ETP 2010:

Working Together on Societal Challenges

Conference Report

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Conference website
http://ec.europa.eu/invest-in-research/policy/agenda_en.htm

Report
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Executive Summary

The European Technology Platforms (ETPs) 2010 Conference, held in Brussels on 11-12 May 2010, brought together around 450 representatives of national authorities, EU associations, academia, civil society and other stakeholders active in R&D and innovation. They discussed some of the major challenges facing European society, debated how ETPs can best contribute to their solution, and considered how the role of ETPs should evolve to enable them to do so. ETP 2010 was an important milestone in the development of the *Europe 2020* strategy, which foresees a re-focusing of EU research and innovation (R&I) policy on societal challenges.

The Changing Face of Innovation

The Conference heard that research and innovation are becoming ever more important to the European economy and society. The economic crisis has reinforced **the importance of innovative products and services in enabling companies to remain competitive**. At the same time, it has emphasised **the need for transformational change in the way public services are delivered**, providing taxpayers and users with better value and more personalised services.

Europe's innovation performance has improved over recent years. Until the crisis, the innovation performance of the EU-27 was converging and improving. **But the pace of global competition is unrelenting**. Surveys show that the narrowing of the gap with international competitors has halted and, with its rapid rate of relative improvement, China is expected to catch up with Europe within the next ten years. Moreover, there are indications that some companies have reduced their innovation expenditures as a result of the economic downturn.

Technological change is happening at an exponential rate. Innovation cycles are getting shorter. Yet this pace of change is not matched by the speed of our actions in how we plan and support research and innovation activities. While the world is changing faster than ever before, we are still thinking the way we did ten years ago. **We have to shift up a gear and respond faster, in our companies, in our policy-making and in our approach to public funding.**

At the same time, we are coming to a broader understanding of 'innovation'. Innovation is more than research. It also embraces innovation in business models, management structures and processes, the delivery of services by the public sector, as well as innovation in design and marketing, and also social innovation — meaning innovation in, for example, working practices and community-building. So research spending is only part of the issue.

Policy Context

Thus, Europe's new policy for research & innovation is taking shape against a background of profound and rapid change. **The European Commission's *Europe 2020* strategy foresees a re-orienting of R&D and innovation policy on the challenges facing European society.** The vision is to seamlessly integrate research and innovation policies so as to create the conditions for a more dynamic, inclusive and sustainable Europe.

The opportunities are clear for all to see. In energy, for example, there are prospects for new, decentralised approaches that take production much closer to where energy is used and allow end-users to be producers as well as consumers. In transport, new paradigms are emerging around electric vehicles and truly integrated multi-modal transport systems. And in healthcare,

advances in ICT, nano-technologies and genomics are opening the door to more personalised approaches to medical treatment and patient care. The societal challenges are broad ranging, cut across many technology domains, and transcend individual industry sectors.

Such challenges bring huge opportunities for business. Companies are very aware of the opportunities these new markets present to offer innovative goods and services. Increased demand for sustainable or energy-efficient products and services, new services for older consumers, and education and healthcare services are all seen as promising areas. The opportunities are not confined to 'sunrise' industries but are open to traditional industries too. Indeed, established sectors such as energy production, water, chemicals, and manufacturing are crucial to addressing the societal challenges. Furthermore, the 'long-tail' phenomenon means there are opportunities for companies in every sector to realise growth by extracting additional value from existing inventory and products.

The Innovation Union initiative, currently under development, will give effect to these ideas. **The initiative will aim to remove major bottlenecks to the flow of knowledge and to the emergence of a "Single Market for Research and Innovation".** It will focus on the framework conditions, including demand-side policies, so as to create the right environment for innovation to flourish. Specific measures envisaged include: a vigorous push to reach an agreement on an EU Patent; improving the mobility and careers of researchers and expanding mobility schemes for nascent entrepreneurs; catalysing an increase in the public procurement of innovation; and developing world-class research infrastructures.

European Innovation Partnerships will be a central plank of the Innovation Union initiative. These Partnerships will involve the EU, the Member States, industry and all relevant stakeholders. They will not be yet another initiative, mechanism or instrument to run alongside existing ones. On the contrary, **they will be a framework for integrating ongoing and new initiatives to address specific societal challenges**. This offers a great opportunity to simplify our actions and focus efforts on what is really important. The Innovation Union initiative will identify a first set of these Partnerships.

The ETPs are well placed to provide the foundations for these Partnerships. The challenge, essentially, is to turn the current technology platforms into platforms for delivering innovation. This requires that the ETPs reach out beyond their original constituencies to embrace an even broader range of stakeholder groups, and in particular those on the demand side, such as public procurers, standardisation organisations and regulatory bodies. With user-driven and open innovation becoming the dominant paradigm, it is essential that the ETPs make building partnerships with users their top priority.

Why is Innovation so Problematic?

The barriers and obstacles to innovation are well documented. Generic barriers identified at the Conference included:

- Lack of access to finance for innovation;
- The intellectual property rights system in the EU is still costly and fragmented;
- Standardisation processes are not yet synchronised with research and market needs;
- Complex EU financing instruments deter innovative businesses from participating;
- Weak involvement of SMEs in research and innovation;
- Lack of innovation-friendly state aid rules
- Underuse of public procurement to buy innovative goods and services, whereby public authorities take on the role of "launch customers".

Overall, the transformation of ideas and knowledge into new products and services is slow in Europe.

Conference discussions emphasised, in particular, **the lack of focus on users**. Until now the supply and demand sides of the innovation equation have operated in isolation. End-users, designers, social entrepreneurs, regional and local innovators and policy-makers have been only weakly involved in policies or in the innovation process.

Demand-side factors, such as the impact of regulation, consumer behaviour, appropriate business models, etc., **can be both a driver and a barrier to innovation**. These aspects will be very important in the context of the societal challenges and should occupy a central place in the ETPs' strategic roadmaps and innovation agendas (see below). Regulators – in areas such as environment, health and pharmaceuticals - need a mindset that is prepared to embrace innovative solutions.

Standardisation was also emphasised. Standardisation processes inevitably take longer than the lifetime of an R&D project and standardisation issues (if any) should be addressed at an appropriate time, neither too early nor too late in the project lifetime. Projects need to be "standardisation minded", clearly allocating responsibilities for such issues. And Europe as a whole needs to be more proactive on the international stage. We should speak with one voice so as to increase the chances of European standards being taken up at international level, but also be open to adopting standards developed elsewhere when it is in our interests to do so.

Making a Success of Collaboration

Why should ETPs collaborate? Conference discussions suggested the rationale is threefold. Firstly, collaboration will enable industry and other stakeholders to **address societal challenges and global competitiveness in a holistic manner**, ensuring all viewpoints and all available expertise are taken into account. Secondly, collaboration **broadens the participants' agendas**, allowing ETPs to move beyond technology to address aspects such as education and skills, regulation, standardisation, public procurement, etc. Thirdly, progress on major societal challenges and this broader agenda requires **collaboration with a wider range of stakeholders**. At industry level, a whole value chain approach is needed (supplier-user collaboration), while at policy level there is a need to include stakeholders from Member States, NGOs, civil society, etc.

The collaborations envisaged comprise a clustering or networking of ETPs with relevant interests around specific societal challenges. The clusters should become the foci for activity in their fields, linking to and leveraging from relevant activities being undertaken through European, national and regional programmes and initiatives. They should embrace a market, rather than a supply chain, view and include specific measures to address and involve SMEs.

Although each case is different, participants considered that overall the route to collaboration was well defined. ETPs should:

- Link with all relevant stakeholders
- Identify common key issues (technological, non-technological)
- Be goal-driven, not process-driven
- Maintain individual ETP structures and develop effective interfaces
- Organise joint policy-maker and stakeholder interactions
- Manage expectations and strike a balance of benefits between the collaborating ETPs.

Expected results from such a process include:

- Concrete R&D projects and significant innovation actions delivering solutions to the challenges our society faces
- Boost, streamline, interconnect ongoing research activities under the FP
- Input to a broad range of policy-making processes.

The Conference heard many examples of existing or developing collaborations between ETPs. Other opportunities for clustering and collaboration were identified during the workshop sessions. Examples (from both categories) included:

- Collaboration between ETPs involved in Water & Sanitation Technology (WssTP), Sustainable Chemistry (SusChem), SmartGrids, and the Energy-Efficient Buildings PPP on issues such as: water and energy efficiency in agriculture and industry; development of improved technologies for wastewater treatment, reuse, and energy recovery; water- and energy-efficient buildings; and linking water and electricity grids.
- Collaboration between ETPs involved in Sustainable Chemistry (SusChem), Sustainable Mineral Resources (SMR) and Steel (ESTP) in relation to greener and more sustainable industrial processes and products.
- Collaboration between ERTRAC, EPoSS, and SmartGrids in relation to a common roadmap for electric vehicles, and more generally in terms of sustainable urban transport.
- Collaboration between ETPs involved in healthcare (IMI, Nanomedicine) and in various aspects of ICT (NESSI, EPoSS, Photonics21, ARTEMIS, eMobility, ENIAC) on new applications in eHealth.

In terms of **collaboration with national authorities**, key messages were:

- **Public authorities should set objectives and decide upon strategic orientations** as they are best placed to articulate the needs and priorities of a societal challenge-related R&I initiative. This will require new modes of cross-domain working by public authorities.
- **Participants should engage in a structured dialogue with a broader range of stakeholders**, focusing in particular on potential non-technological 'show stoppers'.
- **Research and innovation agendas or roadmaps should be developed** in close cooperation with clusters of ETPs.
- **ERANET+-type instruments** (with a variable geometry) are a potential means to effectively mobilise EU, national and local resources.
- **Research funding is just one of the possible instruments -** other instruments that are closer to the market should also be considered for implementing societal-challenge-related R&I initiatives.
- **EU-wide working groups should work on particular framework conditions**, such as the alignment of relevant legislation, standardisation and public procurement to encourage the uptake of new solutions in the market.

Regarding existing initiatives, the Conference acknowledged the importance of existing approaches, such as the PPPs, JTIs and LMIs, for research and innovation in Europe. Such initiatives can boost competitiveness and serve the needs of society. The need was stressed to safeguard industrial relevance and make innovation happen. Within the different initiatives, accountability and governance are important elements that have to be carefully addressed.

The Conference also backed the recommendations of the '*JTI Sherpas Report'*, for instance in relation to the simplification of procedures and processes.

The transition from a technology-focused ETP to a more societal-focused initiative requires an evolutionary approach, starting first with cross-ETP research & development before moving on to 'horizontal'/non-technological issues under a common Strategic Innovation Agenda.

Towards Strategic Innovation Agendas

European Technology Platforms, either individually or within the coming European Innovation Partnerships, need to **look beyond their traditional research agendas to develop Strategic Innovation Agendas (SIAs)**, setting out the specific innovation context for their domain. These should identify concrete actions to accelerate the commercialisation of products and services in their sectors by tackling regulatory barriers and skills gaps, speeding up the development and consolidation of standards, and encouraging the public procurement of innovative solutions. In short, the SRAs must make better linkages in ETP activities between research and innovation.

Issues to be addressed through the SIAs include:

- **Widening stakeholder engagement**, including ensuring a user perspective (as consumers, patients, students, citizens, etc) in ETP activities. Here it is important to have *the right stakeholders* involved at *the right time*: the configurations are not necessarily permanent.

- **Integration of new and existing technology** (as opposed to research) and **an open innovation approach**. This requires pre-competitive cooperation and supporting innovation simultaneously in key sectors throughout the value chain, so that new technologies and processes feed through into real-life solutions.

- **Moving from pilot implementations to large-scale deployments**. In several workshops the need for wide-scale demonstration was mentioned. Financial support for moving from pilot implementations to large-scale deployments is lacking, however. EU policy could help deliver business opportunity and a European framework to support mainstreaming within Member States. Models and practical support are also required to support service innovation. Such mechanisms would help bring down the costs of innovation for public authorities and other end-users.

- **Innovative business models** are required to reflect socio-economic impact of innovations. In societal applications, especially, the benefits fall to the state but business models are unlikely to emerge unless and until there is a direct model for investment in cost saving.

- **Communication and information** are important in building awareness of new products and services and their benefits among potential customers, as well as ensuring public acceptance of the technologies.

- **Education and skills** issues were widely mentioned and are an area on which many ETPs have already made progress. It was stressed that education and skills should be integral components of ETP activities as a key part of the knowledge triangle. A 'one size fits all' approach is not appropriate and ETPs should share experiences in order to: identify generic/transferable and specific skills; develop appropriate courses and funding approaches; as well as accreditation and recognition.

- **Facilitating collaboration: '**Collaboration' is often talked about but seldom recognised as a competence in itself. ETPs may need specialist support and facilitation in how best to collaborate and coordinate their activities in order to realise the opportunities available to them.

Setting the Framework

Issues for policy-makers in the EU and Member States within this agenda are:

- **Better and more responsive regulatory regime**, so as to ensure regulations stimulate rather than hinder innovations. Coherent regulations and policies are needed.

- **Simplification of rules and procedures**. The European system must be understandable to citizens and SMEs, so the architecture of programmes must be easier to navigate and to access. A Communication, presenting specific proposals on simplification, has recently been issued.

- **A simpler and more responsive IPR regime**, including a much-needed agreement on a single European patent. As noted above, this is a key aim under the Research & Innovation Strategy.

- **Invigorating public procurement**: Public procurers in Europe are not well networked and operate as if the single market did not exist. We need to create large European markets for innovative products and services by using public procurement based on common Europe-wide specifications. Transnational Public Procurement Networks setup by DG Enterprise (within the framework of the LMIs on protective textiles and sustainable construction) provide a potential model in this direction.

- **More flexible research and innovation funding:** Ensuring research and innovation funding is matched to the diverse range of circumstances and actors involved, from relatively small-scale activities within SMEs to large-scale rollouts of societal applications. This, too, is a key aim under the Research & Innovation Strategy.

In addition, EU support may be needed to create incentives for initial collaborations between ETPs (whether through formal or informal means); to help the initiatives reach critical mass (networking, support for large-scale implementation projects); foster the sustainability of ETP collaborations; and provide support for developing the innovation-type activities (such as involving new stakeholders) of the innovation agendas.

Introduction

The European Technology Platforms (ETPs) 2010 Conference, held in Brussels on 11-12 May, brought together around 450 representatives of national authorities, EU associations, academia, civil society and other stakeholders active in R&D and innovation. They discussed some of the major challenges facing our society, debated how ETPs can best contribute to their solution, and considered how the role of ETPs should evolve to enable them to do so. The Conference was organised by DG Research in collaboration with other Commission services.

ETP 2010 was an important milestone in the development of the Commission's *Europe 2020* strategy, which foresees a "re-focusing of R&D and innovation policy on the challenges facing our society". Under *Europe 2020*, the Commission is committed to developing strategic research and innovation agendas concentrating on tackling challenges such as energy security, sustainable transport, climate change and resource efficiency, health and ageing, and environmentally friendly production methods.

European Technology Platforms (ETPs) have an important role to play. They should be mobilised to contribute to this process, and encouraged to speed up the turning of research results into products and services and bringing them to market. Industry's incentive to do so is the new business opportunities that tackling societal challenges will open up.

The Conference was designed to build momentum for implementation by encouraging ETPs, Member States and other stakeholders to collaborate to this end. In particular, it was intended to help pave the way for the launch of European Research and Innovation Partnerships. The main aims were to:

- Engage ETPs in collaborating on key areas of common interest where R&D and innovation are needed to help tackle specific societal challenges;
- Encourage ETPs to extend their actions beyond R&D to also cover innovation and demand-side issues (especially regulations, standards and public procurement);
- Enable ETPs and national representatives to share views and experiences on objectives and measures to tackle specific societal challenges, including combining demand- and supply-side measures.

Participants explored opportunities for collaboration in twelve workshops. Each covered a ‘hot topic’ in the areas of Clean Energy, Health and Ageing, Transport, and Sustainable Consumption and Production, and examined both supply and demand-side issues. In four further workshops, participants exchanged experiences in clustering and collaboration, establishing public-private partnerships, working with national authorities, and addressing skills gaps. There were also addresses from the Commissioner for Research, Innovation & Science, the Spanish Presidency, and the chair of ITRE.

Opening Plenary

Chaired by Anneli Pauli, Deputy Director-General, DG Research, European Commission

Opening the Conference, Ms Pauli explained that the meeting had been considerably enlarged since last year, based on a good response from the October 2009 event. The aims were clear: for the ETPs to contribute to improved cooperation and collaboration at various policy levels. As initiatives involving public funding, the ETPs must deliver for Europe: taxpayers expect nothing less.

Juan Tomás Hernani Burzaco, Secretary-General for Innovation, Ministry for Science & Innovation (MICINN), Spain

Mr Hernani said it was a pleasure to open this very interesting conference session on working together on societal challenges. Spain is in the middle of a severe economic crisis, Mr Hernani explained, with company stocks and lines of credit under pressure. This particularly affects SMEs. We have to ask, what are the solutions to this crisis? Are we doing enough? And how do we adapt?

Governments in Spain and across Europe are working for the long term, he noted. Transformation does not happen overnight: it is the result of many individual decisions. Innovation and research play a huge role in this. The Commission had provided a new approach by appointing, for the first time, a Commissioner for Research, Innovation and Science, and the Spanish government had gone in a similar direction two years ago when it set up a Ministry for Research and Innovation.

Europe 2020 provides a new response to these challenges, including specific indicators of achievement. Mr Hernani stressed that we must ensure research is targeted on societal challenges and economic indicators. These challenges are shared and global. The European economies are clearly interconnected, which requires common objectives, co-development, and hence a shared approach to innovation. We will not get everything right first time. Failure of individual projects is acceptable but we must be oriented in the right direction.

The Spanish Presidency was pleased to have the context of a new Commission, Mr Hernani continued. It was a moment of huge opportunity. Spain has based its Presidency on the "three i's": Integration, Involvement and Inclusion. Five areas, in particular, were worthy of note. Firstly, the Innovation Union initiative was progressing rapidly and would provide a new look for European policy in this field. Secondly, the new public-private partnerships (PPPs) – an issue closely linked to the Conference – provided a huge opportunity for the public and private sectors to come together in realising new economic paradigms. The third issue was simplification, where the Commission had recently issued a Communication. Reform in this area was essential: the European system must be understandable to citizens and SMEs, so the architecture of programmes must be easier to navigate and to access. On "mobility of knowledge", the fourth issue, Mr Hernani said that the Presidency was working with the

Commission on proposals to make it easier for researchers to transfer their pensions and associated benefits from one country to another. Finally, the Presidency had ensured the research agenda addressed poverty and inclusion issues. A conference had been held, and gender and other inclusion issues are set to be a key part of Europe's research policy going forward.

Mr Hernani thanked the Commission for the invitation and wished the Conference every success.

Máire Geoghegan-Quinn, European Commissioner for Research, Innovation & Science

Ms Geoghegan-Quinn said she was delighted to be attending her first ETP conference and was looking forward to participating in many more. She thanked Secretary-General Hernani and the Spanish Presidency for their support for the event, which covered well the Presidency's three priorities of integration, involvement and inclusion. She also thanked Herbert Reul MEP, colleagues from national administrations, and the many representatives of ETPs in the audience.

The ETPs were continuing to incubate fresh ideas and approaches as the research and innovation landscape changes, the Commissioner noted. A growing number of ETPs were going beyond research agendas to develop what were often referred to as "innovation agendas". The conference would be hearing many examples of these.

Concretely, she said, more and more ETPs want to accelerate the commercialisation of products and services in their sectors by tackling regulatory barriers and skills gaps, speeding up the development and consolidation of standards, and encouraging the public procurement of innovative solutions. The talk was of "cross-cutting approaches" to connecting R&D — the supply-side — to such demand-side topics; or, in short, making better linkages in ETP activities between research and innovation. These efforts were very much headed in the right direction, the Commissioner believed.

As Research, Innovation and Science Commissioner, Ms Geoghegan-Quinn said she aimed to help create the conditions for a more dynamic Europe. A Europe where innovative firms want to do business, and where talented people want to live and work — an "i-conomy" based on vibrant innovation.

She said that one of the first tasks is to draw up a new Innovation Union initiative that sets out how the Commission intends to drive forward the research and innovation elements of *Europe 2020*. This Initiative will be ready in September, as the Heads of State and Government have decided to hold a special discussion on research and innovation at the autumn European Council. The fact that research and innovation are riding high in the political agenda is a sign of their growing importance for our economy and society.

Given the short timeframe, the Commission, she said, was moving rapidly to develop a robust, mutually supportive set of initiatives. Although many of the details were still in the pipeline, Ms Geoghegan-Quinn went on to outline the Innovation Union initiative's main features.

- **Research and innovation policies will be refocused on the major societal challenges** facing Europe and the world, such as climate change, energy and resource efficiency, health and ageing. These issues – and the overarching themes of the Conference – are top priorities for policy-makers and also present huge commercial opportunities.

- **A broad understanding of "innovation"**. The Commissioner said that we have to understand that innovation is more than research. It also embraces innovation in business models, management structures and processes, the delivery of services by the public sector, as well as innovation in design and marketing, and also social innovation — meaning innovation in, for example, working practices and community-building.

- **Breaking down barriers**: The Innovation Union initiative will aim to remove all major bottlenecks to the flow of knowledge and to the emergence of a "Single Market for Innovation". Specifically, it will give a vigorous push to reaching an agreement on an EU Patent. It will also propose measures to improve the mobility and careers of researchers, and expand mobility schemes for top talents and for entrepreneurs. "The circulation of brain-power is good for us all", the Commissioner noted. In addition, measures will be proposed to catalyse an increase in the public procurement of innovation, so as to create new opportunities for businesses and lead to better services for citizens.

- **Developing and optimising Europe's R&D performance** will be a further core feature of the initiative. It will include measures for developing world-class research infrastructures: everything from polar research vessels and bio-banks to particle accelerators and very large telescopes. And it should help put an end to the fragmentation of national research efforts and the wasteful duplication that this leads to.

The Innovation Union initiative will put great emphasis on financing the i-conomy. The Commissioner said there was a need to ensure that innovative companies, especially high-growth SMEs, get easier access to funding, and added that we must work harder on improving the cross-border provision of venture capital in conjunction with institutions such as the European Investment Bank.

The Commissioner emphasised that we must also make the best possible use of current instruments. The upcoming review of the Framework Programme will be an opportunity to tie it much more closely to the major societal challenges and ensure it has more leeway to fund innovation. Simplification was also an important aspect, and she stressed that the recent Communication on this subject, referred to by Mr Hernani, was a declaration of intent.

To help solve particular and urgent problems connected with specific challenges, she said that strategic partnerships are required, ambitious in scope and scale, that combine demand- and supply-side measures and weave together the many existing instruments already in play. There are already many such initiatives, such as the JTIs, the Joint Programming Initiatives, the Lead Market Initiative, the Knowledge & Innovation Communities (KICs) launched by the EIT, the public-private partnerships of the Recovery Plan, and the thematic priorities of the current and

future Framework Programmes. To tackle particular challenges effectively, these need to be gathered together, framed, and focused to maximum effect.

This idea had been taken up in the *Europe 2020* strategy, which called for "European Innovation Partnerships" involving the EU, the Member States, industry and all relevant stakeholders. The Commissioner emphasised that these Partnerships will not be yet another initiative, mechanism or instrument to run alongside existing ones. On the contrary, **they will be a framework for integrating whatever is relevant**. This offers a great opportunity to simplify actions and focus efforts on what is really important. The Innovation Union initiative will identify a first set of these Partnerships, the Commissioner added.

She said the Commission was currently taking soundings on how the Partnerships could operate and what the first set of topics could be. The ETP 2010 Conference was an important part of that process.

The Commissioner stressed that by moving in the direction of combining R&D with the smart use of demand-side tools such as public procurement and standardisation, ETPs will be in an excellent position to contribute to the Innovation Partnerships. This is a clear win-win situation, she said: new technologies, services and products and approaches are needed to meet Europe's major societal challenges, and their development will open up new markets for business.

Concluding, Ms Geoghegan-Quinn reminded the audience that the Conference was also an opportunity to meet people. She wished delegates “many serendipitous encounters!” and quoted the Irish poet and dramatist William Butler Yeats: "There are no strangers here; only friends you haven't yet met."

Herbert Reul MEP, Chair, ITRE Committee, European Parliament

The recently proposed *Europe2020* strategy rightly puts a strong emphasis on solid growth, noted Mr Reul, aiming for an economy based on knowledge and innovation in order to overcome the current economic and financial crises and to strengthen Europe's future added value.

He said that the EU’s innovation performance lags behind its main competitors: USA, Japan, and China. Europe urgently need a modified strategy on research and innovation that should focus on actions to improve access to finance for innovation and to push for better market conditions: the intellectual property rights system in the European Union is still costly and fragmented; the standardisation process is not yet synchronised with research and market needs; complex EU financing instruments deter innovative businesses from participating; weak involvement of SMEs in research and innovation; lack of innovation-friendly state aid rules and public procurement, etc. Especially, the transformation of ideas and knowledge in new products and services is slow in Europe.

The European Technology Platforms (ETPs), Mr Reul said, play an important role in this knowledge transfer by strengthening the links between industry and research. They provide a

common framework for technological development and innovation by bringing together stakeholders, reaching consensus on a common vision, and establishing a strategic research agenda.

Since 2003 more than 35 Platforms have been set up covering a wide range of technologies, such as ICT, environment, health, nanotechnologies, space, manufactures, textiles, photovoltaic, sustainable nuclear energy, etc. They aim to define medium to long-term research objectives and to develop roadmaps to achieve them by creating synergies between different research and innovation stakeholders fostering European competitiveness. In short, the ETPs have helped create a favourable climate for the development and implementation of innovative technologies.

Mr Reul highlighted another important element in the *Europe2020* strategy: the focus on "grand societal challenges", such as security of energy supply, ageing, climate change, health, etc. In addressing broader socio-economic challenges and going beyond mere technological needs, he stressed that ETPs play an important role in several European policy initiatives (such as the Lead Market Initiative, the SET Plan for energy technologies, and the ESFRI Roadmap for research infrastructures).

One of the flagships of *Europe2020* is developing an "Innovation Union" by setting up, amongst other things, European Innovation Partnerships geared towards these grand societal challenges. ETPs should play a major role in these Innovation Partnerships. But to be successful in this, it is vital, he emphasised, for the ETPs to keep developing themselves.

Mr Reul concluded by saying that if we want to overcome the economic crisis and to address the major societal challenges, we must focus on improving the efficiency, effectiveness and coherence of actions in research, technological development and innovation. The active cooperation of all actors is necessary, promoting synergies not only between R&D programmes on EU, national and regional levels, but also ensuring the alignment of research priorities between industry, academia and the public sector. The ETPs and their Strategic Research Agendas are vital for that.

Plenary Session: ETPs and Innovation

An Innovation Agenda

Françoise Le Bail, Deputy Director-General, DG Enterprise & Industry

Ms Le Bail said she wished to share her thinking on what "Innovation Agendas" would mean for European Technology Platforms. What should be their activities and who should drive these? And what could be the possible pitfalls?

The vision was to seamlessly integrate research and innovation policies in Europe. We need to make sure, she said, that the tools and policies help researchers, industry and policy makers to best use the opportunities of a changing Europe. This new approach of policy-making needs new types of partnerships and new combinations of policies. In short, we need a new approach, a sea-change, in order to live up to our ambitions and expectations for the Europe we want to live in. One only has to look at the EU's innovation performance to see why.

Ms Le Bail noted that the innovation performance of the EU-27 as a whole and of most Member States has improved in the last five years. The innovation performance of the 27 Member States varies greatly, but until the recent crisis there was a convergence towards a steadily growing average. However, the Innovation Scoreboard also shows that the pace of global competition is unrelenting. Although the innovation gap with respect to the US and Japan has been reduced over the past five years, the latest indications point to stagnation. Looking to China, with its rapid rate of relative improvement in its innovation performance, we can expect it to catch up with Europe within the next ten years.

Moreover, the crisis could affect the overall EU performance and the convergence trends. For instance, the 2009 Innobarometer showed that 23% of innovative firms had decreased their innovation expenditures as a direct result of the economic downturn.

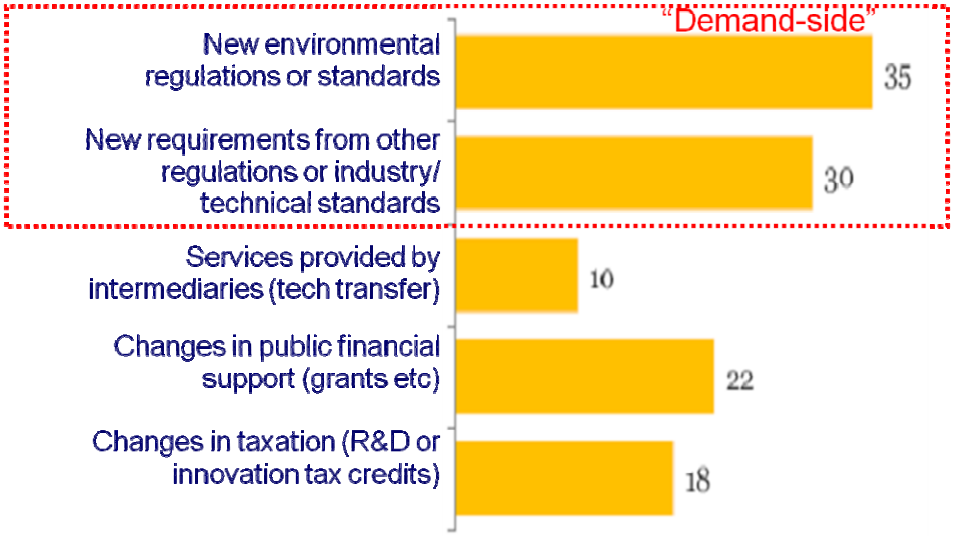
Mrs Le Bail said that the Innobarometer survey also showed that companies are very much aware of opportunities created by changes in society. Companies see societal challenges as offering clear opportunities for producing innovative goods and services, such as an increased demand for sustainable or energy-efficient products and services, new services for older consumers, and education and healthcare services.

How, then, can public policies create the right framework for companies to exit from the crisis?, Ms Le Bail asked. How can public policies equip companies, researchers and citizens to take the opportunities in our changing society? From the past, we know that supporting research and innovation are key to a more vigorous and lasting recovery and influence our growth patterns for the next decade. But we need to go one step further. Surveys show that regulation and standardisation have a big effect on entrepreneurs' willingness to invest in innovation, more so than support through funding and technology transfer.

She said that on this basis, we need to make better use of our policy tools. Their aim should be to get rapid deployment of research and innovations to the market and to address Europe's societal challenges. Both supply-side and demand-side innovation policy actions are required, on both EU and Member State level. Until now these have launched in isolation. And policies

have only weakly involved society: end-users, designers, social entrepreneurs, regional and local innovators and policy makers.

Figure 1: Responses to Question: "What policies have had a positive effect on innovation in your company?"



Source: Innobarometer Study, 2009

How can we put this in practice? Ms Le Bail asked. Firstly, Europe must look to build **new types of partnerships** to achieve its policy goals. For example, the forthcoming Innovation Union initiative will announce a major new partnership with the European Investment Bank to improve access to finance for innovating companies. Secondly, the "European Innovation Partnerships" where the Commissioner explicitly asked ETPs to get involved. Indeed, she said, we have to pool resources to tackle main societal challenges that no Member State can address alone.

Thirdly, the future role of technology platforms and innovation agendas. In its excellent report, the Expert Group on European Technology Platforms, chaired by Horst Soboll, proposed some very interesting future directions for ETPs. One of these was to re-orient ETPs towards the market uptake of technologies. "Is it time for technology platforms to develop a new type of partnership around innovation agendas?", Ms Le Bail asked. "Time to combine the search for new knowledge with the application of existing knowledge, bringing in actions for researchers, public procurers, standardisation experts, and regulators?"

These actions are called "demand-side innovation policies". At the European level, the Lead Market Initiative (LMI), launched in 2007, was the first big initiative in demand-side innovation policy. The experiences of the LMI show there are many opportunities to apply these policies to sectors. Smart combinations of funding with demand-side actions could speed up time-to-market even more.

At least 10 ETPs have been involved in LMI activities, including the sustainable construction ETP, the SusChem ETP and the Textiles and Clothing ETP. Ms Le Bail added that their

involvement and drive had greatly contributed to the implementation and visibility of the Lead Market Initiative. These and other ETPs had already set up specific tasks and/or workings groups to address framework conditions. Examples were: education and training, standards, and intellectual property. In the future, this work could, perhaps, be consolidated into **"strategic innovation agendas".**

Ms Le Bail offered the following examples of how actions on regulation, standardisation and public procurement could speed up time-to-market.

- **Making regulation more innovation-friendly** is a big challenge. The actual regulatory process takes many years. The Lead Market Initiative for bio-based products, for instance, has encountered at least seven separate packages of legislation in the last 12 months. They ranged from landfill legislation to eco-labelling. These could all hamper or support the uptake of new bio-based products, such as bioplastics to the market. But more often, the barriers are in the application of regulation at national, regional and local levels. There is huge fragmentation in implementation. Some regulatory agencies are SME-friendly and use electronic submission tools – we need to mainstream these best practices.

- **For standardisation,** we need to improve the standardisation processes in Europe. We must find ways to speed up the development of standards for rapidly moving technologies. At international level, Europe has to take the lead in standards development. The more that international standards can be adopted at European level — and vice-versa —, the better we support worldwide market access by European industry. Ms Le Bail said that we need to ensure that standards are well-known and barriers for their effective use are removed, so they are actually used by public and private users — such as procurers and SMEs. We should also consider incorporating more standardisation activities in EU funding programmes and improve links between researchers and standardisation experts so as to facilitate "smart standards".

- Next to standardisation and legislation, **public procurement** has untapped potential to stimulate the development of innovative products and services. Each year in Europe, 17% of GDP, meaning 2000 billion euro, is spent through public procurement. The predominant public purchasing culture is still too risk-averse. A third of companies say that low cost is still far more important than innovation. Maybe that is one of the reasons why nearly two-thirds of companies do not bother offering any innovation at all in their application! This means, she said, that the public sector is missing out on innovations, and, in the end, so do we as citizens.

Ms Le Bail added that public procurers are still very much operating as if the single market did not exist, and suggested that we need to create large European markets for innovative products and services by using public procurement based on common Europe-wide specifications. She noted that DG Enterprise has set up three trans-national public procurement networks within the framework of the LMI in areas such as protective textiles and sustainable construction, and added that these will be looking into defining common technical specifications and best practices for public procurement. From experiences in the

United States, she said, we also know that public procurement policies can support innovative SMEs in particular.

In venturing into areas like regulation and standards, Ms Le Bail acknowledged that many researchers, whether in academic organisations or in companies, would be "outside their comfort zone". This was also uncharted territory for many funding agencies and innovation policy-makers. She urged delegates to make new connections with colleagues in other ministries, in environmental agencies, and with public procurers, outside of typical funding schemes. The Commission would offer help and support to make these new connections and networks.

In concluding, Ms Le Bail wished the Conference well in defining future priorities for the actions of ETPs, for policy makers and for all other stakeholders present at the meeting.

Speeding Up Time-to-Market

ETP Panel moderated by Horst Soboll, Chair, ETP Expert Group

Introducing the session, Mr Soboll noted that the ETPs had started out as discussion platforms for stakeholders to generate common research agendas and decide how to implement them. We are living in very different times, he said. Innovation is key. Last year's meeting had recognised the need to link ETP activities to the market for two reasons: serving citizens and meeting business needs. This year's event would continue and intensify these discussions.

Mr Soboll then introduced the panellists as representatives of the ETP community. Each made a short presentation on their experiences and hurdles in reaching out to the market.

Peter Schintlmeister, of the Austrian Federal Ministry of Economy, Family and Youth, spoke on behalf of the Ad-hoc Advisory Group for the LMI for Bio-based Products. The Group's report, produced in November 2009 and available online[1], outlines measures to promote the market introduction of innovative bio-based products. It includes over forty recommendations for overcoming barriers to innovation in the sector.

Bio-based is a broad sector, embracing both biochemical products (bio-plastics/bio-polymers, bio-surfactants, bio-solvents, bio-lubricants, and chemical building blocks) and enzymes (technical enzymes, food enzymes, and animal feed enzymes). These may be produced either from feedstocks (such as cereal crops, oilseed, and waste) or raw materials (such as starch, sugars, proteins, oils and fats, etc.). Similarly, there is a diverse range of stakeholders.

There were three important messages delegates should take away. Firstly, regulations related to bio-based carbon are necessary. The US has taken the lead here and has had a central website for relevant legislation for many years. Secondly, we need to encourage authorities to promote bio-innovation through public procurement. Many authorities are not networked and

[1] See:
http://ec.europa.eu/enterprise/sectors/biotechnology/files/docs/bio_based_from_promise_to_market_en.pdf

remain to be convinced to accept bio-based products. Thirdly, as Ms Le Bail had indicated, we need to develop clear international standards.

Bio-based products can make an important contribution to green growth. This is not just a matter of making products bio-degradable so they have less impact on the environment. Rather it is about making the whole economy and society more sustainable.

Francesco Marchi spoke on behalf of the ETPs for the Future of Textiles & Clothing and for Industrial Safety. His presentation focused on the lessons learned from the Protective Textiles and Clothing LMI. The initiative has produced a strategy and roadmap, both available online[2]. Moving from a technology-focused ETP to the more societal-focused LMI had involved a three-stage approach, each with its own actors and policies. Under the first stage, cross-ETP research and development had been started, initially through a cluster within FP7 and later leveraging national activities through ERA-NETS. Projects were linked to the LMI roadmap.

The second stage focused on public procurement. An assessment of the state-of-the-art in Europe showed that innovation in protective textiles was not stimulated or encouraged. Public procurers do not network or exchange knowledge. A project called ENPROTEX was set up to address this problem. Also addressed at this stage were standardisation (better coordination with CEN) and stakeholder networking (aiming to mobilise industry).

Concluding, Mr Marchi said Europe's post-R&D innovation performance needed to be improved. A better balance between R&D and innovation was essential. This, in turn, required more R&D follow-up support and demand-side measures.

Laila Gide, of THALES, described experiences from the ARTEMIS ETP. Standards and standardisation are essential for innovation, Dr Gide explained. They provide public reassurance, enhance competition, and act as a market accelerator. But for embedded systems, the markets, technologies and research are fragmented, with many different committees, contributing communities, and standardisation bodies.

ARTEMIS identified the importance of standardisation and regulation early on and referred to them specifically in the Strategic Research Agenda published in 2006. Subsequently, the ProSE Support Action was funded as a means to help realise the ARTEMIS objectives. It has helped respond to the needs of the fragmented and fast-evolving markets for embedded systems and fostered cross-domain synergies. A separate Strategic Agenda for Standardisation was developed so as to ensure standards activities were of high value. The ProSE project aims to link existing bodies. Its activities include gap analysis, mediating between stakeholders, developing a roadmap, and promotion.

Many things have been learnt from the ProSE experience. Firstly, the need for "cycle matching". Standardisation processes take longer than the lifetime of an R&D project and standardisation issues (if any) should be addressed by the end. The momentum for

[2] See http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/protective-textiles/index_en.htm

standardisation is often initiated by the wrong entities, either too early or too late in the project's lifetime.

Secondly, projects need to be "standardisation minded". Executives are not aware of the issues, and marketing people not involved. No dedicated departments deal with standardisation and the content and context of standards are often misunderstood. Companies and projects need to prioritise and a mediator like ProSE can help.

Third, perseverance is essential. People promoting standards need better visibility and more stamina, to nurse key competencies, and to find smart ways for funding non-R&D activities.

The fourth panellist was **Rainer Fischer**, Administrative Co-ordinator of the FP6 project Pharma-Planta. This project was concerned with recombinant pharmaceuticals from plants for human health. It aimed, among other objectives, to take molecular farming beyond proof-of-concept and develop a candidate product (HIV antibody) for phase I clinical evaluation, and to develop a process for the manufacture of a plant-derived recombinant pharmaceutical product.

The project achieved virtually all of its objectives but encountered many hurdles along the way. It was an uneasy marriage between an R&D project (broad focus, knowledge-oriented, relatively relaxed specifications, limited funding) applied to pharmaceutical development (narrow focus, product-oriented, relatively tight specifications, more and better-targeted funds). European regulatory bodies were unprepared for dealing with academic partnerships and were inconsistent in terms of fees and level of commitment. Finally, the GMP infrastructure[3] was very expensive to develop and large companies were not interested. Eventually Fraunhofer itself provided the additional investment. The project would not have been successful without this.

Discussion

The Chair thanked the Panel for their presentations. Do we need new stakeholders, or new types of incentives or support, he asked?

The Bio-based Products LMI had four ETPs contributing, Mr Schintlmeister explained. ETPs acting alone would not have been able to cover such a heterogeneous field. Certainly, we have to look for the right stakeholders, he said, but these need not be permanent configurations – better to have the right people involved at the right time. Mr Marchi said the Protective Textiles LMI experience had opened his eyes to the importance of involving the whole value chain. This was essential in building mutual understanding. Each ETP is unique – this is a challenge but also an opportunity. We need to ensure SMEs find access to finance, whatever the sector, otherwise research will be wasted. Ms Gide cautioned about imposing further tasks on the JTIs. They already have focused agendas and cannot take on any more. Mr Fischer stressed that we need to find new funding instruments. In the US there were lots of funding instruments available, through both public and private sources. Non-funding instruments were also required, Mr Soboll added.

[3] GMP refers to the Good Manufacturing Practice Regulations promulgated by the US Food and Drug Administration

A questioner asked whether international standards required better coordination. Mr Fischer thought they did. Europe was just one regulatory regime; there was little harmonisation with the FDA, and Japan was different again. Mr Marchi expressed the view that Europe needed to speak with one voice so as to increase the chances of European standards being taken up at international level. China and other emerging economies are looking to take the best international standards wherever they are developed. Mr Schintlmeister added that the reverse was also true. Europe should not be so reluctant to take over standards developed in the US or elsewhere if they can help drive the market. "We should give up the search for perfection for the sake of workability", he said.

A CEN representative drew attention to CEN/CENELEC workshops. These are projects with standards as deliverables. They should be used much more as a means of fast-tracking standards.

Another participant asked how we could create a mindset for innovation, so as to ensure we have people to work on these ideas. Mr Schintlmeister replied that we had to incentivise risk-taking and to make people aware that technology is the only solution for a sustainable future. In the Bio-based LMI, the partners are working on building market awareness because if they do not share their ideas with the outside world, there will be no market.

Drawing the session to a close, Mr Soboll asked the panel what would be their highest priority for completing the innovation chain. Their replies were: Ms Gide "to work together"; Mr Marchi to "better understand each other"; Mr Fischer to "move funding to clinical trials"; and Mr Schintlmeister to "avoid fragmentation and talk to each other". The Chair thanked all the panellists for their contributions.

Keynote Address

The Long Tail of Innovation — Challenges and Opportunities

Ardo Reinsalu, CEO, Curonia Research OÜ

Curonia Research is an SME involved in start-ups and technology ventures. Hence, Mr Reinsalu was well placed to offer an entrepreneur's view on innovation and growth.

The rate of technological change is exponential, Mr Reinsalu noted. In the next ten years we will achieve more than in the last century, and in the next century we will achieve more than in the last 20,000 years. Innovation cycles are getting shorter, but public funding cycles remain the same, observed Mr Reinsalu. In the Framework Programme, an application can take at least one year to be funded – is this good for Europe? Patenting is another example. Obtaining a patent "takes forever". How else can we protect our IP and should we even try? The clothing industry, for example, hardly bothers with IP protection, they just come out with new designs every six months.

The world is changing faster than ever before, yet we are still thinking the way we did ten years ago. So we have to shift up a gear and respond faster. The best companies adapt very quickly to technology and market signals. Asia is very good at this and companies have exceptional speed to market and with high quality too.

As an example of how practices can become ingrained, Mr Reinsalu quoted the story of five monkeys in a cage. At the top of the cage was a banana attached to a shower. The monkeys were able to climb to reach the banana but if they pulled it they would be sprinkled with cold water. The monkeys learnt not to take the banana because they did not like getting wet. Gradually each of the monkeys was replaced, one by one, until there were five new monkeys in the cage. None of the monkeys had ever gotten wet but they too did not reach for the banana because they inherited the group's norms and behaviour. "Aren't we, too, like the monkeys", Mr Reinsalu asked, "saying 'It's always been done this way in this cage'?"

There were many exciting opportunities ahead, Mr Reinsalu suggested. In energy, the system has been wedded to huge centralised power stations that are expensive to build and often situated well away from where the power is needed. People are starting to think about new, decentralised approaches such as wind farms and energy harvesting. Bill Gates has talked about "innovating to zero" in energy and we need to change to make this happen.

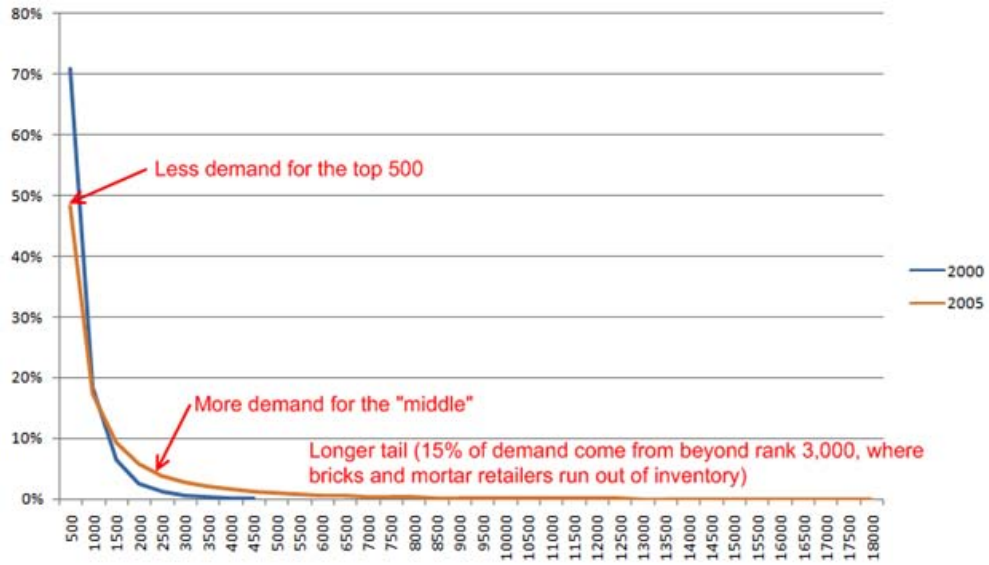
When we think about transport, can it make sense for us to all drive alone in cars with four or five seats, just because we have always done it that way? This model works for industry because the internal combustion engine is very complicated and it does not cost much more to make a large car than to make a small one. Electric vehicles, by comparison, are less sophisticated so it will be easier to make cheaper, simpler vehicles and bring them to market quickly.

Turning to healthcare, Mr Reinsalu noted that the system requires massive investment and massive sales, yet on average pharmaceutical companies launch just one drug per year. Advances in ICT, nano-technologies and genomics now allow more personalised approaches to

medical treatment. Contact lenses, implants, and bacteria can all be used to deliver drugs. Customer segments are becoming smaller and smaller. These personalised treatments are already a reality, for instance reinjecting blood plasma.

All of these are examples of the phenomenon known as 'the long tail'. Originally applied by the author Chris Anderson to media and online retailing (see www.longtail.com), in fact the concept of a long tail of demand applies to all areas of business within the global, networked world. In essence, **the long tail is about extracting additional value from existing inventory and products**. In the offline, mass market world, only the most-appealing or most-recent products can be promoted vigorously, and hence these become the top selling. But this ignores the potential of the long tail of existing products that people do not know about, and the store cannot even stock. The internet environment, with its unlimited inventory and universal reach, unleashes this potential. Long tail items are more profitable for suppliers because people actually want to buy them and there are no promotional or price pressures.

Figure 2: The Long Tail as Illustrated by Sales of DVD Titles



Source: www.longtail.com

We need to stop talking about mass production and think more in terms of market requirements. Short-tail mass production is not disappearing, but long-tail innovation is where the growth is. This innovation need not be radical: often it will be about adapting a product or service for a new market, or finding a new business model, rather than starting from scratch.

Such innovation requires a flexible response: it is an ideal opportunity for SMEs and large companies acting like SMEs. It could lead, Mr Reinsalu concluded, to a "big bang for SMEs". "We need new stars and galaxies who will take our technology development to a totally new level."

WORKSHOP TRACK A: CLEAN ENERGY

Session A1: Low-Carbon Energy Technologies — Social Dialogue

Session Organiser: Martin Huemer, DG Research, European Commission

Session Chair and Moderator: Rob P. Kool, NL Agency

Session Rapporteur: Simone Landolina, EUREC Agency and RHC-Platform

1. Scope and Objectives

The transition to a sustainable energy system has been identified as one of the main societal challenges of the next decades. To reach this goal, the availability of clean and affordable energy technologies, going far beyond the current state of the art is indispensable. The Strategic Energy Technology Plan (SET Plan) addresses this challenge by mobilising all relevant European stakeholders to enable or facilitate the development of clean energy technologies.

However, the availability of technology is only part of the picture. Successful deployment of technologies also has to take into account users and those affected by the technology. Lack of awareness and acceptance, for example, may constitute important barriers to dissemination. Furthermore, the increasing complexity of energy systems, linking together many different distributed generators and millions of users of very different scales, requires more and more interaction between producers and consumers.

The dialogue among energy-related European Technology Platforms (ETPs) and with civil society was at the heart of this workshop. The main aim was to favour the exchange of experiences and lessons learned to address awareness / acceptance problems of energy technologies.

2. Presentations

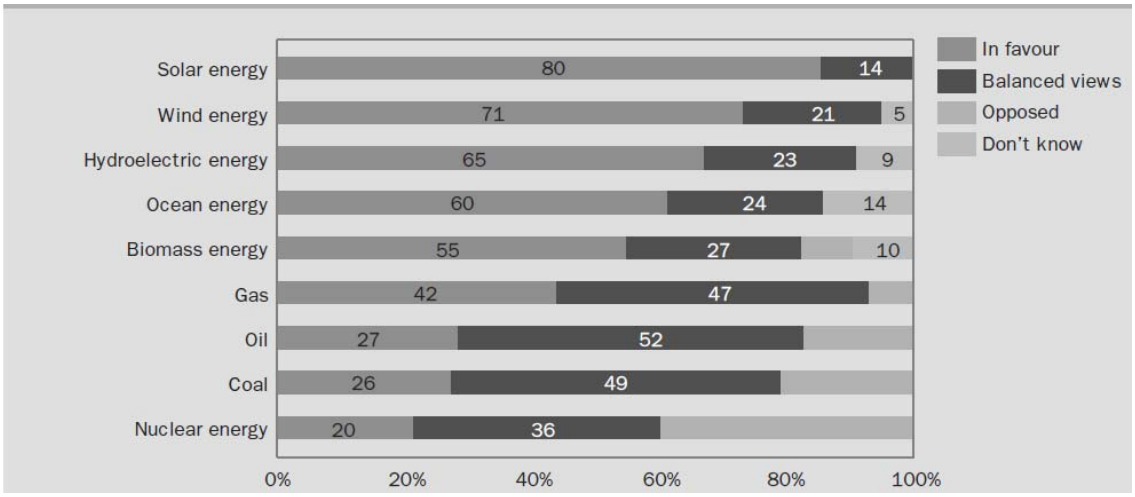
2.1 Wind Energy Development: Societal Benefits and Challenges

Lise Backer – VESTAS / WindTP

The first speaker of this session presented the experience of the wind energy industry on tackling social acceptance and public opinion towards this renewable energy technology.

Wind energy, being a clean and renewable energy source in a global context of increasing social concerns about climate change and energy supply, is traditionally linked to very strong and stable levels of public support. Recent empirical evidence at both the EU and the country level was provided to support the assumption that renewable energy sources are already highly accepted if compared with nuclear or fossil fuels (see Figure 3).

Figure 3 – General Attitudes Towards Energy Sources in the EU



Source: European Commission, Special Eurobarometer 262 (2007)

Nevertheless, the largely favourable public support for the technology of wind power is not always matched by an equivalent level of "community acceptance" of specific wind projects at local level. Ms. Backer presented three categories of factors affecting the public perception of wind farms and other energy installations:

- Psycho-social factors, such as knowledge, general attitude and familiarity;
- Perceptions of physical and environment factors, which are related to the technical characteristics of the technology;
- Social and institutional factors, governing the interaction between the technology and the hosting community, such as planning and level of engagement.

The recipe for successfully overcoming eventual resistance to wind energy installations is always a complex one; however it is certainly based on proper communication and information strategies. It includes effective long-term spatial planning and good siting strategies, and relies on the involvement of the local community in the project.

2.2 Meeting the Social Dialogue Issues Faced in Radioactive Waste Management

Torsten Eng – SKB

The second speaker of this session covered the issue of long-term management of radioactive waste and presented a successful experience of siting a deep repository for the final disposal of spent nuclear fuel.

Based on the experience of several decades of applied research, the Technology Platform on Implementing Geological Disposal of Radioactive Waste (IGD-TP) is today working to build confidence in deep geological disposal as the most appropriate solution for long-term management of spent radioactive fuel. Mr Eng explained how siting of such a special and potentially controversial facility as a deep repository for nuclear waste is a very singular project. It is critical to feed the public and political debate related to the safety of deep geological repositories with factual scientific data.

In two successful siting case studies in Finland and Sweden, social and political challenges were addressed by prioritizing the dialogue with local communities to share the extensive scientific

and engineering work underpinning the conclusion that "geological disposal is technically feasible and safe".

2.3 Winning the Customer – the Case of Smart Homes & Energy Demand Response

Philip Lewis – VaasaETT

Shifting consumers' patterns of energy consumption was the focus of the third presentation of this session. "Respond 2010", a research project by VaasaETT in collaboration with EEE Ltd, is looking at how energy usage behaviour can be controlled, modified and incentivised through advanced services that include feedback, education, smart home automation, advanced pricing, and marketing (or some combination of these).

Talking about the factors preventing smart meters to be widely deployed, Dr Lewis insisted on the importance of involving energy consumers in any new technological solution. Cost-effectiveness is also a key driver for the adoption of innovative energy technologies; however their perceived value is closely dependent on customers' awareness of the associated benefits.

2.4 The Social Platform on Sustainable Lifestyles

Satu Lähteenoja – UNEP / Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production

For sustainable development to pass from a conceptual idea to an operational reality, requires not only a shift in the energy technologies we use but also the transition to a decision-making process where choices for actions are made differently.

In the last speech of the session Ms Lähteenoja presented the concept of "sustainable lifestyle": a balance between basic material standards, meeting basic needs, and non-material aspects of welfare. To be sustainable, lifestyles have to turn towards low resources use, including the key resource of energy. For this change to happen, technology is important but individual preferences and social choices are dominant. Civil society organisations such as the "Civil Society Platform on Sustainable Consumption and Production" (CSO) can play an important role by ensuring the involvement in the process of all relevant stakeholders.

3. Key Issues and Discussion

Sustainable energy production and use is by no doubts one of the so-called "grand societal challenges" that Europe faces at present. It is widely recognised that the energy sector may have a negative influence on the environment. All the processes involved in the whole energy chain (raw material procurement, conversion to electricity/heating and energy use) generate externalities affecting the environment. Although low-carbon energy sources produce significantly lower environmental impacts than the conventional alternatives, experience with the deployment of clean and renewable energy installations in the EU shows that social acceptance of these technologies is not only related to the attitude of the relevant stakeholders and policy-makers, but it is crucially connected to the acceptance of specific projects at the local level.

According to the experience of the panellists, it would be a mistake interpreting public attitudes towards energy facilities as merely influenced by the characteristics of the technology, without properly considering how the implementation of the technology is part of a socio-technical system that interacts with the local community, the local environment, the key stakeholders and the project developers. Whether the proposed installation is a wind farm or a deep repository for radioactive waste, the siting strategy has a critical influence on its acceptance by concerned individuals, local population and key stakeholders.

The importance of positive interaction between energy producers and consumers is reinforced by the fact that technology is experienced as an innovation that may or may not fit in with preferred ways of life. The change towards a more sustainable lifestyle is therefore a cross-cutting priority for all energy technologies. Low-carbon energy researchers and industrialists' engagement with civil society organisations is an essential condition for implementing the long-term behavioural changes which would make sustainable the entire energy scenario.

4. Conclusions and Next Steps

Achieving the transition towards a post-carbon society is one of the most important challenges to modern society. Measures from both the supply and the demand side are needed to address these challenges. Finding solutions requires not only a shift in technologies, but also a shift in consumers' behaviour.

Energy-related European Technology Platforms have proven successful in identifying scientific research priorities and deployment roadmaps for the respective technologies. However, deeper involvement of final energy users is now a condition for the transition to a sustainable energy scenario.

Cross-cutting dialogue among ETPs can potentially provide this kind of integrated solutions which are sought for by civil society. Increasingly, energy consumers are looking not for answers to specific technical problems, but for systemic approach and answers to large-scale issues. Successfully to meet these expectations means shifting the focus of ETPs' activities from the energy technologies to the energy systems, including the full range of diverse users and stakeholders.

Session A2: Interconnecting the Water and Energy Cycles

Session Organiser: Environment Directorate, DG Research, European Commission

Session Chair and/or Moderator: Steve Kaye, Anglian Water Services Ltd

Session Rapporteur: Panagiotis Balabanis, Environmental Technologies & Pollution Prevention Unit, Environment Directorate, DG Research

1. Scope and Objectives

Water and energy linkages have recently received increasing attention by scientists and policy makers for several reasons. First of all, interconnecting the water and energy cycles presents opportunities for fast and cost-effective reductions in emissions and energy consumption. At the same time, it provides an opportunity for a more integrated approach to climate and energy policy that could combat climate change and increase energy security. Finally, it provides opportunities for technological investments in the water sector, thus increasing the competitiveness of the water industry.

The overall scope of this workshop was to increase awareness about the importance of linking the water and energy cycles and to discuss related research and innovation challenges in the context of the various European Technology Platforms (ETPs), as well as, possibilities for synergies.

2. Presentations

The workshop included key note presentations on the main water/energy challenges and related experiences in some industrial sectors, followed by an open discussion between the speakers and the audience.

In opening the session, **Steve Kaye, Research and Innovation Manager at Anglia Water Services Ltd**, gave a general introduction on the preliminary work of a dedicated Task Force on Water and Energy (TF) that was established in the context of Water and Sanitation Technology Platform (WssTP) and stressed that the establishment of this TF demonstrates the importance WssTP gives on those issues.

Linking water and energy was necessary for a paradigm shift in the European Water Industry (supply and sanitation), energy reduction and security of renewable energy sources, meeting the European carbon reduction targets (80% by 2050), minimising impact to environment, maintaining public health, and meeting quality standards of current legislation.

The TF produced a first roadmap which puts emphasis on five research pillars: energy efficient water treatment and supply; energy neutral/positive wastewater treatment; water and energy tools and systems; water and energy efficiency in homes; and water and energy in industry. This roadmap is expected to be finalised in July and a report indicating research opportunities and gaps was foreseen by the end of 2010. Therefore this workshop was an opportunity to

exchange views and experiences with other interested stakeholder and benefit from the discussion for providing a consolidated report.

In concluding his presentation, Steve Kaye argued for a more holistic approach between the various sectors, while at the same time he acknowledged the complexity in considering issues like regulations, business models, etc. in addition to technology development and in managing a complex setting of various sectors and stakeholders.

Karen Hussey, Research Fellow at Crawford School of Economics and Government, Australian National University gave a presentation entitled "*Interconnecting the water and energy cycles: identifying and exploiting the synergies".* This presentation was based on the outcomes of a workshop for a preparatory COST action on water and energy that took place in the begging of 2009. COST has been focussed in four key areas: energy consumption in the urban water supply chain; water demands in the energy sector (traditional and renewable); water and energy for food security (including bio-energy generation) and water and energy demands in other industrial sectors (i.e. chemical production, paper, transport, mining, beverages, etc.). COST brought together different stakeholders and provided policy recommendations on the basis of 12 case studies.

In highlighting the rationale in linking water and energy, Karen Hussey indicated that water is an integral element of energy resource development and utilization, it is used in energy-resource extraction, refining and processing, and transportation, and it is an integral part of electric-power generation (directly in hydroelectric generation and indirectly for cooling and emissions scrubbing in thermoelectric generation). Moreover, she noted that the development of alternative energy supplies, such as biofuels, and the proliferation of hydro and nuclear power, will place even greater strain on water resources.

Karen Hussey stressed the need of exploiting synergies in policies and investment decisions and the need of developing appropriate regulatory, economic and social frameworks that will encourage uptake of existing technologies, and encourage new innovations. She pointed out that the goal is to identify and implement synergistic policies and technologies and to avoid conflicting policies in water and energy, and/or in knock-on sectors such as food. She also remarked that although energy demand and water management are very important issues in the context of climate change, up to now the climate change debate has been monopolised and dominated by the carbon agenda and this needed to change. She finally discussed the role of innovation, emphasising that we know little about how innovation is affected by regulation and the role of financial incentives either by markets or by governments in stimulating innovation.

Harald Schneider, Vice President of the European Federation of National Associations of Drinking Water Suppliers and Waste Water Services (EUREAU) and CEO Innsbruck Utilities, gave a presentation on "*Water and energy: challenges for the water utilities*". In his introduction he presented figures on the world water situation, which shows that only a limited amount of the global freshwater resources is easily available, and he pointed out that the global primary energy demand will increase by 45% until 2030. Water and energy resources were therefore under huge pressure and the production of more energy increases water requirements and vice versa.

He also highlighted the interconnection and dependencies between, water, energy and climate, stressing in particular the role of consumers (rising consumer demands are driving the demand for energy and climate change) and the pressure climate change is putting on water supply, and he insisted on the need to develop integrated approaches.

Then he emphasised the overall water/energy challenges for the water utilities. They need to: optimize their production and distribution processes and improve their infrastructure; develop best practices in close collaboration with the agriculture and industry and accelerate interdisciplinary collaboration; and communicate and increase awareness about the water/energy linkages with their customers

Stefano Carosio, D'Appolonia, Chairman of the ad-hoc industrial advisory group of the Energy-efficient Building Public-Private Partnership (EeB PPP) gave a presentation on '*The Perspective from Energy Efficient Construction*'. EeB PPP was launched under the European Economic Recovery Plan to address the challenge of researching new methods and technologies to reduce the energy footprint and CO2 emissions related to new and renovated building.

The multi-annual roadmap developed in the context of EeB PPP has the three pillars: the adoption of an integrated/systemic approach, considering both the global and local challenges, as well as technological and non-technological issues; working at district level; and focusing in geographical areas with similar climatic characteristics (geoclusters). While the emphasis of the roadmap was given in delivering short term solutions, long term research is not ignored. The methodology used for the identification of the various research priorities based on a large involvement of related professional associations and other stakeholders, consultation with related ETPs, Joint Technology Initiatives and related Lead Market initiatives.

Water and energy issues have been considered in several research priorities at both the individual building and district/communities level, i.e. systems and equipment for energy use, design/integration of new solutions, energy management systems, labelling and standardisation, interaction between buildings, grid and heat network. In this context, specific efforts should be devoted to space heating and hot domestic water, which represent the largest part of energy use in buildings today. There is a need to design reliable, scalable and cost-effective solutions for solar hot water and electricity production in buildings (e.g. multi housing or social housing stock). And there are some logical links between those priorities and the integration of technologies and approached at the district level, in both residential and commercial areas. Work in EeB PPP shows that current patents' trends reveal constant industrial interest and innovations in this area and the analysis of scientific publications reveals increasing S&T activity trends too. In addition to the technological issues, non-technological ones, especially user behaviour and interactions, had also to be considered. Cooperation has been already established with WssTP as regards water heating issues and possibilities for synergies with other platforms were also welcomed.

3. Key issues & Discussion

During the discussion the following points were in particular raised:

The non-technological aspects of water energy linkages, such as impact of regulation, consumer's behaviour, appropriate business models, etc. was considered very important in the definition of strategic roadmaps and research agendas. The TF of WssTP is fully aware about this and intends to enlarge the expertise of the group and consultations to reflect better those issues in the consolidated report to be produced at the end of the year.

Energy needs differ in the various regions. It is therefore important to consider these challenges and know more about energy use in the various regions. Indeed the work of the TF of WssTP reveals that information and data on this issue are missing.

Linking water and energy research present also **an opportunity for international cooperation**. In fact during the discussion it was argued that implementing and assessing the potential of new solutions from the beginning might be easier in developing countries, since companies in developed countries are a bit reluctant to change their practices due to the current structure of the energy market sector.

The capacity of water for energy storage, the potential for synergies with the electric power industry, the use of more renewable technologies instead of water for energy production and the need of knowledge transfer and dissemination of good practice in linking water and energy have been also pointed out during the discussion. The extraction and use of energy from the wastewater treatment plants in Denmark has been considered as a good example to reduce energy demand and it was argued that such measures should be further supported.

As regards links with the electricity power industry, the discussion revealed the need to explore further synergies between WssTP and the SmartGrids Technology platform, especially as regards smart metering. Smart metering can help to increase consumers' awareness about water and energy linkages. However, the introduction of simple metering in water use, in combination with the introduction of appropriate water pricing would already make significant reduction in water use.

The discussion has also revealed that in dealing with water and energy issues, the development of new technologies was not a panacea. In several cases better application of existing technologies and management strategies and the combination of technological and non-technological options could provide appropriate solutions (i.e. the combinations of desalination, dams and water trade helped Australia to deal with water use in agriculture and face the problem of water scarcity).

Finally, the role of information and communication technologies (ICT) as components in reducing both waste of energy and water was noted. In this context, information on a related opened FP7 call for proposals under the ICT programme for pilot actions on energy and water efficiency in social housing was provided.

4. Conclusions and Next Steps

The workshop concluded that research on water and energy interactions has the potential to provide solutions to problems associated to the major societal challenges identified at EU level

(e.g. combating climate change, resource and energy efficiency, etc.), support innovation, and promote a more sustainable growth and competitive economy.

Water utilities realise the benefits and opportunities in developing products and services that reduce water and energy demands. In doing that, they should optimize their production and distribution processes and improve their infrastructure, develop best practices and increase awareness by communicating better with their customers. Therefore, linking water and energy has the potential to mobilise a wide range of stakeholders and policy makers and provides incentives for major and fast technological investments in the water sector. The latter is very important in order to reach the proposed EU greenhouse emission reduction targets by 2050.

Legislation, appropriate institutional and financial tools and mechanisms, awareness, communication, participation and education, are essential drivers in helping to bring water and energy issues together and strengthen synergies and in helping the uptake of appropriate technologies. Water and energy links seem to be poorly understood in the regulatory framework and this should be better investigated. In addition, research on how government and industry can best manage energy-water interactions and exploit synergies, and on the development of appropriate regulatory, economic and social frameworks that will encourage uptake of existing technologies and innovation, should receive proper attention in the definition of appropriate research agendas.

The workshop highlighted the importance several ETPs and PPPs (e.g. WssTP, SusChem, SmartGrids, EeB PPP, etc.) are giving on water and energy issues and made clear that this area provides opportunities for more synergies between them and opens new possibilities for research and innovation. The preliminary technology roadmap of the WssTP provides a good framework for defining a common research agenda. Areas which should be further explored include: water and energy efficiency in agriculture and different industrial sectors (e.g. chemicals and biorefineries); development of improved technologies for wastewater treatment, reuse, and energy recovery; water in the context of energy efficient buildings; and linking water and electricity grids. However, to help create conditions for a more dynamic and innovative Europe, attention should also be given to non-technological issues and bottlenecks that hamper research and innovation. To this end, a more systematic interaction with other non-water related industries, venture capitalists, policy makers, regulators and consumers should be ensured.

Session A3: Greening Industrial Processes

Session Organiser: Charlotte Andersdotter, DG Research, European Commission

Session Chair: Dr Gernot Klotz, Executive Director, Research and Innovation, CEFIC / Sustainable Chemistry ETP

Session Rapporteur: Mary Todd Bergman, INTRASOFT International S.A.

1. Scope and Objectives

The world's basic industries, such as chemistry (including bio-based), steel and mining, supply the roots for smart and sustainable growth. As they all depend on water, energy and raw materials, cooperation and alignment throughout the value chain is essential. The supply of these resources is diminishing and society is calling for the swift delivery of sustainable solutions. The need to improve or establish more efficient production processes and resource-consumption patterns has therefore become pressing. A paradigm shift that will impact the entire value chain is vital if we are to reach these objectives. Achieving this goal and maintaining the EU's global competitiveness are key to ensuring Europe's success over the coming decades.

The purpose of this workshop was to discuss challenges and opportunities in order to identify potential joint initiatives between the EU, Member States and European Technology Platforms (ETPs). Participants discussed how industry could collaborate to solve societal challenges and capture opportunities to find ways of guaranteeing sustainable growth in the basic industries, which are characterised by high and long-term investment with long pay-back times.

2. Presentations

Following the opening remarks of the Chair, DG Enterprise and Industry representative **Didier Herbert** spoke about 'Elements for a sustainable industrial policy'. He highlighted the challenge of combining ambitious climate change objectives with strong industrial competitiveness, and urged the presenters to clarify how policymakers could remove obstacles to meet energy-efficiency benchmarks.

Mr Herbert stressed that the European Commission is supporting the transition of industry to greater energy and resource efficiency; reducing the transaction costs of doing business in Europe; improving access to the Single Market and the international market; supporting the transition to more effective recycling; and improving the way in which European standards are set in order to ensure the long-term competitiveness of European industry. He also stressed the need for confidence in the reliability and coherence of policies to ensure private investment.

Dr Peter Nagler, a member of the SusChem (Sustainable Chemistry ETP) Board, delivered the keynote speech: 'Which Evolution Does the Chemical Industry Target?' He highlighted the strategic steps undertaken by the chemical industry towards implementing sustainable

solutions for the challenges facing society. He underlined the importance of taking a 'value-chain' approach that addresses the need to improve the resource efficiency of materials used in all sectors. Indeed, developments in the chemical industry impact both manufacturers and consumers.

Dr Nagler noted how urgent it is to swiftly address the scarcity and security of supply of many resources such as feedstock, energy and water. As an example he elaborated on 'water as a resource'; here, there is clear upcoming competition between food production, urban and industrial manufacturing. The bioeconomy for example, he pointed out, will not happen without solving the water challenge. Working together on technology, innovation and proof-of-concept in public-private partnerships (PPP), also addressing non-technology barriers, is required to tackle these societal challenges.

Dr Nagler indicated that SusChem is ready to take the lead in cooperation between the chemical industry and other sectors, which is vital to improving this situation. Together with the Water Sanitation and Supply ETP (WssTP), SusChem has begun to develop a roadmap that will result in a new approach to water use along the value chain. Similar initiatives are underway for sustainable production and manufacturing as well as for new sustainable materials. These are expected to contribute substantially to finding solutions in the areas of mobility, solar energy, construction and environmental protection.

Dr Nagler also stressed the importance of education and re-training the workforce; these topics are already on the SusChem agenda. He concluded that speed is of the essence, and that PPPs must address innovation at various stages of the value chain simultaneously in order to expedite real-life uptake of research results.

Mr Bertrand de Lamberterie, Secretary-General of the European Steel Technology Platform (ESTEP), presented a talk on 'Resource-efficient steel production'. He outlined how the steel industry can offer low-carbon solutions in diverse areas of production and application. The ESTEP's roadmap addresses the need for resource-efficient production, particularly in terms of recycling iron. The platform is concerned with water usage, as there is an urgent need to 'close the loop' and improve water intake and discharge in steel processes. ESTEP is working with an informal network of material producers to ensure that the next Framework Programme includes support for innovation in the energy-intensive industries (EIIs). Mr de Lamberterie highlighted the partnership between public and private steel companies in the project 'Ultra-low CO_2 steelmaking', which is planning two demonstration projects in the next few years.

Mr Henryk Karas, Chairman of the High-Level Group of the Sustainable Mining Resources ETP, spoke on 'The contribution of research and technological development to address the sustainable use of natural resources and strategic raw materials'. The main challenge facing this sector is the mandate to reduce the environmental impacts of mining while meeting the rising demands for raw materials, in the face of dwindling European mineral deposits. Since all manufacturing relies on raw materials, it is imperative that Europe's mineral supply be secured; there is a need for innovative extraction techniques and intelligent mining as well as for other measures to be taken beyond the scope of the ETPs. Mr Karas explained that improving the recycling and reuse of materials in the EU will help keep the increasing demand for minerals in check.

Mining is another water-intensive industry, and the ETP Sustainable Mineral Resources (SMR) has prioritised the development of a Seventh Framework Programme (FP7) research and demonstration project of best practices for water-management systems. Mining and construction share similar problems and challenges, and SMR welcomes opportunities to work with other ETPs to resolve specific technological challenges. Mr Karas spoke about the 'Mine of the Future' concept, a potential PPP to be undertaken with ETP Manufuture.

3. Key Issues and Discussion

'The production industries, including mining, steel manufacture and chemical production, are the roots of the European welfare and economy,' explained Dr Klotz, who chaired the session. “Without this strong European basis, the greening of economy in and from Europe is impossible. The energy revolution will not happen without mining, and greening will not happen without chemical materials and processes. We have to look at our resources in an intelligent way.”

Even if approaches or specific interests varied from one sector to another, the session identified some crucial common needs.

The **urgency of action** on the societal challenges is of the same level as the financial crisis, only the urgency is less visible for all in our daily life. Greening of the economy requires a vast exploitation of innovation, quickly. Speed is thus a key aspect that must be integrated in our policies and initiatives, considering also the need for EU competitiveness.

A major theme of the workshop, addressed by all presenters, was the need for **integration** of new and existing technologies that will lead to real-life solutions This can be done by embracing pre-competitive cooperation and initiating and supporting innovation simultaneously in key sectors throughout the value chain so that new technologies and processes can be in place within the next 10 years. All speakers welcomed opportunities to work with ETPs in other sectors, driven and measured by added value and output.

The speakers mentioned several **barriers to innovation** such as a lack of complementarity between policies within the EU and between the EU and the Member States. Demonstration and proof-of-concept projects are fundamental for bringing new ideas to market so that society, and not just a few individuals, can benefit. Industry needs an EU Innovation policy with improved access to risk capital, incentives for the rejuvenation of existing manufacturing processes and supportive state aid rules that support innovation. Benchmarks should be set for innovation policies based on 'best in class' in EU Member States and abroad (e.g. US, India, China). This would help ensure both the sustainability and competitiveness of European industry.

Education and training are pressing concerns for the advanced technologies used by these industries. If we want to change the way we act, we need to change the way we educate our youth in order to provide them with the appropriate skills.

4. Conclusions and Next Steps

It was recommended that the **three industry technology platforms each come up with three priorities for future PPPs** (including those already made in the presentations) that will be open to collaboration with other ETPs. The priorities could serve as useful inputs for the remaining FP7 period and for the shaping of FP8. In the very short term, it is important to define PPPs that take an 'open innovation' approach to defining strategic options for tackling serious societal challenges. Industries also need to **outline their education and training needs** and identify how best to address them. It would be advisable for ETPs to review their balance to ensure that all parts of the knowledge triangle, including academia, are appropriately represented.

The participants strongly recommended integrating policies within the European institutions and between the EU and Member States. They were strongly in favour of devoting 30% of the next Framework Programme to innovation to complement the support for basic research. They agreed that there needs to be a clear distinction between research and innovation (e.g. distinct policies and instruments); this requires a review of the suitability (and possible adjustment) of the funding instruments and of the criteria for selection of innovative projects and PPPs.

WORKSHOP TRACK B: TRANSPORT

Session B1: Smaller Footprints - Decarbonisation of the Transportation of Passengers and Goods

Session Chair: András Siegler, Director, DG Research, European Commission

Session Moderator: Joachim Szodruch, DLR/ACARE ETP

Session Rapporteur: Mike McDonald, University of Southampton & Odile Arbeit de Chalendar, INRETS

1. Scope and Objectives

Transport plays a significant economic role in Europe and represents 7% of the GDP and 5% of employment. At the same time it is a significant contributor to global warming and contributes 19% of greenhouse gas emissions. Overall, transport must contribute to the development of a sustainable and inclusive future for Europe and substantial targets have been set to reduce greenhouse gas emissions, congestion and fuel dependency. This session focused on the decarbonisation of transport with a particular emphasis on electrification and the many related initiatives. The modal ETP presentations were intended to highlight current and potential cross-platform relationships.

2. Presentations

2.1 Sustainable Logistics in Europe (Wando Bouvé, EIRAC Chairman)

Freight movements will grow and sustainable initiatives must be capable of coping with growth. Goods movement already costs the EC an estimated USD 650 billion per year.

At present, the process of movement of goods is considered a logistics chain in which both goods and information are passed from one handling situation to the next in sequence. However, the concept may be improved by thinking in terms of 'a logistics circle' with IT at the centre. This further introduces the concept of 'synchro-modality' - enabling goods to be moved more flexibly between shippers in a way which will move the present load factors of 45% of capacity to a higher level of some 70%.

Several research and organisational opportunities were described, including the use of single documentation for all modes. A key issue was identified as the need for clear standards relating to CO_2 and NO_x so that unambiguous carbon comparisons could be made between alternative transport decisions. The need to cooperate/coordinate across Technology Platforms was emphasised and a suggestion to rebadged EIRAC as 'Earth Friendly Logistics' was made.

2.2 Sustainable Transport: Innovation Challenges for the Maritime Supply Chain (Govert Hamers, Waterborne Chairman)

In 2007, maritime transport contributed 3.5% of worldwide CO_2 emissions. The ETP has identified a series of improvements in sustainability in the three areas of economy, society and ecology. However, a balanced approach to carbon reduction is needed and NO_x is already reducing substantially as a result of Tier II (2011) and Tier III (2016) requirements, with regional restrictions such as those in the Baltic, North Sea and English Channel.

Some sustainability actions such as the reductions in vibration and noise thresholds also provide ecological benefits to sea mammals as a positive side effect. However, an example was given which indicated the approach to carbon reduction should be based on energy management, not power management. In the short to medium turn, gas engines will become more prevalent with the possibility of fuel cells in the long term. Several cross-cutting issues were identified and new approaches to old industries will be required.

2.3 Smaller Footprints: Decarbonisation of the Transport of Passengers and Goods (Wolfgang Steiger, ERTRAC Chairman)

About three-quarters of the projected worldwide increase in oil demand from 2006 to 2030 will come from transport. Decarbonisation is a major social challenge which can be addressed by a systems approach.

The systems approach adopted by ERTRAC has the four enabling perspectives/technology sets of vehicle, infrastructure, logistics and mobility services. These have been focused on the three transport applications of urban mobility, transport infrastructure and long distance transport. The roadmaps for these three applications will be delivered at TRA in June.

A key example of electrification was presented with related R&D topics and the links to three other ETPs. A timeline for delivery with milestones was also given. Other examples which particularly required multi-platform activities were co-modality of logistics, integrated information and services for the user, integrated networks management, and cooperation and business models.

Substantial consideration was given to the conclusions. The needs to reform industrial supply chains, processes and manufacturing, and to develop new skills and attract competences were seen as crucial to the future competitiveness of Europe. The remaining conclusions were presented under the headings of “Political” or “Instruments”. The main thrust of these was the need for efficient research, innovation and market uptake. No new instruments were considered to be needed, but specific improvements were identified.

2.4 Standards-helping to Translate Innovation into Market Success: Two Topical Examples (John Ketchell, Director, Innovation CEN-CENELEC)

An overview of the structure of standardisation bodies and their roles and responsibilities was presented. The potential for rapid action was noted and two examples of current activity presented.

The first example was that relating to electric vehicles. With a clear mandate and close links with the innovators, the process will take less than a year (May 2010 to March 2011). The rapid pace of parallel development internationally requires such a swift development if problems of interoperability are to be avoided. The second example, of energy consumption and greenhouse gas emissions, is necessary to quantify energy use for baseline understandings, to measure performance, and to set goals and assess the level of their achievement. This is a longer, three-year activity which began in 2008 and the full involvement of the research community is an issue.

The key message was that standards can be developed very rapidly if there is a well defined mandate and a close relationship with the innovators.

2.5 Joáchim Szodruch, Co-Chair of the Aeronautics ETP

Joáchim Szodruch, who was moderator to the Session, gave a brief introduction to air transport issues and vision as an introduction to the session discussion.

Whilst aviation fuel represents only 2% direct contribution to climate change, its overall impact is estimated to be between 3% and 8% because 40% of its use is above the tropopause. A cut of 50% of CO2 emissions is required of air transport by 2050 from the 2005 levels and it is estimated by IATA that growth in aircraft emissions will be carbon neutral by 2020, with 1.6% annual reductions thereafter.

Main lines of research relate to the aircraft, air traffic management, operations and alternative fuels. At the operational level, formation flying and in-flight refuelling could save 40% of CO_2 emissions.

The need for an innovative culture (including education and young professional learning and adequate research infrastructure) was identified, with a multi stakeholder approach and coordinated actions.

3. Key Issues and Discussion

This is one of the three related transport workshops, largely with the same attendees and with similar issues and discussion points raised. Therefore, the list of issues below overlaps with similar points in all three sessions:

i) Clear standards are required for CO_2 (and other pollutant) measurements and estimation in order that carbon reduction decisions can be made effectively and consistently. The standardisation process is in hand, but requires the full cooperation of researchers.

ii) More generally, it was agreed that standards could be developed rapidly, but linkages between the standardisation bodies and the innovators would need to start at an early stage.

iii) The role of regulation to drive reductions in emissions was noted.

iv) For several modes, and road in particular, the need for fundamental reform of the industrial supply chain and manufacturing processes was emphasised. This would require new skills and training approaches.

v) All the JTEs highlighted the need for cross-platform cooperation and several cases were identified where this had occurred.

vi) An area of considerable concern related to the application of the funding instruments. The exponential pace of development of technology and market opportunities requires that funding should be delivered more rapidly, have a reduced administrative burden, and allow greater flexibility of direction to take advantage of opportunities as they arise. No new instruments were considered to be needed, but the existing ones should be reviewed and applied more flexibly.

vii) Joint Technology Initiatives with joint programming was discussed and some platforms identified the need for more cooperation between platforms.

viii) The potential for greater use of Industrial Advisory Groups was discussed and generally seen as being positive.

ix) Information was noted as being the key for all services for travellers and goods and for effective use of new technology. A case was made for a horizontal activity which reflected this.

4. Conclusions and Next Steps

i) ERTRAC will publish key roadmaps and milestones for three application areas at TRA in June.

ii) The current EC review of funding processes to make them quicker and less burdensome is welcome, but there was some concern that the changes may not be sufficient.

iii) Multimodal issues may require increasing cooperation and coordination between platforms. However, ETPs stressed the need to preserve existing ETPs to sole mode-specific issues at an appropriate level.

iv) ACARE announced that it would invite other transport-related ETPs to a workshop on co-modality in autumn 2010.

Session B2: Mobility - The Door-To-Door Strategy

Session Chair: Thierry Van de Pyl, Director, DG Information Society & Media, European Commission

Session Moderator: Santiago Kraiselburd, Zaragoza Logistics Centre/EIRAC

Session Rapporteur: Mike McDonald, University of Southampton & Odile Arbeit de Chalendar, INRETS

1. Scope and Objectives

Congestion costs Europe 1% of its GDP and in urban areas, transport is responsible for some 40% of the CO_2 produced and 20% overall.

A sustainable future for urban areas will involve behavioural change and innovations in technology will both enable and support such changes if applied in a structured and systematic way. The aim of this session was to focus on the ETPs' systems approach to the provision and use of infrastructure, the use of information and communications technologies (including traffic management services), provision of and support for sustainable modal opportunities, and the development of enabling business models.

2. Presentations

There were four presentations dealing with vision, innovation and policy issues, public transport operations, the role of Smart Systems, and urban mobility issues more generally.

2.1 Socio-Economic, Spatial Development Aspects, Innovation and Deployment (Sylvain Haon, Executive Director of Polis and ERTRAC)

The provision of mobility is essential for social and economic viability of cities, whilst meeting sustainability objectives will require strong integration between modes and networks. The vision of seamless travel is a particular urban problem because of increasing ageing urban populations with more new migrants, the scarcity of public funding and increasing costs of public transport. However, cities exhibit very different characteristics and solutions will need to reflect local conditions. A multi-faceted systems approach will provide the innovations at a European level which can be used to address a variety of city needs.

Areas which were particularly highlighted in the presentation included the economic consequences of achieving sustainability in urban areas and the need to increase efficiency with a wide range of activities, from better planning to the management of demand. Cleaner vehicles and innovative solutions would give more options to city authorities with new solutions focused on the movement of people. One problem is the discrepancy between those investments which produce outcomes which are readily visible to the population and, hence, have great political significance and structural investments which may have a low profile or remain invisible.

Active deployment to test innovative solutions, with incentives for such tests perhaps involving local industrial clusters, would support local political decision-making and give a clearer role for local authorities. Specific areas of research include better cost-benefit analysis, procurement processes, and the best way to introduce research and innovation into a complex urban environment.

2.2 What are the Research, Innovation and Deployment Problems that need to be Solved to Achieve an Energy Efficient Urban Mobility? (Yves Amsler, UITP, ERRAC)

The potentially huge sustainability advantages of public transport and "soft" modes were identified for dense urban areas. However, it was also noted that in many cities such modes are not user friendly and lack political support. The difficulties of providing for the complex movement patterns in urban areas means that there is no simple solution.

A list of problems associated with the provision of better urban public transport centred on the characteristics of large number of stakeholders involved. The complexities have led to a lack of EU tools and funding, as it is easier to focus on single modes/systems for innovation. A lack of relevant expertise at city levels reduces the potential for innovation, and there are often difficulties in identifying the benefits of new solutions in a multi-stakeholder environment where different elements of the transport system have very different life spans. Overall, new solutions are essential, but this will require new approaches to procurement, which will in turn need time, money and cultural/language changes when considering urban public transport.

2.3 European Technology Platform on Smart Systems Integration (EPoSS). (Günter Lugert, Chairman of Executive Board, EPoSS)

The EPoSS approach was described and examples given, including automotive. Global trends were presented which predicted increases in the vehicle fleet and in freight (ton/km) by a factor of three from 2000 to 2050. The accelerating trend of urbanisation with more than half the world population living in cities with growing problems of scarcity of resources, security and the environment. Results of a survey showed transport to be the main driver for competitiveness.

The importance of networking was highlighted with reference to the electric vehicle initiative, with the many technology challenges and a common roadmap. (ERTRAC, EPoSS, SmartGrids)

Recommendations for a PPP Green Car Initiative in FP8 were presented with a case for big Strategic Industrial Research Projects with complementary EU and MS funding. This was presented in the context of FP7 instruments. A crucial view from industry was given of current public funded R&D processes. The three main areas of criticism were the administrative burden, the proposal and evaluation processes, and resource and money efficiency. This aspect of the presentation was the focus of a significant part of the Workshop discussion.

2.4 Urban Mobility: The Door-to-Door Strategy (George Giannopoulos, Hellenic Institute of Transport)

The complexities of door-to-door urban mobility were introduced with an emphasis on the increasing numbers of people who will be mobility impaired. Urban mobility was placed in the context of various European actions and activities including those of ECTRI.

Examples of current research on urban mobility were given which identified innovation in the areas of intelligent urban mobility management and traffic control, transport planning and traffic information, public transport navigation and information systems, and personalised and accessible transport.

It was noted that technological innovation is crucial, but will address only part of the transport problem and we will need to address many other issues to reach a sustainable urban transport future. Also, the modal structure of ETPs should remain, but cross-ETP working is essential with common guidelines.

3. Key Issues and Discussion

i) In Europe, the degree of urbanisation is increasing. Urban areas are a focus for migrants and suffer growing financial problems which impact on the provision of transport infrastructure and services. The increasing costs of energy and the need to reduce carbon footprints add to the problems of developing a sustainable solution.

ii) The vision of seamless door-to-door transport in urban areas has been clearly defined, but a problem of its delivery remains. Transport in a city involves multiple stakeholders with very different objectives, systems/services, and competences. It is a very difficult environment in which to introduce innovation, particularly as technology will form only part of any comprehensive future transport system.

iii) Cities can be very different in character and development and there is no single transport solution which will fit all. However, a systems approach, including the integration of Smart Systems, can form a framework for transport solutions at a city level as well as at an individual application level such as the introduction of electric vehicles. Public transport will remain the main mode of transport in dense urban areas, but new ways need to be developed to enable multimodal/public transport innovations to be implemented. It was suggested that city authorities could act as catalysts, but the role of the EC would need to be strengthened.

iv) The transport ETPs are modal in nature, whilst many urban problems can only be addressed in a multimodal manner. Whilst it was generally agreed that this structure should remain in place, the need for increased cross-ETP activity was identified. This should be done in a very structured way using specialists in the science/art of coordination to develop a more effective outcome.

v) Considerable support was given to the need to develop better understanding of users/customers. Such understandings are currently often rather superficial, and could lead not only to better services, but also indicate the innovative services and systems which themselves may induce more sustainable behavioural change. Innovators need to understand that decision processes may not always appear rational to an independent observer.

vi) The identity of someone involved in multimodal activities is rather poorly understood by those outside the work area, as is the subject itself. It does not have the same clarity and impact as say the job of a vehicle designer. This is a problem of image which can effect political decisions and support for the activity.

vii) Training at levels and over a wide range of stakeholders is inadequate for current and future challenges, in which greater innovation is essential. It was noted that the lack of trained staff often reduces the effectiveness of current urban systems.

viii) The present funding instruments were generally considered to be adequate, but need regular review. The detailed administrative burden and costs of the processes of funding R&D projects by the EU needs revision to make it more effective in an era of rapid market and technology changes.

ix) Much larger PPP projects (€100m each), linked to member states funding are needed to take forward innovations. Clear roadmaps and milestones will be needed to drive the projects forward. These could be supplemented by small, more flexible research and development focused projects which could respond to new opportunities more effectively.

x) A “low hanging fruit” was identified as that of addressing city governance to try to overcome some of the multi stakeholder issues and lack of competences.

4. Conclusions and Next Steps

i) New funding and administrative processes are needed to support large-scale applications of innovative systems and services (such as the electric vehicle) and to provide the flexibility for smaller projects and companies to be successful. These should be clear for FP8.

ii) Appropriate cross-ETP links should be pursued in a more structured way.

iii) Much more needs to be known about users.

iv) Ways need to be found to support individual cities at a European level.

Session B3: Making Transport Safer and More Secure

Session Chair: Jean-Eric Paquet, Director, DG MOVE, European Commission

Session Moderator: Jesús Monclús, CDTI

Session Rapporteur: Mike McDonald, University of Southampton & Odile Arbeit de Chalendar, INRETS

1. Scope and Objectives

A white paper on transport policy will be completed by the end of the year. IT will use a defining vision for 2050 to work back to 2020 horizon. The focus will be sustainable transport with the three components of TEN-T transport networks, an integrated and effective funding framework and a transport technology plan.

The session addressed safety and security across all modes of transport.

2. Presentations

2.1 Waterborne Technology Platform: Safety and Security (Pierre Besse, Waterborne Vice Chairman)

Six challenges and assets were identified, two of which were considered in more detail. The first was very large ships and offshore structures in which four areas of research are needed. The second dealt with arctic conditions and included new tools for ice-structure strength assessment, large icebreaking merchant ships, offshore platforms in ice, and accident risk management.

Implementation activities included recommendations on PPPs and national research agendas and the process of developing the roadmap. The twelve Waterborne Technology outcomes were listed and the seven which related to safety and security introduce din more depth. These were the low risk ship, the autonomous ship, designs for short sea operations, the European cruise ship, energy transport in extreme conditions, intelligent integrated transport network and intermodal waterways.

The presentation concluded with the identification of shared safety and security concerns with the Air ETP, including human factor issues for crews and others. Cooperation over databases and improved inspection systems were also considered to be important.

2.2 Air Transport Safety (Dominique Chatrenet, Airbus)

This presentation included a comprehensive review of air transport accidents by aircraft type and accident categories, the lessons learned and future challenges. Fatalities per million departures have fallen substantially with each successive generation of jet aircraft. In the last 10 years the number of fatal accidents per million flight cycles is 0.10 for fourth generation aircraft compared with 6.92 for first generation aircraft. Two thirds of the full loss accidents to

fourth generation aircraft are runway excursion and controlled flight into terrain and 85% involve human performance issues, although air transport accidents are very rare in total. The implementation of technology has reduced accidents and increased survivability and continued investment is necessary. In view of the human element in accidents, a coherent approach to cockpit technology and training technology is needed. Particular challenges are to improve navigation provision, to address loss of situation awareness, and assisting the crew in decision making at crucial times.

Security requires a comprehensive view, as risk depends on the weakest link in the long global security chain which was presented. Multi-partner networking is essential, and there are many potential innovations in both security and communication systems.

A particular challenge with air transport is risk management (public and political risk) and the management of public expectation as a zero accident target is worthwhile, but not achievable.

2.3 Working Together to Improve Road Transport Safety and Security (Nevio di Guisto (Fiat Research Centre/Ertra – presented by David Storer)

The EU target for reducing fatalities is being substantially met. However, whilst fatalities have been falling, the reduction in absolute numbers of accidents and number of injury accidents has fallen at a much lower rate. ERTRAC has set a target of a 60% reduction in severe injuries and fatalities by 2030 and a 70% reduction in loss in freight transport (theft and damage). At the same time, long term growth trends in mobility demands are predicted with many complicating factors such as the ageing population, evolution of vehicle types and economic conditions.

Research will include safety of low carbon vehicles, with increased knowledge needed in several areas, including driver behaviour. On the vehicle, advanced driver assistance/support systems and automated systems with improved safety. Infrastructure must be improved so that there are no surprises for the driver and which is by design forgiving in the event of an accident. Standards are needed for cooperative systems, together with large-scale pilot tests and appropriate business models. Systems to safeguard freight operations are needed. ERTRAC is working with several ETPs and other groups to address the various safety and security issues. An integrated approach is essential with R&D priorities shared by several ETPs and a clear need to remove bottlenecks to implement and to identify market uptake policies.

2.4 R & D & I for Safety and Security of Road Transport (Risto Kulmala, VTT)

This presentation described the eSafety Forum activities and R & D & I topics and personal views on research needs. The range of eSafety RTD topics included vehicle cooperation, digitalisation of road infrastructure, cooperative systems, supervised autonomous driving, measures to influence driver behaviour, and vulnerable road users. Packages and bundles of measures/technologies need to be understood and business models developed. Improved accident database which include in-vehicle systems will support subsequent enhancements. Reliability, security and privacy issues still need to be addressed for some in-vehicle systems.

Personal views on innovation needs included nano-simulation, proactive traffic management, innovative procurement and understanding behavioural adaptation and risk compensation. Road transport safety is a complex issue and requires the involvement of many disciplines.

3. Key Issues and Discussion

i) Human factors in the vehicle/vessel/aircraft control loop are a cross-cutting issue and are one area for further ETP cooperation. Behavioural adaptation is a related issue.

ii) Innovative ways of bringing down the costs for public authorities and others are needed in order that they can be encouraged to invest more. Member States are generally insufficiently focused on innovation.

iii) New expertise is essential in order to enable market take up. This includes new training opportunities and schemes for those involved in all aspects of the development, manufacturing and operation of new technologies. New skills and understandings are also needed for implementation and pre-procurement measures have to be taken into consideration.

iv) Risk management is a key area and techniques researched and developed in the Waterborne ETP could have wider value.

v) SMEs in particular have low success rates in bids and processes must be changed if the promotion of SMEs is a real target.

vi) Large-scale pilot schemes are needed to support major innovations, particularly in road transport.

vii) Many aspects of safety and security are linked, particularly in multimodal applications, and user friendly technologies are needed.

4. Conclusions and Next Steps

In addition to the conclusions and next steps identified in Sections 2 and 3 above, regular review of funding procedures was identified as being important to ensure their continued effectiveness. Four areas in particular were noted:

i) Large-scale pilots to prove the technical and market potential of key innovations.

ii) Support for SMEs in an innovative and flexible way which takes better account of their resourcing and operating practices.

iii) Develop practical mechanisms to involve Member States more in innovation at European level.

iv) Generate market take-up with innovative business models so that available funds are focused and not dispersed.

WORKSHOP TRACK C: SUSTAINABLE CONSUMPTION & PRODUCTION

Session C1: Towards a Zero-Waste Society

Session Organiser: Szilvia Németh, DG Research, European Commission

Session Chair and/or Moderator: Lene Lange, Aalborg University

Session Rapporteur: Markku Karlsson, Biofuels TP, UPM-Kymmen

1. Scope and Objectives

The following general remarks were set for the discussions:

- Research and innovation must be cross-sectoral creating new Knowledge and Competitiveness – this should become a reality.
- Close collaboration across all the disciplines is a pre-requisite.
- Innovation process must seamlessly include also demonstrations and implementations.
- The 'owner of the problem' must be included / integrated in the activities.

2. Presentations

1. The Organic Technology Platform initiative: **Cristina Micheloni**, Associazione Italiana per l'Agricoltura Biologica

2. Food for Life ETP: **Ulf Sonesson**, Vice-Director, Sustainable Food Production; SIK (Swedish Institute for Food and Biotechnology) - excused

3. SusChem ETP: **Marcel Wubbolts**, DSM White Biotechnology B.V.

3. Key Issues and Discussion

Key issues raised by the presentations were waste, sustainability and regulations, and R&D and innovation lines.

3.1. Waste utilisation

- Utilisation of waste is not a problem. The huge market for waste processing technologies can put EU on the global competitive edge, which means, that waste is a problem AND a solution at the same time.
    - RTD and innovation targets and policies should focus on the 'waste-free' society

- Integration of design is a pre-requisite in all processes

- The EU already has industrial biotechnology, bio-waste upgrading processes and biorefinery technologies under development (e.g. FP7 Star-COLIBRI project).

- A lot of EU economy is based on sustainability, but it is not boosting rapid actions – acceleration is needed.

3.2. Sustainability and regulations

- Regulations can have multiple characters:
  - they can stimulate innovations
  - they can hinder innovations (e.g. using bioplastics waste)

- Coherent regulations and policies are needed.

3.3. R&D and innovation lines

- Framework conditions are important.

- Stronger and better collaboration between research and economy is needed.

- A paradigm shift in education is needed to stimulate risk taking of the younger generation as well as start-ups and entrepreneurship.

4. Conclusions and Next Steps

Overall conclusions from the workshop and pointers/recommendations for the future, having particular regard to the expected outcomes for the workshop sessions:

- Foresight activities are not the first priority when moving to a sustainable society.
- New business must be based on new technology and science, supported by world class research infrastructures which need to be set-up.
- Public - private partnership on new technology and science has to be created to speed up innovations and demonstrations.
- The society must be more educated to understand the benefit of new technologies and science(s) as a solution to the grand challenges.
- EU will only stay competitive if a new atmosphere of entrepreneurship combined with new technology and science can be created.
- ETPs, who are integrating the industry, research community and policy makers, are best suited to initiate cross-sectoral multidisciplinary actions.
- Some grand challenges can only be addressed by clustering the relevant ETP's.

Session C2: Open Innovation in Nanotechnology

Session Organiser: Charlotte Andersdotter, DG Research, European Commission

Session Chair and/or Moderator: Peter Krüger, Bayer Nanotechnology Working Group

Session Rapporteur: Raimondo de Laurentiis, D'Appolonia SpA

1. Scope and Objectives

Nanotechnology is widely considered as one of the key technologies to address Grand Challenges of this century, potentially able to deliver substantial solutions in many different application fields. To make the promising nanotechnology related options happen, the transformation of scientific results into commercially viable innovations is urgently needed.

Novel cooperation related collaboration models, such as open innovation, can contribute significantly to the successful use of nanotechnologies.

The need for responsible governance of nanotechnology-driven innovation at government and corporate level highlights the necessity of systemic approaches to the development of applications involving nanotechnologies.

The NANO*futures* initiative was presented as an initiative addressing these issues, and the workshop showcases how nanosciences and nanotechnologies could contribute to solving several of the 'Grand Challenges' that Europe is facing in the near future.

In this framework, the main aim of this workshop was to identify and describe new ways of collaboration in promoting open innovation processes in the field of nanotechnology to support solutions for sustainable development. Furthermore, the workshop intended to provide recommendations on the necessary steps forward and framework conditions.

2. Presentations

Introductory Speech: Current Status of the Technology and Main Challenges, **Peter Krüger***,* Head of the Bayer Nanotechnology Working Group

Mr Krüger introduced the concept of the innovation process, which goes beyond the research phase, including also development, production and commercialization. The driving force of innovation is to address societal challenges of our time (sustainable energy supply, climate change, lack of resources, ageing population etc). Nanotechnology offers a broad cross-sectional platform potentially able to offer/propose incremental and also disruptive solutions.

Mr Krüger mentioned the major challenges currently faced by nanotechnology, among which are:

- the risk of fragmentation;
- the need for sound safety research as the basis for nano-innovation;

- the need for collaboration among different disciplines, between industry and academia, within one value chain and among different nanotechnology related value chains of industrial partners;
- the need for educated people;
- the need for appropriate infrastructures;
- the need for global standards and smart IPR management;
- the presence of a reliable legislative environment;
- the promotion of scientific and effective communication.

Lowering Barriers to Commercialisation, **Joel Segal**, University of Nottingham

Mr Segal presented the NanoCom Coordination and Support Action. This is an EU-funded project, started in December 2009, aimed at lowering the barriers to nanotechnology commercialisation by: (1) critical analysis of the barriers that result from surveys and from many complementary EC, national and industrially-funded research and development (R&D) projects; (2) analysis and promotion of best practices via new nanotechnology and nano-manufacturing specific open innovation methodology and tools; (3) creation of the commercialisation-oriented forum and mechanisms for coordinating the efforts of many complementary R&D projects in the ERA.

In collaboration with NANO*futures*, the European Technology Integration and Innovation Platform (ETIP) on nanotechnology, NanoCom is expected to contribute to the implementation of the EC's Action Plan for Nanotechnology and to provide recommendations for future appropriate measures to stimulate investment and spread best practices for research and rapid commercialisation of next generation nanotechnology based products.

The Role of Finance investing in Nanotechnologies, **Alessandra Perrazzelli**, Head of International Regulatory and Antitrust Affairs – Managing Director of IntesaSanpaolo Eurodesk S.p.r.l.

Ms Perrazzelli presented the point of view of a bank in financing nanotechnology start-ups and companies. In Italy the industrial and commercial developments of nanotechnology are still in an early and uncertain stage. The fact that the very early stage of technology development and validation is characterized by the highest risk of failure is certainly hampering a commercial breakthrough. Banca Intesa developed a number of services and tools to support innovation in the field of nanotechnology. Among these there is Filarete Foundation, a Public/Private Partnership created by the University of Milan, Cariplo Foundation and Intesa Sanpaolo. It is a business accelerator incorporating “state-of-art” scientific platforms with advanced advisory and financial structures for business incubation and technology transfer.

Governance of Nanotechnologies, **Anna Gergely**, Director EHS Regulatory, Steptoe & Johnson

Ms Gergely described the most important aims of regulation, i.e. the achievement of maximum societal benefits and the control and mitigation of any adverse effects. In nanotechnology early, non-mature mandatory rules may be counterproductive, resulting in regulatory discrepancies or in worst cases dead-lock.

The interest of responsible industry to place safe products on the market drives towards minimized risk: proper governance should include all viable regulatory options - voluntary measures and mandatory requirements. Moreover, when the dominant risk of legislation is uncertainty and/or ambiguity, such as in nanotechnology, the regulatory framework shall be improved involving not only regulatory experts, but also scientists, stakeholders and civil society. All responsible stakeholders should cooperate at the international level, avoiding isolated efforts that may result in market disruptions and trade disputes.

Transnational Cooperation in Nanotechnologies to Boost Open Innovation for Regional Growth, **Lars Montelius**, Director of Øresund University

Mr Montelius presented the successful example of transnational cooperation in the Øresund Region: Øresund Org, an organization bringing universities, businesses and public authorities together, creating cross-border networks, projects and clusters.

In order to be effective, future clusters shall meet the cross-thematic nature of the Grand Challenges of our time, i.e. global warming/energy, water supply, food supply, public health, ageing societies, pandemics and security. Therefore, vertical thematic clusters should be connected horizontally within the region and inter-regionally. An example is given by Øresund Org: the four clusters Øresund Entrepreneurship, Greenhouse, Materials, Campus connects the four thematic clusters Food, IT, Logistic and Environment.

3. Key Issues and Discussion

In the following discussion, the broad nature of nanotechnology in terms of required, potential applications and impact on civil society is highlighted. Nanotechnology appears as one of the most promising tools to successfully address the societal Grand Challenges.

Europe can count on an increasing number of activities, research clusters, networks of excellence, science parks and facilities in the field of nanotechnology. However, Europe must compete in a global (nanotechnology) contest, where other emerging countries, such as China, Korea, Taiwan, Russia and India are increasingly investing in a coordinated way.

Thus, it is fundamental to reduce the fragmentation of European nanotechnology, building a unique European nanotechnology context, conceived as a “nano-hub”, able to link industries, non-governmental organisations, national authorities, financial institutions, research institutions, universities and civil society in order to agree on and coordinate strategies and activities in nanotechnology at European, national and regional level.

The cross-thematic nature of nanotechnology requires collaboration within all single and different value chains, i.e. between different technology sectors and ultimately ETP networks.

Another key issue is safety, which must be one of the main building blocks of nanotechnology innovation, in order to deliver safe nano-enabled products along their life cycles and ensure the public acceptance of nanotechnology.

A reliable and widely accepted regulatory framework must be adopted for a good governance of nanotechnology, including mandatory rules and voluntary industry-driven measures. Regulation related issues must be covered at international level involving all relevant stakeholders.

4. Conclusions and Next Steps

The workshop pointed out the cross-sectional nature of nanotechnology in terms of disciplines, value chains and stakeholders. International collaboration with all relevant stakeholders (industry, academia, scientists, regulatory experts, politicians, government, financial investors, insurances, general public, NGOs etc) is fundamental to develop nanotechnology solutions for the societal Grand Challenges of our time. Among the key challenges are global warming/energy, water supply, food supply, public health, ageing societies, pandemics and security.

The workshop gave an overall picture of the current barriers to nanotechnology development and commercialization and provided suggestions how to overcome such obstacles. In particular, focus must be given to cross-sectoral research and open innovation approaches able to meet the cross-thematic nature of the Grand Challenges. A number of key nanotechnology research nodes must be identified, addressing issues of nano-specific and cross-sectorial relevance for innovation and rapid uptake of nanotechnologies.

The NANO*futures* initiative aims at addressing such objectives by interlinking different value chains and sectors through the active participation of 11 ETPs[4], several support actions (ProNano, NanoCom, ObservatoryNANO, Nano2Market, Nano-TV etc.) and active research projects and a grid of horizontal Working Groups cross-matching key innovation actions to be driven by nanotechnologies.

[4] More information on www.nanofutures.eu

Session C3: New Business Models for Sustainable Growth

Session Organiser: Serena Pontoglio, European Commission

Session Moderator and Rapporteur: Fabio Iraldo, Scuolo Sant'Anna di Pisa

1. Scope and Objectives

The session investigated the development dynamics of new business models that can fit the needs of a sustainable growth relying on innovation and competitiveness. The issue of environmental sustainability was analysed in the session presentations, aiming to find an answer to the following questions:

- What are the barriers to the take-up of innovative solutions oriented to sustainability?
- What are the most effective "business models" to face up to the challenges of sustainable consumption and production?
- What is the role of eco-management and eco-innovation tools / policy instruments?
- How can ETPs help to change the framework conditions and favour eco-innovation?

2. Presentations

Catia Bastioli presented the case of **Novamont**, a very innovative company oriented at developing solutions for product sustainability in the bio-plastics industry. The business model on which Novamont relied is very much grounded on the concepts of "spread technology" and "delocalised plants", meaning by that the importance of integrating the different actors of the supply chain in the innovation process (e.g. farmers in the biochemical industry).

The business opportunity that Novamont pursues is to change the development pattern in the bio industrial sector, that is, to decentralise and to operate in the local contexts to help to preserve them. Novamont utilises life cycle assessment (LCA) to assess the environmental impact of innovative solutions offered in the market. Although a Life Cycle Thinking approach today is useful, it is not affordable for SMEs. LCA has to be improved to make it an effective communication tool.

Finally, the presentation emphasised how legislation can be a barrier to experimental activities, for instance by providing legislative requirements that do not leave room for very innovative experimentations (as in for instance the case of the waste legislation).

Howard Whitby from **Chemistry Innovation UK** presented BIOCHEM, a new Europe Innova project aimed at supporting SMEs to innovate in the bio based products market. The presentation started by emphasizing that, among the barriers to innovation in the bio-based products market, a great role is played by the following:

- Lack of awareness of IB and its benefits and potential within the chemical value chain;

- Lack of confidence to enter a new business and gain access to new supply chains;
- Majority of companies are not well connected to each other, to the technology base or to their potential supply chains;
- Limited access to specialist demonstration and other facilities;
- Limited access to specific market expertise and access to investment capital.

To overcome these barriers, BIOCHEM proposes a wide range of innovative services, such as: tools and approaches to assess the market, a business support toolbox, SME audits and development plans and other decision-making process support tools. Moreover, the project provides for lifecycle methodologies and IPR strategies.

One of the most effective and innovative solutions proposed by BIOCHEM is an "Online partnering and open innovation" solution, which aims at getting the companies together to favour technological transfer and matchmaking. Key stakeholders and potential partners are involved in the project by way of workshops.

Finally, the project helps SMEs to identify funding opportunities for proof-of-concept projects (major obstacle for new SMEs) and to access finance through four Europe-wide venture capital events that bring selected SMEs into contact with interested regional seed-funds, venture capital and business angels.

Andreas Kleinschmit von Lengefeld proposed a presentation on the **Forest-Based Sector Technology Platform – FTP**. The presentation started by recognizing that market opportunities for green products are a great stimulus for innovation. Moreover, it was underlined that strong leadership is an essential driver for innovation and that, in order to be effective, "green innovation" has to be a core part of the business strategy and vision. In other words, sustainable innovation requires strong management and needs market results (and profit). How can these conditions be created? In the forest-based sector, SMEs are "pushed" to innovate by: competitors taking the initiative, reactions to demand by the customers and reaction to deteriorating competition. Therefore, in this sector innovations could arise from: product differentiation, successful specialisation to niche markets, or product innovations adapted to organised value chains.

Such a strategy relies on three pillars: a company must change the business culture and head it towards green values; it has to put customers and consumers in focus (and not the supply chain, as in the traditional approach); and it has to consider innovation not as 'quick fix' but as a strategic process that needs investments and takes time.

3. Key Issues and Discussion

The starting point is to be aware that innovation processes today are basically "reactive": to competitors, to market demand and to deteriorating competition. This creates a context in which the most significant barriers to sustainable innovation are the following:

- Lack of awareness on the (environmental and economic) benefits that the innovation can bring;
- Lack of confidence on (and knowledge of) a new kind of market (e.g.: green products);
- Innovators are not connected to each other, are not connected with the supply chain and with the sources of information;
- Lack of resources to invest in the green innovation process;
- Often environmental regulation is not able to consider the front-runner environmental innovation, implying the risk of slowing down the most innovative processes (e.g.: waste regulation).

On the other hand, there are some success factors that prove to be effective in stimulating and supporting the sustainable innovation process:

- Strong leadership (e.g.: CEO direct commitment), pervasive vision and strong management are needed, especially to lead a "green" innovation process.
- Education, training, individual mentoring, and more general 'lifelong' learning processes are necessary to change the business culture (e.g. from supply-chain to market in the forest-based sector).
- A great importance has to be given to "vertical integration" (research-innovation-production) and integration among the different actors of the supply chain in the innovation process (e.g. farmers in the biochemical industry) as a means to favour the development of a "green innovation" process. In this framework, operating in regional and territorial "clusters" for sustainable innovation is a key to success.
- It has been acknowledged that the use of LCA (and of lifecycle approaches) can be crucial to support the eco-innovation process, but LCA should be more "easy to use" and "easy to communicate", especially for SMEs.
- In general, it is effective to take existing business tools (e.g. Environmental Management Systems or environmental certification standards) and tailor them to the needs and specificities of the innovators (SMEs, sectoral specificities, clusters, etc.).

4. Conclusions and Next Steps

The following suggestions emerged from the workshop, to be addressed both to ETPs and to the European Commission and to the Member States for future action in this field:

- It can be particularly useful and effective to favour networking and clustering among innovators and between them and their supply chain, to share resources, information, know-how, etc. (e.g. connection between ETPs and Biochem and with the Europa Innova network) and relevant research centres and institutions.
- It is advisable to create and diffuse a 'one-stop-shop' approach, applied to information but also to funding, e.g. to implement a single funding source where companies can find the resources to sustain innovation.

- The link between ETP and the Lead Market Initiative should be strengthened, in order to favour mutual support and consistency of the initiatives that can be supported in the sectors covered by LMI.
- A “Better regulation” by the EC (and the member States) should be a primary aim, also meaning that the outcome of the research and innovation projects funded by DG Research, DG Environment, etc. should be an input for the environmental regulatory process of other DGs.
- The strong call for one single patent for the EU should be heard and satisfied.
- The EC (as other funders) should make sure that the projects have an “after life” plan, i.e.: that networks, support services, local resources and know-how continue to work effectively after the time span of the project (e.g. Biochem project).

WORKSHOP TRACK D: HEALTH AND AGEING

Session D1: Affordable Personalised Health Services: ICT-enabled Solutions

Session Organiser: Griet Van Caenegem, ICT for Health Unit, DG Information Society & Media, European Commission

Session Chair and/or Moderator: Michèle Thonnet, Min des solidarités, de la Santé et de la famille and Niilo Saranummi, Technical Research Centre of Finland

Session Rapporteurs: Veli Stroetmann, Empirica and Rod Hose, University of Sheffield

1. Scope and Objectives

ICT can enable the transformation of today's health systems to be patient-centred and empower individuals to be more involved in the management of their health. A current primary target in ICT for Health in the FP7 programme is the development of the technology to support a pan-European healthcare information infostructure that will facilitate access to and integration of health (including clinical) data and its transformation into information. An important and currently underutilised source of data is that obtained using Personal Health Systems (PHS), which can facilitate high quality, personalised care through wearable, portable and implantable systems for disease prevention and early diagnosis, as well as remote disease management, rehabilitation and treatment.

One of the mechanisms for transforming data into knowledge is the construction of models. The Virtual Physiological Human (VPH) initiative supports the prediction, prevention and treatment of diseases by construction of personalised models that exploit the infostructure to integrate demographic, genomic and phenotypical data with anatomical and physiological data (including that collected by PHS) into state-of the-art computational models of human physiology. The CIP (Competitive and Innovation) programme supports Member States and stakeholders in the implementation of EU-wide interoperable health services.

Some ETPs are entirely focused on healthcare (e.g. IMI, Nanomedicine), whilst others have dedicated Working Groups on Health (e.g. NESSI, EPoSS, Photonics21) or identify healthcare as am application domain in their SRAs (e.g. ARTEMIS, eMobility and ENIAC). The overall objective of workshop D1 was to highlight the potential for coordinated action from ETPs, particularly in the context of infostructure, PHS and VPH applications, ideally leading to a common Strategic Research and Innovation Agenda to tackle more effectively common challenges in the area of eHealth, make better use of Europe's human and material resources, and strengthen the competitiveness of the European eHealth industry.

2. Presentations

1) Leo Kliphuis, MPH, Dutch Association for Integrated and Primary Health Care: *ICT-enabled solutions for affordable personalised healthcare*

Dr Kliphuis observed that *'we struggle to deliver integrated care in NL, ICT support is key enabler and common language is essential.'* He described the development of care standards, and the integration and co-ordination of the activities of the many providers of the components of primary care, from the patient through social, medical, clinical and public health sectors. Semantic and technical interoperability were identified as essential to the success of an integrated care model. Other key issues identified included: involvement of patients in the delivery of their healthcare; reallocation of resources; improvement of chronic care; introduction of integrated reimbursement (less acute admissions as a common goal); integrated entitlement of care; the need for integrated outcome indicators (IOI); the development of detailed clinical models (DCM) as a new way of structuring health information integrating medical knowledge and data through common terminology; making all components compulsory, consensus leads to quality.

2) Niilo Saranummi, Technical Research Centre of Finland: *Research, innovation and deployment problems that need to be solved*

Professor Saranummi focused on the role of the 'citizen patient' as an active participant in their own healthcare. Healthcare has for too long been 'outsourced' to a clinical care team. He stressed the need for personal access to information, and the need to be able to interact with the traditional care providers, to make a success of this model. 'Response ability is necessary to take responsibility'. He expressed the need for semantic and technical interoperability as necessary for integration of the personal health record (seen as a vehicle for the management of health and wellness) with the electronic health record (seen as the vehicle for care of illness). He highlighted the problems of: lifestyle modification & sustaining changes; education, training & tools, motivation; demonstrating value to users; inertia and the difficulty of challenging and disrupting current established practices against the complex organisational, socio-economic and regulatory background.

3) Tove Sørensen, Head WHO-CC for Telemedicine and eHealth: *Can we learn from the successes and failures of eHealth?*

This presentation included a frank review of some of the successes and failures of eHealth, and particularly telemedicine, applications in Norway. It focused on what we can learn from these experiences, and particularly from the failures. She emphasised the complexity of existing healthcare systems, power balances and political and financial frameworks. She identified the actors in healthcare (patients, providers, authorities... and IT providers), and stressed the need for technology acceptance and for trust (from patient and clinical team) as precursors to adoption. She insisted that support for large-scale deployment is imperative if this research is to impact on society: evidence in the form of successful pilots is not enough. She advocated 'less preaching, more doing', and suggested that 'eHealth success is when no-one notices it is eHealth'

4) Josema Cavanillas,R&D&I Director, Atos Origin, ETP NESSI

This presentation emphasised the role of NESSI in the development of enabling IT technology, with healthcare (including patient empowerment) as an important target market. Particular mention was made of a 'cloud of clouds' initiative, with the VPH

community as a target user. Three ambitions were described: i) setup of a pan-European knowledge space based on semantic technologies and interoperability of ontologies across the internet, facilitating the evolution of a large network of hi-tech SMEs; development of a large-scale infrastructure to host services to provide collaborative tools for a constellation of healthcare providers; to enable the beginning and interoperability of the initial VPH services, duly connected to the info space and accessible by the mHealth infrastructure.

5) Jeroen Wals, Philips Research, EPoSS: Healthcare Smart Systems

Smart systems are critical in driving innovations in the field of medical technology. Important observations were that information-based care precedes evidence-based care, that often early technology solutions do not meet clinical need, and that there will be no take up without careful clinical validation. Successful new products require joint technological development, with multidisciplinary collaboration across industries and with multiple academic partners. A need was identified for innovative business models... who will pay for these services?

6) Nicolas Gouze, Secretariat of ETP Nanomedicine: The European Technology Platform Nanomedicine

The underlying theme was that nanomedicine drives the convergence of nanotechnology and medicine. This is enabling technology but requires vertical integration to fully exploit its potential in eHealth, and this is a major focus of current activity. Several existing collaborations including those with IMI, EPoSS and Photonics21 were highlighted, and it was emphasised that ETP Nanomedicine is ready to play a role to a cross-ETP initiative in healthcare, integrating the nanomedicine roadmap into the wider healthcare environment. Translation of research to meet patient need was identified as a priority.

7) Luis Correia, Techn. Univ. Lisbon, ETP eMobility: A view on Health and ICT

The core vision is to support individuals and professionals via future mobile applications to enhance healthcare delivery, clinical performance and lifestyle. Four key areas were identified: wireless diagnostic and disease management; hospital consultation and emergency scenarios; assistive technologies; well being and personalisation. Challenges include: improving usability to overcome human barriers to use of ICT; development of systems with high reliability, quality, scalability and interoperability; respect of personal data security and location privacy; complex legal and regulatory issues need to be addressed in order to move towards a European System of eHealth.

8) Karin Schütze, Photonics 21

Dr Schütze emphasised that photonics is a key enabling technology that supports a host of healthcare applications. The major highways of communication and information flows are optical. Photonics Information and Communication provides the basics for fast data handling and data storage. Internet and data transfer modalities should be attuned to “eHealth” standards and requirements, including high speed, high quality and extreme safety constraints, and recognising the need to transform data into useful medical information to support optimal diagnosis and treatment. New diagnostic and therapeutic possibilities arise

from the potential of photons to enter and traverse living cells. Cellular processes can be observed and monitored without interfering with their molecular functions and cell viability.

9) Ann Martin, IMI: IMI focus on the needs common to pharmaceutical industry and patients

This presentation outlined the role of IMI in co-ordinating and funding pre-competitive research in efficacy, safety, education and training, and knowledge management in pharmaceutical applications in healthcare. Emphasis was placed on the development of a knowledge management infrastructure and on its exploitation to support an improved modelling and simulation activity for drug discovery and development. The infrastructure requires the development of common standards for basic and for translational clinical research. A vision was developed of an open pharmacological space in which data from public/private institutions could be shared openly, with secure and stable service models. The need for a sustainable framework for interoperability and secondary use of EHR data was identified, with a focus on clinical trial protocol feasibility, patient recruitment, drug safety, and cost effectiveness.

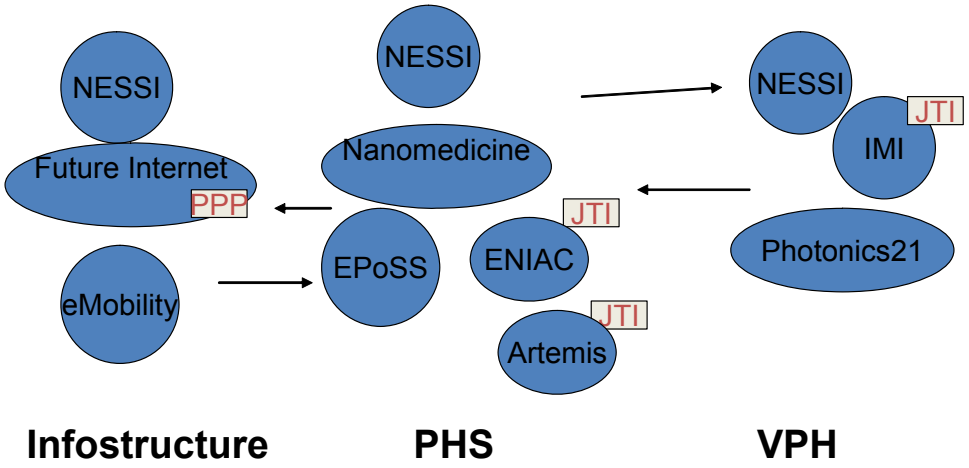
3. Key Issues and Discussion

A number of common issues can be identified in the invited presentations. It is widely recognised that the ETPs, even when not focused on healthcare provide enabling technologies that are ripe for exploitation in this sector. There was repeated emphasis on the construction of an appropriate infostructure, recognising the complex socio-economic environment in which it must operate. Underlying themes were the integration into the infostructure of diverse levels of information, from personal to population, and the interaction of the empowered patient. Issues of standards, interoperability, security and trust were pervasive. The challenges of translation and the need for careful clinical validation were acknowledged and emphasised by several speakers, and in the ensuing discussion.

The biggest single obstacle, almost universally acknowledged, was the establishment of the business model for eHealth solutions. A common question was ‘who pays?’ It is a simple fact that current healthcare systems are designed primarily to provide, and to pay for, the management of treatment of illness and disease. These costs can and will be reduced by eHealth solutions, partly by involving the citizen earlier and by encouraging wellness and disease prevention and partly, for example by allowing people to take responsibility for their own care for longer. However, there is generally no mechanism for the current healthcare providers to support these initiatives. Money that is not spent will be reallocated, without conscious planning, to other processes of disease management. The state and society will benefit, but unless and until there is a direct model for investment in cost saving, it is difficult to construct the business model. Several speakers and participants made the observation that research funding has produced many successful pilot applications that demonstrate that eHealth can transform healthcare for individuals. That these have often not translated to national and international deployment is a problem of funding models. A mechanism has to be found to support large-scale deployment of successful solutions.

As part of the brief, the presenting ETPs were invited to consider how they could map onto three current and important eHealth initiatives, in the domains of infostructure, personal health systems and the virtual physiological human. There was enthusiasm for engagement with these initiatives, and opportunities for mutual collaboration and vertical integration were recurring themes. The figure below illustrates a mapping of some of the ETP portfolio onto these research themes.

Figure 4



4. Conclusions and Next Steps

The European healthcare system is facing an increasing demand by citizens for best quality healthcare, increasing costs of managing chronic diseases and the need for prolonged medical care for the ageing society. ICT can enable a restructuring of health delivery systems in EU towards a preventive and person-centred delivery model. The underlying theme of workshop D1 was the expression of the ***vision*** of **improved personalised healthcare *through* ICT-enabled solutions for monitoring health and for prediction, prevention and management of diseases *based on* common info-structure**, including integration of information from **Personal Health Systems**, realised in **Virtual Physiological Human applications.** The ***outcome*** should be **services used by citizens/ patients and health professionals – anytime, anywhere**

- ETPs are ready to collaborate, ideally through a common Strategic Research and Innovation Agenda, to ensure European leadership and to strengthen competitiveness of European eHealth industry.
- Support is needed for validation and large-scale deployment.
- Innovative business models are required to reflect socio-economic impact of preventative, personalised healthcare, complementing existing illness management models.
- The community recognises demand side issues: standardisation, interoperability, business models, regulation, legal & ethical aspects.
- The message is clear: ICT support for health is not an option, it's a necessity!

Session D2: Healthy Eating

Session Organiser: Szilvia Németh, DG Research, European Commission

Session Chair and/or Moderator: Beate Kettlitz

Session Rapporteur: Prof. Dr. Gerd Harzer

1. Scope and Objectives

The last three decades have seen the levels of overweight and obesity in the EU population rise dramatically, particularly among children. This is indicative of a worsening trend of poor diets and low physical activity levels, which will increase the prevalence of chronic disorders and diseases. In the long term, this will result in a negative impact on life expectancy in the EU, a reduced quality of life and increased healthcare costs. To counteract this, there is a need to better understand the relation between diet and the onset of disease and to better understand consumer behaviour with regard to food choice and lifestyle. Therefore more research in food and consumer and social sciences and food chain management is needed, to be carried out in a concerted effort by universities, research organisations and industry, with private and public money. From the perspective of European Technology Platforms, it seems reasonable to expect that this research has to deliver innovative, novel and improved food products and or production methods in line with consumer needs and expectations.

2. Presentations

The four presentations elaborated different aspects of “Healthy Eating”.

The way how to close the knowledge gap in the understanding of diet and disease onset and prevention was subject of **Casper Zulim de Swarte**’s (International Policy Food and Nutrition Innovation Program, The Netherlands) presentation.

After defining the problems of obesity under societal and cost aspects, he stressed the need for more research in the field. Only a better understanding of the physiological background between food and its components in relation to diet and onset of disease can lead to novel food solutions. It is understood that there is some major time lag between the generation of research results and the generation of innovative products in this field. As nutrition research is extremely expensive and time consuming he made it clear that available research inclusive spending needs to be well coordinated across Europe in order to avoid doubling of efforts. The Joint Programming Initiative put in place by the Commission is proposed as way forward. In this Initiative a group of European experts in the field of nutrition (research) will identify research needs and propose respective projects. Joint funding of projects should then come from national funding bodies across Europe.

Food production and food safety was elaborated by **Dr. Kerstin Linnemann** from the German Institute for Food Technology. Dr. Linnemann stressed the need for new innovative food production methods in order to meet future challenges in the view of the ageing population in

western societies and the still rapidly-growing population globally. Higher yield plant production with less impact on carbon footprint, less water and energy usage needs the combined efforts of all bio-economy players. More efficient food preservation methods may arise from the advancements in the field of nanotechnology. Although consumers ask for food which is safe in the first place, but also healthy, affordable, readily available and convenient in use, they are very reluctant to accept new technologies for food production. This situation requires research to better understand the development of consumers' risk/benefit perception in order to develop better ways of consumer communication. Trust is thought to be a major part of health and wellbeing. Often restrictive food legislation is seen to counteract innovation. Restrictive standard of identities (mayonnaise, chocolate, cheese, etc.) and lengthy approval procedures (novel food, GMOs) just to be mentioned.

Healthy Eating in relation to other societal challenges, such as water and energy usage, the ageing population, a zero-waste society or personalised nutrition, was discussed by **Prof. Mike Gibney** from the UCD Institute of Food and Health in Ireland. Like the previous speaker Prof. Gibney stressed the need for combined efforts of all relevant ETPs, in particular the bio-economy players, to manage the foreseeable water crisis or to reach the goal of a zero-waste society. New developments in ICT can help to manage personal nutritional needs. Attached or implanted monitoring devices may control physiological parameters or the level of physical activity during the day and give nutrition or lifestyle advice based upon registered data. In this way the healthy food choice may be made the easy way. In particular, older people do have special nutritional needs which are often not met. Therefore, specifically fortified or otherwise modified products will be needed in increasing amounts. Mental decline is a major problem of ageing. It needs to be understood therefore, whether and in which way diet can slow down the process. This type of research can today easily be conducted by ICT-based systems for remote assessment of cognitive function using analysis of vocalisation, speech markers and mood. In-home ICT-based attention and alertness training may help in addition.

The problem of knowledge transfer in the field of nutrition and food technology towards SMEs was elaborated on by **Gerd Harzer** from Kraft Food R&D, Europe. Major issues being the highly complex industry with many different technologies and/or different interests and needs. The sheer number of companies across Europe (>300000) is prohibitive for a broader innovation dialogue. The relatively small margins in the food business (often driven by an aggressive trade) do often not allow for high investments into research and development as well as investment into innovative technologies. Besides those issues more or less related to SMEs, the regulatory environment is often restrictive, as already mentioned above. Especially, the hurdles for making health claims on products are getting extremely high. Respective research can definitively not be afforded by SMEs. Even the larger companies may not be willing to take the risk any more.

3. Key Issues and Discussion

From the presentations and the discussions during the workshop it became clear that personal health, and in particular the problem of obesity and related diseases, needs a broader discussion than simply products. The lack of physical activity, with children in particular, was a

major discussion point. Also, the obvious knowledge gap of consumers when it comes to understanding of the health outcomes of food and lifestyle choices, were part of the discussions. In addition, the impact of food production on the environment needs consideration when talking conditions to allow for health and wellbeing in a given population. All this asks for an involvement of many different stakeholders, e.g. food industry, represented by both large, small and medium-sized companies, agro industry, academia, consumers organisations, retailers, catering sector, stakeholders from the physical activity area, medical devices producers, IT specialists, etc.

4. Conclusions and Next Steps

In conclusion, many opportunities were highlighted where cross-fertilisation of ETPs was considered essential in order to meet future societal challenges in the light of Healthy Eating.

Specifically, a need to initiate research to better understand the relationship between diet and the onset of non-communicable diseases such as diabetes, cancer, high blood pressure, cardiovascular disease, etc., as well as to understand the relationship between diet, mental performance and ageing was identified. As this type of research is very expensive it needs to be well coordinated and funded across European funding bodies. With 95% of the current research funding in the EU coming from national bodies, the Joint Programming initiative seems to be the right way forward.

Due to the outlined structure of the food industry it seems unrealistic to involve SMEs early on in this type of research. The current system of EU framework nutrition research programs is geared towards the participation of large food companies only. Obviously this leads to a situation where large companies have a much quicker access to research results, thus leading to a clear competitive advantage. It was thought that a funding system less dependent on private money, like in the United States, could be to the benefit to the European food industry as a whole. A system would need to be installed, however, to ensure a quick and efficient knowledge transfer from academia to the private sector.

In this respect it was proposed to create, under the auspices of the ETP Food for Life, an EU-funded European Institute for Food Technology and Innovation. This could be a centre for research coordination, but also for the development of technology and innovation curricula to ensure that SMEs would get (likely through the national ETPs) quick access to the latest research results. Via an institute of this sort, the linkage to other relevant research areas and ETPs (e.g. agriculture, environment, ICT, consumer protection, etc.) would be ensured. This set up could definitively speed up the innovation process across the European food industry as a whole and thus increase its competitiveness.

Session D3: Ageing Well - Turning Challenges into Opportunities

Session Organiser: Peter Wintlev-Jensen, Unit ICT for Inclusion, DG Information Society & Media, European Commission

Session Chair and/or Moderator: Lambert Van Nistelroij, MEP

Session Rapporteur: Andrew Ruck

1. Scope and Objectives

The trend towards an ageing population is introducing drastic changes into our society. Information and Communication Technologies (ICT) can play a major role in helping to motivate and assist older people to stay active for longer in the labour market, to prevent social isolation and promote societal inclusion and finally to help people stay independent for as long as possible. Policies are needed that will help promote the introduction of appropriate solutions for improving the quality of life for elderly people and their carers, greatly increase the efficiency of our care systems and open up new global market opportunities for European industry. The European Commission's Action Plan for Ageing Well in the Information Society. includes measures to raise awareness and share good practice, build stakeholder consensus, promote policies to stimulate innovation in the public sector, and overcome technical and regulatory barriers to market development, accelerate take-up and innovation, and boost research.

The objectives of the workshop were to identify how research and innovation cooperation across technologies can address the ageing challenge and how to create a European market area for solutions. This requires:

- A listing of main research and/or innovation lines to be pursued and their related market potential.
- An identification of framework conditions and the stakeholders who need to be involved.
- Identification of the potential for coordinated action and listing of possible steps forward.

2. Presentations

Lambert Van Nistelroij (MEP): The need for a reliable pension system for our ageing population has been brought into clear focus by the current economic crisis.

(Peter Wintlev-Jensen for) Florin Lupescu: Director, DG INSO, European Commission: The focus of activity is the creation of opportunities from the changes consequent on an ageing society, whilst at the same time providing help to carers, relatives and elder people. The current rate of ICT penetration is low (3%) compared to other sectors. The Commission's Action Plan launched in 2007 focuses on dissemination of best practice and evidence. The challenge now is to further stimulate innovation; this involves supporting risk-taking within the public sector, including support to projects with 40 regions. European research programmes, funded at €1

billion, are the world's largest: the challenge is to make progress against the Roadmap for ICT in Ageing and impact on the market and solutions provided.

Overview of ICT and Ageing Market Study: Lutz Kubitscke, Empirica: The speed of deployment of ICT for Ageing is low in relation to the potential contribution identified for welfare technologies. Across Europe, whilst social alarms and more advanced telecare are becoming mainstream in most countries, home telehealth and telecare services are at an earlier stage. Barriers to speedier deployment vary by national markets and include: uncertainty about the case for ICT solutions; the nature of reimbursement systems; the fragmented nature and rigid boundaries between services; professional reluctance; organisational inertia; an underdeveloped consumer culture; and unfavourable regulatory regimes.

Overview of Danish Finance Ministry Initiative on Introduction of Welfare Technologies in the Danish Public Sector: Thomas Borner, Danish Finance Ministry: The Ministry of Finance co-ordinates introduction of new ways of working and introduction of ICT based solutions, including welfare technologies, since costs are incurred in one part of the (public) sector whilst benefits are realised in another. By identifying excellence and a positive business case within a pilot, the Public Welfare Technology Foundation then supports mainstreaming. This approach not only improves service productivity but also addresses the supply side by creating new business opportunities.

The AALIANCE Roadmap and Strategic Research Agenda in ICT for Ageing: Well Ger van den Broek, Philips Research: The roadmap was evolved as a result of a collaboration between multiple actors – industry, research, public policy, end-users and service providers, and in the context of the Ambient Assisted Living AAL Programme (set up under Article 169). The start point is the user (elderly person's) perspective, where it is clear that ICT can help provide better support in the user's preferred environment, whilst recognising that people's needs do evolve over time.

However there is a clear need for collaboration in service provision, since the competences required go beyond the domain of just one company or organisation: this will be a challenge to deliver. The major classes of services which need to be offered as an integrated package with a single easy-to-use interface for the user include home control and automation (an established business), health and wellness solutions, and solutions for infotainment and 'social connectedness'. The technologies involved are in the areas of sensing, reasoning, acting, communication, and interaction. Challenges have been identified in the areas of power consumption, models for reasoning, system integration, and extending solutions on the market to embrace the potential of new technologies.

3. Key Issues and Discussion

The chair Mr Lambert Van Nistelroij (MEP) suggested debate centre on three key issues:

- What is the contribution of industry in ICT?
- How can we create a European market for ageing well?
- What happens in the context of the economic crisis?

This then prompted questions from the audience on issues such as use of specific technologies such as the television, and the challenge faced by business in meeting the requirements for personalisation of services.

The panel included Mr Wolfgang Gessner from AALIANCE, Mr Joeron Wals from Philips, Eirini Zafeiratou (Vodafone) and Mr An Nguyen-Dinh from the SME, Vermon.

- Mr An Nguyen-Dinh from Vermon felt than an SME's ability to address challenges can be enhanced by participation in European projects and collaboration on policy initiatives in European projects.

- Ms Eirini Zafeiratou of Vodafone pointed out that mobile was a key infrastructure for ageing well, since it reaches all over Europe and into every home. Handsets are being developed for the elderly but there is a question about how to make design for elderly more mainstream. Challenges perceived include provision of swift and secure data services to the patient, inter-operable services, lack of ICT budget in public services, and the overall pattern for industrialisation / commercial service deployment. This last requires a close study of the whole eco-system, especially since there is a lack of a clear contracting service owner from the public service, which makes the business model – how to achieve ROI - problematic.

- Mr Wolfgan Gessner from AALIANCE felt it was clear that companies want to develop this market. However problems in doing this include user acceptability of solutions, ethical and privacy considerations, reimbursement and incentives for AAL products / services, and the standardisation and regulatory regimes.

- Mr Joeron Wals from Philips highlighted that no single company can deliver the mix of requirements. This level of complexity creates risk. It is not clear who pays. This is why pilots fail – no-one wants to pay for mainstreaming. If incentives are put in the right place – entrepreneurs can however be expected to step up. There is a need to influence public authorities and provide practical support for innovation by means of deeper engagement of stakeholders.

- The example of the Danish Ministry of Finance was evoked in the context of how to achieve breakthrough. Sufficient funding of the right kind is required for mainstreaming: Mr Thomas Borner of the Danish Finance Ministry explained that in the case of Denmark a commitment to pay up to 75% of expenses incurred in mainstreaming and against a positive business case may point the way forward. This level of expenditure is justified by the fact that labour shortages will make continuing service provision on the current model increasingly impossible. However it was pointed out that for Germany the equivalent investment to Denmark would be €6 billion, and thus difficult to obtain.

- Mr Wintlev-Jensen from the European Commission is now aiming to maximise policy incentives to enable uptake of research into deployment.

- Mr Lutz Kubitscke from Empirica pointed out that a key challenge will be service innovation – we should not expect to underpin old processes with new technologies. Rather, a 'space' is required where service providers and technology providers can work together to develop innovative service approaches underpinned by deployment of technology.

4. Conclusions and Next Steps

- Public Policy:
    - Europe already has the largest research programme in world in this area: AAL with Member States, FP7.
    - European support is being provided to pilots in 40 regions.
    - A holistic policy support package is required to deliver for the three major wins targeted:
        - Improved quality of life
        - Better effectiveness in care effectiveness
        - New Market opportunities.
- The AALIANCE Roadmap
    - Maps the contribution of technology onto user needs
    - Already commands consensus with key stakeholders, which needs to be built on
    - Provides a mechanism to engage both the supply and the demand sides.
- Pilot to large scale deployments
    - The question of who pays is currently a stumbling block
    - Political support is required to deliver business opportunity
    - A European framework for policy enablement is required to support mainstreaming within member states (EU policy enablement)
    - Models and practical support are required to support service innovation.
- Wider stakeholder engagement is indicated on:
    - Integration and standards,
    - New technologies
    - Matching supply and demand.

WORKSHOP TRACK H: HORIZONTAL ISSUES

Session H1: ETP Clustering and Collaboration

Session Organiser: Steve Rogers, Unit C.2: Private investment and technology platforms, DG Research, European Commission

Session Chair: Karin Metzlaff, European Plant Science Organisation, EPSO & Plants for the Future TP

Session Rapporteur: Lutz Walter, Euratex & ETP-FTC

1. Scope and Objectives

Increased coordination between industry, researchers and other stakeholders in undertaking R&D and innovation is a key objective of the ETP mechanism, and most respondents to the survey underpinning the evaluation of ETPs in 2008 said that their ETP coordinates its activities with other ETPs to a significant extent. Over the past couple of years, in fact, ETPs have increasingly joined forces in making contributions to the formulation and implementation of measures such as the Lead Market Initiative, the SET Plan, Joint Technology Initiatives, and several public-private partnerships. In parallel, the European Commission has been exploring ways of supporting and incentivising the clustering and collaboration process. The aims of the types of collaboration covered in this workshop include helping prepare a demonstration project or related research; preparing a joint vision document and strategic research agenda; launching a public-private partnership; creating networks; and creating working groups for platforms operating in different technological sectors that converge on common applications.

Specific questions that were addressed by the session speakers and during the discussion included:

- Which general lessons have been learned?
- Which hints & tips can be derived for future ETP collaborations?
- Which recommendations can be given for EU policy measures to support ETP collaborations?

2. Presentations

The session chair Ms. Karin Metzlaff opened the session, welcomed all participants, introduced the speakers and briefly outlined the scope and objectives of the session.

The first speaker Ms. **Silvia Travella** of the Plants for the Future ETP presented the BECOTEPS project of which she is the coordinator. BECOTEPS (Bio-Economy Technology Platform), which started in 2009, is a KBBE-funded CSA project to support the collaboration of nine biotechnology-related European Technology Platforms. Its objectives are the initiation of dialogue between the different stakeholders in the various biotechnology sectors, value chains

and policy areas, and the development of policy recommendations to remove gaps and bottlenecks and unlock the full potential of the European BioEconomy.

Mr. **Lutz Walter** of Euratex, representing the ETP for the Future of Textiles and Clothing (ETP-FTC) introduced the European Consumer Goods Research Initiative, which currently brings together five Technology Platforms. The aim of the initiative is to bring together industry, research and policy makers to jointly develop and implement a research and innovation agenda in the field of design-based consumer goods. The related industry sectors are highly diversified and dominated by SMEs but jointly represent a significant portion of European industry and have many research and innovation challenges in common. The further implementation of the initiative will be supported by the PROsumer.NET NMP-CSA project expected to start in late 2010.

Mr. **Péter Krüger**, from Bayer AG presented the NanoFutures Initiative. NanoFutures is a European multi-sectoral cross-ETP integrating platform with the objective of connecting all ETPs which require nanotechnologies in their products and processes. It addresses a broad range of horizontal issues with relevance to nanotechnologies which it connects with product-, process- or sector-specific issues introduced by the various collaborating ETPs. So far ten ETPs have signed MoUs for collaborating under the umbrella of NanoFutures. The further implementation of the initiative will be supported by the NanoFutures NMP-CSA project expected to start in late 2010.

Ms. **Sylvie Baig** of Degrémont Suez Environnement, representing the Water Supply and Sanitation ETP (WssTP) and Mr. **Ger Spork** of CEFIC, representing the Sustainable Chemistry ETP (SusChem) jointly presented the collaboration initiative between these two ETPs in the field of water. The scope of the collaboration is the "sustainable water use in industry by optimal integrated resource management". The objectives include the combination of ETP efforts along the value chain, the development of a joint strategy and action plan with broad stakeholder engagement and industry support. The further implementation of the initiative will be supported by the WaterChem NMP-CSA project expected to start in late 2010.

3. Key Issues and Discussion

During the presentations and the subsequent lively discussions with the audience the following main concepts emerged as of the reasons, best practices and expected results of ETP collaborations:

Why collaborate:

- Address Grand Challenges and global competitiveness holistically.
- Broader agenda including innovation and education, collaboration with wider stakeholders (various DGs, EP, MS, NGOs…).
- For progress on major societal challenges a full value chain approach, including related stakeholders is needed (supplier-user collaboration).

How to collaborate:

- Link with all relevant stakeholders
- Identify common key issues (technological, non-technological)
- Be goal driven, not process driven
- Maintain individual ETP structures and develop effective interfaces
- Organise joint dissemination and policy/stakeholder interaction
- Manage expectations & strike balance of benefits between the ETPs

Expected results:

- Recommendations on research, innovation and education
- **Concrete R&D projects & significant innovation actions**
- Boost, streamline, interconnect ongoing research activities under the FP
- Increased knowledge & research results transfer through value chain approach
- Input to broad range of relevant policy-making processes
- Feed new ideas back to the individual ETP's

EU Policy Support needed:

- **Create incentives for initial collaboration**:
  - Flexible, ad-hoc support for initial stakeholder exchange
  - CSA-like activities to develop first joint activities
- **Reach critical mass implementation**
  - Ensure strong engagement of all relevant policy-makers (EC DGs, EP Committees and Member State ministries…)
  - Substantial support for large-scale implementation projects in research & innovation)
- Sustainability of ETP collaborations needs stability of underlying ETPs (which sometimes need support too).

4. Conclusions and Next Steps

The session concluded that ETP collaborations can indeed be a suitable means for addressing research and innovation issues related to 'grand societal challenges' in a holistic way and with a broad stakeholder involvement.

Ideally such collaborations should emerge bottom-up through initiatives taken by the ETP's themselves. However, EU policy plays a key role in encouraging the emergence of these collaborations and in supporting their implementation. EU support mechanisms should be tailored to the different stages of collaboration such as: (1) emergence; (2) networking and agenda development; (3) implementation. A deep involvement of relevant policy-makers across policy areas and at all levels must be ensured and strong commitment during the implementation phase is especially crucial.

ETP collaborations should, however, remain flexible and not lead into highly complex mega-ETP structures. The identities and functioning of the underlying ETPs should be maintained.

ETP collaborations can be considered successful if the outcome of their activities represents more than the sum of the results of the work of individual ETPs.

Session H2: Public-Private-Partnerships and Societal Challenges

Session Organiser: Nina Baumeister, DG Research, European Commission

Session Chair and/or Moderator: Wolfgang Burtscher, Deputy Director-General, DG Research, European Commission

Session Rapporteur: Effie Amanatidou, Research & Innovation Policy Analyst

1. Scope and Objectives

Public–Private-Partnerships (PPPs) in research are a relatively new phenomenon in comparison with such alliances in sectors like infrastructures or providing public services. Nevertheless, they are characterised by a growing trend for a variety of reasons, such as correction of market failures; increase "efficiency" of public support in R&D and addressing perceived gaps in innovation systems. The driving aim may vary from creating critical mass in research activities and resources in a given sector, to reaching a higher level investment which the private sector could not carry out alone due to the long-term nature, level of risk involved and budgetary constraints. PPPs motivate the private sector to create alliances with other research actors within their open innovation strategies.

At European level, the importance of research PPPs is widely recognised as they can offer extra leverage in delivering shared policy objectives such as combating climate change, supporting sustainable transport or ensuring high quality, affordable healthcare. The Europe 2020 strategy mentions that research PPPs are important instruments through which the EU can maximise and accelerate the practical benefits of research for Europe's large businesses and SMEs.

A first approach establishing PPPs has been the creation of Joint Technology Initiatives (JTIs). Five JTIs have been created until now. In addition, three special PPPs were set up under the European Economic Recovery Plan in sectors that have been particularly affected by the economic downturn and where innovation can significantly contribute towards a more green and sustainable economy. At the same time, the PPP in the field of Future Internet technologies has been initiated as well. There are also national PPPs in research that can provide valuable advice and lessons learnt for the future of such initiatives. This first experience enlightens the approach to creating further research PPPs. For this purpose the JTI Sherpas' Group - a group of industrial leaders from the JTIs and Recovery Plan PPPs - analysed the existing five JTIs and produced recommendations on future PPPs to the Commission.

To capitalise on the available knowledge and experience, the objectives of the workshop were to explain the rationale and the growing trend behind the set up of research-related PPPs, and present the general state of affairs as regards national and European research-related PPPs. The intention was to give interested ETPs the possibility to understand the trend in setting up PPPs at national and European level.

2. Presentations

The workshop hosted four presentations, i.e. one presentation of a national research PPP and three presentations referring to European level PPPs.

- The experience of a national research PPP in Europe, presented **by Jan van der Meer**, NedStack
- Innovative Medicine Initiative (IMI) Joint Undertaking, presented by **Estefania Ribeiro**, IMI JU
- European Economic Recovery Plan PPP "Factories of the Future", presented by **Massimo Mattucci**, Factories of the Future
- 'JTI Sherpa´s Group Report: Designing together the "ideal house" for public-private partnerships in European research', presented by **Effie Amanatidou**, Research & Innovation Policy Analyst.

The national PPP experience was the case of DutchHy, a national coalition between the cities of Nijmegen and Amsterdam, research institute ECN and six companies (Advanced Public Transport Systems, AirProducts, HyGear, HyTruck, Linde, NedStack, Shell). The DutchHy's mission is to formulate projects by the coalition members in the area of Hydrogen and Fuel Cells (HFC). These projects are also to be connected with the European JTI New IG, but also the Interreg programme and local funds. The coalition brings together policy-makers, industry and consumers and aspires to establish the role of HFC in the transport sector. DutchHy fills in particular the need for large-scale demonstrators in fulfilling this aim.

Going to the European level PPPs, IMI is a European PPP focusing on the needs of the pharmaceutical industry and patients. IMI addresses the major hurdles for the development of innovative therapies which are the unpredicted failures at late stage of drug development and the fragmentation in available knowledge. IMI builds new business models based on collaboration and transparency, involving patients and lay people and applying an 'open innovation' approach. The two calls for proposals present some very encouraging results. They attracted more than 2000 applicants which resulted in 24 funded projects with a total budget of €400 million. Country representation is also considerably wide. The first stage of the second call attracted 124 expressions of interests from 1118 participants, involving 38 patient organizations as well as 204 SMEs. Interested applicants came from 25 EU Member States, 7 FP7 Associated Countries and 7 FP7 Third Countries.

The Factories of the Future (FoF) PPP was set up under the European Economic Recovery Plan. It addresses the needs of the manufacturing industry, namely the need for more sustainable ways of production, to make full use of next generation ICT in the shop floor, to boost labour productivity and use less resources and new materials. It aims to create critical mass by pooling public and private resources as well as to increase efficiency in EU research, leading to commercially viable products and processes. It aspires to lead manufacturing to a desired vision for 2030. The 2010 call for proposals was a great achievement as it was characterized by high success rate for proposers, streamlined administrative procedures, strong involvement of industry, including SMEs, and little time required for proposal preparation.

The JTI Sherpas' Group report makes a valuable contribution for the future design of research PPPs at European level. The Group was set-up at the initiative of Commissioners Potočnik and Reding to take stock of the first experiences in running JTIs. It complemented this experience by other PPP evidence at national level and drew lessons and recommendations on the "ideal house" for future JTIs / research PPPs. The overall recommendation was that PPPs should be a genuine public-private partnerships based on mutual trust and confidence, underpinned by key principles that can be grouped in four areas: Legal structure and governance; operational modalities; funding and Member States' participation. After examining different types of legal status, the Sherpas concluded that PPPs in research are special cases and should be treated as special bodies in the applicable framework and regulations. In this regard, and to make their recommendations as specific as possible, they are willing to provide relevant input to the Commission on issues such as the revision of the Financial Regulation.

3. Key Issues and Discussion

Following the presentations, two interventions were made by two panel members. Leena Sarvaranta (VTT – Finland) presented examples of partnerships among RTOs (Research and Technology Organisations) such as the European Energy Research Alliance. The importance was noted of treating partnerships as special cases with differences from one type to another. At the same time partnerships also involve organisational development to be streamlined with other partners that should be involved on an equal basis. In this regard, achieving organisational efficiency is crucial.

Günter Lugert, from Siemens AG, Chair of the "Automotive Working Group" of the EPoSS ETP, and member of the advisory group of the European Green Car Initiative, noted the need for simplification of procedures and processes in pooling sources together and urged to take steps for the effective implementation of the recommendations of the JTI Sherpas' Report. The importance was highlighted to establish trust towards public funding authorities without the burdens of the past.

The discussion that followed acknowledged the importance of the PPP approach for European research. PPPs can inform policy-making in research while serving the needs of societies. By bringing together the best of both the private and the public sector they benefit both European business and societies. The need was stressed to safeguard industrial relevance and make innovation happen. At the same time, stronger cooperation and commitment is needed to take the European PPP initiative to the next level.

The value of the JTI Sherpas' report was generally acknowledged. In up-taking the results the Commission noted that the recommendations had already been taken into account in drafting specific changes about to be proposed for the revision of the Financial Regulation.

Triggered by the plea for more simplified and clear procedures in PPPs the issue of simplification was widely discussed along with that of 'tolerable risk' given the latest Commission's Communication. Industry representatives made clear that conditions of low overhead costs and administration burdens are appreciated when participating in research partnerships or more generally in public research programmes. Since public money is involved

it is imperative to ensure accountability and sound financial management. The point was made to ensure that simplification agenda is as strong as possible. At the same time this should not be done at the expense of accountability and sound evaluations of programmes and policies. In parallel, the need was noted for risk management rather than risk tolerance, especially when large-scale projects implying large risks are aimed at.

Following the issue of risk, the low market up-take of innovation was discussed and how conditions can be improved to lead to better uptake of research results. In this regard, the Commission marked that this issue is being looked at in the new Research and Innovation Plan that is in preparation. The point was made that every partnership should take steps to bring results closer to the market. At the same time, the nature of research done at EU level – precompetitive, collaborative - should not be overlooked.

The variety of the different instruments available for research partnerships was another point that attracted attention. It was made clear that the institutionalized PPPs (JTIs) and the contractual PPPs (the three European Economic Recovery Plan PPPs and the Future Internet PPP) are very different in nature. These stand alongside ETPs while at the same time new Joint Programming Initiatives are emerging. Naturally, the issue that was raised was that of coordination in order to avoid duplication. Given also the variety of different intervention mechanisms, all seemingly addressing societal challenges, another issue that came up was who should address which challenge and at what level (local, national, European, international). These are crucial aspects of governance that should be carefully looked at. The variety of intervention mechanisms is indeed the second component for simplification that the relevant Communication is looking at.

4. Conclusions and Next Steps

There was broad consensus on the importance of research PPPs as the way forward and the willingness of both the private and public parties to take such initiatives further. The concerns expressed referred to more general, rather than PPP-specific, issues of market uptake of innovations and simplification of procedures and processes applied.

Simplification, organisational efficiency and a trust – based approach in establishing research partnerships is an area that needs greater attention. Yet, these have to be seen alongside the need for accountability and sound financial management of public money.

The future of research funding landscape within the ERA is being drawn with a variety of instruments enabling research partnerships (ETPs, JTIs, contractual PPPs,) alongside the Framework Programme. The multitude of these instruments addressing societal challenges raises issues of governance and coordination that need to be carefully addressed.

Yet, there needs to be action now to take PPPs further. The JTI Sherpas report is valuable in this regard by drawing recommendations based on the lessons learnt from the already gained experiences. It is imperative that the recommendations are acted upon as the immediate next step.

Session H3: ETPs and National Authorities: Working Together on Societal Challenges

Session Organiser: Agata Janaszczyk, DG Research, European Commission

Session Chair and/or Moderator: Andrzej Siemaszko, Director of the National Contact Point for Research Programmes of the EU

Session Rapporteur: Christine van Wunnik, Executive Agency for Competitiveness and Innovation, European Commission

1. Scope and Objectives

This conference session discussed the governance of research and innovation initiatives that address societal challenges, in particular the role of national and EU policy makers, research and innovation programme owners and ETPs. The objectives of the session were:

- Present the role of public authorities in ongoing research and innovation-(R&I)-related policy initiatives addressing societal challenges;
- Exchange ideas and experiences concerning the different governance models (national, multi-national, EU);
- Identify the best mechanisms to improve coordination and maximise synergies as it comes to societal challenges.

2. Presentations

Three examples of societal-challenges related R&I initiatives were presented: a national initiative (Dutch societal research and innovation programme), a multi-national initiative (Ambient Assisted Living Joint Programme) and an EU initiative (Strategic Energy Technology-plan).

1. Karen de Ruijter, Programme Manager of the Societal Research and Innovation Agendas at the Inter-ministerial Knowledge and Innovation Department, the Netherlands

The Dutch Societal R&I Programme mobilises about €260 million for solutions to the main challenges the Dutch society faces: energy, health, water and security. The approach is strictly challenge-led which requires an interdisciplinary use of R&I funding and a cross-sectoral approach to technologies and policies.

For each of these challenges both the objectives and the research and innovation agenda are set by the Dutch government. This has led to the creation of temporary inter-ministerial task forces between the ministries that are responsible for addressing a particular challenge. A range of policy instruments are used to implement the agendas, notably: research funding, Small Business Innovation Research (SBIR), the public sector as a launching customer, innovation vouchers, and innovation performance contracts.

Success factors of the programme include:

- A larger overall R&I budget due to the opening up of new, more institutionalised markets to research and innovation;
- Increased legitimacy of the solutions that are developed due to the involvement of the relevant policy ministries and agencies.

Issues that remain to be improved are the following.

- Integration of ongoing fragmented efforts relevant to a particular challenge;
- Involvement of key stakeholders in agenda setting, something that is not obvious for all departments.

Governments are responsible for the solutions to societal challenges and should therefore articulate the societal needs and priorities. This requires national authorities to look outside their own organisation and to invest in new relationships, both with other public sector organisations and the stakeholders with which these organisations interact. It takes the expertise of business partners and knowledge institutes (or clusters of ETPs) to define adequate research and innovation agendas, as the solutions should be developed by industry or PPPs themselves. The governance model that is chosen needs to stimulate the deployment of solutions.

2. Rafael de Andrés-Medina, Member of the Executive Board of the Ambient Assisted Living (AAL) Association & JP (Brussels); and Chief of the Department, Documents & Technical Studies, Fund for Health Research (FIS). Institute of Health Carlos III (ISCIII). Spain

The AAL Joint Programme (JP) is a joint research and development funding programme implemented by twenty European Member States and three Associated States. Its current size is €600 million, with an additional co-funding of €25 million of the European Commission. The objective of the programme is to develop products and services for ageing well at home, in the community and at work. The new funding activity anticipates ageing and other demographic change in Europe, which will have an impact on the citizens, the social and healthcare systems as well as industry.

Main activity under the AAL JP is the funding of R&D projects in the AAL domain which is managed by the AAL Association, an association under Belgium law, and the national funding organisations of its members. The AAL JP channels money by national structures. The European Commission contributes to the implementation with a substantial financial support granted on the basis of article 185 of the Lisbon Treaty (the previous article 169 of the EC Treaty).

Success factors of the AAL Programme are:

- An increased efficiency of research and innovation achieved by a centralist approach;
- A strong focus on implementation and business development.

Pending problems are not technology-oriented.

- the need to re-engineer the processes and the organisation's culture in the health sector;

- the transition from low to large scale is not only about increased absolute costs;
- the positioning of this initiative at global level;
- the available workforces and the new skills needed in the health sector, which has initiated a process to cluster different kind of actors and stakeholders than the ones that are currently involved (industry and venture capitalists).

The AAL JP is broadening the joint programming concept, with a strong focus on implementation. Its governance is sophisticated. Running the programme required the participating countries to tackle several operational issues, such as ensuring national commitments and making certain that only excellent projects are funded. The AAL JP is extending its scope to address political, legal and also educational issues that affect the implementation of the research and innovation results.

3. Gerrit Jan Schaeffer, Energy Research Director of the Flemish Institute of Technology Research (VITO) and Belgian Representative for the European Strategic Energy Technology Plan (SET-plan)

The SET-plan is the technology pillar of the EU's Energy and Climate Strategy. The plan primarily aims at technology development and is implemented by European Industrial Initiatives (EIIs). These are public-private partnerships that try to combine and implement the roadmaps of energy-related ETPs, but are more focused and more industry-driven than ETPs.

In the area of energy, 20 percent of the available research funding comes from the EU, the rest from MS. A steering group of MS (two of each), backed by sherpas, discusses the ever evolving SET-plan in order to reinforce the coherence between national, European and international efforts. It allows Member States and the Commission to plan joint actions and coordinate policies and programmes. Participation in the SET-plan has confronted Belgium with some shortcomings as regards its energy-related research activities: the quality of the research is high, but initiatives are too dispersed.

Success factors of the SET-plan are:

- its quantitative policy targets[5] and the 2050 time frame;
- the availability of (more or less undisputed) data (SETIS[6]), including clear estimates of financing that is still needed to bring the technologies to the market;
- the variable geometry approach;
- good cooperation with the European Council concerned.

Issues that remain to be solved for the SET-plan are:

- the consistency of roadmaps for the different technologies;

[5] The SET-plan supports the energy and climate package: to achieve a 20% reduction of greenhouse gas emissions and primary energy use and an increase of renewable resources to 20% of the total energy consumption by 2020. By 2050, the EU should have achieved a reduction of 50% of greenhouse gas emissions.

[6] SETIS is the online Information System for the European Strategic Energy Technology (SET)-Plan. It provides support for the effective strategic planning, conception and implementation of the European Energy Technology policy. It enables monitoring of the SET-Plan actions and activities, assessment of its impact on policy and the identification of corrective measures if needed.

- the coordination with other, related initiatives, such as the Climate and Energy Knowledge and Innovation Community (KIC).

It should be public authorities who decide upon strategic orientations of societal-challenge related R&I initiatives. The open question is how to organise this on national, EU and multi-national level. The approach of the SET-plan, with its dominant industry coalitions, may not be the best solution. The European Initiatives, in which key players interact with national authorities through horizontal platforms or mirror groups, might deliver better results. A good outcome is expected from a big ERAnet+-style programme currently in the pipeline, given that it is coordinated with other relevant initiatives, such as the KICs.

3. Key Issues and Discussion

The session suggests the following key messages for designing effective R&I initiatives to tackle societal challenges.

- **Public authorities set objectives and decide upon strategic orientation:** As governments are the final responsible for the solutions to societal challenges, they are best placed to articulate the needs and priorities of a societal challenge-related R&I initiative and set its objectives. This will require public authorities to work cross-ministerial and beyond the common distribution of competencies, e.g. by inter-ministerial task forces. Adequate representation of MS in EU-level initiatives could be ensured by a high level steering group such as the one of the SET-plan.
- **Participants engage in a structured dialogue with a broader range of stakeholders:** In the end, it might turn out to be non-technological problems that prevent solutions to societal challenges from being implemented. This could be addressed by broadening the stakeholder community to go beyond industry, ETPs, financing institutions and venture capitalists, and organising a structured interaction with them as is being done in the case of the AAL JP.
- **Research and innovation agendas or roadmaps are developed in close cooperation with clusters of ETPs:** Research and innovation agendas or roadmaps need the input from businesses and/or knowledge institutes, as they possess the necessary scientific and technological expertise to solve particular problems. ETP clusters are a natural partner in this, given that current geographical unbalances are overcome and the discussion is initiative is open to innovative ideas from new players and SMEs.
- **Devise ERANET+-type instruments to mobilise resources:** No recipe came out of this session as regards the best way to mobilise EU, national and private funding. ERANET+-style instruments with a variable geometry, such as the one that is being developed for the SET-plan, are expected to deliver good results when it comes to mobilising national resources.
- **Research funding is just one of the possible instruments:** Research funding, but also other instruments that are closer to the market could be considered for implementing societal-challenge-related R&I initiatives. The Dutch government applies a range of

instruments: Small Business Innovation Research (SBIR), the public sector as a launching customer, innovation vouchers, etc. The AAL JP involves venture capitalists and the SET-plan liaises with financial institutions that could provide loans.

- **EU-wide working groups work on particular framework conditions:** In order to be effective, societal-challenge related R&I initiatives will need to mobilise more than just funding. The implementation of the research and innovation results might require the alignment of relevant legislation, standardisation and public procurement to encourage the uptake of new solutions in the market. The eHR-Q-TN project, launched under the Competitiveness and Innovation Programme, was set up to achieve comparable quality assurance and certification of e-Health products across Europe and is an example of such a working group.

4. Conclusions and Next Steps

With a new Commission, a new Europe 2020 strategy and a new Framework Programme ahead of us, we can rethink our strategies and put the concerns of the EU citizen in a more central position of research and innovation policy. As the Commissioner said, we need a framework for integrating whatever is relevant. It is in the interest of both ETPs and the national authorities, as well as the EU citizen to design the best coordination mechanisms. In a challenge-led approach, the question is not whether public authorities need to be involved but how this should be organised in the best possible way. The points listed above reflect the most important outcome of the conference session in this respect.

If implemented well, this process will deliver better and more legitimate solutions to challenges we all face. Moreover, societal challenge-related R&I initiatives have the potential to mobilise a much larger overall budget due to the opening up of new, institutionalised markets to research and innovation.

Session H4: Education and Skills

Session Organiser: Davy Berghmans, European Commission

Session Moderator and Rapporteur: Conor O'Carroll, Irish Universities Association

1. Scope and Objectives

The focus of this workshop was to exchange experiences on how different ETPs deal with education and skills in their plans. In the ETP_4th Status Report 2009 all platforms identified education as a key area, with many focusing on the skills needed within the disciplines relevant to that platform.

In 2004, ACARE (Advisory Council to Aeronautics Research in Europe) focused on education as part of its Strategic Research Agenda (SRA). However, in 2008 it noted that little progress had been made. Harmonised education, better and consistent accreditation schemes, more soft skills training, are all steps that have previously been identified and need to be taken forward. Research must remain connected to the upstream (education) and downstream (innovation) elements if researchers are to be attracted and effective.

This issue was also highlighted in the Expert Group 2009 report[7], which stated: *"Each ETIP activity cluster should identify where there are shortfalls in the skills required to undertake the planned research programmes and innovation activities effectively, and develop an appropriate Education Action Plan".* The report noted that some ETPs are already actively incorporating education into their plans, but suggested that all ETIP clusters should engage in this exercise. Of course, the responsibility for higher education lies with national and even regional governments, but it may be of great help to leverage the Europe-wide agreements in ETIP clusters to improve education opportunities and environments.

Education and skills cannot be taken in isolation as they are an integral component of the Research / Innovation / Education triangle.

2. Presentations

1. Ferran Sanz, Professor of Biostatistics & Biomedical Informatics, University Pompeu Fabra; Director, IMIM-UPF Joint Research Programme on Biomedical Informatics

Prof. Sanz focused on the skills needed within his sector from a university perspective, including addressing bottlenecks in expertise in biomed knowledge. Skills identified include: a 'helicopter view of entire process of medicines', R&D processes, and regulatory issues.

In addition, specific disciplinary skills are needed along with lifelong training to update skills. Some specific gaps were identified:

[7] *Strengthening the role of European Technology Platforms in addressing Europe's Grand Societal Challenges*, Report of the ETP Expert Group, October 2009

- Working in silos
- Industry / academic interaction minimal
- Training needs on translational sciences
- Scientists & technicians in specific areas; pharmacology, safety
- Continuous Professional Development (CPD) on new developments
- SMEs need knowledge of medicines
- Outreach to journalists, public and venture capitalists.

Sanz saw the universities as being best positioned for providing the education and skills for ETPs. However, there are challenges to evolve from what professors want to teach to what society demands. It is essential to collaborate with industry to go beyond classical subjects to those needed within the ETP context.

A four-university alliance in Catalonia provides a specific example of how this is being done. The programmes are developed with the support of a council of advisors from industry that sets the teaching priorities. Teaching is in English due to industry demand. Funding for these courses comes through the use of charging real costs and full fees.

2. Henning Kruse, Senior Export Manager, Siemens Wind Power and Chairman of ETP Wind initiative

From the business perspective, Kruse concentrated on how rising demands for wind will require a major increase in the number of trained specialists in this area. There is a need for 1000 high-quality graduates per annum to achieve wind energy targets. Manufacturing and components take up 60%, with consultancy engineering at 3%, and university R&D only 1%. This shows that it is really important to know the training needs of the various people employed in the sector, as these can be quite diverse.

Skills must be matched with labour markets. There is a need for more scholarship and internship programmes, funded through university/wind industry partnerships. Actions to upgrade skills include: reviewing education programmes to have them targeted to the EU; access to lifelong learning; and on-the-job training. There is currently no wind turbine engineering education in Europe; companies take on those with basic skills and run their own internal courses.

Without a sustained campaign to train new people it will not be possible for Europe to reach its 2020 targets. This is independent of the technology and demonstrates the central role of education and skills.

3. Key Issues and Discussion

In addition to the two speakers the discussion panel comprised two experts from the European Commission:

Peter van der Hijden Policy Officer at DG RTD, Unit C.4 ('Universities and Researchers') spoke about EU initiatives in the areas of education, skills and training, and noted the agreed European Qualifications Framework and Tuning Project. Currently doctoral training across the

EU is being benchmarked and skills & training will be an integral component of this study. He reminded the participants of the New Skills for New Jobs initiative that will support matching to labour needs.

Gudrun Maass, **Policy Officer at DG EAC, Unit A.2 ('European Institute of Innovation and Technology')** emphasized that the KICs formally need all three elements of the knowledge triangle to be successful. Partners commit in kind and cash to provide the education. With the first three KICs funded by EIT, education will be the first concrete deliverable. KIC branded courses have been developed. The intersectoral mobility of students will be part of the evaluation in the next round of EIT.

The discussion developed into an open exchange of practice between different ETPs on how they have dealt with education and skills issues.

It seems that all SRA's have identified education & skills needs and are looking for means to develop and fund. In one example, FP6 was used to develop a curriculum with universities, with the ETP looking to provide the accreditation. So they have solved the problem themselves with the universities.

There were doubts raised on how to define training needs, which can be either highly specific or somewhat general. Prof. Sanz believed that there must be a mix of both – students must have access to good basic bachelor's degrees while acquiring other transferable skills at same time. Masters degree should be more specific and must be adapted to the needs of society.

Kruse was convinced that the education system must change to meet new demands of certain sectors to have a sufficient number of high-grade graduates every year. Some very specialist areas should be taken care of by companies, however.

Mr van der Hijden pointed out that many of the comments came from the energy sector. There should be cooperation between ETPs. The higher education sector must be made aware that there are ETPs across Europe with clear visions of the future.

4. Conclusions and Next Steps

- Education and Skills are recognised as integral components of European Technology Platforms as a key part of the knowledge triangle.

- A "one size fits all" approach is not appropriate across all ETPs for education and skills. There is a clear need to share experiences across all ETPs on:
    a. How to identify generic / transferable and specific skills
    b. How to develop appropriate courses
    c. How to fund them
    d. Accreditation and recognition.

- The European Commission can play a very useful and supportive role in this regard. The European Research Area (ERA) is now a legal objective of the Treaty of Lisbon. The

European Partnership for Researchers as part of the ERA has a clear focus on Enhancing the Skills and Training of Researchers (4th pillar of the EPR).

Overall, the conclusion was that this is “work in progress” and there is the opportunity to develop through the sharing of best practice between European Technology Platforms. The EC can certainly support this through the knowledge partnership within the EU2020 Vision.

ANNEX 1: CONFERENCE AGENDA

ETP 2010

Working together on societal challenges

Brussels, 11-12 May 2010

Charlemagne Building

PROGRAMME

http://ec.europa.eu/invest-in-research/policy/eu_tech_platform_en.htm

11 MAY - DAY 1

08h00	**Registration**
09h30	**Welcome and Introduction** **Chaired by Anneli Pauli,** Deputy Director-General, DG Research, European Commission **Juan Tomás Hernani Burzaco,** Secretary-General for Innovation, Ministry for Science & Innovation (MICINN), Spain **Máire Geoghegan-Quinn,** European Commissioner for Research, Innovation & Science **Herbert Reul MEP,** Chair, ITRE Committee, European Parliament
10h15	**Coffee**
Session 1	**ETPs and innovation**
11h00	**An Innovation Agenda** **Françoise Le Bail,** Deputy Director-General, DG Enterprise & Industry **Speeding Up Time-to-Market** **ETP panel** moderated by **Horst Soboll,** Chair, ETP Expert Group
KEYNOTE	**The Long Tail of Innovation: Challenges and Opportunities**
12h30	**Ardo Reinsalu,** CEO, Curonia Research OÜ
13h00	**Buffet networking lunch**

SOCIETAL CHALLENGE BUILDING-BLOCKS

parallel workshops	*Clean Energy*	*Transport*	*Sustainable Consumption and Production*	*Health and Ageing*
Session 2 **14h30 - 16h00**	**Low-Carbon Energy Technologies: Social Dialogue**	**Smaller Footprints: Decarbonisation of the Transportation of Passengers & Goods**	**Towards a Zero-Waste Society**	**Affordable, Personalised Health Services: ICT-enabled Solutions**
Session 3 **16h30 - 18h00**	**Water & Energy**	**Urban Mobility: the Door-to-Door Strategy**	**Open Innovation in Nanotechnologies**	**Healthy Eating**

19h30 - 21h30 **Buffet networking dinner**

12 MAY - DAY 2

Session 4 **09h00 - 10h30**	**Greening Industrial Processes**	**Making Transport Safer & More Secure**	**New Business Models for Sustainable Growth**	**Ageing Well: Turning Challenges into Opportunities**

10h30 **Coffee**

LEARNING FROM EACH OTHER, LEARNING FROM EXPERIENCE

(parallel workshops)

Session 5 **11h00 - 12h30**	**ETP Clustering and Collaboration**	**Public-Private Partnerships and Societal Challenges**	**ETPs and National Authorities: Working Together on Societal Challenges**	**Education and Skills**

12h30 **Buffet networking lunch**

Session 6: **Wrap-up plenary**

14h00 **Chaired by Anneli Pauli,** Deputy Director-General, DG Research, European Commission

Workshop results: presentations by rapporteurs, followed by Q&A

Conclusions

Looking forward to ETP 2011

16h30 **Close**