identified five application areas, each of them driven by clearly recognizable societal needs:
* Health, e.g., The Doctor in your Pocket, Real-Time Diagnostics, Bio-Chips / Body-Sensors;
* Mobility / Transport, e.g., 100% Safety on the Road, Integrated Transport Systems, Preventing Pollution;
* Security / Safety, e.g., Personal Emergency Systems, Protection against Crime and Terrorism, Secure Home Environment;
* Communications, e.g., Seamless Wired / Wireless Access, Mobile Services without Compromise, Protection of Privacy / Content;
* Education / Entertainment, e.g., Learning Anywhere / Anytime, Content with Best Quality, Content Protection.

The Strategic Research Agenda (SRA) translates each of these areas into technical requirements, thereby outlining the key challenges and roadblocks to be resolved in order to reach integrated intelligent Nanoelectronic solutions. ENIAC recognizes six technology domains:

- More Moore: complex digital circuits (compute);
- Beyond CMOS: pushing the physical limits of scaling;
- More than Moore: non-digital functions and human interface (interact);
- Heterogeneous Integration: total system integration ('System-in-Package');
- Equipment and Materials: enabling technology into manufacturing;
- Design Automation: effective platform-based system design.

Intelligent systems incorporate 'More Moore', following Moore's Law of exponentially circuit scaling to increase computing power for the system's 'brain', and 'More than Moore' for connecting this 'brain' with the outside world in a rapidly increasing number of electronic and non-electronic interactions, providing the system's 'ears, eyes, arms and legs'.

Europe has a world-class R&D infrastructure for digital technologies, combining academic knowledge with industrial investments in state-of-the-art facilities for development and industrialization. In order to maintain Europe's world-class position in 'More Moore', this infrastructure will continue to need additional investments in capital and people. 'More than Moore' and 'Heterogeneous Integration' ask for diverse competencies of increasing complexity as more and more functions get integrated. Effective cooperation across multiple dispersed competences is required here. In 'Beyond CMOS', filtering of ideas is a challenge in itself, requiring parallel evaluation and structured communication. The eventual materialization of technologies into manufacturing defines the challenges in 'Equipment and Materials', and capital expenditures in this domain are high, like in 'More Moore'. The translation to the systems environment is covered in 'Design Automation', providing the 'glue' between ENIAC and the European Technology Platform ARTEMIS. Because of the multiple and varying requirements in capital investments, knowledge, and people skills, the Strategic Research Agenda is driven by a core group of industrial players and academic institutions that can recognize the challenges involved and pull together the necessary resources, using best-practices from Europe's already highly successful semiconductor collaborations. The resulting research programs will reach much further than that, because many of the new competencies lie within the wealth of SME at the heart of Europe's economy.

Nanoelectronics is a key enabler in building a sustainable economy for Europe. It is a major driver for innovation in the research and implementation of essential components and design skills for embedding in high-technology systems world-wide. It will ensure the continued employment of highly-skilled workers in knowledge-based industries, creating as many as ten indirect jobs for every direct worker in the nanoelectronics industry itself. It will promote infrastructures in which industry will stimulate innovation-focused scientific research and training, and where large industrial players will foster SME's and start-ups in emerging segments of the overall economic value chain. In particular, it will further reinforce Europe's existing strength in areas such as telecommunications, medical and automotive electronics. Key to the success of Europe in realizing its visions in the areas of Information and Communication Technology and Ambient Intelligence will be to ensure that critical intellectual property in the area of nanoelectronics is generated and benefited from in Europe.

Budget / Financing
With the worldwide nanoelectronics market growing at 8-10% per year, R&D efforts will need to double in the coming decade in order to be able to counter the major challenges lying ahead. Apart from the strategic shifts in technical content indicated above, an increasing fraction of the total effort will have to be dedicated to shared Technology Integration and pre-competitive Advanced Research, including investments in research infrastructures and pilot lines. Stimulating such cooperative programs in Europe will make it possible to limit the overall expense associated with product development and production ramp-up, thereby enhancing world-wide competitiveness for the European industry at large. Shared R&D efforts through public-private partnerships have proved to be very successful in establishing Europe's position in microelectronics; extending these partnerships to jointly attack the new challenges of nanoelectronics is the logical way forward. Sharing financing of Technology Integration on the basis of 50/50 public/private contribution, and Advanced Research on the basis of 75/25 public/private contribution, is considered a fair overall guide for future programs. Application development and prototyping are anticipated to be

largely covered by private means, as is the case today, which brings the eventual overall percentage of public participation to nanoelectronics R&D to approximately 18%. This approach is summarized in the below table.

	2005 Private	Public	2015 Private	Public
Advanced Research	80	175	140	420
Technology Integration	490	325	780	780
Application Development	1980	0	3390	0
Prototyping	850	0	1290	0
Total (Mio euro per year)	3400	500	5600	1200

Deployment Strategy

To enable coherent, co-operative action, ENIAC puts forward a synergetic approach consisting of three pillars under a common roof.
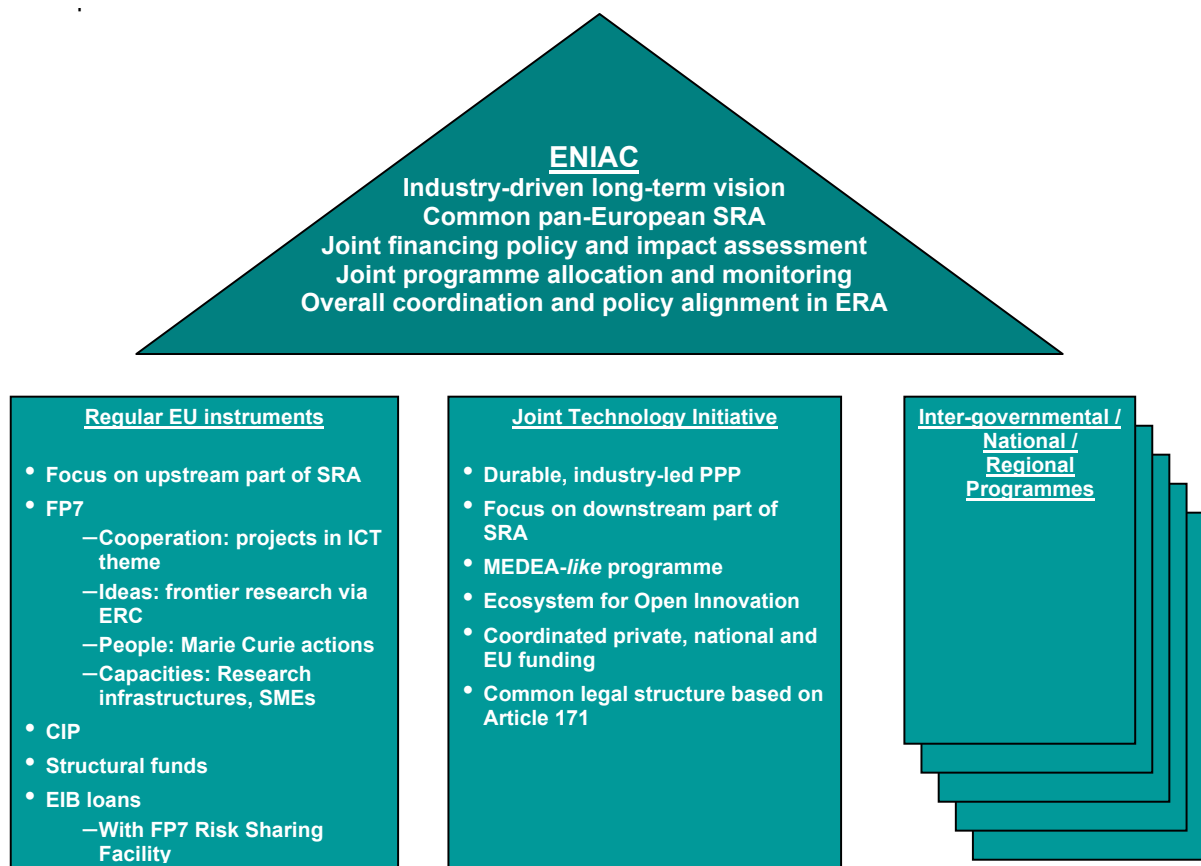
For the first pillar, focusing mainly on the upstream part of the SRA, use will be made primarily of the regular instruments envisaged for FP7, including the Marie Curie Fellowships. Centres of Excellence may envisage applying for EU Structural Funds, as well as loans from the European Investment Bank in combination with the new Risk Sharing Facility foreseen in FP7; the new EU Competitiveness and Innovation Program may provide opportunities for SME. For the second pillar, focusing mainly on the downstream part of the SRA, ENIAC proposes setting up a Joint Technology Initiative (JTI). The only means to mobilize the critical mass required for implementing selected parts of the SRA in a JTI is a partnership combining private sector resources with national and European public funding. Industry will commit to contributing the R&D efforts necessary for accomplishing the selected SRA objectives. For the third pillar, it is anticipated that trans-national (e.g., EUREKA), national or even regional activities could take advantage of coupling with the ENIAC SRA. This will allow full consistency of the European development work, while ensuring dedicated support where the local impact can be maximized.

The public deployment of the ENIAC activities is defined in the EUROSAINT project. The EUROSAINT project will set up and promote a structured communication plan. Its goal will be to establish ENIAC as being an important voice in the European research environment. The major components of the dissemination and communication are to:
- Evidence the key role of nanoelectronics as critical enabling technology for all ICT services and applications, to attract academic and industrial interest;
- Increase the visibility of nanoelectronics towards the non-specialized public, underlining its role of application enabler, and its critical contribution to today's world;
- Promote the role of the SRA as a planning tool for all research programs in the field of nanoelectronics;
- Interrelating people and experts : through creation or participation to scientific events and annual conference, inviting experts;
- Sharing information and knowledge: newsletter, web-site, databases;
- Publications of articles and reports: to targeted media in specialised areas, or to larger audience for public media.

These activities will be performed by the ENIAC Office established under the EUROSAINT project.

Next Steps
ROADMAP of key activities and milestones planned for the platform in the short term.

- 22-23 March 2006: presence at ICT Platforms meeting in Vienna
- 4-5 May 2006: Plenary speech at ETP conference in Vienna
- 26 June 2006: meeting of ENIAC Steering Committee and Forum of Stakeholders in Leuven
- 22 September 2006: SRA workshop at ESSDERC conference in Montreux
- June 2006: JTI proposal to Council
- November 2006: adoption of Council decision on JTI and presence at IST Conference
- 1Q2007: start of Joint Undertaking
- 2Q2007: first call for proposals by JTI
- 3Q2007: start of first JTI projects

NanoMedicine - Nanotechnologies for Medical Applications

Website: www.cordis.lu/nanotechnology/nanomedicine.htm

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Overall Context

NanoMedicine is an emerging and quickly moving field with strong fragmentation and a lack of coordination. The need for a ETP has been identified by external stakeholders in order to:
Establish a clear strategic vision in the area, to identify research priority areas, to set up a strategic research agenda, to mobilise public and private investment, to alleviate fragmentation in nano-medical research and to strengthen innovation in nano-biotechnologies for medical use.

STAGE 1: Stakeholders getting together

How the platform has been set up / Stakeholders profile

- A strategic group of key stakeholders (big industry and SMEs, research centres, hospitals, universities, EIB, industrial associations, coordinators of large projects in the area of NanoMedicine, different Commission services) has been invited by the Commission to:

- Investigate whether there is a need for a Technology Platform in NanoMedicine,

- Identify priority areas,

- Start the set up of a vision document with wider consultation.

The group will decide on enlarging its participation mainly by industry after the official launch and will have the following profile identified by the stakeholders already now: Large industry and high-tech SMEs, industrial associations, research centres and universities;

Hospitals, patients' organisations (NGOs) as stakeholders for the civil society, Insurance companies, financial institutions like EIB, standardisation organisations like CEN and regulatory bodies. All Member States showed interest as well as the Associated States and several regions as e.g. Thône-Alpes (F) and Towns, e.g. Münster (D).

- An **exploratory meeting** was held with a group of strategic key stakeholders on 6 October 2004 to investigate the need for a Technology Platform in NanoMedicine, to-identify priority areas and to start the set up of a vision document with wider consultation. Seen the very favourable and unanimous reaction of the participants, a consultation process within the group took place in order to come up with a first draft vision document by beginning of December 2004.
- A **second meeting** with a small group of authors of the draft vision document took place beginning of January 2005 to discuss an advanced draft and prepare a version for a **third meeting** on 24 January 2005 with the whole initial group.
- *Formal launch* of the platform took place on 6th September at EuroNanoforum 2005 in Edinburgh, a large conference dedicated to NanoMedicine where the vision document has been successfully presented.

- On 23rd November 2005 the **first meeting of the launched platform** is organised by the two chairing companies Philips Medical Systems and Siemens Medical Solutions in Eindhoven, HighTech Campus of Philips Medical Systems. Participants are the founding organisations of this platform. In this meeting the rules of participation and the structure of the platform will be discussed in order to open the platform to new participants and to start working on the Strategic Research Agenda.

- A **call for Expression of Interest** is on the website of the Platform since January 2006 in order to open for new members.

- A **Mirror Group**, consisting of representatives from the Member and Associated States as well as the Candidate Countries has been established and will meet for the first time **on 7.3.2006** to ensure synergies at regional, national and European level.

- The **enlarged Platform will meet on 21.3.2006** in Erlangen at the premises of Siemens Medical Solutions to discuss the **first draft of the Strategic Research Agenda.**

- On **16.5.2006** the enlarged Platform will discuss the **final draft of the Strategic Research Agenda** and present it in the afternoon of the same day to the **Mirror Group**.

STAGE 2: Stakeholders define a Strategic Research Agenda (SRA)

Methodology: The five working groups of the Platform establish the first draft of the Strategic Research Agenda that will be circulated to all Platform members for comments.

Timing, updating: Start by end 2005. Termination expected in summer 2006.

STAGE 3: Implementation of the Strategic Research Agenda

Operational focus / Concrete projects

There is preliminary agreement that collaborative research projects will be carried out as well as ancillary actions needed to promote the industrial take-up and use of the new nanotechnologies, e.g. nomenclature, metrology, IPR, regulations, public awareness,…

Industrial orientation

The ETP has a clear and recognised industrial orientation both in terms of participation and of its goals. Due to the highly innovative field, some industries do not exist yet but are spin-offs of current research projects.

Commitment of stakeholders

At present, the commitment is shown by the fact that stakeholders participate and work actively without any specific financial support of the Commission. The vision document recognised as of high quality has been established by the stakeholders without any remuneration. New requests for participation from industry arrive on a regular basis.

Outlook towards building a long-term public-private partnership

The field is favourable for public-private partnership research, technological development and industrial innovation initiatives. Hospitals represent a particular example.

Plants for the Future

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Vision Document
Plants for the Future: 2025 a European vision for plant genomics and biotechnology
http://www.epsoweb.org/Catalog/TP/TP%20Documents.htm   (available in EN, FR, DE and HU)

Platform launch date: June 2004

Overall Policy Objective
To facilitate and accelerate the development and deployment of plant research, including genomics and
biotechnology, to ensure European and global supply of healthy, safe and sufficient food and feed; work
towards sustainable agriculture, forestry and landscape; develop green products; and contribute to the
competitiveness of European agricultural, food and biotech industry, consumer choice and governance.

Strategic Research Agenda
- Stakeholders proposal for a Strategic Research Agenda (August 2005)
-            Part I : Summary
-            Part II : Strategic Research Agenda
-            Part III : Draft Action Plan 2006-2010
- Consultation on this Proposal with: Member States (in some 20 countries), Members of the European
Parliament and Members of the European Commission (June 2005 to January 2006)
- Final Strategic Research Agenda 2025 and Action Plan 2010 (Publication autumn 2006)

Web-link
Stakeholders proposal for a Strategic Research Agenda :
http://www.epsoweb.org/Catalog/TP/TP%20Documents.htm

Executive Summary
The Strategic Research Agenda and Action Plan will endeavour to address four main challenges:

Challenge one: Healthy, safe and sufficient food and feed
Food demand is likely to rise significantly in the coming decades within Europe and globally. This will
be fuelled by population growth, which is expected to reach 9 billion by 2050. In industrialised countries,
more prosperity and a greying population will push up demand for high-quality and safe food. While
the poorest countries will continue to struggle putting food on the tables of their populations, improving
living standards elsewhere in the developing world will enrich the diet of the average citizen, including
more diverse food and an increased demand for meat, straining agricultural resources further. Meat
consumption is expected to increase by 7% annually over the next decade, resulting in a doubling of
today's feed production by 2015. We will either need to double the arable land needed for animal feed or
significantly increase crop productivity.
Diets and lifestyle are cornerstones of human health. The combination of high-fat, energy-dense diets
and sedentary behaviour increases the incidence of such chronic conditions as obesity, diabetes
mellitus, cardiovascular disease, stroke, hypertension and some cancers. These 'rich world' diseases
spread to developing countries as they industrialise. We have to encourage people to eat healthier
diets, exercise more and lead healthier lives. We should exploit the potential of food for preventing the

onset of chronic diseases. Nutrition research can help identify the relationship between food and health and plant sciences can help develop specially tailored food products.

The specific goals under this challenge are: 1. Develop and produce safe and high-quality food. 2. Create food products targeted at specific consumer groups and needs. 3. Produce safe, high quality, sufficient and sustainable feed.

Challenge two: Sustainable agriculture, forestry and landscape

The invention of agriculture sparked massive growth in the human population. Millennia have passed since uncultivated wildlife alone could satisfy the human race's food needs. The human population will continue to increase. Some parts of the world still suffer from periodic famines. Today, around 800 million people are malnourished. However, the unprecedented food abundance in many parts of the industrialised world makes many people, including Europeans, oblivious to the want elsewhere.

Over the next 20 years, the challenge is not only to satisfy growing demand, but also to do it in a sustainable manner. Political and social will must lead the way. Europe's common agricultural policy serving the agricultural self-sufficiency in the continent shows what can be done when the political will is there: Europe's agricultural productivity has jumped two-fold within the last fifty years. However, the EU is still a net importer of agricultural raw material.

Comparable developments are expected in the forestry sector: the FAO predicts a 25% increase in wood demand between 1996 and 2010. This means further deforestation, associated with a loss of biodiversity and natural resources, appears to be on the cards. The increasing demand for forest products can be met by increasing the yields of conventional forests through tree improvement and better-managed forests.

This Technology Platform will result in new knowledge of plants that can help to address future needs. This knowledge will demonstrate what is possible in new energy-efficient farming practices and how the use of fertilisers and of phyto-chemical products can be modified. It will also help broaden the range of European crops, and reduce energy-consuming transportation of food.

The specific goals under this challenge are: 1. Improve plant productivity and quality. 2. Optimise agriculture to further reduce its environmental impact. 3. Boost biodiversity. 4. Enhance the aesthetical value and sustainability of the landscape.

Challenge three: Green products

Environmentally friendly bio-based 'green' products are an opportunity targeting the needs of consumers, industry, society and government. European welfare depends, to a large extent, on the emergence of new markets and the growth of existing ones, while respecting the environment and responding to societal expectations. To this end, critical success factors are the ability of companies to innovate their product portfolio and production processes in line with unmet customer demand, and the endorsement of this by the public and government.

In the traditional commodity markets in plant-derived products, a growing number of companies are encountering difficulties in rejuvenating their product offerings. The main reason is that new means of extracting, processing or modifying raw materials are running out. Similarly, fossil fuel-based industrial sectors are beginning to face difficulties in sustaining their businesses, due to diminishing global reserves and growing public concern about future supply and the environmental impact of burning more fossil fuels.

These trends are leading to a rapidly growing demand for quantum-leap innovations. Many breakthroughs may derive from plants and plant-based raw materials with improved or new properties. With the explosion in biological know-how and enabling technologies, developing a broad range of new plant-based products that meet the future needs of consumers and industry, as well as those of society and government, appear feasible.

The underlying concept is that plants are exploited as a production system in the broadest way imaginable. This may include any plant species and range from their use as a production vehicle for proteins and chemicals for industrial and health use, to a renewable, totally redesigned resource for the health, nutrition, materials and energy industries. This would provide the world not only with better, cheaper and safer products, but also with totally new products, production methods, land uses, jobs and ways of living.

The specific goals under this challenge are: 1. Develop advanced plant-based raw materials and pharmaceuticals. 2. Develop plants as energy production systems. 3. Convert plants into production factories.

Challenge four: Competitiveness, consumer choice and governance

The successful implementation of the previous challenges of this Research Agenda and the EU competitiveness depend on a strong European resource base: vibrant basic research, skilled and mobile researchers, access to key research infrastructures and networking.

The plant science sector in Europe can only be effective in responding to society's needs and building economic competitiveness if the scientific endeavour is matched with a political one. Public participation is useful and essential in a free and democratic society, particularly on ethical issues and our collective future. Certain aspects of plant science stand right at the frontier of human knowledge taking us into some uncharted ethical territory. The optimal way of resolving emerging ethical issues and to ensure that the plant sciences deliver the technology and applications people desire is to engage in a broad public debate.

Legal and regulatory issues, especially those relating to the safety of the use of plants and the products resulting from innovations in genomics and biotechnology, together with the provision of choices for citizens, are important aspects that need to be addressed in a balanced manner. Any dialogue around these issues must take into consideration a careful weighing of the relative risks and benefits associated with these innovative products compared to the *status quo*.

The financial environment for private investment in plant sciences and biotechnology depends very much on how markets for these products will develop. At present, plant-related projects attract small amount of seed funding but, in general, commercialisation occurs through large, multinational corporations. While wider funds, proof-of-concept financing, or start-up financing may help to support innovation in this sector, stronger consumer confidence and a regulatory environment supporting open markets for high-technology plant products are likely to be the decisive elements in strengthening investor confidence.

The specific goals under this challenge are: 1. Vibrant basic research. 2. Human resources, infrastructure and networking. 3. Public and consumer involvement. 4. Ethics, safety, legal and financial environment.

Budget / Financing

We estimate that public and private funding – at EU, national and regional level – will have to exceed 45 billion EUR over the next ten years if Europe is to remain competitive.

This concerns the agro-food industry in the first place, which with more than 600 bill EUR in annual turnover, is the leading industrial sector in the EU. But it is also important for the chemical and energy industries. Our S&T capacity will likely change the face of agricultural production, which employs 8% of the EU workforce and counts 17 million farms.

Deployment Strategy

In progress, will be developed as part of the final SRA.

Next Steps

- Consultation in 22 European countries, with members of the European Parliament and the European Commission on the Stakeholders Proposal for a Strategic Research Agenda (until Jan 2006)
- Finalising the Strategic Research Agenda 2025 and the Action Plan 2010 (Publication autumn 2006)
- In parallel already input to European (FP7) and National Programs (ongoing, from 2005 on)
- Stock Taking of existing and planned activities contributing to the SRA in Europe at national and European level (foreseen, throughout 2007)
- Consultation with European countries, members of the European Parliament and the European Commission on the implementation of the Action Plan 2010 (throughout 2008)

Water Supply and Sanitation Technology Platform (WSSTP)

Web-site: http://www.wsstp.org

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Vision Document
Water safe, strong and sustainable, European vision for water supply and sanitation in 2030, version
October 2005

The Vision Document was conceived and drafted by five working groups, consisting of water sector
experts and representatives of water sector stakeholders. The vision paints a picture of what could
be achieved by 2030 if resources for research and development resources would be made available
and targeted to respond onto the issues and challenges that the European water sector is facing. It
addresses the delivery of the mission of the WSSTP and identifies research needs on a high level,
which are further developed in the Strategic Research Agenda.

http://www.wsstp.org/Shared%20Documents/WSSTP%20report%20for%20public%20consultation/
Vision%20documents%20(comments%20to%20Kiwa)/Draft%20merged%20Vision%20document/
Vision%202030%2007-10-05.pdf

Platform launch date: 05/2004

Overall Policy Objective:
To bring together all stakeholders involved in water supply and sanitation in Europe, manufacturers,
water suppliers, waste water managers, research community, technology developers and suppliers,
consumer organisations, scientists etc. To jointly define a common vision for the short, medium and long
term, the associated research needs for these periods and to set research priorities and accompanying
implementation plans. To increase the competitiveness and sustainability perspectives of the European
water sector and to contribute to the relevant Millennium Development Goals.

Strategic Research Agenda
Draft – February 2006

Executive Summary
The experts working together in the WSSTP have jointly identified four major challenges for the future of
water in Europe and beyond. These four challenges are:

- Increasing severity of water stress or shortage of water, affecting an ever increasing part of the world.
  Primary drivers for water stress are high population density, extensive and inefficient irrigation, rapid
  industrial growth and changes in rainfall patterns. Water stressed areas need to be managed in such
  a way that water is no longer a barrier to economic growth, public health and social welfare.

- Urbanisation. Rapid increasing urbanisation is one of the most distinctive changes of the previous
  and current century. In the near future more than 65% of the world population will be living in urban
  areas. Flexible and innovative solutions are needed to cope with sudden and substantial changes
  in water demand for people and their associated economic activities. There is an increasing need
  for innovative water supply methods and technologies, while water re-use options have to be further
  developed and implemented.

- Extreme events. Climate change is not just a challenge of long term changes in average precipitation, it is also the challenge of increased frequency and severity of extreme events as droughts and floods. Both have a devastating effect on human and animal life and on the economy. There is a need for appropriate, timely and readily understandable mitigation, warning and management methods and measures to keep short and long term damages as limited as possible. Solutions are required which will significantly reduce the social and economic impact.

- Rural and under-developed areas in need. Many of such areas exist within and outside Europe, many of which lack any significant infrastructure such as water and waste water services. People are self supporting and have small scale agricultural activities, while industrial activity is mostly absent. The development of such areas is economically not interesting for private enterprises and is left to municipalities and regional or national governmental bodies which often lack money and the know-how for proper improvement. Improvement will make the areas more attractive for new activities and will boost the development in such regions and will reduce the need to migrate to urban areas.

To address these four challenges system solutions have been identified across the five topical areas:

    i. Integrated Water Resources Management
    ii. Urban and peri-urban water (water for people)
    iii. Water in industry
    iv. Water in agriculture and
    v. Cross cutting issues.

Common solutions for all challenges are:

- Integrated and transparent management of water resources

- Balancing demand and supply by water saving, increased re-use (water and waste as useful resources) and by exploiting alternative water sources such as brackish water, seawater and treated waste water

- Ensure the quality and security of water, by knowing the quality of water everywhere in the water cycle and produce and use water fit for purpose. Real time monitoring tools and models are required within the whole water cycle be it water resources management, water for people, water in industry or water in agriculture.

- The development of a new approach to the design and operation of water assets is needed, with emphasis on small scale decentralised systems to reduce the need for extensive networks and to ensure a higher degree of flexibility to changing conditions and demands.

- A reduction of the environmental impact of (waste) water services, through a reduction in energy consumption and an increased use of energy, minerals, valuable waste water flows and other resources produced in various processes and water cycles.

- A number of enabling conditions have to be met to achieve a successful implementation of the technological innovations, such as a sound socio-economic, socio-cultural and legal framework. This to ensure contributions from private and public stakeholders, the scientific disciplines and the civil society.

As a next step in the development of the WSSTP a total of 6 pilots have been identified. All pilots address a major water challenge in Europe and will result in a number of implementation cases. The pilot themes are all structured around the concept of integrated water resource management (IWRM) complemented by an aid to the decision support system (DSS). They cover the six following key water challenges in Europe:
- Mitigation of water stress in coastal zones
- Sustainable water management for urban areas
- Sustainable water management for agricultural areas

- Restoration of degraded water zones
- Sustainable water management for industries
- Adaptation and mitigation management of extreme hydro climatic events (floods and droughts).

One of the two objectives of the WSSTP is contributing to the MDGs and the EUWI. The platform is of the opinion that system solutions should be demonstrated and verified in the European situation before they are exported and customised to the developing countries outside Europe. To facilitate the contribution of the platform to the MDGs twinning between European and developing countries will be established in the implementation cases within the pilots.

The WSSTP structure and the working groups will be adapted to the efficient management of the pilot programs. Each pilot will have an advisory group coordinating the generic RTD actions and ensuring the cross fertilization of generic RTD and enabling technologies among the various implementation cases. The Board of the WSSTP will be assisted by a smaller coordination group as an operating body overseeing all the pilots. This group will work in synergy with the ETP projects financing work group already set by the European Commission. A financial engineering group will be organized to assist pilot programs in the grant and debt financing relevant to the pre-competitive research phase and further commercial deployment. The Board of the WSSTP includes the major (though not all) industrial players. The platform will continue to work on a higher involvement of the industry and will also pay special attention to the participation of SMEs.

Web-link http://www.wsstp.org/Shared%20Documents/WSSTP%20report%20for%20public%20consultation/Strategic%20Research%20Agenda%20documents%20%20(comments%20to%20rapporteurs)/Draft%20merged%20Strategic%20Research%20Agenda%20(send%20comments%20to%20bianca.van.der.wolf@kiwa.nl)/051005%20merged%20draft%20SRA.pdf

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Budget / Financing

At the moment it is not possible to give an estimate on these issues. In fact, this is going to be considered in the Strategic Deployment Document which is under preparation.

Deployment Strategy

See above item

Next Steps

Up to the launch of FP7 the following steps are foreseen:

- Completion of the Strategic Research Agenda to include the pilot schemes and related implementation cases, generic and enabling research items.
- Revamping the WSSTP, the Board and its bodies to better coordinate the next phase.
- Preparation of the Deployment Strategy and the installation of a financial engineering group to assist the pilots with financial matters.
- Strengthening connections with other related Technology Platforms and European networks.
- Inventory of FP5, FP6/funded and other related research projects on water, energy, socio/economic aspects and safety, security to better use each others research and technologies and to better identify gaps in knowledge and research.

A strategic plan for the future and continuation (strengthening) of the WSSTP, and ways to enhance ownership of the platform and its activities by the industry.

The Photovoltaics Technology Platform

Overall Policy Objective
To contribute to a rapid development of a competitive European Solar Photovoltaics (PV) industry for a sustainable electricity production in order to provide 4% of the global electricity production by 2030.

Executive Summary
Solar Photovoltaic (PV) technology has many attractive features as a sustainable source of energy, however it is still expensive compared to other electricity sources except in specific geographic locations. PV investment costs are falling as a result of ongoing research and continuous improvement and the PV market has grown by more than 30 % per year over the past 10 years helped by favourable regulations.

The objective of the Commission White Paper on the promotion of renewable energies for a total installed generating capacity to 3 GW by 2010 will be achieved. To increase the amount of PV electricity produced in the EU ambitious measures have to be taken to accelerate the uptake of PV technologies and overcome the remaining technical and non-technical barriers.

Technical developments should be accompanied by socio-economic research related to wider public awareness and acceptance, training programmes for installers and harmonisation through European codes and standards.

The Strategic Research Agenda (SRA) describes the main research issues to be addressed in order to realise the vision. It is rather a set of principles, issues, requirements and research areas which should inspire all stakeholders when they develop their own activities or programmes in the PV research sector.

From the point of view of robustness of PV development, it is necessary to have a continuous development chain from basic research to industrial manufacturing. Basic research generates a range of options necessary in the long-term research agenda. Applied research focuses on the most promising options by critically assessing the potential in relation to industrial application. This comprises development of materials, devices and processes up to prototyping level. Knowledge has to be transferred rapidly and effectively to the manufacturers. In order to speed up the availability of mature and standardized production equipment, R&D on the industrial aspects should be supported. This will reduce capital costs per unit to keep the risk to the investor at a calculable and affordable level. Spin-

offs and cross fertilization with other markets are important factors.
In order to maximise the environmental benefits of PV, particular attention should be paid to the environmental impacts of the various technology options, through the use of appropriate methods like integrated impact assessment and life-cycle analysis (from cradle to grave).

Research efforts should therefore encompass:
- ⊙ **basic research** - focussing on promising materials, device concepts and conversion principles, whilst allowing some intellectual freedom to researchers
- ⊙ **applied research and development**- results of the basic research should be critically assessed on their industrial potential, and materials and processes have to be transferred effectively and rapidly to a prototyping level according to manufacturing needs
- ⊙ **demonstration** of innovative solutions for PV manufacturing and system integration
- ⊙ **supporting research**, providing support in the socio-economic, standardization, quality assurance of systems (including safety aspects) and environmental areas.

Important subjects to be addressed also include:
- ⊙ the need to develop European production of silicon feedstock
- ⊙ the development of dedicated industrial manufacturing equipment instead of adaptation of laboratory equipment
- ⊙ EU manufacturers' cooperation versus competition.

Research efforts should be geared towards very substantial price reductions of installation of systems, from 6 to 1 € per Watt-peak

A tentative list of research areas, built on the basis of the Council's own analyses and priorities mentioned above is provided in the Appendix to this report. The main topics are the following:
- current module technologies
- new and emerging module technologies
- balance-of-system
- building integration
- systems aspects (storage, grid optimisation, etc.)
- manufacturing issues
- supporting research.

Budget / Financing
The implementation of the SRA up to 2030 requires a budget of about 10 billion € per year on average. The funding will come mainly from the PV industry and public funding from Member States and the EU, including EIB loans. The detailed financing plan will be defined in the final Strategic Research Agenda and the Deployment Strategy.

Deployment Strategy
To be defined

Next Steps
- National R&D Programmes coordination: "Mirror" Group meeting 13 March 2006

- PV Technical Days (FP projects contractors' meeting): 17-18 May 2006

- General Assembly of PV stakeholders: 19 May 2006

European Technology Platform for Sustainable Chemistry (SusChem)

Web-site: http://www.suschem.org

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Vision Document
European Technology Platform for Sustainable Chemistry: The vision for 2025 and beyond
http://www.suschem.org/media.php?mId=2170

Platform launch date: July 2004

Overall Policy Objective
The European Technology Platform for Sustainable Chemistry aims to boost research development and innovation in Europe in the areas of chemistry, biotechnology and chemical engineering.
The objectives are to foster the development of innovative chemistry and technologies that contribute to sustainability and ongoing competitiveness of the European chemical industry through:
- the development of leading-edge advances in environmentally respectful, energy and resource efficient processes and product technologies in the three main technology innovation areas: industrial biotechnology, materials technology and reaction and process design.
- actions that may allow identifying and addressing major barriers to innovation in chemistry

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Strategic Research Agenda: Final - November 2005
http://www.suschem.org/media.php?mId=3670

Executive Summary
The European Technology Platform (ETP) for Sustainable Chemistry (SusChem) has prepared a Strategic Research Agenda (SRA) which outlines the future priorities for European research efforts as perceived by its stakeholders. The document comprises the contributions from four working groups, tasked with identifying key areas of research, the limitations and hurdles faced by researchers, and to propose amendments where necessary for future activities. This process was conducted in an open and transparent fashion, with participants from all spheres of society, from non-governmental agencies through academics to the industry representatives.

The SRA document is structured in such a manner as to address all aspects of research within the European Union. The SusChem Vision is discussed, followed by the economic and social importance of the chemical industry in Europe, the structure of the ETP, the synergies with other ETPs and the thematic priorities of the 7th Framework Programme. This is followed by an examination of the societal needs that are the driving force behind the activities of SusChem. Three truly visionary projects are described that give an impression of what will be possible in the future using the results of SusChem's proposed research. A budget to realise the goals and targets set by the working groups in the SRA document has also been developed.

The main part of the document is devoted to the contributions from the specific working groups: industrial biotechnology, material technologies, reaction and process design and horizontal issues. To present the reader with an accessible document, the detailed technical discussions have been prepared in the form of an appendix. One point is clear throughout: chemistry is a key driver for innovation in many technologies and disciplines, providing the knowledge to improve and combine the benefits of traditional technologies with nano- and biotechnologies, leading to new and improved products. A clear interdisciplinary approach of the three technology areas supported by the horizontal measures is needed to for a successful implementation of these challenges.

The SusChem vision responded to the societal needs for chemistry in Europe by
- Providing the innovative drive for Europe
- Being at the heart of the new technologies that are the basis of the knowledge-based economy
- Investing for sustainable development
- Protecting and extending employment, expertise and quality of life

The Industrial Biotechnology section details the approach to make Europe's industries leaders in biotechnology processes and technologies for various sectors, including chemicals, textiles, leather, animal feed, pulp and paper, energy and waste processing. Industrial Biotechnology plays a significant role in increasing the sustainability of the European economy. It will be one of the key contributors to the competitiveness of many of Europe's industries. From a business perspective the main objectives for R&D in Industrial Biotechnology are the development and production of novel, innovative products and processes in a cost- and eco-efficient manner, and the discovery and optimisation of strains and biocatalysts.

The Materials Technology section focuses on materials for mankind's future surroundings, which will be designed to enhance the quality of life. These materials will make life simpler, easier, safer, better, and more importantly place mankind at the centre of technology. One important factor will be the role of nanoscience, and the related nanotechnologies, in providing the knowledge necessary to lead to new innovative products and process methods. Nanotechnology is presented as an important enabling technology for the development of new material technologies. The size of the nanotechnology market worldwide is already comparable to the biotechnology sector, but the projected growth rates are substantially higher. Products that are generated through the assistance of, or which include, nanotechnologies represent currently only 0.1% of the worldwide industrial production. By 2014 this is expected to reach 15%.

The Reaction and Process Design section considers the developments necessary to achieve sustainable development: the identification, design and development of appropriate products and the processes that will produce them. These fundamental enabling technologies contribute to the entire life-cycle of processes ranging from product development via catalyst and process development, plant development and operation to product handling and logistics. By integrating the complementary approaches of chemical synthesis and process design and engineering, and providing key contributions to all relevant steps from reaction to viability of process plants, they can be applied to all areas of chemistry and biotechnology.

The Horizontal Issues section focus is to find better solution for these innovations, thus providing improved security for our society. The top level goal is to ensure that the citizens of the EU benefit from the development and use of innovations based on the SusChem SRA. In particular there is a need to ensure that SusChem technologies lead to wealth and job creation within the EU. Priority areas for further work within the horizontal arena fit into two themes: addressing environmental, health and societal concerns associated with new products and processes; and stimulating support for innovation. These include the evaluation and improvement of funding models for innovation as well as means to develop the appropriate skills sets to enhance the human capacity that will underpin these innovations.

The EU(25) is still the leading chemical production area in the world. The contribution of the Chemical Industry to the Gross Domestic Product (GDP) of the European Union is around 2.4 %, almost equivalent to the contribution provided by the agricultural sector. A recent study conducted by Cefic concluded that the competitiveness of the chemical sector is declining. The current leading position of the EU in chemical manufacturing is already slowly eroding because of the dynamic development in Asia; the EU(15) share of global output has declined from 32% a decade ago to 28% today. The Cefic competitiveness study developed different scenarios with a 2015 time horizon. A defining part of the most optimistic scenario is a chemical industry focused on innovation, thus innovation is the key driver for the future competitiveness of the sector and its associated supplier and customer industries.

To provide guidance in setting priorities for the SusChem technology areas, a strategic assessment of the factors influencing the chemical industry with a special focus on innovation was performed. The SusChem strategic research agenda was developed with this analysis in mind, focusing on current strengths and especially future opportunities for the industry. Downstream users have been involved to ensure that SusChem addresses their future needs. Innovation in products and processes will be essential for the

future of the industry in Europe. Advances in chemistry and biotechnology, and new enabling processes and pathways leading to innovative products are a key element of a European research strategy.

Sustainable chemistry provides important enabling technologies for innovation in other industrial sectors which are particularly important for economic growth in Europe. At the same time sustainable chemistry contributes to the other pillars of the 'Lisbon strategy' by creating highly qualified workforce and attractive employment opportunities, and by contributing to sustainable development and to protection of the environment.

Budget / Financing
The SusChem strategic research agenda is an ambitious plan that will require significant funding in order to be successfully implemented. Different funding sources including EU framework programmes, national and regional initiatives as well as private sector spending need to be accessed. This requires a high level of commitment from both, public bodies and private enterprises. The SusChem SRA offers an unique opportunity to focus the European spending in chemical R&D towards the most promising areas regarding their impact on the overall goal of sustainability and a high level of competitiveness. In order not to lose ground Europe needs to do as good as or even better than its competitors on the world market. This is especially true for research spending. Possible new funding mechanisms, new ideas, and required changes in the framework conditions for research and innovation will be presented in the forthcoming SusChem Implementation Action Plan.

The estimated resources needed for the SusChem SRA amount to approximately 5.5 billion € per year. The required budget for the technology part of this figure was estimated based on the added value due to innovative process design for the overall industry production. The materials part (from the Materials Technology and the Industrial Biotechnology section) is based on the estimated future volume of the world market in SusChem related areas and the necessary R&D spending to access new markets (between 2 and 5% depending on the maturity of the different markets).

The Implementation Plan will develop proposals for covering in the most effective way the financial needs for the implementation of the SusChem SRA.

Deployment Strategy
SusChem will develop an Implementation Plan by August 2006. A deployment strategy will be an essential part of this plan. First indications were discussed at the stakeholder meeting in London in November 2005. Due to the diversity of the chemicals market and manufacturing base a variety of measures will have to be defined.

The Implementation Action Plan (IAP) will explain how exactly the research themes defined in the SRA are to be implemented in reality. It will also describe what SusChem and its stakeholders need to and will do to facilitate this process and which other parties to involve. While the SRA focused on topics and themes, the IAP will focus on activities and actions.

The Implementation Action Plan will to describe more precisely for each research theme identified in the SRA what issues need to be addressed to realize the full potential of research and innovation, i.e. a gap analysis from both a scientific point and a broader perspective. This will be followed by a definition of the necessary next steps to go forward with each topic and of the prerequisites, if any, that need to be fulfilled (requirements, constraints) before this next step can be taken. This process will lead to a further prioritization, an ordering of topics and activities and a refinement of roadmaps and timelines.

The IAP will also include a general perspective on the necessary framework (such as policy, capacity building, public acceptance) to speed up innovation in chemistry and biotechnology, and a description of the actions needed to set-up these adequate conditions.

SusChem is already setup to monitor the implementation of the research agenda due to its wide stakeholder base. Estimated future market sizes for new products to be developed under the SusChem regime are given in the SRA.

Next Steps

Implementation Action Plan
- First draft of Implementation Plan at the end of March 2006
- Development of Implementation Plan until August 2006
- Meetings as needed by the working groups (Industrial Biotechnology, Materials Technology, Reaction and Process Design, Horizontal Issues) to draft content of Implementation Plan
- 4th stakeholder meeting to endorse Implementation Plan on 27 August 2006 in Budapest

Communication
- Booth and presentation at ACHEMA 2006 (28. International Exhibition-Congress on Chemical Engineering, Environmental Protection and Biotechnology, 15 to 19 May 2006)
- Further newsletters (http://www.suschemsolutions.org)

Stakeholder engagement
- 5th stakeholder meeting at FP7 launch event
- Annual stakeholder meetings thereafter

European Technology Platform for Global Animal Health (GAH)

Web-site: http://www.ifah.be/Europe/euplatform/platform.htm

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Vision Document
A European Technology Platform for Global Animal Health: Vision 2015

Overall Context
Platform rationale and objectives
Outbreaks of major epidemic animal diseases and zoonoses, some of which already exist in Europe, can have a devastating impact. The challenge is to facilitate and accelerate the development and deployment of new and more effective tools to control animal diseases and zoonoses. Focussed socio-economic and technical research that delivers new vaccines and diagnostic tests would assist not only in combating disease already in Europe but greatly reduce the risks to European agriculture posed by globalisation and the liberalisation of trade. Disease control in the developing world will also assist in the alleviation of poverty and contribute to achieving the Millennium Development Goals. The Technology Platform is a multi stakeholder partnership addressing the whole process from innovation to delivery of new vaccines and tests. This mobilisation of all the key stakeholders towards a common goal is expected to deliver substantial benefits and/or avoid substantial losses*.* In order to meet the challenge it is essential to:-
• Sustain and strengthen the research environment in the EU to create synergies and avoid duplication of research effort.
• Ensure Europe has a multidisciplinary strategic research capacity with core expertise and facilities to deal with new and emerging diseases as well as existing diseases
• Facilitate the rapid and efficient transfer of innovative discoveries into practical applications for disease control.
• Create global alliances with third countries working in partnership to enhance research
• Mobilise the public and private sector at EU and national levels to commit more dedicated funds to R&D
Improve education, training and understanding throughout the supply chain from the basic research to the deployment of new products.

STAGE 1: Stakeholders getting together

How the platform was set up
As part of an international development initiative an inter-agency group of livestock research donors - comprising 14 high level representatives from industry, academia and EC member countries met in December 2000. Following up the key recommendation of this meeting, the inter-agency group commissioned a study to identify the technology gaps in the control of tropical livestock diseases. In April 2002 the Interagency group commissioned a study to explore the potential for the private

pharmaceutical industry to contribute to the development of new vaccines and diagnostics tests against tropical diseases. The study identified substantial interest within the private sector to participate and contribute towards a global effort to provide new technologies against tropical livestock diseases. By March 2003 the Interagency group agreed to explore options for designing a new structure that would bring together research expertise within the EU, developing countries and the private sector. This will begin operations in 2005 as an independent entity: The Global Alliance for Livestock Vaccines (GALV).

During 2004 it was apparent that the Commission initiative on Technology Platforms was an opportunity to link the Alliance to a European dimension to the need for research and development of new tools to control animal diseases. The objective would be to improve European competitiveness through research that would benefit Europe but which at the same time would be of a benefit to the developing countries by assisting them to control disease.

A brainstorming session held in October 2004 concluded that a Technology Platform for animal health could be an appropriate framework and that a High Level Group should be established to review the position, to decide whether a platform was required and whether key stakeholders would provide their support.

A meeting of the High Level Group held on 14 November 2004 supported the setting up of a Technology Platform (TP) for control of animal diseases/health. It was also agreed that:

• The High Level Group should be expanded to include industrial and producer organisations
• The proposed platform should be the European Technology Platform for Global Animal Health.
• The scope of the TP should be expanded to be fully international and include poverty alleviation, improving food safety, control of zoonoses etc.
• A draft vision paper should be prepared and agreed by the High Level Group
• The launch of the TP with the draft vision paper should take place in December 2004.
• After the launch, the High Level Group should be converted to Advisory Council with representatives of the major stakeholders.
• The structure of the TP needed to be refined with the stakeholders and Member States

Formal launch
The official launch of the Technology Platform took place during the international conference: "The Material and Immaterial Costs of Animal Disease Control" hosted by the Netherlands Presidency on 16 December 2004 in collaboration with DG SANCO. An interim vision paper 2015 for the platform was published at the launch. The TP is lead by the International Federation for Animal Health –EUROPE (IFAH-Europe)

Stakeholder profile
The stakeholders represent the animal health industry, the farmers, the research institutions and academia, the biotechnology industry, the consumers, relevant international organisations, developing countries and Member States and regulatory authorities.

The first meeting of stakeholders was held on 24 February 2005. Major advances were made in the revision of the vision paper in view of reaching a final version, the structure and governance and the arrangements for the development of the Strategic Research Agenda

Structure and Governance
It was unanimously agreed to establish a structure and terms of reference as simple as possible. The structure comprises: an Executive Board, a Steering Council, the stakeholders and a secretariat. In addition three working groups have been established as well as a mechanism to involve Member States.
The detailed terms of reference have been agreed and are available at the platform website.

The Executive Board: comprises 7 members selected from industry, users and public bodies with the participation of the EC as observer. The EB is responsible for ensuring that the process is directed in an efficient and transparent way implementing the recommendations of the Steering Council. The EC attends as observer.

The Steering Council: comprises a maximum of 30 members, it constitutes a network connecting the platform to the major stakeholders and the pool of ideas. The SC oversees the TP and acts to move it forward. The EC attends as observer.

Stakeholders: comprise the organisations and individuals interested in the aim and objectives of the platform. Organisations:
- European associations relevant to Animal Health and Welfare and Food Safety representing industry (IFAH-Europe, EuropaBio, diagnostics), farming industry (COPA-COGECA), veterinarians (FVE) and consumers (BEUC)
- International organizations relevant to Animal Health and Food Safety (e.g. FAO, OIE, ILRI, WHO etc.)
- European Regulatory Authorities (Heads of Medicines Agencies, EDQM, EMEA)
- Representatives from the European Research community (Institutes, Universities, Network of Reference Labs)
- Member States representation
- EFSA

Individuals:
- Invited experts from International Organisations or NGOs and from regional organizations (Asia, Africa, Latin America)

The Secretariat: lead and hosted by IFAH-Europe. It coordinates the daily work of the platform including the organisation of workshops, editorials etc. Works in close collaboration with the EB.

Member States: The Member States are involved through the representation at the SC by 4 Chief Veterinary Officers (CVOs) responsible for Animal health Policy in each Member State. A representative of the Heads of Medicines Agencies of the EU, responsible for the licensing of veterinary medicinal products will also represent the Member States by membership of the SC and the EB. The Member State representatives would be responsible for the dissemination of information through their relevant channels across the Member States authorities.

Overview of activities of the platform
The final version of the vision paper has been agreed. It is available at the platform website.

The terms of reference have been agreed with the structure and governance of the platform. These are also available at the website.

Three working groups have been established for the preparation of the Strategic Research Agenda.

Other relevant issues
A Specific Support Action (SSA)- ETPGAH - granted in "Scientific Support to Policies" contributes to the support of the secretariat and the working groups

Whilst the European Technology Platform for Global Animal Health would concentrate on animal diseases of priority for Europe it will take into account the perspectives of a global setting in which these diseases move. The global nature of these problems and the scale and complexity of vaccine and diagnostics development clearly indicates that solutions will not be very effectively produced or be very robust if developed for and in Europe. Alliances with third countries and international organisations will be essential to ensure mutual benefits and to utilise resources to maximum effect.

STAGE 2: Stakeholders define a Strategic Research Agenda (SRA)
Methodology
The SRA will be focused on the challenges to be overcome in facilitating and accelerating the development and deployment of new tools to control epidemic animal diseases and zoonoses. In the first instance this will relate mainly to new and improved vaccines and diagnostic tests.

Three working groups have been established to develop the SRA focused on the challenges at various

levels of the chain from innovative research through development, production to final deployment of practical products:

WG 1: Mapping and Basic Research
WG2: Exchange and Transfer of Technology
WG3: Horizontal issues

Timing, updating
The WGs have met twice, in October and November /December 2005 respectively. It is expected to have a solid draft early January 2006 which would be distributed to the stakeholders for consideration and eventual endorsement at the second stakeholders meeting on 15 February 2006.

Summary content and structure
The SRA is related to the vision for the platform. Whilst Europe has a relatively good scientific research base to take advantage of the new technologies it tends to be much weaker in translating scientific discoveries into vaccines and tests, which can be used, in an operational situation. This needs to be overcome. The SRA will consider research needs to ensure breakthrough and innovation in the development of new tools. It will also consider research needs to resolve the problems in manufacture, production and registration of the new products. This will involve identifying the research needed to develop new methodologies and tests for demonstrating the safety, quality and efficacy of the new products to enable their rapid registration and approval by the regulatory authorities.

Strategic approach
The SRA will be industry led and as much as possible represent a consensus of all stakeholders on a strategy to meet the vision to facilitate and accelerate the development and deployment of new tools to control animal disease.
At present there is no clear picture or overview of the totality of current research into the major diseases throughout the EU or indeed the whole world is available. There is no readily accessible information on research funding by public authorities neither at a national or regional level nor by large pharmaceutical or the smaller biotech companies. Information on planned or proposed research is also unavailable. Whilst pharmaceutical companies have extensive research programmes there is the question of competition and intellectual property rights, which may limit the exchange of information. It is important to develop in partnership with the public and private sectors an overview of current research, to identify the gaps and take action to develop programmes to fill these gaps whilst at the same time developing research collaboration and synergies and to avoid duplication of research effort. The SRA will be the medium-term strategy and guide to which private EU and National and research programmes would be aligned. The SRA will also address the enabling institutional issues such as the regulatory framework and wider European policy issues linked to competition, agriculture, development, health and consumer affairs, trade, etc

Consensus building
The approach will be developed with all stakeholders. Mechanisms such will be established to take account of stakeholders' views, to facilitate their input to the discussions and to generate and incorporate their ideas.

Interests of public authorities
The European Commission is involved through the Directorate-Generals for Agriculture, Development, Research, Enterprise and Industry, Trade, Environment, Health and Consumer Affairs, the Secretariat General and the EuropeAid Office for Cooperation. EU Member States are involved through the CVOs and a representative of the HMAs. The European Food Safety Authority (EFSA) is also involved. International organisations such as the World Organisation for Animal Health (OIE), Food and Agriculture Organisation (FAO) and the International Livestock Research Institute (ILRI) are also involved.

Budget and financial engineering
At this early stage the implications of the platform or the budgetary requirements to run the platform and to implement the SRA have not been analysed.

Communication strategy

Wide dissemination of the vision paper has currently been undertaken. However, a communication plan will need to be developed for the dissemination of the SRA and the Implementation Plan to a wide range of interested parties.

A specific web site has been created by IFAH-Europe.

Key outstanding issues

Any improvements to the development and deployment of vaccines and tests will improve the competitiveness of the European Animal Health /industry and will as a consequence contribute to the Lisbon objectives. It will also contribute to the Millennium Development Goals.

European Road Transport Research Advisory Council – ERTRAC

Web-site: http://www.ertrac.org

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Vision Document
European Road Transport Research Advisory Council - Vision 2020 and Challenges www.ertrac.org/publications.htm

Platform launch date: June 2003

Overall Policy Objective
The Technology Platform ERTRAC's main goal is to reflect on the future research priorities necessary to support the development of a truly sustainable road transport system in Europe and to establish and promote a Strategic Research Agenda and its implementation for the next decades for Member States, European institutions and road transport stakeholders.

The TP ERTRAC is fully in line with the Lisbon objectives and is also considered as being a key element in the European strategy for increasing the R&D investment in the Member States to 3% of GDP by 2010, as stated in the Barcelona Council.

Road transport is one of the major sectors of the European industry and an important driver for the growth of the European economy. In particular, the automotive industry employs directly 1.9 million people, indirectly the sector employs 14 million people (10% of jobs in the EU). It represents 11% of EU GDP and contributes to € 33 billion of EU external trade.

Strategic Research Agenda
Final – December 2004
www.ertrac.org/publications.htm

Executive Summary
Based on the Vision 2020 which was published in June 2004, the SRA was elaborated by different Working Groups with input from various external experts who participated in a set of workshops and with individual contributions. Due to the complexity of the issues and the number of stakeholders involved with road transport, ERTRAC has structured the discussion and development of the ERTRAC Vision for 2020 and Strategic Research Agenda around four pillars:

- Mobility, Transport and Infrastructure
- Environment, Energy and Resources
- Safety and Security
- Design and Production Systems

The SRA is organised in sections covering each of the four pillars. Each pillar is presented with a logical flow from the Vision statements to the targets for 2020, followed by a detailed description of the research areas which need to be addressed to achieve the Vision. The SRA follows a true systems approach and integrates all the relevant research areas for a sustainable future road transport system. Every effort was made to capitalise the work already done in other European studies and roadmap projects concentrated on specific road transport themes.

All of the research areas are considered to be priority, but there are differences in the timing, technical difficulty, level of investment, and other factors. An assessment of the "Benefits to Society" and "Difficulty to Achieve" is provided on a scale from 1 to 5 for each of the research areas to provide the reader some sense of balance. These two indicators cannot be used alone to establish the priority of research as each research area is like a component that must be considered as part of a more complex system.

5

Difficulty to Achieve

Land Use

Multimodal Interfaces

Mobility Management

Mobility Concepts

Social Trends & Behaviours

Information Provision

1   **Benefit to Society**   **5**

MOBILITY MANAGEMENT

Champion: Public Bodies

Supporters: Industry, Research Providers

- DATA COLLECTION — Harmonisation of methods, real-time information for traffic management, forecast tools
- POLICIES — Impact studies of transport policy options, impacts of future driving environments on travel choices
- PAYMENT — Payment systems, fee collection for transport and other services
- COSTS, FINANCING, PRICING — Business models for cost and financing, impacts of pricing in urban areas
- CONCEPTS — System-wide optimisation of concepts, dynamic wave, real-time traffic information for users and management

MULTIMODAL INTERFACES

Champion: Public Bodies, Industry

Supporters: Research Providers

- DATA COLLECTION — Mobility studies, traffic flow
- COMMUNICATION — Multi-modal route planning, co-operative systems
- DESIGN — User-focused design, intelligent infrastructure design, new vehicle concepts

INFORMATION PROVISION

Champion: Public Bodies, Industry

Supporters: Research Providers

- INFORMATION SERVICE DELIVERY — Trip information, multimodal provision for different user groups, process understanding
- BUSINESS MODELS — Public and private provision, implementation
- TECHNOLOGIES — Harmonisation, multi-channel solutions, vehicle-to-vehicle-to-infrastructure communications
- BASE DATA — Mapping accuracy, location, short term forecasting, interoperability, integrated information, integrated traffic management
- BEHAVIOURAL RESPONSE — Long and short term response, relationship between travel, time, reliability

TIME   2005   2010   2015   2020   2025

RESEARCH DEMAND: ■ Basic research   ■ Applied research   ■ Technical development

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In the SRA the assessment charts and roadmaps as shown above for the research are "Mobility of People" are presented for each major research objective across the four pillars.

The ERTRAC SRA will be reviewed and updated regularly to ensure an alignment by the various stakeholders around the different research issues and determine the priorities for action. As mutual interests on research areas are formalised, strategic research co-operations focused on a systems approach will be developed.

Budget / Financing

The financial resources needed in the next 20 years in research and development to achieve the Vision 2020 represents about 70% more than the current level of expenditure in Europe. The SRA has been created to influence all the European research in the sector and, thus, it should be implemented through the synergy of EU, national, regional programmes and industrial programmes.

In the case of the EU Framework Programme, implementation mechanisms could include:

1) Cooperative RTD including Joint Technology Initiatives;
2) Research Infrastructures;
3) Training and Mobility of researchers; and
4) Coordination policies.

Other funding scheme like national, private, Eureka, EIB... will also be considered. In particular the JTI will be suitable for significant private funding participation through different schemes.

Deployment Strategy

So far most activities have been focusing on the creation of the Vision and SRA and now on finalising the Strategic Research Recommendations for the implementation of the SRA.

ERTRAC activities are already influencing the planning of concrete projects. For example, the FP6 project "CALM II - Coordination of European Research for Advanced Transport Noise Mitigation" will establish an Advisory Board with representatives of all four transport-related research advisory councils (ACARE, Waterborne TP, ERRAC, ERTRAC). Also several Integrated Projects from the last Calls of FP6: HI-CEPS on hybrids, GREEN on heavy duty engines, HySYS on fuel cell hybrid vehicle, HYICE on hydrogen combustion engines, SILENCE on environmental noise reductions, CITYMOBIL on advanced road transport systems for urban environment, SLC on production technologies and light weight cars.

- *Strategic Research Recommendations*

  Based on the SRA, Strategic Research Recommendations (SRR) are being developed for the research implementation. The aim is to have a more detailed guidance for research initiatives/ programmes to achieve the Vision 2020 and face the Challenges as defined by ERTRAC. The SRR focus on the definition of RTD targets, the evaluation of impacts and effectiveness, as well as cost-effectiveness considering the goals of sustainable growth, competitiveness and social aspects. A first draft document will be published early 2006. In particular, this will serve as input for several Thematic Priorities of the 7th Framework Programme for R&D.

- *National Activities*:

  In addition an inventory of national research activities in the road transport sector was created. This inventory is based on information from FP6 initiative ERA-NET Transport and FP5 project EXTR@ WEB and input from national ERTRAC representatives. It covers a short overview of the national road transport sector and the recent RTD programmes. Currently there are 17 European countries: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, The Netherlands, Norway, Poland, Sweden, United Kingdom, Italy, Slovenia. Next step will be the analysis of overlaps and gaps between these national activities, the EC programmes and the ERTRAC recommendations.

Workshops and presentations at national events such as a comprehensive ERTRAC presentation at the Strategic Development Conference on November 10th, 2005 in Ljubljana.

National ERTRAC platforms are started to be created (e.g. ERTRAC Slovenia).

- ***Outlook towards building a long-term public-private partnership***

  The Technology Platform ERTRAC is basically an initiative of the road transport industry, which invests approximately € 19 billion per year on R&D. ERTRAC has, for the first time, established an open dialogue between the main driving forces in the European public and private road transport sectors and published a SRA which was agreed by all stakeholders. It will play a major role in helping to align both private and public research activities, as well as national with EU research initiatives. Continuous investment in RTD is the most important factor to remain competitive.

  In support of the CARS 21 initiative to support the competitiveness of the European automotive industry, the industry looks forward to creating a detailed research, development and demonstration programme in two main areas: "Clean fuels and vehicles" and "Intelligent roads and vehicles".

- ***ESFRI***

  A proposal for FP7 has been submitted on "open European database on vehicle and traffic safety".

- ***INCO***

  International Cooperation is an important topic for future research collaborations in road transport, especially with emerging countries (e.g. China, India, Brazil and South Africa). Six main topics of collaboration have been identified. The detailed areas of research collaboration and countries for collaboration are being investigated.

- ***TRA 2006 Conference and Exhibition, 12-15. June 2006, Gothenburg***

  The first road transport research conference and exhibition is co-organised by ERTRAC, CEDR (Conference of European Directors of Roads) and the European Commission. The conference aims at supporting the implementation of the European Research Area on road transport. That means alignment of European, national, regional and private research and development actions on road transport by enhancing the networking and clustering of Europe's research and development capacity based on a shared Strategic Research Agenda.

  Further information: http://www.traconference.com

- ***ERTRAC Office:***

  In February 2006, ERTRAC has opened its office in Brussels for a further improvement of networking and the implementation of proposed activities. It is located: Rue du Trone 98, 1050 Brussels.

Next Steps
- March 2006: Structured Research Recommendations published
- June 2006: TRA 2006 Conference and Exhibition
- December 2006: Strategic Research Agenda – first update

European Rail Research Advisory Council (ERRAC)

Web-site: www.errac.org

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Vision Document
No Vision document was prepared prior to the 1st Strategic Rail Research Agenda.
A new document, Rail Vision 21, was presented to Commissioner Potocnik in March 2006, as input to FP7 and the updated version of the SRRA (SRRA II)
http://www.errac.org/reftexts.htm (contains all the ERRAC reference texts**)**

Platform launch date: September 2001

Overall Policy Objective
ERRAC was set up in 2001 with the ambitious goal of creating a single European body with both the competence and capability to help revitalise the European rail sector and make it more competitive, by fostering **increased innovation and guiding research efforts at European level.**

Strategic Research Agenda
1st Strategic Rail Research Agenda (SRRA) handed over to Commissioner Busquin December 2002.
Updated version (SRRA II) in preparation with expected completion end 2006.
http://www.errac.org/reftexts.htm (contains all the ERRAC reference texts)

Executive Summary
* European Rail is at the heart of a sustainable transport policy

* Increased investment in rail provides the opportunity to rebalance the transport modes

* Rail freight offers an alternative solution to road congestion in the logistics chain

* Rail has the potential to provide a high-speed centre to centre passenger service to all major European cities and a complementary urban and regional transport system.

* The inherent system characteristics of rail give it unassailable advantages in safety and environmental friendliness

* The expansion of the EU to close to 30 members provides an enormous challenge to its transport system and offers the ideal opportunity for rail to gain greater market share

ERRAC

The European Rail Research Advisory Council (ERRAC) has brought together, for the first time, Member States, academics, opinion formers and customer groups with senior representatives of the railway undertakings, infrastructure owners and the railway industry. The European Commission is facilitating this process. Their collective role is to define the research needs and targets to be achieved to develop a railway system that Europe can be justifiably proud of, meeting the needs of the European Citizen and the demands of Sustainable Mobility. The target is to achieve this vision by 2020, its development coming hand in hand with the legislative reforms on liberalisation of the railway market and interoperability.

SRRA

ERRAC is now able to present its first "Strategic Rail Research Agenda 2020" (SRRA). The agenda identifies key research drivers which will place rail at the core of the European transport system. It is the first step in a continuing process which is anticipated to modify content, regulate achievement and revisit its objectives in accordance with changes in market demand, social and legislative conditions and speed of achievement of results.

Business Scenario

The rail sector has a vision for the future of rail in 2020, which reveals its ambition to become an important player in the European transport system by providing seamless, integrated high speed passenger services and door-to-door freight services, as well as, efficient and environmentally friendly metropolitan and urban mass-transport.

In order to support this vision, ERRAC has developed the Railway Business Scenario 2020 which anticipates the ambitious target of the rail mode capturing twice the freight and passenger market share and three times the freight and passenger market volume compared with 2000.

Strategic Targets

In line with the Business Scenario, and in order to achieve the customer goals in terms of quality and cost, the research priorities of the SRRA are focussed on strategic priorities which address the relevant elements, from service quality to production and interoperability.

These are:
- Seamless Passenger Services
- Door to door Freight Services
- Integrated Mass Transit Services
- Modular Interoperable Rolling Stock
- Fully Interoperable Infrastructure
- Environment and Sustainability

ERRAC, through the SRRA, has identified the key research avenues, in line with the strategic targets, which need to be developed to deliver the anticipated market results.

Significance of the SRRA for the stakeholders

The SRRA represents an identifiable, coherent forward looking and adaptable framework for railway research at the beginning of the 21st Century. It gives a clear signal to all the stakeholders involved of the direction to be taken and the speed of progress needed to be made.
- *Commitment*

All stakeholders are committed to the co-ordination of research investment based on the ERRAC strategy at in-house, national and supra-national levels.
- *Implementation*

ERRAC will continue the dialogue it embodies in order to further develop and adapt the SRRA to become the core of the overall management of rail research.
- *Financing*

Considerable investment will be required from all partners to make the vision a reality. The level of investment in the research as outlined in the SRRA is currently being determined.

Budget / Financing

Historically there has not been an agreed figure for the cost of implementation of the SRRA.

When the SRRA was published in 2002 there was a conscious decision made not to make any figures public at that time.

This may be reconsidered for SRRA II.

It is normally considered that the Commission provides a leverage budget for research which represents 5% per annum of the total pre-normative research spent by the entire rail sector.

On an annual basis this is thought to be

No JTI is currently planned for FP7.

Given the current lack of a clear cost of implementation no indication can be given of a shortfall in funding.

Deployment Strategy

A task force comprising of the communications experts of each of the major organisations involved in ERRAC activities (CER, UIC, UITP, UNIFE) is responsible for the dissemination activities associated with the TP. Events to date include the launch of the SRRA in December 2002, a series of sessions in Member States communicating ERRAC and its activities and an information session in October 2005 to Simon Chichester (Chair of the EP Research Committee), MEPs, Commission services and other influential personalities in Brussels. The principal aim is to ensure widespread awareness of the SRRA at European and national level through seminars in the EU Member States

A Working Group has also been established which is reviewing recently completed and current rail research projects to assess their impact on and contribution to the SRRA. In addition assessments are being made of how current research and development programmes align with the SRRA (national rail programmes, rail research projects under the Fifth Framework Programme, programmes for other transportation modes, research in Japan, Korea and the United States)

A review has been carried out of the initial Rail Business Scenario for 2020 (which was established in 2001) to modify and update it in relation to changing trends in the Transport Sector by examining the drivers that influence, and the actions that will improve, the rail sector's short to medium-term competitiveness.

Other related benchmarking activities include:

- Examining the research implications of investment in rail infrastructure
- Reviewing the light rail and metro system market sector in the 25 EU Member States for the next 20 years and highlighting the inherent research implications
- Analysing future research needs required to make smooth the transition to a harmonised European railway market

Their purpose is to ensure a robust and harmonised evaluation of the SRRA ambitions in the context of sector activities to deliver a compliant research strategy.

Next Steps

Main future activities of ERRAC
General tasks
- Ensuring the best alignment of the research programmes with the identified ERRAC research priorities
- Identifying synergies among various corporate, national and EU research programmes and promoting better co-ordination
- Nurturing and endorsing new research initiatives
- Evaluating on-going and completed projects
- Driving training and development of engineers with new skills for the emerging technologies = > key role for EURNEX (the European Rail Research Network of Excellence)

Specific tasks
- Acting as an advisor on future rail research needs to the European Commission for the 7th Framework Programme (2007-2013) and beyond
- Drawing up the second Strategic Rail Research Agenda
- Promoting ERRAC activities and implementing an efficient communications strategy

Contribution to the 7th Framework Programme
Draft the SRRA II
- Use the Rail 21 Vision as the basis for SRRA II
- Produce the first draft by April 2006 to make an effective contribution to the FP7 Work Programme for rail
- Focus on the identification of gaps and update SRRA I objectives

WATERBORNE

Web-site: http://www.waterborne-tp.org

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Vision Document
THE WATERBORNE SECTOR: A Key Asset for Europe's Development and Future http://www.waterborne-tp.org/bal_ims_controler.php?menu=YmVmPTgzZG1qZTVgMGk3Zg===&page=1&reset=search

Platform launch date: 25 January 2005

Overall Policy Objective
The primary policy objective of the WATERBORNE ^{TP} is to support the Research Policy. WATERBORNE ^{TP} is a forum where all the stakeholders develop on a medium to long term Vision for the maritime industry and waterborne transport and operations, assess the key challenges, formulate the R&D actions to be fulfilled for meeting these challenges in a Strategic Research Agenda and promote the mobilisation of the necessary resources.

Strategic Research Agenda
Draft - January 2006
http://www.waterborne-tp.org/bal_ims_controler.php?menu=YmVmPTgzZG1qZTVgMGk3Zg===&page=1&reset=search

Executive Summary
The history of civilisation and of commerce cannot be separated from that of waterborne transport. Trade of goods, passenger transport, exchange of knowledge, and the development of cities, regions and even civilisations, were in past centuries often only possible by means of waterborne transport.

Today's Europe would not be one of the world's most powerful regions, giving a stable and safe standard of living with a high social security for around 400 million citizens, without the performance of waterborne transport and operations, including the related European industry, know-how and professionals. Always with a high commercially motivated innovative pitch, almost all maritime technology developments have been made in Europe, even today, in the age of globalisation. European stakeholders along the waterborne value chain belong to the world leaders in their fields, benefiting from a tradition of development cooperation between e.g. operators and builders or clients and suppliers – a proven maritime cluster.

The WATER*BORNE* ^{TP} is the initiative of all parties involved in the areas of shipping and shipbuilding, offshore industry and leisure vessels, ports and infrastructure development, and equipment manufacturers and systems suppliers to present their contribution to the development and prosperity of the EU and the member states.
Continuing the successful efforts of the Maritime Industry Forum (MIF) in publishing two volumes of maritime R&D Master Plans since 1994, the industry stakeholders of the waterborne sector launched the WATERBORNE Technology Platform in January 2005, together with the EU member states, the European Commission services and stakeholders from science and society. A vision of the year 2020 (Vision 2020) was developed and was followed by the WATERBORNE Strategic Research Agenda (WSRA).

The WSRA addresses the innovation challenges in the next 15 years, summarised under the 3 Pillars of the Vision 2020:
•   Safe, Sustainable and Efficient Waterborne Operations
•   A Competitive European Maritime Industry
•   Manage and Facilitate Growth and Changing Trade Patterns

It describes the key priority themes for Research, Development and Innovation accordingly. Whatever the coming years will bring, they will surely present serious challenges. There will be threats and there will be opportunities for Europe.

It is important to realise that some of these challenges will impact on more than one Pillar. The challenges are not stand alone issues, to materialise the highest innovation potential often an integrative and interdisciplinary approach is the most promising way. These represent opportunities which the members of the Waterborne Technology Platform intend to seize.

The WSRA has been primarily compiled to address the market and society challenges for the waterborne sector. It supports by its nature in many aspects major policy lines and initiatives of the EU Commission, such as e.g. safety, security and sustainability in transport, avoiding traffic congestions by modal shift etc.

The WSRA summarises and introduces at executive level the numerous RDI challenges and thus to support the acknowledgement of the importance of continued and enlarged RDI efforts in the waterborne sector for the European society and the competitiveness of the European maritime industry, as well as to contribute to the mobilisation and effective use of the necessary resources and funds.

The WSRA will be followed by the WATERBORNE Implementation Plan which will further detail the targets, specify their time horizon and expected funding.

Budget / Financing
This part is currently under evaluation.
At this stage it would be premature to envisage a JTI.

Deployment Strategy
The deployment strategy is part of the programme of activities of 2006 and will be the result of a consensus based agreement.

Next Steps
The WATERBORNE Implementation Plan (Roadmap) is also part of the programme of activities of 2006; it will be the result of a consensus based agreement and should be ready by September 2006.

Innovative and Sustainable Use of Forest Resources

A Forest-Based Sector Technology Platform (FTP)

Web-site: www.forestplatform.org

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Vision Document
Innovative and sustainable use of forest resources
www.forestplatform.org /Documents
Vision for 2030
The European forest-based sector plays a key role in a sustainable society.
It comprises a competitive, knowledge-based industry that fosters the extended use of renewable forest resources.
 It strives to ensure its societal contribution in the context of a bio-based, customer-driven and globally competitive European economy.

Platform launch date: February 15 2005

Overall Policy Objective
− To increase the sector's competitiveness while continuing to build on its competence in providing functions that enhance sustainability.
− To ensure the perpetuity of renewable forest resources as the basis for meeting the multi-functional needs of society, including a range of sustainable processes, products, services and other benefits for individual consumers and other users.
− The overall vision is that by 2030, products, services and energy derived from renewable, wood-based and composite materials should be amongst the preferred choice of the consumers.
− To contribute significantly to achieving goals set up by European Councils in Lisbon Gothenburg and Barcelona as well as contributing to well-founded policies, directives and regulations.
− To contribute strongly to the fulfillment of the objectives of the European Research Area in respect of integration, co-operation and focusing of research concerning utilization of renewable forest-based resources.

Strategic Research Agenda
Finalised in February 2006

Executive Summary
The Forest-based Sector Technology Platform (FTP) represents a step into a new era for the sector. An era that will build a more knowledge-based, more customer focused and more innovation oriented industry. At the same time, the sector aims at developing the economic and social benefits it provides today, while still seeking continuous improvement in terms of sustainability.

The Strategic Research Agenda (SRA) is aimed at increasing the competitiveness of Europe by developing innovative products and services. Competitiveness is the key objective of the platform, because without it there will be no capacity to deliver the economic, social and environmental goods and services for which the sector strives so hard. By contributing to all three pillars of sustainability, the sector walks hand in hand with the EU in reaching goals and strategies set out in Lisbon and Gothenburg.

The sector's prime asset is the renewable nature of its raw material – wood. Fabricated by nature using carbon dioxide and water, this resource can be used for a variety of products and services, as well as for energy. The amazing properties of wood means that today there is probably no other major industry that positively influences the daily life of Europe's citizens as broadly as the forest-based sector. This situation is not guaranteed, however. On the contrary, the sector is subject to a variety of threats and challenges, mainly due to increased global competition, changes in the energy market and the concern for the effects of climate change.

The forest-based sector can turn these threats and challenges into opportunities though. This is precisely the goal of the FTP and its Strategic Research Agenda (SRA). Society demands and deserves higher added-value products in existing product segments. However, there is also need for the development of entirely new uses for wood as a raw material and a more active engagement in the bio-energy field. Indeed, "green" chemicals, novel composites, and the non-wood values of European forests are already identified as product opportunities.
New concepts that use wood will further contribute to mitigate climate change as all wood products in essence 'lock up' carbon. Wood can contribute in other ways too, though, for example by providing substitutes for non-renewable materials in sectors such as packaging, fuels, chemicals and construction.

However, to take advantage of all these opportunities, secured wood supplies are obviously vital. This is helped by the fact that Europe's forest areas are increasing, but even more important is to mobilise already existing forest resources in a sustainable way. Efforts are also needed to increase the growth yield of forest biomass through various measures. In order to secure wood supplies, Europe must also create a supportive policy framework that allows the use of the potential existing in Europe's forests. Furthermore, forests represent far more than a secure raw material supply base in today's Europe. For example, the forest provides a valuable resource in terms of recreation, tourism and other indirect 'non-wood' values.

The forest-based sector is well aware that it needs to develop open and effective communication channels with Europe's citizens on issues of stewardship. As a result, the SRA also outlines the need for a scientific approach that will generate a better understanding of the public's perceptions and concerns and provide effective responses. Sustainability, product development, resource availability, multiple forest use, biodiversity, the production of bio-energy and energy efficiency – in tackling all these areas and more, the SRA is clearly an ambitious undertaking.

Successful implementation of the SRA depends on bold steps and innovative ideas. Here, the research society has to take the lead with industry, forest owners and public bodies to clear a path toward commercial or societal implementation. A well-functioning innovation system, a strategic communication action plan, and activities in the field of education and training must support the drive to ensure that the sector's vision for the future becomes reality – for the benefit of all.

Web-link: www.forestplatform.org /Strategic Research Agenda

Budget / Financing
So far the FTP project has been financed by the industry through the European Confederation of Woodworking Industries (CEI-Bois), the Confederation of European Forest Owners (CEPF) and the Confederation of European Paper Industries (CEPI).

For the implementation stage, the FTP is planning to apply for EU funding through a SSA instrument.

Deployment Strategy
For the implementation stage, the FTP is planning to apply for EU funding through a SSA instrument.

Next Steps
- Printing of the SRA document early March 2006
- Official implementation launch event of the SRA will be on the 2-3 May 2006 in Styria, Austria, in the context of the Austrian Presidency to the EU.
- The general promotion of the FTP and dialogue with the Commission continue (secretariat, communication group, all the organisation bodies, National Support groups)

EuMaT – European Technology Platform for Advanced Engineering Materials and Technologies

Web-site: www.eumat.org

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Vision Document
The Vision document is included as Part II of the main document **"Roadmap of the European Technology Platform for Advanced Engineering Materials and Technologies (EuMaT)"**, entitled "Grand Challenges and the Vision ("The Vision Paper")"

Status of the document: Draft completed and agreed, published on web (www.eumat.org). The above document consists of the following main subdocuments:
- Executive Summary; The EU ("2-page Form")
- Introduction
1. Grand Challenges and the Vision ("Vision Paper")
2. Realizing the Vision ("Strategic Research Agenda")
3. Technology Foresight Resources ("Implementation Agenda")
- Conclusions
- Annex I: Preliminary contact points
- Annex II: EuMaT Terms of Reference
- Annex III: Summaries of Interests Expressions of Interest

Platform launch date: Nov. 28. 2004 (Kick-off Event, Brussels); Launch Event planned for spring 2006

Overall Policy Objective
The overall policy objective of the TP is the promotion of the leading global position and global competitiveness of the EU technology and companies in the area of Advanced Engineering Materials, as well as promotion of the consolidated and unified R&D and innovation European policy in this area, e.g. in the fields like materials resistant to extreme conditions, intermetallics or other multicomponent materials. The concerted EU R&D in this area is essential for the issues like material production technologies, monitoring and predicting material performance and degradation, environmental and/or health impacts

Strategic Research Agenda
Part III of the "EuMaT Roadmap"
Status of the document: Draft completed, under revision, available upon request. Final agreed document planned for March 2006.
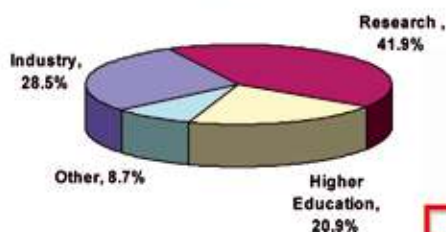www.eumat.org

Executive Summary
The main practical policy objective of EuMaT is to assure optimum involvement of industry and other important stakeholders in the process of establishing European R&D priorities in the area of advanced engineering materials and technologies. EuMaT should improve coherence in existing and forthcoming

EU projects, and introduce "Radical Changes" and assure "Sustainable Development" in the sector of advanced engineering materials and related technologies. EuMaT covers all elements of the life cycle of "Advanced Engineering Materials & Technologies" (AEMT). The term AEMT refers in EuMaT to the three pillars
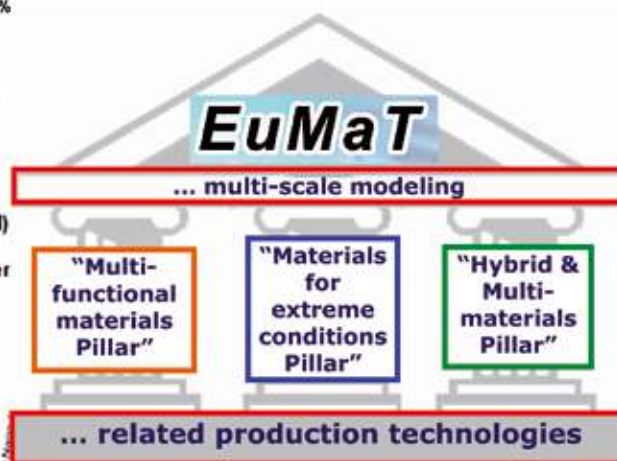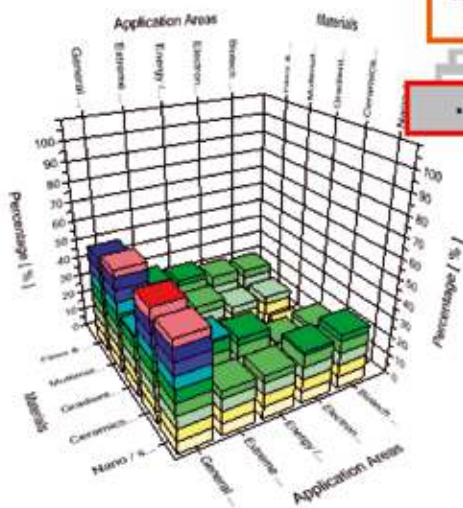
- multifunctional materials for macro-applications, primarily
- engineering materials for challenging (extreme) application conditions, including
- multimaterial (hybrid) systems

as used in engineering (and, e.g., coupled with "conventional" structural materials like steel, aluminium, titanium, metallic alloys, composites, polymers, advanced ceramics, coatings, adhesives, concrete, …) and/or used to enhance the engineering products, systems and processes in areas like energy, gas & oil, chemical, space, transportation, electronics, environment, health…EuMaT covers the lifecycle of lightweight materials and nanomaterials in engineering components/ applications/systems. In particular it clearly points out the link toward large European projects like KMM-NoE (www.kmm-noe.org) and Extremat (http://www.extremat.org), in which advanced engineering materials like intermetallics, metal ceramic composites, functional engineering materials with gradient properties, self-passivating protection materials, radiation resistant materials and heat sink materials and high-temperature materials are investigated. The examples of **advanced new products** directly enabled by the progress in the area of advanced engineering materials are, e.g., gas and steam turbines (for 1600 ºC and 800 ºC respectively, ITER reactor or the "Third Millennium Car"). The similar impact would the advanced engineering materials have in the area of **manufacturing** (cf. the MANUFUTURE Technology platform).

The overall performance targets EuMaT and materials and technologies which EuMaT envisages for 2030 are to:

- help to reduce life-cycle costs of process equipment and infrastructure by 30% and energy consumption by 50% (more efficient materials)
- increase productivity of assets by reducing downtime by 25% (more reliable materials)

- protect the environment by containing processes (e.g. by recycling 95% of metallic and 70% on average of other advanced engineering materials at the end of their useful life)
- capture existing knowledge and effectively train a future workforce and develop capability and capacity to develop new generation of materials

In order to assure the breakthrough in the area, EuMaT will also tackle the horizontal and life-cycle issues like multi-scale modelling and simulation, testing, inspection, monitoring, characterization, including standardization and qualification of materials and manufacturing processes, prediction of in-service behaviour/characteristics and failure criteria, risk and impacts of new materials and training and education issues. EuMaT has currently a very broad membership, as shown in the figure.

__The Strategic Research Agenda (SRA)__ is created with appropriate involvement of industry and other main stakeholders. It will provide a basis for identification of needs and will establish priorities on the short-term (3-5 years), the medium term (4-10 years) and the long-term (> 10 years) time scale.
The SRA covers the following items: (a) Aspects to be considered, (b) Methods for selecting, at EU level, future basic research directions, (c) Coordinating the Roadmap with other FP6 activities, (d) Strategies and policy f or research excellence beyond national boundaries, (e) Academia / Industry collaboration, and (f) Expected impacts. The EuMaT SRA)is a part of the EuMaT Roadmap document.

Major challenges have been identified in the areas of (a) development of new cost-effective and environment-friendly materials and related processes for challenging application conditions, (b) condition assessment and performance/degradation modelling/prediction, (c) knowledge management and materials information delivery. EuMaT organized its structure in terms of strategy and policy (General Assembly, International Advisory Board), in terms of management (Steering Committee and Operating Agent),and in terms of technical work (Task Forces working on SRA and horizontal issues, like e.g. international collaboration, standardization) and technical issues (modelling, multi-materials, production technologies, product life cycle management). EuMaT is open to all the interested new members and new members can join as regular partners, ad-hoc partners, investing partners and core partners. National Mirror Groups have have been created in the following countries:, Germany, Hungary, Italy, Romania, Slovenia (under construction), Spain, Switzerland, United Kingdom.

Budget / Financing
In the 7th Framework Programme (FP7) the resources planned for this area should go well beyond 4 billion €, for topics like better theoretical fundamental understanding of materials and their behaviour, interdisciplinary aspects in materials science, linking fundamental research with products and linking to horizontal issues related to hazards, risks, environment, sustainability, standardization, etc. Annual operating cost for the EuMaT is estimated at about 600,000 € for the costs related to management, supporting activities and the work of the Focus Groups. Preparatory cost of EuMaT is currently covered by the participants, for their own costs. Costs related to the further development and implementation of the SRA should correspond to a budget of about 0.5 to 2.5 billion €/year. This budget will be obtained through the contribution of industry (target 35%), national governments (target 35%), and the European Commission (target: 30%). In order to assure for the large-scale coordination capacity needed, it is proposed to proposed to initiate EUREKA and ERA-NET projects. National Mirror Groups will be financed at the national level.

Deployment Strategy
The EuMaT deployment strategy covers (a) the coordination of the overall research work in the EuMaT area, and (b) providing the basis for planning of the future R&D in EU in the area of EuMaT (e.g. by periodic updating of the EuMaT SRA). EuMaT has already established a close cooperation with EMF (European Materials Forum), E-MRS (European Material Research Society), DGM (German Association for Materials). Further collaboration agreements (Memorandum of Understanding - MoU) are under preparation with several other national and international groups. Similar MoU's are under preparation with the Technology Platforms on **Steel and Aluminium** (if/when launched), Transportation TPs (**ERRAC &
ERTRAC**), **Manufuture,** Hydrogen, **Industrial Safety** and Pressure Equipment (if launched), **Sustainable Chemistry,** Construction, **Zero Emission** and other TP's. The EuMaT web (operational since October 2004) provides already links to existing TP and project web sites, relevant working groups, academic institutions, other international initiatives and other networks. The sites also supports the functionality of the EuMaT management (members, national mirror groups, documents, meetings, publications, etc.

Next Steps

The activities will cover:

- Linking to EUREKA and to national organizations and activities supported by national programs/ projects;
- Finalizing the formalities related to linking of EuMaT to E-MRS, ESF and other European professional organizations like cooperation with the German Materials Society (DGM), the French Materials Society (SF2M), or the Swiss Materials Federation (SVMT), as well as the formalities related to linking of EuMaT to other TP's of the EU, like, e.g., Sustainable Chemistry, Industrial Safety and others
- Final publishing of the EuMaT documents (vision, SRA, Implementation Agenda, Terms of Reference…) and the Launch event (spring 2006)
- Periodic updating of SRA

European Technology Platform on Industrial Safety (ETPIS)

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Vision Document
Safety for Sustainable European Industry Growth
http://www.industrialsafety-tp.org/

Platform launch date: 30 June 2005, Gdansk (Poland), at the ESREL 2005 Conference.

Overall Policy Objectives of the ETPIS

- To gain 'Safety for the Sustainable Growth of all European Industry' by reducing the number of accidents & by supporting safe technological innovation. This has a major impact on cost of manpower, availability of production systems and therefore on the competitiveness of the Industry.
- To bridge the different aspects of "industrial safety" (Occupational health & safety of workers plus environmental safety including prevention of major accidents & protection of the environment).
- To facilitate and accelerate the breakthrough for progress in industrial environmental, health & safety (EH&S) via a co-ordinated, integrated research & implementation process.
- To valorise, exploit and implement results of research and innovative methods within Industry.

The platform will be a major industrial contribution to the design of Commission policies related to Safety and Health (particularly Framework Directive), SEVESO II Directive, ATEX Directive, IPPC Directive, transport of dangerous goods, REACH, etc.

Strategic Research Agenda (SRA)
The SRA of the ETPIS has been finalised during the Milan Seminar (December 2005) and then presented at the first ETPIS General Assembly meeting, on 7 February 2006 in Brussels, in the presence of RTD Commissioner J. Poto□nic.
http://www.industrialsafety-tp.org/

Executive Summary
It is expected that improving the level of industrial safety will sustain and foster the competitiveness of the European industry. In particular, improved control of industrial risks will contribute to the sustainable growth of the European industry. There is also a benefit to be expected from the development of a co-ordinated effort in safety-related research across industry sectors. As it stand today, the effort in *Research & Development* often remains fragmented, at both national and European levels, and no

coherent attempt is made to transfer success from one industry to another or the benefits of research in one sector to another.

The ETPIS recognises that only an integrated approach to risk assessment and management will help introduce better and integrated safety standards across the European industry, along with occupational practice that matches the objectives of industrial safety. Such integration includes: man-machine interactions, organisational and cultural factors, influence of safety culture, etc. The ETPIS also recognises that it is through education and training that can be established a context wherein managers, technology developers and designers can create safe industrial systems, while operators at facility level also know how to operate and maintain these systems in a safe way.

The methods relied upon by ETPIS partners include: modelling the risk, as well as reliability and availability of the systems throughout their lifetime. Purpose here is to be able to study the impact of new maintenance and repair schemes on system safety, life cycle costs, reliability, serviceability and quality. Another major problem facing many industrial products, structures and industrial facilities at large is the technical need, or economic pressure, to extend the lifetime of industrial systems and structures. It is therefore critical to ensure that this extension will not degrade the level of safety in industrial activities. This problem is being dealt with in different industries, that usually rely on the same main theoretical background but often develop different strategies and approaches. Thus, methods for the assessment of existing structures and equipment (reliability; ageing; etc.) are also addressed by ETPIS. This is also the case of approaches and criteria relied upon to extend, in a safe way, the lifetime of products and industrial systems. Purpose is that this practice of extending lifetime of systems and products is done based on properly identified and accepted levels of risk, reliability and availability.

For safety to be maintained throughout the operational life, safety management systems are required. These deal with physical systems, processes and people; these systems are based on measures including: risk elimination, prevention, control and mitigation, emergency response and recovery. All these features shall be used in different combinations, depending on the nature of hazards, precursors, accidental scenarios (e.g.: from benign incident to worst-case) and potential loss.

The ETPIS is closely co-operating with the industry-specific platforms, such as MANUFUTURE, ECTP, Sustainable Chemistry… so as to turn the methods and technologies developed within the Platform Industrial Safety into practical, accessible and easy-to-apply principles and tools. This will require an industry-specific approach. The commitment of ETPIS is expected to help industry practitioners to identify and prevent potential risks, understand and improve safety culture, and understand what other factors have an influence on safety.

RTD Strategy. Analysing the broader situation of industry and safety interactions and related issues, ETPIS members came up with a RTD strategy focusing on 5 major challenges in safety sciences.

Improving methods and technologies to reduce risks at work and to prevent major accidents

Basic knowledge, methods and technologies need to be developed in: Technologies and methods for eliminating or reducing risks at source; Technologies and methods for inherently safe design and for inspection, monitoring and assessment of defects; Application of information technologies in advanced safety-related systems; Reducing risks by collective protective systems and devices; Advanced materials and technologies for developing personal protective equipment; Technologies and methods for preventing and reducing risks due to Major Industrial Accidents.

Developing new risk assessment and risk management methods addressing the complexity of industrial systems

Basic knowledge, methods and technologies need to be developed in: Understanding hazardous phenomena to develop safety equipment and technologies; Development and validation of methods and tools to improve risk assessment and management; Impact of natural and man-made hazards on plant safety; Harmonisation in risk assessment; Reliability and safety of network systems; Methods for dynamic reliability assessment; Risk management and governance (new forms of participative governance); Multi-criteria analysis and decision support tools; Systemic methods to address the complexity of the industrial systems; Uncertainties in risk assessment and management

Understanding the impact of human and organisational factors in risk control

Basic knowledge, methods and technologies need to be developed in: Human-Centred Design Human Factors in System design and modernisation; Human-Technology Interfaces & Usability; Integrated Risk Assessment and Management Methods & Techniques; Human Factors in Emergencies and Crisis Management; Safety Culture & Safety Climate; Decision making process; Human Performance; Human Factors in Organisational and Managerial Safety - SME-related issues; Human Factors Knowledge Engineering & Management; Health & Social Issues; Data Retrieval; Operational feedback and learning from experience; Actual safety and perceived safety

Understanding emergent risks and cross-cutting risk & safety issues

Basic knowledge, methods and technologies need to be developed in: Unified / consolidated legislation, codes, standards; Reliable data; Economic Price & Value of risk (VAR – the Value-at-Risk concept, too) and risk management; New technologies; "Blind" application of tools; Old/aged plants; Globalisation; Integration of Life cycle; Risk perception, Political Price & Value of risk; "Forced" application of risk-based approaches; Impact of demography on industrial safety; Banking and Finance; Security Research

Structural safety

Basic knowledge, methods and technologies need to be developed in: Structural reliability based design; Structural Health Monitoring (SHM) and risk-informed inspection; Structural Safety of Aged & Repaired Structures; Fitness-for-Service (FFS) of Structures; Integrity of Multi-Material (Hybrid) Structures; Structural Safety from Natural Hazards; Structural Safety from Accidental loads

Focus Groups (FG) of the ETPIS

According to the above-listed challenges in safety sciences, ETPIS members have set up five topic-based focus groups.

- FG 1: Risk Assessment and Management
- FG 2: Advanced Risk Reduction Technologies
- FG 3: Structural Safety
- FG 4: Human and Organisational Factors
- FG 5: Emerging Risks

As some industrial challenges involve several industrial sectors and/or expertise from several Focus Groups, the ETPIS has forged the concept of research HUB. A HUB is a topic-based group of stakeholders aiming at both exchanging knowledge and starting projects, once they have defined a research agenda that is specific to their topic of interest.

Two HUBs have been created so far:

- HUB Education and Training. This HUB addresses issues related to basic knowledge, methods and technologies needed to maintain and develop safety-related skills. Approaches include: open platforms for education and training; virtual reality etc.
- HUB Safety. This HUB addresses safety-related issues in the field of nano-technologies and nano-materials. This HUB seeks support from industry partners.

Deployment Strategy: Key axis
- Bringing the scientists together
    - *Output : Annual colloquium to share the result of research*
    - *Network of practitioners and researchers in industrial safety*
- Preparing the future (Periodic review and update of the SRA)
    - *Output : Biennial workshop to review and update the Strategic Research Agenda*
    - *Output : Contribution (input) to the Workprogramme of FP7*
- Protocol for project review and support

- Active recruitment and engagement of industry partners
    - *Strengthen industry-research partnerships on safety*
    - *Co-ordinate research activities with industry needs*
    - *Develop ETPIS deliverables relevant to industry needs*
    - *Support competitiveness of European Industry*
    - *Sustain the development of the ETPIS*
- Co-ordinating RTD efforts and linking with national TPs
    - *Active TPIS exist in Poland, Spain, France, United Kingdom and Check Republic*
    - *Output: Distributed effort & consolidated financial plan for RTD (SRA implementation)*
    - Output : Coordinated funding structure with creation of "ETPIS label" to identify projects relevant to the SRA
- Co-ordinating with other ETPs & Associations :
    - *Ongoing contacts with the Construction ETP*
    - *Providing input to the SRA of Manufuture ETP*
    - *Request from the Steel ETP that ETPIS be part of its High Level Group*
    - *Close link with the Sustainable Chemistry ETP*
- Implementation of the RTD results & measurement of the impact :
    - *Output : Creation of the observatory of Industrial Safety*
- Communication strategy
    - Web Site open in October 2004: www.industrialsafety-tp.org. See links to existing projects.
    - Open Public Workshops organised on regular basis (sector-based and or cross-cutting topics)
    - Newsletters; Symposia;
    - Promotion of benchmarking, success stories and stakeholder image
    - Implement feed-back loops into industrial establishment's design and safety management
    - Link to relevant CEN working groups on risk assessment, protection and security of citizens.

- Education and Training
    - Links to Academic institutes engaged to improve education programmes in industrial safety
    - Sponsored Scholarships and Ph.Ds are foreseen
    - Web based training tools developed within supported research projects are foreseen
    - 'Off the shelf' training aids (self, train the trainer, skills for exploitation of research) etc.
    - Access to curriculum planning of Academic Institutes will be facilitated
    - European Qualification in Industrial Safety is being studied

- Links with other international initiatives
    - Links to different industrial programmes (e.g. Responsible Care)
    - Strengthen existing networks between OSHA Agencies in Europe, the USA and other countries
    - Support networking when major industry members of ETPIS operate international companies
    - A formal link is being established with the American Institute of Chemical Engineers, Section dealing with industrial safety

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Next Steps
- 2006 : continuing the process to create a national TPIS in each Member State
- End 2006 : 1st draft of a Consolidated financial plan for RTD involving the contribution of the various Member States and industry participation
- Periodically, the SRA will be updated (every second year)

Food for Life

Overall Policy Objective
To strengthen the competitiveness of the EU food and drink sector, to increase R&D investments and to promote a better coordinated EU food and nutrition research activity for an effective consumer-oriented and consumer-targeted food innovation and for the establishment of a greater synergy between consumers' demand, social welfare and wellbeing, economic growth, and environmental production in Europe.

Strategic Research Agenda
Draft1 was discussed internally in January and February 2006. Draft 2[2] will be published and submitted to a wide consultation process in April 2006.
http://www.ciaa.be/pages_en/news_events/news_list.asp?news_id=180&year_crit=2006

Executive Summary
Note that this is the executive summary of the vision paper of July 2005, as the Strategic Research Agenda is still being drafted.
An effective integration of strategically-focused, trans-national, concerted research in the nutritional-, food- and consumer sciences and food chain management will deliver innovative, novel and improved food products for, and to, national, regional and global markets in line with consumer needs and expectations. These products, together with recommended changes in dietary regimes and lifestyles, will have a positive impact on public health and overall quality of life ('adding life to years'). Such targeted activities will support a successful and competitive pan-European agro-food industry having global business leadership securely based on economic growth, technology transfer, sustainable food production and consumer confidence.
The European agro-food industry is the largest manufacturing sector in Europe. The food and drink industry had a turnover of 810 billion euro in 2004, transforming over 70% of the EU's agricultural raw materials and employing over 4 million people, the majority within the SME sector. The European agro-food industry is a leading global exporter and it affords significant added value and offers scope for growth within new EU Member States, development of regional economies and exploitation of cultural diversity and tradition. The European agro-food industry is thus central to the wider, economic development of Europe.

There is an increasing societal awareness of the opportunities to improve the quality of life through healthy eating and of the contribution that sustainable production can make to improvement of the overall environment. The preferences of consumers for quality, convenience, diversity and health, and their justifiable expectations of safety, ethics and sustainable food production serve to highlight the opportunities for innovation. In some sectors, such as food safety, process engineering and sustainability, Europe is already a world leader and innovation and investment is high.

A coherent research strategy for the future must be developed based upon the shared vision of the diverse stakeholders. Key elements of this flexible strategy comprise initiatives in food and health, food quality and manufacturing, food and consumer, food safety, sustainable food production and food chain management. These elements are to be supported by effective strategies for communication, training and technology transfer.

A step-change in research intensity and investment, together with effective technology transfer, is a prerequisite for ensuring that the European agro-food sector remains innovative and competitive. The private and public resources available for food research at the national level are insufficient to meet the challenges that will arise if the objective of adding 'life to years' is to be achieved. The Technology Platform Food for Life will galvanise the resources available at the national and EU level and ensure effective co-operation under the umbrella of a coherent Strategic Research Agenda and its associated Implementation Plan.

The European Technology Platform Food for Life will:
- support a sustainable, successful and competitive pan-European agro-food industry,
- provide increased employment and entrepreneurial opportunities for all of Europe,
- ensure that the healthy choice becomes the easy choice,
- underpin regulation and support policy making at national and regional level,
- contribute to sustainable development in Europe,
- enhance the ability of the European agro-food industries to create and exploit market opportunities that are less sensitive to price competition, and
- promote the 'fork to farm' approach to add value to food chains.

In addition, the European Technology Platform Food for Life will:
- provide an effective and sustained interaction between all stakeholders,
- present a well-defined Strategic Research Agenda (SRA) for innovative food production,
- offer an Implementation Plan that will include mobilization of resources to support pan-European collaborative research; training, education and dissemination,
- ensure increased confidence in the food supply amongst European consumers,
- significantly reduce health costs, and
- enhance long-term career opportunities in European food science and technology.

Budget / Financing
To be defined

Deployment Strategy
To be defined

Next Steps

Apr 2006	Publication of draft 2[31] of the Strategic Research Agenda
Apr to Dec 2006	Consultation process about the Strategic Research Agenda
March 2007	Publication of the final Strategic Research Agenda

eMobility - Mobile and Wireless Communications Technology Platform

Web-site: http://www.emobility.eu.org

Technology Platform Contact
Chairperson: Fiona Williams, Ericsson

Commission services contact
Mr Francisco Medeiros, DG Information Society and Media, Communication Technologies Unit

Vision Document
Strategic Research Agenda

Platform launch date: 18 March 2005

Overall Policy Objective
The eMobility Technology Platform aims are to reinforce Europe's leadership in mobile and wireless communications and services and to master the future development of relevant technologies, so that it best serves Europe's citizens and the European economy.

Strategic Research Agenda (SRA)
Version 4.0 November 2005

Executive Summary
The potential of mobile and wireless communications to stimulate growth and re-vitalise economic sectors is far from being exhausted. We are now entering into a second phase of growth in the mobile and wireless communications sector as applications and services are incorporated into business processes and all aspects of daily life. The importance of the sector to economic development is also appreciated in Asia and in the US, where large scale investments in mobile and wireless technologies are part of their strategic priorities. Further R&D investment in advanced applications based on new technologies is now required in order to ensure that the European economy reaps the maximum benefit from the productivity increase and improvement in the quality of life that mobile and wireless communications technologies offer.

The SRA covers research required over the full range of wireless and mobile technologies and is developed in the context of the rationale and vision described in the November 2005 report of the Technology Platform. It contains the following main chapters:

- Seamless User Experience
- Business Infrastructures
- Security, Trust and Business Infrastructure
- Ubiquitous Services
- Ubiquitous Connectivity
- Frontier and Multidisciplinary research
- Accompanying measures

Key outstanding issues
- *Technical*: Mobile and wireless communications requires end-to-end compatible solutions encompassing not only a range of constituent technical solutions, but also a consistent context for their use as part of the communication grid, the services and the applications. This implies a systematic collaboration of all sector actors within a consistent framework and a shared vision.
- *Economic*: Economics will play a key role in this collaboration. A return on the massive investments and long lead-times depend on economy of scale and on a large home market. The need for inter-working implies concentration on the most attractive options, and the need to master technology requires an optimal use of human resources and research facilities, finance and time.

- *Political:* Mobile and wireless communications have created unprecedented possibilities for people to communicate and the sector has been a key driver of economic growth. Europe has for some time been leading this development based on timely initiatives of administrations, the scale of the EU market, a consistent regulatory approach, as well as considerable industrial and R&D investment. Building on the success in the European home market, success on global markets followed. Maintaining the momentum of economic growth in Europe through mobile and wireless technology in the light of changing user requirements, markets, competition, regulations & policies and the technology options and in the context of the EU enlargement to 25 Member States, will be both a challenge and an opportunity.

Budget / Financing

The budget estimate for the implementation of the SRA is €1 billion private funding matched by €1 billion public funding, provided through the EU 7th Framework Programme, national and EUREKA programmes. This budget should be viewed in the context of an investment in R&D, in Europe, by leading European mobile equipment manufacturers and operators of over €16 billion in 2004.

Deployment Strategy

Operational focus / Concrete projects

The eMobility Technology Platform is open to all organisations active in European R&D in the area of mobile and wireless communications systems, applications and services. At present, 248 organisations, covering the whole value chain, have joined the eMobility Technology Platform. Specifically, on-going R&D work under the 6thFP and future projects under the 7thFP will be closely associated and close relations with related EUREKA Projects are being established. With the support of the Mirror Group, close collaboration with future activities supported on a national level will be established. International links will be extended, for example, through liaison with the Wireless World Research Forum.

Industrial orientation

The Platform aims to exploit research and development results, eventually aiming at products and services for the European and global market. It will address the needs of urban and rural regions differing very much with respect to the communications infrastructures.

*While, so far, mobile communications has been concentrating on voice communications, the focus of industrial development is shifting towards multi-media communications, with mobile services being embedded in other applications. This results in an industrial orientation towards **S**implicity, **E**fficiency and **T**rust (SET-concept) as the key elements of future systems.*

Outlook towards building a long-term public-private partnership

The eMobility Platform has already matured into a framework representative of the industry and of the research community in mobile and wireless communications. Links with related activities and organisations (e.g. standardisation) are being systematically developed. A dialogue with representatives of the Member States (Mirror Group) has been initiated and agreements with EUREKA Projects (e.g. CELTIC) are under consideration. Beyond this, several options for the implementation of the eMobility Platform under the form of a public-private partnership are being considered by the Technology Platform, and will be investigated further as information on their possible implementation becomes available.

Next Steps

- Steering Board, Mirror Group and Expert Group meetings in 2006 and 2007
- Annual General Assemblies in 2006 and 2007.
- Two further releases of the SRA have been planned in 2006 and 2007.
- A meeting with European Parliament representatives has been planned for 2006.
- Dissemination of results planned through Mirror Group, General Assemblies and presentations at many conferences and other meetings e.g. Interop and CELTIC.
- Reflection on "issues beyond research" is being advanced.

Innovative Medicines for Europe

Web-site: http://europa.eu.int/comm/research/imi.html

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Vision Document
"Creating biomedical R&D leadership to benefit patients and society"
http://europa.eu.int/comm/research/fp6/p1/innovative-medicines/pdf/vision_en.pdf

Platform launch date: May 2004

Overall Policy Objective
The overall objective of this initiative is to increase the competitiveness of the European Pharmaceutical sector and to foster Europe as the most attractive place for pharmaceutical Research & Development. By removing research bottlenecks in drug development, moreover the access to innovative medicines for the benefit of patients and society will be enhanced.

Strategic Research Agenda
Complete version as of July 2005
An open consultation has been conducted in the second half of 2005 via the Member State Contact Group and further to this consultation a revised version will be published in the first quarter of 2006.
http://europa.eu.int/comm/research/fp6/pdf/innovative_medicines_sra_final_draft_en.pdf

Executive Summary
The research bottlenecks, i.e. the main areas of research to be addressed in order to achieve the paradigm shift in the sector of pharmaceutical development, are regrouped in the following areas, representing the four cornerstones of the Strategic Research Agenda (SRA):

• Improved prediction of safety
• Improved indication of efficacy
• Improved knowledge management for better decision-making
• Improved education and training to develop the necessary skills and know-how

In the first pillar, Improved Prediction of Safety, the creation of a "European Centre for Drug Safety" is foreseen to address two issues, notably:
                - Development of *in silico* methods and
                - Tackle Intractable Toxicities;
Further topics in this pillar will be on:
        o   **Biomarker Development**
        o   **'omics technologies for improving predictablity**
        o   **Relevance of non-genotoxic carcinogens**
        o   **Clinical Safety and Pharmacovigilance**
and the instalment of the appropriate IT infrastructure and support.

The second pillar, Improved Prediction of Efficacy, will focus on the following core areas:
- o **Predictive pharmacology (incl. validation of biomarkers)**
- o **Recruitment of patients and assessment of risk**
- o **Regulatory approvals and sharing of data**

As therapeutic areas, to start research with, the following have been identified:
- **- Cancer**
- **- Brain disorders**
- **- Inflammatory diseases**
- **- Diabetes mellitus**

Improving prediction of safety and efficacy, particularly in the early stages of drug development will help to concentrate developmental efforts on those medicines that have a higher likelihood of passing all stages and making it to a medicinal product.

The pillar **Improved Knowledge Management** will be an underpinning field and address:
- Development of an intelligent infrastructure for data integration and knowledge management, to allow better collaboration between industry, academia and clinical centres at all necessary steps from drug design to drug delivery to the patient.

And the pillar **Improved Education and Training** will further:
- Training in managing of clinical trials and, in particular, at the interface between molecular and clinical studies, to create the knowledge for translating research results into benefits for the patient.

Subject to the current analysis of the open consultation with the stakeholders, new areas or fields may be added to these.

The SRA has also been submitted to the European Medicines Agency (EMEA) for feedback.

The resulting recommendations will be translated into research priorities for the final research work programme to be implemented.

Budget / Financing

The budget necessary to implement the research needs identified in the SRA and as described before amounts to app. € 400 million per year over a period of 7 years. The detailed breakdown in mio. € for the four pillars is as follows:

Improved Prediction of Safety	**165.4**
Improved Prediction of Efficacy	**247.7**
Improved Knowledge Management	**13.1**
Improved Education & Training	**8.2**

These amounts may change in function of the revision of the SRA, as mentioned above.

The administration of implementing the research (running costs = evaluation of proposals, coordination of research, meetings of the Scientific committee, etc.) is estimated to another 6 mio. € per year.
In the proposal for FP7 a Joint Technology Initiative has been suggested for the implementation and, therein, an Executive Office is foreseen to perform these administrative tasks.

The European Commission and the European Federation of Pharmaceutical Industries and Associations (EFPIA) will share the running costs of the Executive Office.

Pharmaceutical companies, which are members of EFPIA, participating in research projects will contribute in kind with 100% of their resources, but only the investment done by the companies in addition to their regular R&D cost will be taken into account in this calculation.

Academic institutions and SMEs will be funded by the European Commission, investigations to use other funding sources especially for SMEs are underway (European Investment Bank, Venture Capitalists, investment banks).

Deployment Strategy

o MONITORING OF ACTIVITIES

The research topics resulting from the Innovative Medicines SRA will be open to any scientist/research performer and will be implemented by the best projects to be selected by peer review evaluation. The only foreseen limitation is that research should be conducted in Europe (MS+AS).
In order to assure that all activities are undertaken, a detailed and continuous activity monitoring system will be set up.

Regular activity reports regarding the IMI work programme (= implementation of SRA) will be made by the Executive Office to the stakeholders. The Executive Office will also ensure compliance to ethical and scientific standards.
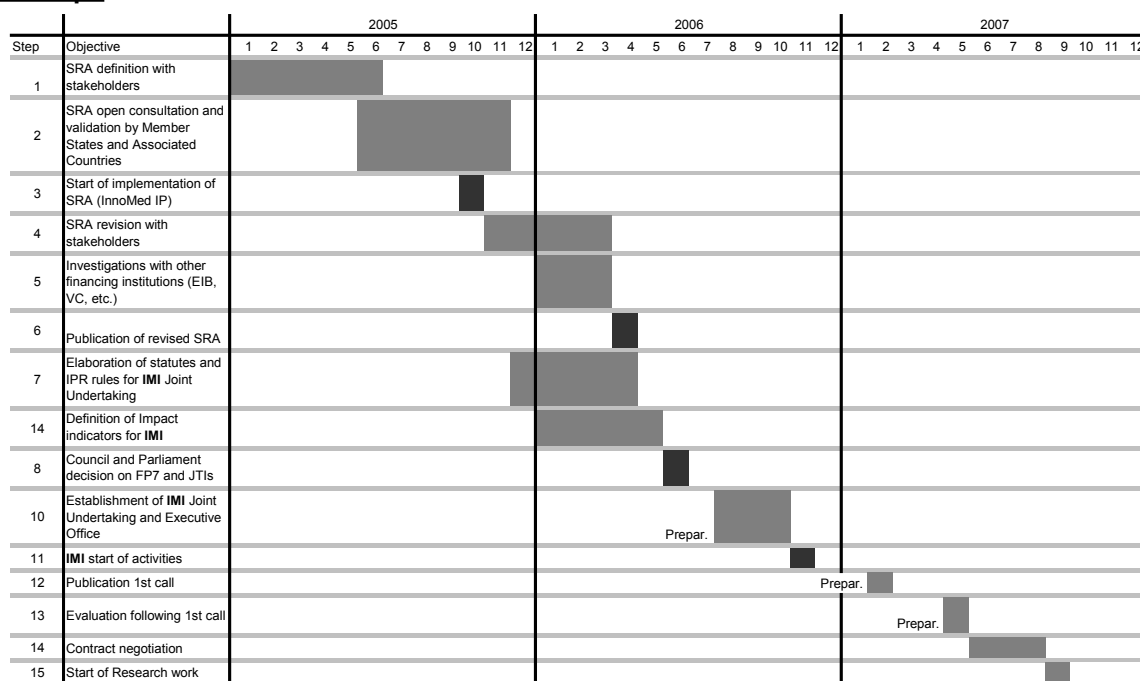
o RESEARCH REVIEW AND IMPACT ASSESSMENT

The research outcome, as foreseen in the technical annexes related to the various research topics, will be periodically assessed by the Scientific Committee. To monitor impact, a set of indicators is currently identified by a dedicated working group.

o FINANCIAL MONITORING

The Executive Office will be in charge of setting up and maintaining a financial monitoring system in order to follow the expenditures of IMI. Particular attention will be given to the annual in-kind contributions of the private institutions involved in the different research consortia.

Next Steps

Step	Objective	2005	2006	2007
1	SRA definition with stakeholders			
2	SRA open consultation and validation by Member States and Associated Countries			
3	Start of implementation of SRA (InnoMed IP)			
4	SRA revision with stakeholders			
5	Investigations with other financing institutions (EIB, VC, etc.)			
6	Publication of revised SRA			
7	Elaboration of statutes and IPR rules for **IMI** Joint Undertaking			
14	Definition of Impact indicators for **IMI**			
8	Council and Parliament decision on FP7 and JTIs			
10	Establishment of **IMI** Joint Undertaking and Executive Office	Prepar.		
11	**IMI** start of activities			
12	Publication 1st call		Prepar.	
13	Evaluation following 1st call		Prepar.	
14	Contract negotiation			
15	Start of Research work			

SRA	Strategic Research Agenda (= Work Programme)
JTI	Joint Technology Initiative (= Structure, Governance, Modus operandi)
IMI	Innovative Medicines Initiative (= Legal entity)
EMEA	European Medicines Agency
InnoMed IP	Integrated Project "Innovative Medicines for Europe", reuniting 44 partners therof 23 industrial

- ■ Milestone
- ▬ Task of defined duration
-    Ongoing activity

ISI – The Integral Satcom Initiative

Web-site: www.isi-initiative.eu.org

Technology Platform Contact
Chairman – Prof. Giovanni E. Corazza, University of Bologna, gecorazza@deis.unibo.it
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Commission services contact
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'Communication Technologies'

Vision Documents
ISI Strategic Vision Statement - http://www.isi-initiative.eu.org/getdocument.php?id=66
ISI Strategic Vision Document - http://www.isi-initiative.eu.org/getdocument.php?id=89

Platform launch date: 1 February 2006

Overall Policy Objective
ISI is focused on all aspects of **satellite communications**, including **broadcasting**, **broadband**, and **mobile** applications, and their **convergence**. ISI promotes European **industrial competitiveness**, **growth** and **employment** in a sustainable way, in synergy with National priorities. Representative sectors of interest include **ICT**, **Space**, **Security**, **Transport**, **Development**, and **Environment**. Specific policy initiatives of interest include **i2010**, the **European Space Policy**, bridging the **digital divide**, as well as **civil security**, disaster relief, and crisis management.

Strategic Research Agenda
ISI Strategic Research Agenda – Version 1.1 – January 2006
 http://www.isi-initiative.eu.org/getdocument.php?id=133

Executive Summary
Satellite communications constitute a strategic sector for Europe, with significant economic impact and high societal relevance. They are instrumental for European-wide and International broadcasting, mobile communications, broadband access, bridging the digital divide, safety, crisis management, disaster relief, and dual use applications. The ISI SRA addresses the overall development of satcoms in Europe over the next 20 years, identifying medium and long term strategic objectives. The SRA is built upon understanding future user needs and necessities and how these are going to be satisfied by satellite communication systems. In practical terms, a classification of satcom user markets into five macro-categories is adopted:

1. Citizens and Governments: the **CG** institutional market
2. Individual users and families in their Homes: the **IH** market
3. Individual users on the Move: the **IM** market
4. User Groups in villages and Remote areas: the **UGR** market
5. User Groups on the Move: the **UGM** market

For each of the above markets, ISI has identified the **major R&D challenges** and defined some clear **system concepts** which incorporate the specific R&D priorities:
- **CG market**: the ISI system concept includes a European civil security system for public protection, emergency and disaster relief, with services for citizens and governments, integrated with GMES and Galileo, as well as High Altitude Platforms.
- **IH market**: the ISI system concept includes high capacity direct-to-home satellite broadcasting systems for HDTV and 3DTV, as well as IPTV development.
- **IM market**: the ISI system concept includes mobile broadcasting and datacasting systems, the 4G satellite component (complementary to terrestrial 4G), and systems for info-mobility integrated with Galileo and GMES.

- **UGR market**: the ISI system concept includes direct broadband access provision for bridging the digital divide, and interworking with several terrestrial wireless access systems for seamless and dependable broadband connectivity.
- **UGM market**: the ISI system concept includes mobile broadband interconnections for the aeronautical, maritime, railway, and vehicular user platforms, integrated with Galileo, GMES, and Air Traffic Management systems.

In order for Europe to achieve and maintain its excellence and leadership in these strategic markets, *several R&D and non-R&D horizontal challenges* must be faced:
   a) Development of new technologies, with lower costs and faster deployment
   b) Design of flexible satellite missions
   c) Interworking with terrestrial networks, with urban and in-building coverage
   d) Development of open standards with world-wide promotion
   e) Development of dual-use technologies
   f) Development of satcoms support to Galileo and GMES
   g) Harmonization of spectrum availability across Europe and Internationally
   h) Exploitation of higher frequency bands
   i) Harmonization of the regulatory framework.

It is mandatory to work at European level in order to achieve any significant result in satcoms, which are trans-national in nature. ISI fosters International Cooperation and includes participants from more than 20 Countries. This element has key strategic relevance. A pictorial view of the ISI scope is the following:
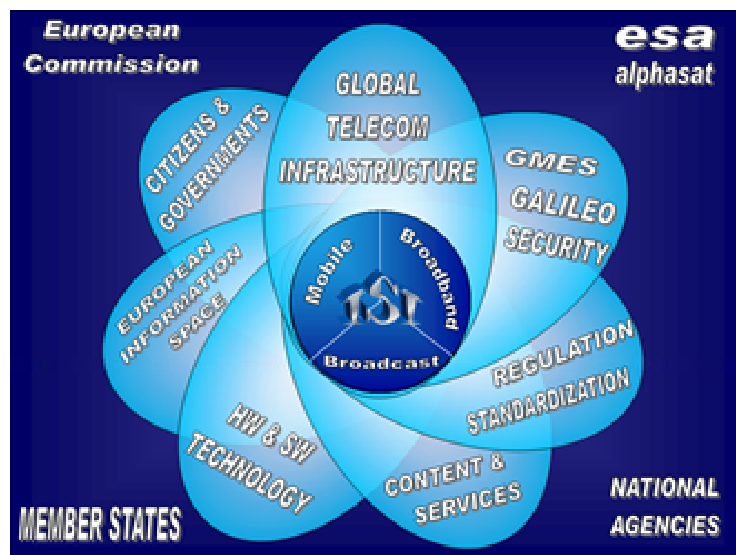

Budget / Financing

Implementation of the ISI SRA requires an effective public-private partnership for the focused support of its ambitious objectives, which have strategic relevance for the citizens and governments of Europe. The estimated amount of public funding provided through FP7 in the period 2007-2013 is foreseen in an average of 200 M€ per year, for a total of 1.4 B€, which will be matched by an equal amount of private funding.

Deployment Strategy

The ISI Governance structure is depicted in the following figure:
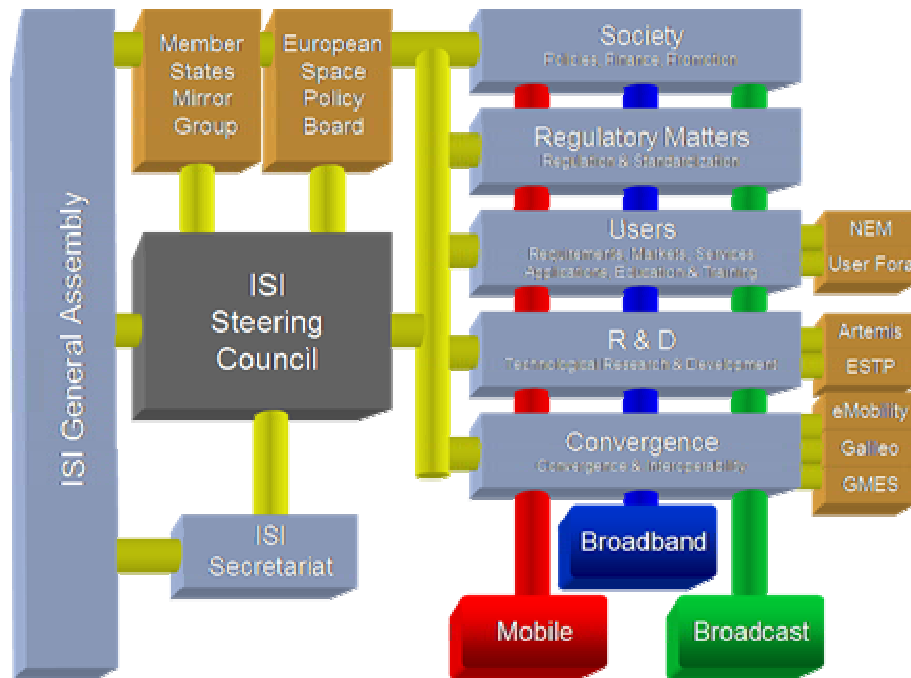
The ISI **Steering Council** is already active and meets regularly by conference call. The duties of the Steering Council are to *monitor the implementation* of the ISI SRA and to ensure the *valorisation of the achieved results*, essentially providing a sort of *business plan* for the ISI ETP that will enable *market penetration*. The ISI **General Assembly** is the open forum for discussion and approval of the *major strategies* and *decisions*. It has been convened three times: on July 19, 2005, in Brussels; on September 29, 2005, in Rome; on February 1, 2006, in Brussels. The **Working Groups** are the core of the ISI activities. WG **Society** must make sure that the ISI implementation is effectively helping and influencing the specific policies of interest; that financial sources are correctly searched for and utilized; that ISI is promoted and its results are widely disseminated. WG **Regulatory & Standardization Matters** must ensure that all relevant non-R&D issues are addressed and that a common European voice is raised in all important for a. WG **Users** must deal with the identification of the user requirements, of the corresponding market segments, and of the most effective applications and services to satisfy the needs; training and education will be pursued as a way to enable the citizens and governments to fully benefit from the above services and applications. WG **R&D** must address the direct implementation of the ISI SRA, and will likely be organized into multiple focused groups in order to maximize efficiency. WG **Convergence** must be especially focused on all matters which entail that satellite communications will converge within the global telecom infrastructure, with terrestrial mobile networks, with navigation and positioning systems, with Earth observation systems, etcetera. All WGs will dela horizontally with the main three vertical priorities: broadband, broadcasting, and mobile satellite communications. The **Member States Mirror Group** and the **European Space Policy Board** must ensure that ISI is in line and supported by the National policies and by the European and National Space Agencies. Active **interfaces** must be ensured with several external entities to ensure coordination and synergy, for example with other ETPs. Finally, the **Secretariat** must ensure that all ISI activities and operations are run smoothly and effectively.

It should be noted that the deployment of ISI is greatly helped by the parallel experience of the *Task Force on Advanced Satellite Mobile Systems* (ASMS-TF), which has been running since the year 2001.

Next Steps

Following the official ISI launch on February 1st, 2006, events are taking place at an extremely rapid pace. Here is a roadmap and the main next dates on the ISI working Agenda:

- March 2, 2006: ISI presentation at APRE meeting (Rome)

- March 21, 2006: ISI meets with ESA in Brussels to discuss coordination issues
- March 22-23, 2006: ISI participates to the ICT Event (Vienna)
- March 2006: ISI sends an extract of the main SRA priorities for EC consideration
- April 2006: ISI Mirror Group meeting
- May 2006: ISI along with other ICT ETPs presented at the European Parliament
- June 2006: ISI General Assembly #4 (Bologna)
- July 2006: ISI Working Groups meetings
- November 2006: possible opening of first FP7 call
- December 2006: General Assembly #5 to address response to first call

ARTEMIS – Advanced Research and Technology for Embedded Intelligence and Systems

Web-site: www.cordis.lu/ist/artemis

Technology Platform Contact
Ivo Bettens, Thales

Commission services contact
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Vision Document
Building Artemis - Report by the High Level Group on Embedded Systems

Platform launch date: June 2004

Overall Policy Objective
Europe currently leads the world in embedded electronics and software for aerospace, automotive, consumer and communications markets. This leading position is threatened by global competition, fragmentation of efforts and insufficient research investment. An ambitious initiative is needed for Europe to maintain its position and realise its potential in new emerging markets for intelligent products and services. The platform will provide the technology to tackle a broad range of social challenges including the aging population, safety of citizens and security of physical infrastructure.

Strategic Research Agenda
Short version - June 2005 (new version in March 2006)

Executive Summary
ARTEMIS - "Advanced Research & Technology for Embedded Intelligence and Systems" - is the Technology Platform for Embedded Systems. Embedded Systems are computers that do not look like computers that are "embedded" in electronic products like mobile phones, cars or even planes. ARTEMIS is an Industry-led initiative to reinforce the position of the EU as a leading worldwide player in the design, integration and supply of Embedded Systems. It brings together leading industrial and academic groups with national and European bodies to establish and implement a coherent and integrated European research and development strategy for Embedded Systems. No action would lead to the same situation as the desktop computing market which is dominated by a few non-European players.

The ARTEMIS Strategic Research Agenda outlines the evolution of the field from a medium to long-term perspective and identifies a number of important technological challenges that have to be met in order to allow Europe to implement the vision of the 'Building ARTEMIS' document as set by the High level Group on Embedded Systems. It also sets financial objectives for Embedded Systems R&D in Europe (see next section).

With the constant evolution of electronics and software technologies, there will be more and more Embedded Systems integrated into products and infrastructure. Already today 90% of computing devices are in Embedded Systems; the growth rate is more than 10% per annum and there are forecast to be over 40 billion devices worldwide by 2020. Moreover, the value added to the final product by embedded software is often orders of magnitude higher than the cost of the embedded devices themselves. For example, 20% of the value of each car today is due to embedded electronics and this will increase to an average of 35-40% by 2015. Similarly in the avionics sector, embedded software now accounts for a significant proportion of the development costs of an aeroplane.

Embedded Systems have evolved from stand-alone single-processor computers of the eighties and early nineties, to the special-purpose sophisticated fixed-function multi-processor systems of the present day associated with increasing communication capacities. The market for electronic systems is characterised by a constant need to bring to the users innovative products and services with increasing functionality

at ever diminishing price. The increase of the technologies capabilities of the hardware as described by Moore's Law, is out-pacing the productivity improvement of the designers. This leads to an ever widening design productivity gap that must be addressed by ARTEMIS. In future, this "productivity gap" is projected to increase even more unless this phenomenon is addressed.

The vision driving ARTEMIS is a major evolution of our society in which all electronic objects will become digital and communication-enabled with self-managed resources. These transformations will be possible through advances in Embedded Systems technologies and their large-scale deployment, not only in industries and services but in all areas of human activity. Taking a leading position in Embedded Systems requires significant investment in research and development. As they form the enabling technology for many areas of enterprise, the importance of Embedded Systems to the world economy, makes it imperative for Europe to intensify its efforts in this area. European efforts must at least match, if not exceed, comparable investments being made in the USA and Asia: the aim is for Europe to achieve leadership in intelligent, interconnected Embedded Systems. Therefore, ARTEMIS recognises the need to focus this investment.

The focus is achieved by setting the following ambitious targets to be attained by 2016:

- 50% of Embedded Systems deployed throughout the world will be based on ARTEMIS results and engineering disciplines including hardware, software and systems design.

- Achieve the cross-domain connectivity needed for the seamless interoperability between the 'Ambient Intelligent Environments' for the citizen at home, at work, travelling etc.

- There will be twice as many European SMEs engaged in the Embedded Systems supply chain, from concept through design, manufacture and support

- Integrated tool chains based on ARTEMIS results to support development of Embedded Systems design.

- ARTEMIS will have generated at least 5 'radical innovations' and will double the number of patents granted per year for European companies in ARTEMIS.

- Adapt the European research infrastructure and education system by 2016 to industry needs, in terms of design skills, based on ARTEMIS recommendations.

- Close the design productivity gap between potential and capability through a reduction by 50% in: system design cost, design time and validation/testing respectively.

The ARTEMIS approach is to remove barriers between application sectors, stimulating creativity and yielding multi-domain reusable results. This will be achieved by specifying an ARTEMIS reference architecture. ARTEMIS will seek maximum commonality across application sectors, however recognising that different application domains impose differing demands on the technology to be developed. ARTEMIS has therefore identified a number of representative 'Application Contexts':

- "Industrial systems" - large, complex and safety critical systems, that embraces Automotive,Aerospace, Manufacturing, and growth areas such as biomedical

- "Nomadic Environments" – enabling portable devices and on-body systems to offer users access to information and services while on the move

- "Private Spaces", - such as homes, cars and offices, that offers systems and solutions for improved enjoyment, comfort, well-being and safety.

- "Public Infrastructure" – major infrastructure such as airports, cities and highways that embrace large scale deployment of systems and services that benefit the citizen

ARTEMIS strategy is to establish common technology to support the development of high value-added Embedded Systems across these application contexts. The common technology will include:

- reference designs, that offer standard architectural approaches for a range of applications to address the complexity challenge and build synergies between market sectors

- middleware that enables seamless connectivity and wide-scale interoperability to support novel functionality, new services and build the ambient intelligent environment

- systems design methodologies and associated tools for rapid design and development

- generic enabling technologies derived from foundational science.

Budget / Financing

The European Embedded Systems expenditure scenario for 2005 and 2010 is depicted in the table below. The total expenditure is estimated at €20 billion in 2005 that would grow to €28.5 billion in 2010. The public component of this expenditure needs to increase almost threefold from about €250 million to €700 million over the same period.

The bulk of the expenditure is the €20 billion private industry R&D which mainly comprises downstream product development based on a conservative estimate of five major industrial sectors. The research component is partially supported through a number of publicly funded activities through the EU framework programme, EUREKA and specific National programmes in member states focused on Embedded Systems. Pre-competitive collaborative research uses the matched funding model. The EUREKA programme supports Embedded Systems through the ITEA and MEDEA+ clusters.

Centres of Excellence may envisage applying for EU Structural Funds, as well as loans from the European Investment Bank (EIB) in combination with the new Risk Sharing Facility foreseen in FP7. Furthermore, the new EU Competitiveness and Innovation Programme (CIP) may provide opportunities for technology take-up by SMEs.

Expenditure in € million	Estimated 2005 R&D			Scenario for 2010		
	Private	Public	Total	Private	Public	Total
EU FP6 / FP7	70	70	140	150	150	300
EUREKA / JTI	225	130	355	450	450	900
National programmes	100	50	150	200	100	300
Industry supported R&D	20000	-	20000	27000	-	27000
Total	**20395**	**250**	**20645**	**27800**	**700**	**28500**

The FP7 proposal includes a JTI in the area of Embedded Computing systems and Artemis members are currently discussing the various implementation options. There is strong interest in moving forward to a public-private joint undertaking able to implement parts of the SRA by pulling together resources at Community, national and inter-governmental (EUREKA) level under the same framework.

Deployment Strategy

ARTEMIS brings forward proposals for improving the coordination of the European research instruments for fostering efficient innovation environments. By doing so, ARTEMIS stakeholders ensure that the right research is conducted in the right way.

To implement its Strategic Research Agenda (SRA) and to achieve coordination and consistency of existing RTD European instruments, ARTEMIS puts forward a synergetic approach consisting of three pillars under a common roof, as depicted in the figure below.
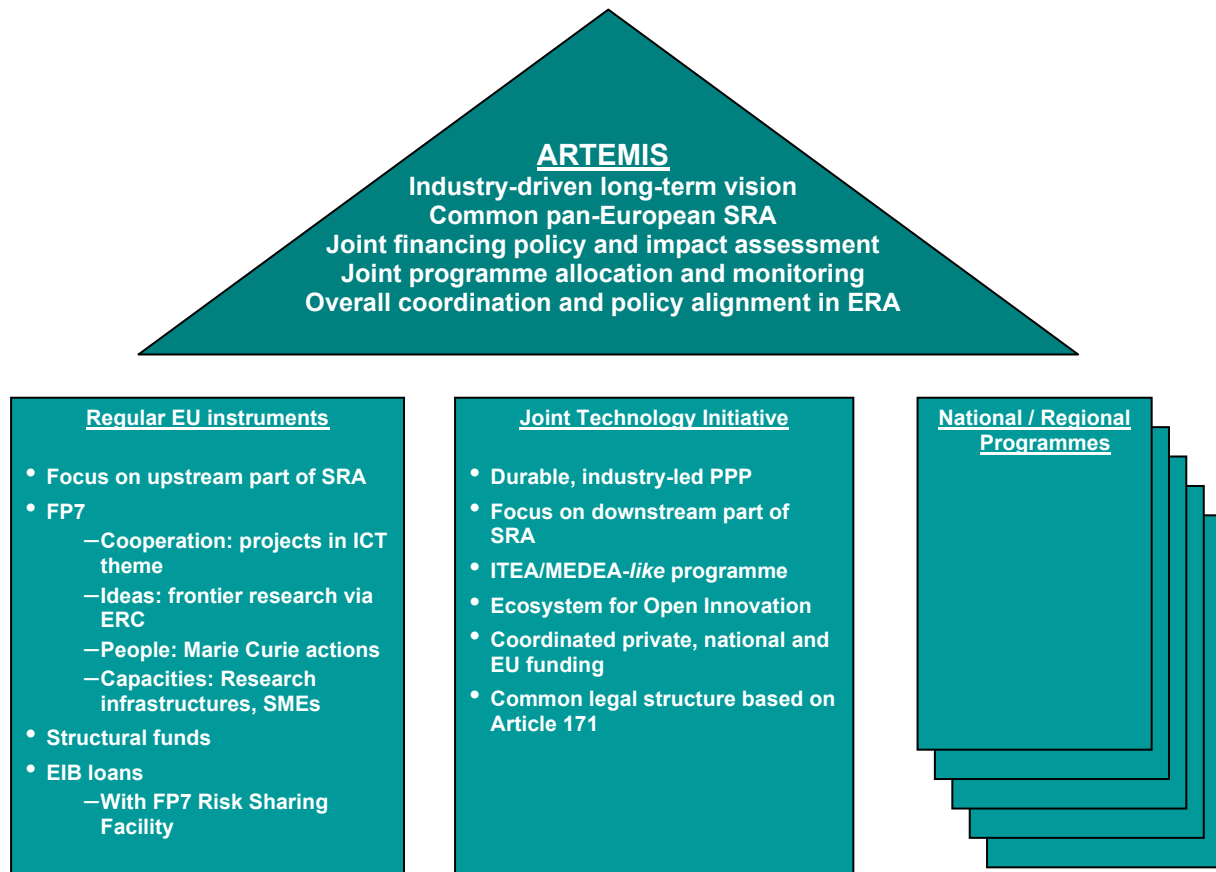
For the left pillar, focussing mainly on the upstream part of the ARTEMIS SRA, use will be made primarily of the regular instruments in the four Specific Programmes envisaged for FP7.

For the central pillar, focussing mainly on the downstream part of its SRA, ARTEMIS proposes setting up a Joint Technology Initiative (JTI). The only means to mobilise the critical mass required for implementing the selected parts of the SRA is a Public-Private Partnership combining private sector resources with national and European public funding. The core of the JTI will be an ITEA/MEDEA+ like industry-driven programme for collaborative RTD. In addition, the JTI will provide a flexible basis for common public-private actions to create a fertile ecosystem in Europe for Open Innovation in embedded systems, involving large firms, SMEs, institutes and universities.

Regarding the collaborative RTD programme, industry will commit to investing the RTD efforts necessary for accomplishing the selected SRA objectives. The private sector will mainly contribute in-kind, carrying the remaining 50% of the precompetitive RTD costs, as well as the costs and risks of all RTD and innovation on Embedded Systems beyond the phase of pre-competitive RTD that is publicly supported in the context of ARTEMIS. Furthermore, industry will cover the organisational costs of governing the JTI and its Operations structure.

On the public side, the EU would provide a financial incentive for Member States to focus national

RTD activities on the ARTEMIS SRA; to join forces within the European Research Area (ERA); and to improve the efficiency of funding mechanisms for intergovernmental cooperation taking place in the ITEA and MEDEA+ clusters in EUREKA. In essence, an EU contribution would complement the financial contributions from each Member State or Associated State engaged in the JTI to its national participants in transnational projects.

In this way, Member and Associated States would increase their RTD expenditures to address the SRA objectives, and cooperate transnationally. In addition, the scheme would optimally exploit the advantages and valuable experiences of EUREKA clusters such as ITEA and MEDEA+ in running industry-driven RTD programmes, while overcoming EUREKA's notorious problem of harmonising and synchronising funding.

Next Steps

Key activities and milestones planned for the platform in the short term:

- Steering Board, Mirror Group and Executive Board meetings
- Working Groups on roadmapping activities and Innovation
- Publication of the "full" Strategic Research Agenda (March 2006)
- Interim Assessment of the platform (mid 2006)
- Annual Conference in Graz, Austria (June 2006)

Next steps foreseen for the JTI-related activities:

- Commission drafting proposal for a JTI Council Decision
- Commission estimation of potential EC contribution to JTI
- Formal proposal for JTI Council decision (Mar/Apr 2006)
- Adoption by Council (June 2006)
- Set up of JTI (July 2006 - 2007)
- Start of JTI operations (2007)

ACARE (Advisory Council for Aeronautics Research in Europe)

Web-site: www.acare4europe.org

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Vision Document
"European Aeronautics: A Vision for 2020"
http://europa.eu.int/comm/research/growth/aeronautics2020/en/

Platform launch date: June 2001

Overall Policy Objectives
The future challenges of the European Air Transport System need an ambitious, holistic approach. To this purpose, in 2001 a Group of Personalities convened by Commissioner Busquin set out a vision for the future of civil aeronautics over the medium to long-term. The Group identified two top-level objectives for Europe: to meet society's needs for an efficient air transport system and to achieve global leadership for Europe in this sector. ACARE's objective is to provide guidance for the future of the European aeronautics research in relation to the above objectives.

Strategic Research Agenda: Status and date
First edition - October 2002, second edition - October 2004

Web-link:
- Executive summary http://www.acare4europe.org/ACARE-SRA2-exec-sum.pdf
- Volume 1 http://www.acare4europe.org/ACARE-SRA2-volume1.pdf
- Volume 2 http://www.acare4europe.org/ACARE-SRA2-volume2.pdf

Executive Summary (2nd edition of the SRA)
The 2nd edition of the Strategic Research Agenda addresses the research needs of Europe in the field of air transport systems over the next 20 years. It sets out the likely directions of technological change that will need to be converted into specific research programmes over the coming years if the objectives of the work are to be realised. As the 2nd edition it builds on, updates, and widens the work done in the 1st edition published in October 2002.
It is built in four sections:

Section 1 – Summary
Section 1 of the Agenda summarises the content and findings for a rapid assimilation of the main messages.

Section 2 – Preparation
Section 2 recalls the preparation of the second edition starting from the basics of SRA-1. It covers the underlying points on the macro-economic importance of the sector and the expectation of creating between 2 and 4 million additional jobs by 2020 and with a direct impact on up to 13% of Europe's future GDP. The section sets out other key figures for an understanding of the sector.

It continues with the history of the Agenda and the key findings of the 1st edition. It makes the point that the Agenda is not only concerned with direct technology programmes but also about the factors that will enable these to be productive and efficient. It also reports on activities since the 1st edition, the dissemination activities and the actions already taken by governments and industries to make use of the Agenda in their technology planning measures.

The work set in hand after edition 1 to create a better assessment of likely uncertainties in the future is set out in Section 2. This scenario work enabled three clearly different possibilities for the future to be identified in addition to the base-line scenario of the 1st edition. This was an important precursor to the 2nd edition and enabled the new Agenda to deal more effectively with possible futures and to consider the technology development implications of these. This work has been one of the main advances of this edition of the Agenda.

This is taken forward in the final part of the Section by the identification of the main advances needed and delivered by this edition. The objectives for the edition are set out and the section describes the notion of the High Level Target Concepts or HLTCs. These are extensions of the scenario work to create emphasis on particular characteristics coming from the scenarios. In the evolution of this concept five HLTCs were selected:

• The highly customer oriented air transport system
• The highly time efficient air transport system
• The highly cost efficient air transport system.
• The ultra green air transport system
• The ultra secure air transport system

Section 3 – High Level Target Concepts
The next Section 3 is in parts that correspond to these HLTCs and discusses each one in depth and is, in many senses, the heart of the Agenda where the technology issues are discussed. There is no sense in which one HLTC will be chosen in isolation or that technologies identified in one will not be appropriate in another but the concept allows the priorities of the technologies to be discussed and examined.

Section 3 also looks beyond the horizon of the HLTC's and is a useful extension of the concept into the longer-term future. By looking towards the latter part of the century and examining possible developments it adds to the understanding of what technologies should be kept alive now, or even started so that these outlying possibilities will be supported with technology at the time.

Section 4 – Implications
Section 4 brings the HLTCs into focus in considering an integrated view of their implications across the whole air transport system. It considers the issues as Business, Policy, Process or Technology and it is here that the wider implications of the Agenda are discussed as a whole.

In the assessment part of the Section the Agenda addresses the institutional and public implications of the work. The scope for public decisions to influence the progress of the Agenda is great. It ranges from investments in facilities, co-operation in the construction of new facilities, research co-operation, education as well as in many aspects of public policy for qualification and mobility of researchers and, indeed, in their broader availability.

The final part of this section deals with the resource and efficiency implications of the Agenda. The overall need is for the technical issues identified by the Agenda to receive more effective research. Some of this increment of progress can be delivered by greater efficiency in the research processes and the means of doing so are identified. Notwithstanding this there is a need for substantially more funding, about 65% more, to be applied from public and private sources if the issues facing the sector are to be properly addressed.

Budget / Financing
According to an analysis carried out by ACARE, the financial resources needed in research and development up to the year 2020 in order to achieve the Vision 2020 ambitions amount to some € 170 billion, of which approximately 20% (€ 34 billion) would correspond to the research and technology demonstration effort. This financial need represents about 65% more than the current level of expenditure in Europe.

The planned split of funding would have to be 2/3 private and 1/3 public (including EC and national funding). This would be in line with the Lisbon agenda and would also translate in an overall increase

in public funding compared to the current situation where roughly 75-80% of the aeronautics research funding is private.

The SRA has been created to influence all the European research in the sector and, thus, it should be implemented through the synergy of EU, national, regional programmes and industrial programmes.
In the case of the EU Framework Programme, implementation mechanisms could include (1) Joint Technology Initiatives for downstream technology development and demonstration, (2) Collaborative Research for upstream and applied research, (3) Research Infrastructures, (4) Training and Mobility of researchers, and (4) Coordination policies. The preparation of a proposal for the mechanism (1) is in advanced stage and would focus on demonstration of environmentally friendly technologies.

Deployment Strategy
The deployment of the Agenda represents a major undertaking to disseminate its findings, promote them through the Member States, to assist in improving co-ordination between sectors and between the Member States and to encourage the core of the Agenda to be formed from European as well as national efforts. The deployment strategy stands on two pillars:

- A plan for dissemination and communication, which will lead to greater understanding of the Agenda and its implications across the European aeronautics stakeholders and countries, including the new Member States. Several dissemination workshops have been organised after the official launch of the SRA-2 in the ACARE Aerodays event in March 05. They have taken place in France, Spain, United Kingdom, Sweden, Italy, Poland, Malta, Romania, Netherlands and Germany. More will be organised in 2006, including the major event Aerodays 2006 in Vienna. Also new promotion tools were developed, such as informative brochures, leaflets, display panels and even videos, material which proves a valuable communication tool to spread the ACARE message also toward the broader audience of the general public

- ⊙ A plan for monitoring the implementation of the SRA. For this purpose ACARE launched a so-called Observation Platform (OP) which will monitor the implementation of the SRA in the stakeholders research programmes and will provide them with information useful for the planning of their research programmes. This is being done both from a technical and institutional perspective, monitoring the implementation of the mechanisms described in the SRA as essential institutional enablers to the realisation of the Vision 2020 goals.

Next Steps
The following is a list of the main activities around which ACARE will focus its efforts in the foreseeable future:

Short-term:
- Continue monitoring of SRA Implementation (Observation Platform)
- Continue with conceptual work on institutional enablers through the dedicated working groups on Research Infrastructure, Human Resources and integration of Member States
- Continue organising workshops for dissemination of the SRA
- Raise the level of the communication efforts toward the political arena, raising/improving awareness on constraints for aeronautics (e.g. consequences of WTO struggle, high oil prices, etc.) to support policy makers

Medium-term:
- ACARE to become THE reference body for European aeronautics (give advice to Commission, Member States, Industry and Research)
- ACARE to play a role in the preparation and implementation of the JTI in Aeronautics and Air Transport
- ACARE to play a role in the implementation of the ERA-NET in Aeronautics and Air Transport
- Take steps toward a closer involvement of NMS in European Aeronautics / International Cooperation
- Perform a more articulated assessment of required resources / priorities for the SRA implementation
- Regular review of SRA

European Space Technology Platform (ESTP)

Web-site: In preparation – available March 2006

Technology Platform Contact
Mr Rui Meneses, EUI-AHH, European Space Agency; rui.meneses@esa.int ; +31-71-5656 589

Commission services contact
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Vision Document
European Space Technology Master Plan (ESTMP)

The European Space Technology Master Plan (ESTMP), issued in November 2005, will be complemented with an executive summary - A Vision for European Space Technology.
web-link: Not yet available (see above)

Platform launch date: The European Space Technology Harmonisation/ESTMP process that forms the basis of the ESTP has been running since 2000. The ESTP has formally been recognised by the EC in 3Q 2004.

Overall Policy Objective
The ESTP will reinforce, improve and enlarge the coordination and planning of the European efforts (based on the European Space Technology Harmonisation/ESTMP process) to establish a sound, competitive and non-dependent space technology base, supporting EU policies and enabling services to the citizen.

Strategic Research Agenda
Draft – March 2006.
SRA to be endorsed by Stakeholders in May 2006

Web-link: Not yet available (see above)

Executive Summary
Europe needs a broad space technological base aimed at deploying competitive and non-dependent space systems in answer to EU policies and European citizen needs. This cannot become a reality without a stronger commitment to technology research, innovation, in-flight demonstration and coordination of resources. Services for civilian use based on space assets must become sustainable through deployment of cost-effective underpinning technology, from upstream onboard space technology to efficient and economic downstream applications and added value services to end-users.

In 2001-2004 the European Space Sector has faced an unprecedented crisis. For the first time, industry is confronted with a drastic decrease in the telecom and commercial market simultaneously with a stagnant-to decreasing institutional market.

Worldwide, the competition is increasing. In the USA, the institutional market, especially the Dept. of Defence, but also the NASA Exploration initiative, are more than compensating for the commercial shortfall. More importantly, this approach is pushing for new systems architectures and higher performance technologies. Russia is still an important reservoir of conventional technologies at low cost while India and China are developing today's technologies at lower cost than their European counterparts in all domains of space activities (e.g. launchers and satellites). In some areas of technology Europe is still dependent on imports from non-European countries.

Coordination and increase of the efforts in space-related activities is a prerequisite to improve the strategic place of Europe in the world and to reduce dependency from the leader in the sector, the US. Increasing efficiency will require maximising synergies through reinforcing complementarities amongst stakeholders

(space/non-space) and avoiding duplications in each element of the value chain.

Aware of this problem, the ESA Ministerial Council, at its meeting in Edinburgh in November 2001, invited ESA and its Member States to pursue, together with the other players in the space sector, the programmatic coordination and harmonisation of technology programmes in Europe and to prepare a European Space Technology Master Plan (ESTMP).

Moreover, the 2nd Space Council (june 2005) reaffirmed the need for Europe to have its space programme (ESP) defined. The European Space Programme will provide an opportunity for ESA and the European space Industry to respond to new European political challenges, exploiting opportunities and reaping benefits stemming from the new environment.

With that respect, the European Space Technology Platform (ESTP) has been established in the frame of the European Commission's European Technology Platforms initiative.

The ESTP builds on the success of the established ESTMP/Harmonisation process (see Figure below). Since its pilot launch in 2000, approximately 40 technologies have been harmonised, with the participation of all ESA Member States, Eurospace, Industry, more than 700 Professionals from more than 170 European Space Companies and research organisations.

The technology coordination and harmonisation process starts with the elaboration of a 'European Space Requirements' (Dossier 0) in which all European missions and technology requirements are gathered from all ESA Directorates, National Delegations, Industry and Operators.

The European Space Technology Harmonisation process takes into account the various European developments, capabilities and budgets to enhance the complementary roles of the various partners in meeting common objectives and agreeing on European space technology roadmaps.

The results of the whole exercise are conveyed into the European Space Technology Master Plan (ESTMP), which gives a complete overview of planned institutional space technology programmes in Europe and harmonised roadmaps for implementation by stakeholders. The 4th edition of the ESTMP was issued in November 2005 and will form the basis for the SRA. The actual execution of R&D activities is carried out through ESA, National and EC space technology programmes.
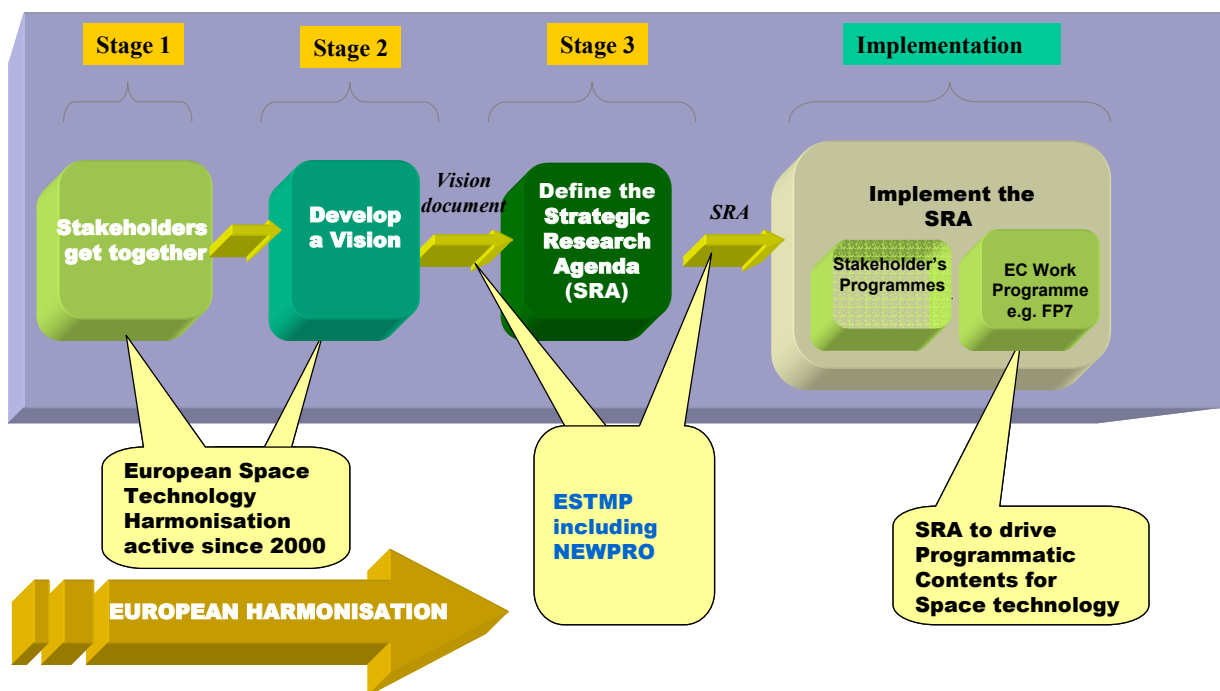
Furthermore, the ESTP will support the enlargement of the Union by helping the integration of new EU Members States in the space sector along roadmaps agreed at European level. It will finally facilitate interactions between the space sector and related technology platforms and initiatives.

The SRA will:
- Identify Space Technologies to be supported by Community programmes within a European Landscape
- Propose implementation mechanisms
- Identify approaches for Coordination with other non-space technology platforms and programmes

The European Space Technology Platform foresees, besides the standard research activities, a particular effort on three strategic pillars:

Pillar 1 – **Non-Dependency** will promote the development of space technologies that are needed for Europe's non-dependence in critical areas.

Pillar 2 – **Multiple-use** and **Spin-in** aims at facilitating synergic actions with the non-space sector in areas of mutual interest such as embedded systems, photovoltaics, fuel cells, nano-technologies or robotics.

Pillar 3 – **Enabling technologies** will support the implementation of EU policies by developing needed technology, for example in the area of security.

Accordingly, the proposal to create in ESA a new programme, called NewPro, able to combine efficiently the European needs with the expertise available in Europe, was welcomed at the ESA Ministerial Council held in December 2005. NewPro will build an interface to new user communities and funding entities, complementing the existing effort and addressing additional needs.

The major milestones achieved in recent months include:

- ESTMP (Vision Document) issued in November 2005
- Initiated in the context of the European Space Technology Harmonisation, the Technology Harmonisation Advisory Group (THAG) has been set up. The THAG delegates supported by EUROSPACE, representing a large group of industries will be the frame to operate the European Space Technology Platform. In a February meeting, the THAG endorsed the ESTP roadmap toward an SRA
- Coordination with non-space technology platforms (e.g. EUROBAT, EuMat, EUROP, ISI).

Budget / Financing

The currently proposed approach considers the main financing from ESA Member States, industry and the EC FP7.

The NewPro implementation plan contemplates financing through ESA Member States and by Community Programmes from 2007 onwards to come in the long run through a coordinated ESA/EC programme.
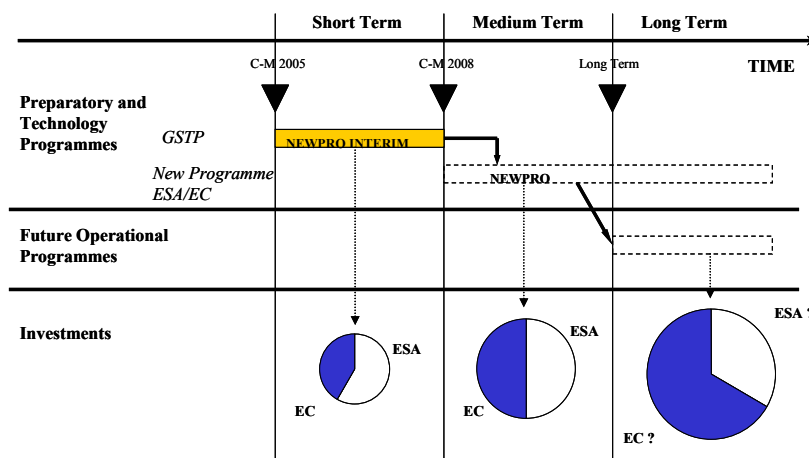
Additional ad-hoc actions may need financing through FP7, and are to be defined as needed (eg. SSAs, IPs, etc)

Deployment Strategy
A full Deployment Strategy for the SRA will be defined in the context of the definition of SRA and will be the result of a consensus based agreement with all stakeholders.
The SRA will be updated as regularly as required through the FP7 period to accommodate for priorities in the ESP and the yet incipient actions (e.g. on Security).
Dissemination, communication and monitoring of the implementation of the SRA will take benefit of the already well established Harmonisation/ESTMP process.
The ESTP will support the preparation of the FP7 (annual and pluri-annual) Work Programmes.

Next Steps

Short-term:
- Web site to be established in March 2006
- Issue Draft SRA to stakeholders in March 2006 for consultation
- Workshop with stakeholders to discuss and endorse SRA in April 2006
- Issue SRA 2006 in May 2006
- Contribution to 2007 FP7 Work Programme preparation June-November 2006
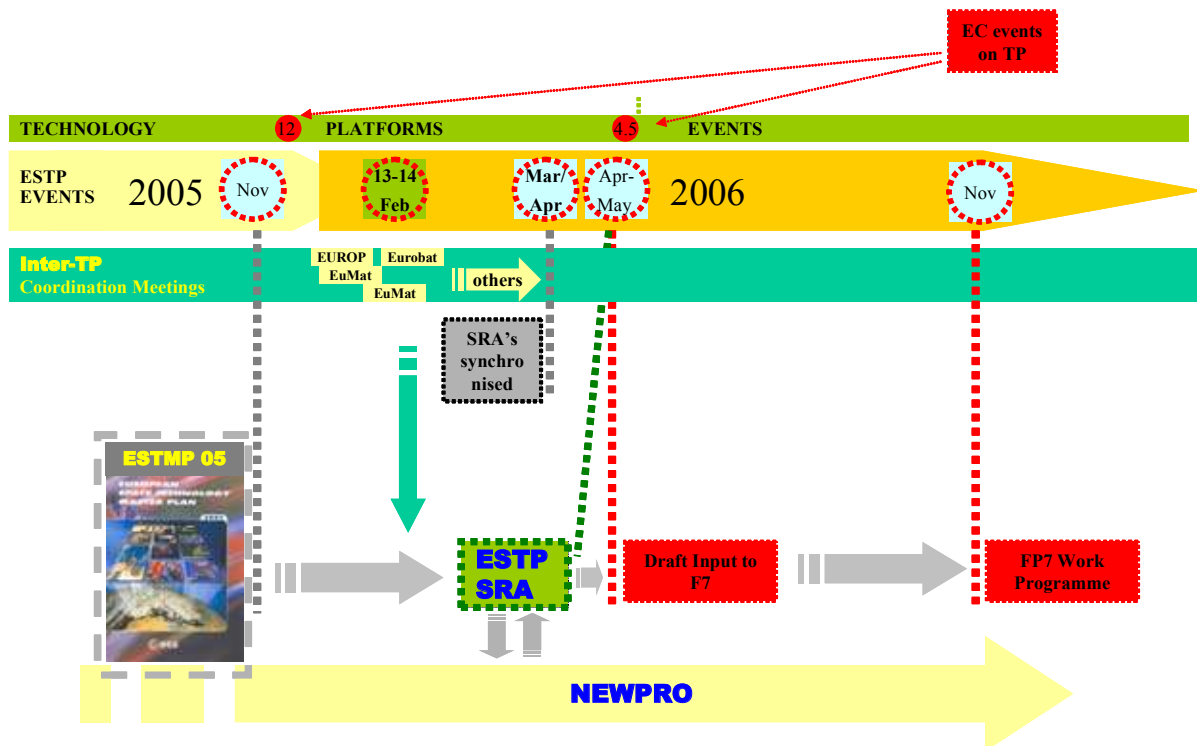
NEM - Networked and Electronic Media European Technology Platform

Web-site: http://www.nem-initiative.org/

Technology Platform Contact
Chair: Jean-Charles Hourcade, Thomson
Operational Contact: Jean-Michel Dupont, Thomson
NEM Secretariat: c/o David Kennedy, Eurescom, Heidelberg, Germany

Commission services contact
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Vision Document
NEM Vision Document (revision 8 - January 2006)

Platform launch date: June 2005

Overall Policy Objective
The Networked and Electronic Media Initiative will focus on an innovative mix of various media forms, delivered seamlessly over technologically transparent networks, to improve the quality, enjoyment and value of life. NEM represents the convergence of existing and new technologies, including broadband, mobile and new media across all ICT sectors, to create a new and exciting era of advanced personalised services. All these efforts will bear in mind the evolutionary framework from home and office environments towards broadband extended home and office environments.

Strategic Research Agenda
version 3 - January 2006

Executive Summary
The NEM Strategic Research Agenda is a statement of research priorities as determined by the NEM community, including the timing and identification of the necessary actions to be taken to achieve the goals of the agenda.

The high level goals of the NEM Strategic Research Agenda supports the overall target of the ERA to enable Europe to master and shape the future developments of ICT so that the demands of its society and economy are met. The challenges identified by NEM:

- Technological. Mastering the full range of communications and networking technologies, enabling new converged electronic media markets to develop in the context of home networks, residential platforms, and extended home environments
- Business. Establishing the conditions which favour open business models, enable competition and safeguard consumer choice while ensuring a significant depth of interoperability at as many layers of the value chain as possible (content, service, aggregation, software, network, device providers, and vendors).
- Societal/policy. Understanding how the range of new networked and electronic media technologies can impact the quality of life of the EU citizen and providing policy makers with options for coherent and effective policies. Development of new services and technologies to the Europeans should also bear in mind its implications on potential augmentation of the digital divide problem.
- Regulatory. Understanding and influencing the development of the most appropriate regulatory framework in a sector characterised by a plethora of diverse content types, wide distribution means, new Digital Rights Management issues, technologically neutral spectrum usage issues, and consumer protection issues. Regulatory policies should be deeply aware on the new challenges faced by the convergent of services and applications using the same technological infrastructures. The traditional borders between fixed and mobile, wired and wireless, satellite and terrestrial are becoming unidentifiable.

- Sustainability. The European efforts in the NEM R&D should bear in mind the overall context of the European strengths and weaknesses empowering the European leadership in the areas where Europe is today at the front of technology and stimulating reasonable efforts in all those other areas where Europe is behind other regions in the world. In addition, the European Union internal coordination has to be significantly enhanced through the fostering of coordination of priorities and goals of the National R&D programs; the setting up of Member States Mirror groups would contribute to a better integration of R&D efforts from the Europeans.
- International co-operation. Fostering the establishment of cooperation agreements and joint R&D projects with non EU partners with a view to influence the development of globally accepted standards and specifications.

NEM has identified several aspects requiring research in order to make the vision happen. These are grouped in five priorities, that each focuses on certain aspects of critical importance.
- Service and Applications
- Content related technologies
- Network infrastructure and Delivery Networks
- Terminals and User devices
- Enabling technologies

Budget / Financing
The market which is in the scope of NEM is estimated at 600 B€ in 2005, with more than 1.5 million jobs, mostly highly qualified, employed in this area today. Implementing the NEM vision could increase the number of jobs in this area to 3 million by 2015.

The financial resources estimated for such an implementation should at least reach the level of 3.5 B€ in the next 10 years. This means that Europe should make a huge effort to maintain the competitiveness of the sector and take benefit of the enormous opportunities that NEM will offer. For the FP7, it is estimated that 2 B€ should be invested in this field in the period 2007-2013.

Deployment Strategy
NEM will also pursue the optimum harmonization with European-wide and other national R&D initiatives. The objective of this liaison is the establishment of pan-European virtual laboratories in the new Networked and Electronic Media by fostering strong cooperation among European researchers as well as the creation of opportunities for the cooperation of European R&D forces with other teams beyond Europe. The immediate goal will be to establish a European Member States Mirror Group in the NEM technologies to foster sharing of information about national R&D programmes and initiatives. The decision making processes of participating Member States R&D organizations will be significantly improved thanks to the wide availability of R&D information, that will be subject to exchanges among responsible entities within each Member State, particularly, to assist NMS and ACC countries to better shape their own national programmes based on the experiences and priorities common to other Member States.
The focus of the NEM strategy is to:
- Extend EU strength with regard to innovation capability in, in particular, the telecom/broadcast constituency, in close collaboration with all associated research and SME entities to build up a visionary public sector that catalyses the take off of novel markets and enterprises to the benefit of the general public;
- Seize opportunities, notably, those offered by the emergence of new untested markets, such as the home/extended home and nomadic environments and the virtual home and office environments, the co-operation opportunities with Asia and other world regions with regard to standardisation, the new forms of convergence that emergence, e.g., between movie and game industry, and totally new application domains;
- Combat weaknesses, notably through greater association of all players in the value networks, including content providers;
- Promote system approaches, i.e., initiatives in the field should cover all elements of the evolving value networks and should not be limited to sub items. This implies that such initiatives should be able to address all levels in the value network, from basic technologies at component level to application level, to achieve consistency of such system approaches at EU level, economies of scale, and economies of scope;

- Address the issues in a sectorial manner, i.e., carried by the strong and well-identified EU industrial/research basis;
- Promote an End-to-End, long-term and integrated approach to provide a level of funding commensurate with the economic importance of the sector;
- Involve Member States, through their national programmes (BMBF, RNRT, RIAM, PROFIT, etc.) and also other European Initiatives (in particular: Eureka CELTIC initiative, SmartHouse Initiative, etc.).

In addition to focusing on the core R&D agenda, NEM will:
- Advise on the achievement of a programme of standards' development that encourages investment and innovation, engenders industrial and consumer confidence, whilst protecting European consumer and commercial interests.
- Disseminate the NEM vision towards its widest acceptance by all constituencies and research groups in Europe.
- Develop a deployment strategy involving the major global companies with large European presence. The deployment strategy will be influenced by the 'European Roadmap' derived from the results of the research programme and will include an analysis of transition strategies.
- Advise on proposals to stimulate and encourage collaborations beyond Europe that benefit European employment and local wealth creation.
- Encourage a monitoring methodology for evaluating the impact of particular projects and of the overall 'NEM Industrial Initiative', against scientific, commercial and social criteria. An impact assessment methodology will be proposed to include tangible measures of value and impact.
- Advise on competition, regulation and other legislative issues to address for maximum impact of the NEM sector.

Next Steps

In 2006 the NEM evolution will be:
- NEM Technology Platform synergies meeting   16 February 2006, Brussels
- NEM Mirror Group,   22 February Dublin, Ireland
- 2nd NEM General Assembly: 7-8 March 2006, Brussels
- NEM Executive Board   3 April 2006, Brussels
- NEM Steering Board   4 April 2006, Brussels
- EU-China Workshop on Home networks   29 May 2006, Beijing
- NEM Executive Board,   13 June 2006, Kingswood Warren, UK
- NEM Steering Board,   14 June 2006, Kingswood Warren, UK
- 3rd NEM General Assembly: Spring 2006
- 4th NEM Mirror group Meeting: Spring 2006
- NEM SRA working groups: Spring 2006
- 3rd NEM Steering Board Meeting: April 2006
- NEM SRA working groups: Summer 2006
- 4th NEM General Assembly: Autumn 2006
- NEM SRA working groups: Autumn 2006
- 5th NEM Mirror group Meeting: September 2006
- 4th NEM Steering Board Meeting: October 2006
- NEM strategic review: November 2006

NESSI – Networked European Software and Services Initiative

Web-site: www.nessi-europe.com

Technology Platform Contact
Chairman - Mr. Jean-Paul Lepeytre
Contact –
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Vision Document
NESSI Vision Document

Platform launch date: 7 September 2005

Overall Policy Objective
NESSI aims at shaping a vision and building an ecosystem that together enable the emergence of a service-oriented economy in Europe.
NESSI's ambition is to develop a visionary unified European strategy and implementing technologies for secure and trusted services architectures, software and grid infrastructures, and trustworthy policies to boost the development of software and service-oriented architectures in Europe. This strategy will target both technological developments and business eco-systems.

Strategic Research Agenda
This is organised in three volumes. Volume 1 "Framing the service economy" is currently open for public review prior to finalisation of version 1.0. Volume 2 "a strategy to build NESSI" and Volume 3 "the short, mid and long term roadmaps"" are currently under preparation. Refer to full details in the "next steps" section of this document.

The innovation driver and core enabler of economic growth in the 21st century is Information and Communication Technology (ICT). The combination of the growing demand for trustworthy software and services together with the structural forces affecting industry, represent a new opportunity for Europe. In this context, the NESSI initiative embodies the strategic mechanism through which Europe will seize this opportunity and exploit its global capability, not only to the benefit of the software and ICT services industry, but also to that of all economic sectors, and at the end of the day, to the benefit of all citizens.
Within ICT the IT services marketplace is today changing dramatically, due to a series of factors, such as:
- private and public organisations require flexibility to keep up with the ever increasing pace of change caused by globalisation and technological innovation as well as the capacity to put in place new business models that distinguish their offering from their competitors;
- the broader uptake of ICT by end-users leads to new needs such as ubiquitous access, ease of use, personalisation and trusted transactional capabilities on all types of platforms, from embedded systems to distributed environments;
- the clear emergence of Open Source Software, which nourishes the dynamics of the ICT marketplace and creates a specific ecosystem that fosters opportunities by: increasing competition and choice, aligning with open standards, positioning software as a public good, improving technological self-reliance, increasing transparency while optimising costs.
To address the above factors properly, the ICT industry in general, and the software and IT service industry in particular, need to step up to the task of developing innovative products and services. Although

technology related aspects are important, it is crucial to address as well the sociological implications of building such systems, since the success of the initiative will be determined in a significant part by the acceptance of new technology by end users and communities.

NESSI aims at shaping a vision and building an ecosystem that together enable the emergence of a service-oriented economy in Europe.

It is with this in mind that NESSI is developing its Strategic Research Agenda, an SRA that is based on a holistic model which embraces the whole service approach from the behaviour of large systems service-based to delivery of a simple service to end-users. This model foresees the NESSI ecosystem as a key element in the EU Economy and architects it in three main constituent parts:

- ICT Technologies, represented by the **NESSI Framework**, where the services, the key elements of the ecosystem, are engineered;
- the **NESSI Landscape**, comprising an emerging service economy, where services are applied to specific businesses and domains as well as made cross-domain. The NESSI Landscape aims at enabling tight interactions between trusted and dependable systems of agile service-oriented businesses in an always changing market;
- the set of instantiation mechanisms based on regulations, rules and policies, experiences and learning approaches constitute the **NESSI Adoption** element and makes services usable by consumers.
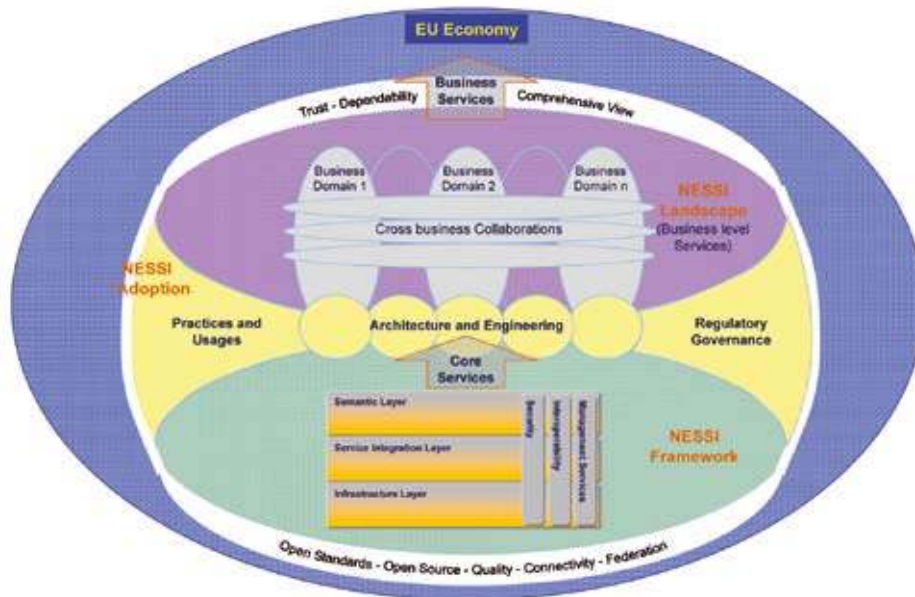
At the core of NESSI vision is **the provision of new approaches enabling the transformation of the European economy through service oriented business models.**

Budget / Financing

The European software and services sector presently employs more than one million specialists and enjoyed a 4.4% growth in 2005. According to NESSI, an R&D investment of 2.5 billion euros is required to advance the competitiveness and global reach of this key sector.

NESSI has been fully financed by its founding industrial partners and is currently investigating additional financing mechanisms.

Deployment Strategy

NESSI organises a deployment strategy along two lines of activities:

- ensuring active participation of all stakeholders;
- disseminating the key role of NESSI in the evolution of a service oriented business model for the European Economy to a wide range of audiences to ensure awareness and coordination with other relevant initiatives.

Deployment strategy – ensuring active participation of all stakeholders

NESSI involves all relevant stakeholders through four Communities each having a specific profile:

- SME Community -
- User Community - representing the interests of industrial, public and private users
- ICT Industry Community
- Academic & Research Community

In order to take into the account the work done at Community level and in general to participate to the NESSI strategic decision process, each of the above communities has its own representatives to the Steering Committee and to the NESSI Board. Members will also be encouraged to participate to Working Groups that will be created, as necessary and on a temporary basis, to focus on specific topics necessary to the overall success of NESSI. NESSI already operates four working groups on the following topics: SRA, governance, new members, strategy and communication.

Deployment strategy – disseminating NESSI to a wide audience, coordinating with relevant initiatives

NESSI is finalising a Strategy and Communication Plan whose role is to identify all audiences to which the NESSI vision and advances should be communicated. This plan foresees specific activities, through events, targeted information notes, animated scenarios, packaged information kits to ensure that the NESSI vision generates interest at all levels and is easily accessible. Specific events include, for instance, the Forum held in January 2006 which attracted over 300 participants from all over Europe. NESSI also monitors European, national and regional events to which it can participate to widen its impact. For instance, it participates to Networks of Excellence meetings to collaborate on the adaptation of education curricula and training programmes that reflect the NESSI vision and, therefore, adapt to the industrial needs for trained human resources in the coming years. NESSI participates to SME specific events, the first such SME event will take place in April 2006. NESSI is currently setting up a Workshop at the e-Challenges 2006 conference, and is investigating the setting up of national events to link to national research programmes. NESSI also links to other IST ETPs, and is currently investigating common activities in the areas of communication and content.

Next Steps

Following its launch on the 7th of September 2005, NESSI opened up its membership at its first Forum Conference on the 26th of January 2006 in Brussels.

With over 300 participants, this first NESSI Forum constituted the key opportunity for NESSI to open to all stakeholders in a structured, organised approach. At the Forum, the NESSI roadmap and the first public contribution of the SRA were presented.

The next steps are :
- the SRA draft and public review processes
- the registration process for new members and partners
- the setting up of the NESSI Office
- the General Assembly for new members held in May 2006
- the setting up of new working groups

The main dates of NESSI over the year 2006 are:

26 January 2006:	NESSI Forum conference - Release of "NESSI SRA – Volume 1"
March 2006	new members registration process
March 2006	public review of SRA Volume 1
April 2006	handling of new member applications
	start of the NESSI Office operation
May 2006:	***General Assembly (all members and partners)***
	Version 1.0 of SRA Volume 1
	First draft of SRA Volume 2
June 2006	Public review of SRA Volume 2
July 2006	First draft of SRA Volume 3
September 2006	Version 1.0 of SRA Volume 2
	Public review of SRA Volume 3
November 2006	Version 1.0 of SRA Volume 3

In parallel to these activities, regular meetings of the NESSI governing bodies (Steering Committee and Board) are held. NESSI is also represented at a number of European events.

EUROP - European Robotics Platform

Web-site: www.roboticsplatform.com

Technology Platform Contact
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Vision Document
Building EUROP, the European Robotics Platform: The High Level View

Platform launch date: October 2005

Overall Policy Objective
The robotics initiative aims to boost the development of robotic businesses within Europe and at bringing the benefits of capable robots to the service of European citizens. It is being set up to ensure that Europe will maintain its market leadership in industrial robotics and expand it in the emerging consumer, home and entertainment markets, as robotic technologies are gradually entering into our homes, offices and public spaces. At the same time, the initiative is also aiming to ensure increased public and personal security levels as well as new levels of quality of life by providing technologies required to enable society to address challenges in terms of ageing and well-being.

Strategic Research Agenda
Work in progress

Executive Summary
(based on Vision document)
A consolidated European strategy in robotics is a requisite for preparing a new generation of robots that will closely collaborate with workers and move out of the factory to conquer a new wave of novel service, security and space application markets.

> **The vision of EUROP, the European Technology Platform in Robotics**
> *As industrial, service and security/space robotics increasingly share the same research challenges and agendas, such an initiative would aim to maintain Europe's leadership in industrial robotics and expand it into the burgeoning service and security markets. It would also aim to ensure increased public and personal security levels as well as new levels of quality of life by providing technologies required to enable society to address challenges in terms of ageing and well-being.*

Robotics is a technology at the cusp. Long accepted by industry to improve factory quality, performance and efficiency, robotics has for at least three decades been a key technology in engineering industries for increasing industrial productivity and for competitive manufacturing. Robotics is now at a decision point where its scope is dramatically expanding. 21st century robot machines will be used in all areas of modern life in the form of surgical devices, machines to explore space and conduct hazardous tasks on earth, robot assistants in the home or work place and the most exciting toys and entertainment devices child-kind has ever seen! The worldwide market for such future robot systems is forecast by the United Nations Economic Commission for Europe (UNECE) and the International Federation of Robotics (IFR) to be in excess of € 55 billion per annum by 2025.

The major challenge for the 21st century is to develop robotic systems that can sense and interact with the human world in useful ways. This will result in robot technologies being embedded in literally thousands of future products, each one having huge commercial potential.

Such future robot systems will affect a broad range of social and economic activities. They will transform everyday life as well as industrial processes and result in a step change of similar impact to Internet technologies at the end of the 20th century. They will enable new kinds of industrial automation; add performance and functionality to future machines; provide a wide range of innovative products, applications and services; and perform complex security and space missions. They will be driven by social aspirations and bring economic benefits, impacting on a wide range of peoples' lives and core issues of our European society.

R&D initiatives in this field will strongly contribute to the creation of new opportunities towards European employment and growth. These opportunities are even more pronounced when facing socio-economic factors such as the aging of our society, increasing Europe's competitiveness or the need to develop a knowledge-based society as formulated in the Lisbon strategy and reinforced by its follow-up review (the "Kok Report"). Robotics can address sustainable perspectives for all of these factors.

Europe has a strong competitive robotics sector. Moreover, dual use opportunities presented by an improved co-ordination between European civil R&D efforts and similar efforts with defence-related R&D could also pave the way for an accelerated development of generic underpinning robotic technologies and integrated robotic systems.

So far though, it is outside of Europe that large robotics R&D initiatives have been set up to address similar opportunities and socio-economic challenges. This is particularly true of Korea, Japan and the USA, where efforts are underway to build new robotics industries and to prepare markets for robotic products. It is essential that Europe match or better this commitment.

Top executives from some 50 leading robotic industrial and research organisations have proposed and strongly endorse the need for a European Technology Platform in Robotics – EUROP (European Robotics Platform). The ambition of EUROP is to unite all the main European industrial and academic robotics stakeholders and public authorities around the EUROP Vision, where industrially relevant research goals, priorities and action plans on strategically important issues can be agreed and relevant actions implemented. This ambitious mission, if successful, will see Europe maintaining its leading position in robotics and develop new companies and supply networks to meet the new societal and technology needs while also supporting the Lisbon objectives.

Budget / Financing
This information is not available yet – work is in progress.

Deployment Strategy
This information is not available yet – work is in progress.

Next Steps
A Strategic Research Agenda is currently under development and comprises the following steps and related milestones:

−   STEP 1 [By end December 2005]: For each of the five main robotic market sectors, namely industrial robots, household service robots, field service robots, security robots and space robots, roadmaps are under development based on the development of different product and product scenario roadmaps covering the period 2008-2020.

−   STEP 2 [By end February 2006]: based on the findings of Step 1 above, technology roadmaps will be produced covering the main underpinning robotic technologies, i.e., mechatronics and component technologies; manipulation and grasping; perception and cognition, design and human robot interaction technologies, and Systems, Engineering and Architectures.

−   STEP 3 [By end March 2006]: the above technology roadmaps will be complemented and extended by using the Technology Roadmap developed by the European Robotics Network of Excellence, EURON (www.euron.org) on the basis of planned joint meetings between the robotics platform and EURON.

−   End March 2006: delivery of the EUROP Strategic Research Agenda

Photonics21 – Photonics for the 21st Century

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'Nanoelectronics and Photonics'

Vision Document
Photonics for the 21st Century

Platform launch date: 1. December 2005

Overall Policy Objective
Photonics21 undertakes to establish Europe as a leader in the development and deployment of Photonics in five industrial areas (Information and Communication, Lighting and Displays, Manufacturing, Life Science, and Security) as well as in Education and Training. Through a shared vision between industrial and public actors, it will create the critical environment necessary for visionary and industrially relevant R&D in photonic components, systems and applications.

Strategic Research Agenda
Ffirst version by March 2006

Executive Summary
The entry into the "photon century" requires a shared European initiative that enables industry and research to uphold their outstanding initiatives to explore the nearly limitless future applications of light and to reap the expected benefits in terms of creating both jobs and wealth. Many important European industries, from chip manufacturing and lighting, health care and life-sciences, to space, defence and the transport and automotive sectors rely on the same fundamental mastery of light. Without strong European leadership in photonics technologies, these industries will be left vulnerable to strong competition from the USA and Asia.

To achieve this leadership for the benefit of Europe and our citizens, an ambitious programme is required to:

- Supply the necessary research environment capable of supporting the visionary and industrially relevant R&D activities for photonics components, systems and their application over a broad range of industry sectors;
- Establish strategic links between mainly SME-based photonics industries and principal user industries to share their long term vision and to mobilise a critical mass of resources;
- Foster co-operation and smooth out the current fragmentation of national and European R&D activities.

The Photonics-21 Technology Platform is committed to ensure that Europe is a leader at the forefront of the photonics century.

The SRA will cover the following areas:

- Information and Communication
- Industrial Production/ Manufacturing and Quality
- Life Sciences and Health
- Lighting and Displays
- Metrology and Sensors
- Design and Manufacturing of Components and Systems
- Photonics Research, Education and Training

Budget / Financing

The public contribution needed for the implementation of the SRA during FP7 is estimated at up to ±250 million € per year, which will be complemented by a strong industrial contribution.

Deployment Strategy

The deployment strategy will be developed by a dedicated Task Force and will be presented shortly after the SRA.

Next Steps

- Strategic Research Agenda for the Photonics industry and the user industries on basic technologies, components, systems and their broad application in different areas
- Deployment strategy including actions for dissemination and raising public awareness
- Recommendations on business development, financing and public-private partnerships
- Innovation: Creation of specific schemes allowing the rapid exploitation of scientific results, especially for SMEs
- Cohesion initiatives to foster the participation of the New Member states
- Policy Interface/Framework: interaction with political institutions and relevant national authorities (Member State Mirror Group)
- Regulatory activities: Fostering pre-competitive harmonisation standardisation;
- Interfaces to the other relevant Technology Platforms, e.g. Nanoelectronics, Nanomedicine, Plant genomics and Biotechnology, Photovoltaics, Mobile and Wireless Communications, Innovative Medicine for Europe, Manufacturing Technologies, …
- Human resources, education and training: Adapting and improving the educational and scientific basis to secure a high-skilled work force
- System for the steering and the monitoring of the implementation of the strategy

European Steel Technology Platform - ESTEP

Web-site: http://cordis.europa.eu.int/estep/

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Vision Document
"European Steel Technology Platform - vision 2030"
http://www.cordis.lu/coal-steel-rtd/steel/events_stp.htm

Platform launch date: March 2004

Overall Policy Objective

The creation of the European steel technology platform as part of the European Research Area will enable the implementation of a strategic research agenda, which is a key part of a sustainable development policy aimed at maintaining the leadership of the European steel industry. Objectives are to:
- Achieve the ambitions of the European Steel sector: to meet society's needs and to consolidate a global, sustainable and competitive leadership,
- Contribute to the European Research Area's objectives: integration and co-operation.

Strategic Research Agenda
Final - July 2005

Current version on http://www.cordis.lu/coal-steel-rtd/steel/events_infostp.htm
Final version soon available on www.cordis.lu/estep

Executive Summary
The Strategic Research Agenda (SRA) of the European Steel Technology Platform (ESTEP) offers a global vision of the innovation and R&D initiatives which will lead to the achievement of the objectives identified in the framework of a sustainable leadership of the steel sector in the coming decades.

The ambition of the European steel industry is to maintain and reinforce a global leadership, which is both sustainable and competitive, given the rapid development of this industry in other parts of the world, notably Asia.

To meet the strategic objectives of the European Steel Technology Platform, in March 2004, the Group of Personalities decided to launch a determined, long-term and structured R&D action.

Six working groups involving around 110 people and corresponding to the 4 pillars of the sustainable development framework of the Platform have been set up (profit, partners involving both automotive, construction and energy sectors, planet and people) and have developed three large and complementary R&D industrial programmes which will have a major societal impact, each of them encompassing several R&D themes and research areas.

Three industrial programmes with a major societal impacts are proposed:
• Safe, clean, cost-effective and low capital intensive technologies
• Rational use of energy resources and residues management
• Appealing steel solutions for end users.

Together they aim to play a major role in boosting competitiveness and economic growth and, as a result, future employment in Europe. The corresponding R&D themes and areas that have been identified in these programmes are making an important contribution to the sustainable development approach.

The European steel sector constantly addresses the challenge of meeting customers' demands for a broad variety of ever more sophisticated high-performance materials. To meet these needs, direct partnerships between steel producers and their immediate customers are a vital requirement. Such collaboration is a major feature of new product development in the steel industry and an essential element in the promotion of steel use. In the framework of this Strategic Research Agenda, the automotive, construction and energy sectors are regarded as priorities.

Protecting the environment (greenhouse gas emissions and more particularly CO_2 emissions) and increasing energy efficiency both constitute major transversal issues in the sphere of the RTD programmes that are proposed. Security and safety represent the third very important objective to be addressed, not only in the relevant industries, but also in customers' every day lives as users of steel solutions (cars, buildings, energy production and transport, etc.) by developing new intelligent and safer steel solutions.

A major transversal theme regarding the human resources aspects has also been taken into consideration (attracting and securing qualified people to help meet the steel sector ambition). In this respect:
- A large European network (TIME, 47 universities), involved in education, training, communication and dissemination activities has been identified among the stakeholders of the EU steel technology platform. This network should play a leading role in analysing how the education system could meet the future requirements for qualified people in the European steel industry, and in devising effective approaches to address its anticipated shortcomings.
- Human resources, as the holders of a company's core competencies, represent a key asset that should be fully optimised. A survey of the steps taken by European steel producers in terms of change management and progression towards "knowledge organisations", leading to exchanges of best practices, should significantly contribute to such optimisation process.

The European steel industry has already met the challenge of lowering CO_2 emissions by creating a consortium of industries and research organisations that has taken up the mission of developing breakthrough processes, the ULCOS (Ultra Low CO_2 Steelmaking) consortium.

This large-scale consortium (48 European participants), which was set up in the spirit of a joint initiative in 2004, plans to develop a breakthrough steelmaking process that has the potential of meeting the target of drastically reducing greenhouse gas emissions beyond 2020. The full development of the process, from basic concept to fully-fledged industrial implementation, would cover both the medium and long term and consist of a number of consecutive projects.

Breakthrough technologies must be developed to achieve the technological advances of the three large industrial programmes of the platform. A critical mass of both skills and financial resources is necessary to meet the challenges of this long term ambition.

ESTEP will further integrate and broaden the scope of the European RTD partnership built in the framework of the ECSC Treaty (more than 8,000 researchers). Indeed, it will constitute broad partnerships involving the whole European steel industry, its suppliers and customers (automotive industry and construction sector and the energy sector), SMEs, private and public research organisations, public authorities and representatives of trade unions.

As regards implementation of the SRA, both private and public sources of funding are necessary to meet the ambitious objectives of the European steel sector.
It is envisaged that all necessary resources of the existing instruments will be combined at different

levels: EU programmes (Framework programmes, RFCS, EUREKA, etc.), national programmes and regional programmes.

The Joint Technology Initiative (JTI), together with loans from the European Investment Bank, will enable the development of emergent breakthrough technologies and their implementation on a large industrial scale in the coming decades.

Budget / Financing

Private funding by the stakeholders and funding from different European, national and regional institutions is foreseen. However, the launch of a Joint Technology Initiative is envisaged and, together with possible loans from the European Investment Bank, it will cover, where appropriate, both the pilot and demonstration and the industrialisation phase of the ULCOS (Ultra Low CO_2 Steelmaking) project.

The total budget for the first priorities amounts to around € 0.8 billion and their implementation should take place from 2007 to 2013 for RFCS, FP7 and other programmes. On an annual basis, approximately 25% of the Research Fund for Coal and Steel programme should be devoted to programmes leading to the implementation of sectoral consensus-based R&D activities. The remaining part should be funded through the different relevant thematic sub-programmes of the next FP7 and national or regional R&D programmes.

The estimated total budget corresponding to the SRA activities amounts to around € 1.7 billion over 15 years.

Deployment Strategy

Detailed information regarding the global implementation process is described in the final version of the SRA: "From a Strategic Research Agenda to implementation" (short and extended versions).

The three industrial programmes, which are fully described in the SRA, are broken down into R&D themes and areas. The implementation strategy consists of defining, for each R&D area, the level of priority according to its strategic importance, the instrument to be used (e.g. the Seventh Framework Programme, the Research Fund for Coal and Steel), and the timeframe (short, medium, long term), as well as the budget deemed necessary. This strategy was endorsed by the ESTEP Steering Committee on 7th July 2005.

A JTI will be proposed to carry out the two last phases of the ULCOS (Ultra Low CO_2 Steelmaking) project (2007/2015). These two phases will aim at developing selected new breakthrough technologies for low CO_2 steel production and their implementation on a large industrial scale in the coming decades (beyond 2015). With regard to the ULCOS project and also other large projects, where a pilot and demonstration phase followed by an industrialisation phase is necessary, loans from the European Investment Bank (EIB) are envisaged.

Valorisation of results, dissemination strategy, the necessary business plans and future markets and their penetration will be defined by the appropriate working groups of ESTEP when preparing projects, according to their specificity.

The six working groups will be in charge of the follow up of both the global implementation process and the different running projects (valorisation, dissemination, training, etc.).

Next Steps

The most important next step is the implementation of the first priority of the ESTEP R&D areas for 2007 to 2013.

Projects focused on steel's core business will be selected by the ad hoc working groups of ESTEP and submitted to the Steel programme of the Research Fund for Coal and Steel.

However, a large proportion of the projects should be conducted under the forthcoming Seventh Framework programme (multi-sectoral programme) and also under EUREKA and national or regional funding programmes. As far as the FP7 programme is concerned, most of the ESTEP R&D areas could find a corresponding equivalent in the FP7 themes of the Co-operation programme.

The key activities planned in the short term for ESTEP are:
- Identification of the appropriate FP7 themes for each R&D area
- Total budget 2007/2013 for each R&D area
- Precise implementation schedule (from 2007 to 2013)
- Preparation of proposals by the appropriate partner teams
- Preparation of the JTI document.

European Technology Platform for the Future of Textiles and Clothing (ETP-FTC)

Web-site: www.textile-platform.org (under construction; in the meantime, information available on http://www.euratex.org - follow links for research & development -> publications)

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Vision Document
"European Technology Platform for the Future of Textiles and Clothing – a vision for 2020" http://www.euratex.org (follow links for research & development -> publications)

Platform launch date: December 2004

Overall Policy Objective
To develop a long-term vision for the transformation of today's European textiles and clothing (T/C) industry into a sustainable, competitive global industrial player, able to provide significant employment and economic added value to Europe; to focus on the effective exploitation of research, innovation and knowledge-orientation in all T/C sub-sector activities; and to overcome the existing fragmentation of textile-clothing RTD activities in Europe, while fostering synergies with other industrial sectors.

Strategic Research Agenda
First draft - in preparation end 2005; Final – launch event 7 and 8 June 2006
www.textile-platform.org (under construction; in the meantime, information available on http://www.euratex.org - follow links for research & development -> publications)

Executive Summary
The draft SRA is currently in preparation within the platform's 9 Thematic Expert Groups, which bring together over 300 experts from industry and research backgrounds, covering 22 countries. The final SRA will be presented at the platform's first public conference in June 2006.

The platform has already identified the long-term strategic importance of the following priorities, around which the SRA will be structured:

- **New materials and processes:**
    o   Development of new speciality fibres and filaments (nano-, high performance- etc), fibre-composites, and innovative fabrics and textile products based on them.
    o   Development of further functionalisation of fibre and textile surfaces, and the related processes (for example coatings, micro-encapsulations, enzymes, plasma, laser, ultrasound, ultraviolet treatments, nanotechnologies…).
    o   Development of biomaterials and biotechnologies for textiles, as well as environmentally-friendly processing technologies.
- **New textile applications**, to establish and expand the use of textiles as raw material of choice in many industrial sectors and new application fields:
    o   New textile products for human performance (i.e. medical, protective clothing, sportswear).
    o   New textile products for technical applications (e.g. transport, construction, geotextiles etc).
    o   Smart textiles and garments.

- **Moving the clothing sector from mass production to customisation**:
  - o Development of technologies to further clothing and fashion mass customisation, including the relevant production technologies, supply chain management tools and logistics systems.
  - o Development of new design concepts and technologies.
  - o Further research into full life cycle and total quality management concepts.

The SRA will also **build on the experiences** made by a number of **projects already running under FP6**, and in the Member States, such as:

o AVALON (IP-SME): novel hybrid textile structures integrating shape memory alloys and the related process techniques for intelligent fabrics (medical and protective), as well as reinforced composites for civil aviation, the automotive sector and aerospace.
o CLEVERTEX (SSA): develop a strategic master plan for the transformation of traditional textile and clothing production into a knowledge-driven industrial sector by 2015
o LEAPFROG (IP): innovate the technology base of apparel manufacturing
o LEAPFROG (CA): create a "knowledge community" for intelligent apparel manufacture
o FLEXIFUNBAR (IP-SME): new generation of multifunctional materials for different applications in technical textile sectors (such as transport, medical uses, protection and clothing) as well as in the paper and footwear sectors
o ACTECO (IP-SME): novel processes based on the combination of nanotechnology and plasma surface engineering for a new generation of hyper functional textiles
o ULTRATEC(STREP): new finishing processes with lower environmental impacts by using ultrasound technologies
o WebTextpert (Collective Research): new generation of integrated innovation and knowledge-management, development of appropriate web-based training methods, tools and best practice demonstrators
o MYHEART (IP): develop intelligent biomedical clothes for preventing cardio-vascular disease
o ENVITEX (SSA): set up a textiles-specific partner research database, particularly for the New Member States and Candidate Countries

Further projects are anticipated from calls which are still in the evaluation phase on (1) technical textiles to develop new markets in the areas of construction, protective clothing and medical uses, and (2) biomaterials for implants (including biocompatible implants).

The SRA is also likely to touch on other issues such as textile analysis techniques, innovative e-business concepts and 3D-forming of textiles. The platform will also address innovation management issues, either as part of the SRA, or during the implementation phase.

Budget / Financing

Activities during the first 2 stages of the Technology Platform will be entirely financed by the platform stakeholders from industry and research. With an average of 40 experts in each of the 9 Thematic Expert Groups, a total stakeholder contribution of € 1.35 million can be estimated for the SRA development phase. To this needs to be added an approximate contribution € 500,000 for the more intensive involvement of the members of the TEG leadership teams, the members of the Governing Council and the Technology Platform secretariat. An additional investment of at least € 100,000 was made during the preparatory and launch phase of the Technology Platform (2004-2005), meaning that stakeholders will have invested up to € 2 million by the finalisation of the SRA in June 2006.

Stakeholder investments will continue into the implementation phase as TEG members will meet and work together to propose and initiate appropriate R&D activities to progress in all priority areas identified in the SRA and undertake a regular review and update of the SRA.

For the implementation of the SRA through collaborative projects for a total budget in excess of € 1 billion is estimated for the first 3 years of implementation, i.e. 2007-2009. This is **in addition to the substantial number of related projects already running under FP6.**

Public funding will be matched by private funding according to EU state aid rules. The technology platform stakeholders continue to request that ample provisions be made in FP7, as well as EUREKA and various national or regional programmes/schemes for support of industrial R&D. In view of the particular structure of this industry, in which 96% of companies are SMEs, specific funding opportunities targeting these companies (like FP6 CRAFT, Collective Research and IP for SME project types) will need to be made available in a sufficient number.

In addition, Technology Platform stakeholders will further explore R&D and innovation financing options like equity, loan and guarantee based schemes, which are so far almost unknown/unused in this industry. For this purpose a specific project "NetFinTex", funded through the EC's Europa-Innova initiative, was launched in November 2005. This project brings together a European-wide financing expert network and aims to develop guidance documents and tools for easier access of textile/clothing companies to such alternative R&D funding opportunities.

Deployment Strategy
 Not yet applicable.

Next Steps
- 1st quarter 2006: 2nd meetings of 9 Thematic Expert Groups (TEGs) and drawing up draft SRA
- April-May 2006: finalisation of SRA by TEGs and Governing Council of platform
- 7 and 8 June 2006: launch of final SRA at platform's first public conference in Brussels
- From June 2006: start of implementation phase

MANUFUTURE - Platform on Future Manufacturing Technologies

Web-site
http://www.manufuture.org
http://europa.eu.int/comm/research/industrial_technologies/manufuture/home_en.html

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Vision Document
MANUFUTURE – Assuring The Future of Manufacturing In Europe. A vision for 2020
http://www.manufuture.org
http://europa.eu.int/comm/research/industrial_technologies/manufuture/home_en.html

Platform launch date: 7 December 2004

Overall Policy Objective
The mission of MANUFUTURE is to propose a strategy based on research and innovation, capable of speeding up the rate of industrial transformation in Europe, securing high added value employment and winning a major share of world manufacturing output in the future knowledge-driven economy.

Strategic Research Agenda
Open consultation on the final SRA document foreseen from 6th December 2005 until February 15th 2006.
Final version expected before 28th February 2005.
Condensed version expected to be published before the end of April 2006.
http://www.manufuture.org

Executive Summary
The Manu*future* Technology Platform was launched at the second Manu*future* conference, held in Enschede, The Netherlands, in December 2004. On this occasion, the document *Manu*future – *a Vision for 2020* was published as the basis for development of a Strategic Research Agenda (SRA) underpinning a transformation of European manufacturing industry into a knowledge-based sector capable of competing successfully in the globalised marketplace.
The economic importance of sustaining a strong manufacturing base in Europe is indicated by the fact that it provides jobs for around 27 million people, and produces an added value exceeding €1 300 billion from 230 000 enterprises with 20 and more employees (2001). Some 70% of this total derives from six main areas – automotive engineering, electrical and optical equipment, foodstuffs, chemicals, basic and fabricated metal products, and mechanical engineering.
Although European manufacturing has huge potential for generating wealth, jobs and a better quality of life, it faces intense and growing competitive pressure on two fronts. In the high-tech sector, especially, other developed economies pose the greatest threat. On the other hand, manufacturing in more traditional sectors is increasingly migrating to low-wage countries such as China and India. And these, too, are rapidly modernising their production methods and enhancing their technological capabilities.

A step further
A number of 'vertical' action plans and Technology Platforms have already been established, or are in the course of preparation, to tackle these issues in various technology- or sector-specific contexts.

Manu*future* goes a step further by addressing underlying 'horizontal' approaches applicable across a broad spectrum of industries.

The initiative advocates a response based on strengthening Europe's ability to compete in terms of high added value, since purely cost-based competition is not compatible with the goal of maintaining the Community's social and sustainability standards.

In this SRA, the priorities for maximising added value are distilled in a strategic perspective linking the principal drivers of change with a series of 'pillars' of activity spanning activities across the short- to long-term timeframe.

The drivers are identified as:
- competition, especially from emerging economies;
- the shortening life cycle of enabling technologies;
- environmental and sustainability issues;
- socio-economic environment;
- regulatory climate; and,
- values and public acceptance

The competitive and sustainable reaction to these challenges is seen in terms of five pillars and their associated new enabling technologies for the industrial transformation of:
- new, added-value products and services
- new business models
- new advanced industrial engineering
- new emerging manufacturing science and technologies
- transformation of existing R&D and education infrastructure to support world-class manufacturing

Role for collective research

Collective research will evidently have a central part to play in realising the transformation. Attaining the objectives of the Lisbon and Barcelona Councils will only be possible by involving the largest possible number of stakeholders.

The existing and proposed Technology Platforms, whether applied at EU or national/regional level, therefore represent an extremely important conduit for sharing the Manu*future* concepts and results.

Another stakeholder group of outstanding importance is the innovative SMEs and other independent enterprises, which figure largely in the structure of all manufacturing sectors. Their participation in the integration activities of engineering platforms will engage them in partnerships across Europe, reinforcing the ability of the manufacturing infrastructure to achieve rapid, reliable progress from research results towards marketable products. Traditionally, European products are associated with high quality, appealing design and cutting-edge technology The effectiveness of the Manu*future* research agenda in transforming industry will depend upon manufacturers' readiness to leverage these strengths, while adapting continuously to change in an open, fast-moving global industrial environment

From products to product/services

The market increasingly demands products that are customised, yet available with short delivery times. It is essential that European companies be able to understand and satisfy the needs of customers, regardless of their geographical location. Consequently, the business focus must increasingly shift from designing and selling physical products, to supplying a system of products and services ('product/ services' or 'extended products') that are jointly capable of fulfilling users' demands. Product/services will offer greater satisfaction of customers' needs, reduce total life-cycle costs and environmental impacts, and avoid problems associated with the conventional buy-use-dispose products.

Innovating production

A fundamental concept of the Manu*future* vision is that of 'innovating production', which embraces new business models, new modes of industrial 'manufacturing engineering' and an ability to profit from ground-breaking manufacturing sciences and technologies.

Even the factories themselves are regarded as complex, long-lived products, operating with the latest technologies and adapting continuously to take account of customers' and market requirements. The 'virtual factory' of the future will manufacture in adaptable networks linking OEMs with value-chain partners (often SMEs) and suppliers of factory equipment/services selected according to needs at a given time. Its composition will not be limited by the presumption of physical co-location, nor by a need to maintain rigid long-term relationships.

In such a dynamic environment, entrepreneurial sprit will be a vital commodity. This has to be fostered by RTD and educational infrastructures that promote the exchange of ideas, the mobility of researchers, the shift towards multidisciplinary and the lifelong learning that will be essential to tomorrow's 'knowledge workers'.

Favourable climate
Reaching these objectives will depend on the implantation of supportive fiscal and legislative framework conditions at EU, national and regional level. Given the realisation of such a favourable boundary conditions, a consensus of support for the Manu*future* vision will lead naturally to the creation of a European Manufacturing Innovation and Research Area (EMIRA) as an integral part of the European Research Area. It will promote the interests of European manufacturing industry, take account of regional and national needs, and recognise Europe's wider role in the global RTDI network.

Budget / Financing
(information not available at this moment)

Deployment Strategy
(information not available at this moment)

Next Steps
- November 2005
  - ❑ Internal consultation of the SRA document among the Manu*future* members
  - ❑ 2nd MG meeting: discussion on the SRA
  - ❑ 3rd HLG meeting: approval of the SRA
- December 2005
  - ❑ 3rd Manu*future* 2005 Conference in Derby (UK)
  - ❑ Press Corner with the presence of the Commissioner J. Poto□nik
  - ❑ Public consultation on the SRA document
- January 2006
  - ❑ 10th SG meeting (17)
  - ❑ 2nd meeting of the SG members with the representatives of the ETPs (23)
  - ❑ 1st meeting of the SG members with the representatives of the NTPs (23)
  - ❑ SRA Task Force meetings: handling the contributions
- February 2006
  - ❑ Closing of the public consultation on the SRA (15)
  - ❑ First Cross-Platforms initiative (Manufuture/Textile) (21)
  - ❑ Final version of the SRA (28)
- March 2006
  - ❑ 11th SG meeting (06)
  - ❑ 3rd MG meeting (13)
  - ❑ Second Cross-Platforms initiative (Manufuture/Agricultural Technologies) (23)
- April 2006
  - ❑ 1st Industrial Advisory group (IAG) meeting
  - ❑ 4th HLG meeting: the SRA final document
  - ❑ Condensed version of SRA published by the Commission
- Mai 2006
  - ❑ Official launch of the first Cross-Platform initiative (Manufuture/Textile) during the ETPs meeting in Vienna (4)
- July 2006
  - ❑ Roadmaps and first version of the Implementation Plan
  - ❑ 2nd IAG meeting (3)
  - ❑ 4th MG meeting (4)
  - ❑ 5th HLG meeting (5)
- October 2006
  - ❑ 4th Manu*future* Conference in Tampere (9-10): Final version of the Implementation Plan

The European Construction Technology Platform (ECTP)

Vision Document
Challenging and Changing Europe's Built Environment
A vision for sustainable and competitive construction sector by 2030.
http://www.ectp.org/documentation.asp#ECTP

Platform launch date: July 2004

Overall Policy Objective
The European construction sector, representing some 10% of GDP and one quarter of industrial output, is the largest industrial cluster in the EU and supplies our living and working infrastructure.
The European Construction Technology Platform (ECTP) will take the construction sector to a new high level, by identifying and analysing the major challenges that the sector faces in terms of society, sustainability, technology, etc. and by developing strategies for how to address these challenges in the coming decades, in order to fit the society needs.

Strategic Research Agenda
Final Draft - November 2005
http://www.ectp.org/documentation.asp#ECTP

Executive Summary
Strategic Research Agenda (SRA) for the European Construction Sector: Achieving a sustainable and competitive construction sector by 2030.

The general Vision of the European Construction Technology Platform (ECTP) states that in the year 2030, Europe's built environment is designed, built and maintained by a successful knowledge- and demand-driven sector, well known for its ability to satisfy all the needs of its clients and society, providing a high quality of life and demonstrating its long-term responsibility to the mankind's environment. Diversity in age, ability and culture, equalisation of opportunities for all is embraced. Finally, Construction has a good reputation as an attractive sector to work in, is deeply involved in research and development, and whose companies are well known for their competitiveness on the local and regional as well as global levels.

The SRA defines the research that need to be carried out to achieve the vision whilst at the same time taking into account market forces. It is for these reasons that the SRA is inherently difficult to get right and at the same time is a document of crucial importance. Construction is a huge industrial sector that involves more than 2.5 million enterprises. Furthermore, the dimensions of the social demand are multiple, which makes the selection of a coherent set of priorities quite a difficult task. The list of priorities which are proposed by the ECTP can be gathered in 13 main items grouped in three pillars.

A.   Meeting Client Requirements

Society is at the same time the end-user and the client of the Construction Sector. It is in permanent evolution, now confronted with an ageing and growing population, with new and more diversified demands for more equity, more comfort, more safety and security, better health, better mobility. The demand of

Society is for a new approach to our built environment; houses, cities, transport infrastructures and networks. Challenge of the Construction Sector is to meet this demand not only by new constructions but even more by renovation and by upgrading of existing structures. Four main sets of R&D needs have been identified in this area:

- ❋ Healthy, Safe and Accessible Indoor Environment for All
- ❋ A New Image of Cities
- ❋ Efficient Use of Underground City Space
- ❋ Mobility and Supply through Efficient Networks

B. Becoming Sustainable

Our built environment is built on nature and from natural resources. It makes most of our interface with natural environment. Impact of our built environment on nature is considerable through the resources it consumes, through the land it occupies and transforms, through the nuisance it imposes. It is therefore vital to strive for a sustainable environment. Emphasis has to be put on the following domains:

- ❋ Reduce Resource Consumption (energy, water, materials)
- ❋ Reduce Environmental and Man-made Impacts
- ❋ Sustainable Management of Transport and Utilities Networks
- ❋ A Living Cultural Heritage for an Attractive Europe
- ❋ Improve Safety and Security

C. Transformation of the Construction Sector

Previous chapters concern the demands of European customers and the European Society in terms of products and functions to be provided by the Construction Sector. But all these demands can be summarised in a more global objective: the Construction Sector must be at the service of the society, a key actor to improve the competitiveness of European industry.

Innovation is needed to support the growing trend towards the integrated teams and long-term supply chain collaboration. Although off-site techniques are not applicable in all cases, advanced manufacturing techniques must be introduced either on or off-site to enable suppliers and manufacturers to reduce cost to enable mass customisation, to reduce installation problems and health and safety risks, to facilitate design and finally improve quality and consistency. The challenge here is to re-engineer the construction process, to transform a technology-driven sector, slow to integrate innovation, into a sustainable demand-driven sector, creative, flexible, innovative, knowledge-based, offering new business opportunities and attractive work places.

Another important challenge is to incorporate the myriad of small and medium-sized enterprises (SMEs) into the global innovation process, a necessary move to increase the impact and application of new ideas in construction.

Four main areas of R&D needs have been identified on this topic:

- ❋ A New Client-driven, Knowledge-based Construction Process
- ❋ ICT and Automation
- ❋ High Added-value Construction Materials
- ❋ Attractive Workplaces

Budget / Financing

Because most firms in the Construction Sector are small or medium-sized enterprises (SME's), the contribution of the sector to European GDP and its importance for overall economic performance are often not fully recognized. As a matter of fact, some key statistics from 2003 (for the EU-15) show that €910 billion were invested in construction, which represents about 10% of the GDP. The R&D effort in the sector so far represents an insufficient part of the needs to develop enough adequate innovations. To reach the level of 3% of GDP for R&D in the sector would be a goal to be followed progressively. Estimating the costs for the implementation of the SRA is underway.

Possible implementation mechanisms include:

- At the level of the EC, the support of projects (mainly both Integrated Projects and Specific Targeted Research Projects) with a public/private share of the costs of the projects,
- At the level of the Member States, an increase of the effort in the R&D in the Construction, through the development of new Programmes coordinated in particular at the level of the ECTP,
- The development of new private/public initiatives such as the "Fondation" scheme in France,
- The identification of parts of the SRA which would need to reach a critical mass through the setting-up of Joint European Technological Initiatives (JTI).

Implementation Plan

The implementation of the Research Strategy will involve a combination of collaborative research instruments and possibly JTI, through an Action Plan coordinating the construction research priorities at European & National levels.

Two initiatives have been today identified; one on Long Tunnels, and the other one of Energy Efficient Buildings The construction of large infrastructure and/or major buildings projects could provide an excellent opportunity to develop JTIs in the Construction Sector. Past examples demonstrate that such large projects combine many characters of the JTIs:

- ❋ Based on private funding and public private partnership
- ❋ Association of a very large number of stakeholders
- ❋ Size and ambition of the project, responding to a major social needs
- ❋ Innovative character of the technology employed
- ❋ Large impact on the competitiveness and public image of the construction Sector.

This Action Plan is currently under development. Its definition associates not only the stakeholders directly involved in the High Level Group, the Support Group and the 7 Focus Areas of the platform, but also a network of nearly 20 National Technology Platforms which constitute essential links with National contexts, R&D needs and activities, authorities in the Member States.

A mapping of the R&D needs mentioned in the SRA of the Platform with the FP7 and Specific Programmes proposed by the Commission show clear links with several priorities such as:

- mainly
- ❋ Nanosciences, nanotechnologies, materials and new production technologies (integration of technologies for traditional industries, materials, processes)

- but also
- ❋ Information and Communication Technologies (ICT supporting businesses and industry)
- ❋ Energy (energy efficiency and savings)
- ❋ Environment (environment and health, natural hazards, sustainable management of resources, cultural heritage)
- ❋ Transport (infrastructure construction & maintenance).
- ❋ People
- ❋ Capacities (new R&D infrastructures)

An ERANET on Sustainable Construction (ERABUILD) started in September 2005 and the Sector is partly concerned with two other ERANET on ICT in traditional manufacturing industries and wood material and engineering. A proposal for setting up an Umbrella in the EUREKA framework (Eurekabuild) has been decided in January 2006.

Next Steps

- Validation of the implementation plans , including the prioritisation of agreed activities by the : Support Group, High Level Group, Focus Areas, NTP's and by MS

- Validation and Alignment of the SRA with R&D National initiatives and Eureka (Eurekabuild). Because of the large number of NTP's, a rationalisation effort is necessary

- Continuous work on the 2 identified JTI ;BEE (Building Energy Efficiency) and Jules Verne (Underground Innovative Construction Technologies)

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