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1. [INFRA-2011-2.1.1: Design studies for research infrastructures in all S&T fields](#)

A proposal under this topic should address all the key questions concerning the scientific, technical and financial feasibility of a new or enhanced infrastructure, laying down its conceptual foundations. The topic is open to all fields of science and technologies.

Funding scheme: Collaborative Projects or Coordination and Support Actions - coordinating actions.

Deadline11: 25 November 2010, at 17.00.00, Brussels local time.

Budget: 20 M Euro

2. [NMP.2011.4.0-2 Advanced underground technologies for intelligent mining and for inspection, maintenance and excavation](#)

Technical Scope/content: There is a clear need for the development of new advanced underground technologies, in order to respond to the increasing societal demands related to underground activities, where a huge capital investment is required. The productivity in this field is very low compared to other industrial sectors. In addition, the underground activities are going deeper and longer and are thus highly damaging for the environment, as they become at the same time more dirty, difficult and dangerous for the workers. Advanced underground technologies can provide competitive solutions for access to new strategic mineral resources for the society and a quality improvement of surface space by transferring less desirable structures below the ground level.

The key research objective is to advance knowledge and practice in the field of underground construction and mining by identifying, developing, reporting, and stimulating industry adoption of the new methods and techniques, and by encouraging new approaches and research. Developing new advanced tools, methods and processes, and then transferring the technologies to industry is the final goal. In this way, a more competitive EU industry will gain access to resources, and routing traffic can be moved below the ground, offering a means to reduce urban congestion, noise and pollution. Breakthrough solutions are needed to transform the underground related industries into highly technological and competitive industries. The objective is to develop a set of technologies for clean intelligent underground activities based on new safe and eco-innovative intelligent diagnosis, extraction technologies, adequate materials and processes applicable to all underground activities, such as mining and exploitation and maintenance of the underground structures.

The research should aim at developing fully integrated underground technologies and processes for diagnosis and extraction. Proposals are expected to focus on the following areas, as appropriate for application in the mining and/or construction sector:

- New techniques and processes oriented to the clear detection of the ground ahead of the excavation front. In-situ on-line resource diagnosis for exploration, continuous extraction and recovery of by-products with new sensors for grade control, rock mechanics etc.; new drilling technology; integrated and automated data processing and analysis for 3D underground geology.
- New automated underground technologies for safe and “invisible” deep in-situ extraction to avoid negative impacts on health, safety and environmental

including small-scale mechanical excavation and backfill systems and their maintenance.

- Extensive risk assessment modelling and simulation on existing surroundings in urban and non urban areas, model-based prognoses of damage on existing infrastructures and working sites, (flood) water storages, monitoring concepts, cost and risk models in line with new regulations.
- Development of master plans/concepts/technologies for inspection, maintenance and retrofitting efforts of existing and new underground structures. (e.g. mines, road or railways tunnels and utilities networks)

Deliverables include the development, integration and demonstration tests in the field of the above concepts, technologies and tools. In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners and industrially-oriented decision making represent an added value and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: Project results are expected to: (i) increase the productivity of underground activities by at least 20%; (ii) enable mining and underground operations with zero impact on existing surroundings in urban and non urban areas; (iii) create inherently safe underground working and operating environments; (iv) strengthen the global competitiveness of the European mining and construction industries; and (v) increase the sustainable access to underground resources in Europe, with the related decrease of EU dependency on resource imports.

3. FoF.NMP.2011-3 Robots for automation of post-production and other auxiliary processes

Technical content/scope: In the future the scope of application of robots will tremendously increase as far as their autonomy and affordability, enabling industrial and service robots to carry out more complex life-cycle oriented jobs, e.g. those which need to be carried out after the product has been delivered to its customer or other auxiliary tasks during the production process itself. This may, for example, include recycling and dismantling, inspection, repair, maintenance or other reconfiguration tasks and more in general post-production automation tasks, as well as the auxiliary processes in the production chains. However, today's systems are too rigid (i.e. designed for specific applications), they are rather expensive and often unusable in physical conditions where humans can not easily get to (e.g., under water, small spaces, or dangerous locations) or cover efficiently (e.g. large structures). Therefore, manufacturing operations with robots in areas that are traditionally human-intensive and not automated would require enhanced capabilities of man-machine cooperative approaches.

To successfully perform complex tasks over the entire product life-cycle in a very open task spectrum, strict requirements with regard to higher degrees of adaptability, scalability, flexibility and dependability must be linked capabilities associated with natural intelligence and perception (e.g. identification and manipulation of unknown component geometry), skilled work reasoning, as well as sophisticated motor abilities, in order to cope with incomplete or non up-to-date information about the parts and the production settings. The automation of ancillary processes in production will extend over several inspection, disassembly, treatment and manipulation tasks, and demand for multi-task planning of processes and action in dense structures, strategies for sequencing and choice of treatment, repair and

replacement. Semantics, reasoning, learning and planning methods will also be needed.

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings. In order to ensure the industrial relevance and impact of the research effort, active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding Scheme: Small or medium-scale focused research projects.

Expected Impact: Most relevant industrial sectors are in capital intensive investment goods (e.g. construction, energy and aeronautics), but the results developed can be applicable to other products having high life-cycle costs. Full life-cycle services are envisaged such as in-field servicing, repair, refurbishing, upgrading, and associated services such as inspection, monitoring and recycling. At the same time, the use of robots in complex manipulation tasks in other industrial sectors will be made possible by the availability of cost effective and flexible automated solutions. The new robotised systems offered should be able to extend the service life and/or improve the operational efficiency and functionality of the product, while at the same time reducing the overall life-cycle costs.

4. NMP.2011.4.0-7 ERA-NET on Industrial Safety

Technical content/scope: The objective of the ERA-NET on Industrial Safety is to step up coordination of research programmes carried out at national or regional level in the fields of safety related to industrial activities, including safety of critical infrastructures and fixed installations in production systems, and prevention of major accidents with off-site consequences and risks to the environment and the society.

This ERA-NET will focus on the ways to improve industrial competitiveness by reducing production disruption and by accompanying safe technological development. The identification of RTD priorities towards the implementation of joint activities and programmes, including joint calls, may involve several levels of cooperation and coordination, depending on the degree of maturity of the network.

Additional eligibility criteria: Only ERA-NET eligible partners can participate. The minimum number of participants is set at three independent legal entities managing publicly funded national or regional programmes, each of which is established in a Member State or Associated Country.

Funding Scheme: Coordination and Support Actions (coordinating actions).

Expected impact: This activity is expected to set the basis for: (i) long-lasting cooperation in key fields of industrial safety research at national and regional level; (ii) helping to solve problems related to industrial risks, for instance through transnational calls to produce jointly developed new technologies and methods to improve safety in industry; and (iii) providing the basis for harmonised standards and legislation

5. Objective EEB-ICT-2011.6.4 ICT for energy-efficient buildings and spaces of public use

Achieving more energy-efficient buildings, neighbourhoods and urban areas will require further work on the buildings construction cycle, supported by partnerships between process engineering specialists, software companies, ICT equipment providers, and buildings and construction companies. Advances in complex urban systems calls for partnerships between some or all of process engineering

specialists, software companies, RES (Renewable Energy Systems) providers, ICT equipment providers, buildings and construction companies, utilities companies, public authorities (planners).

Target Outcomes:

a) Building Energy Management Systems integrating in a single system different energy efficient production/consumption sub-systems, such as renewable energy sources, solid state lighting, heat transfer, blind control, phase change materials, energy harvesting facades or electric vehicles deployed in spaces of public use. These systems shall be based on advanced control algorithms capable of learning from previous operations and situations, and load balancing in near-real time. Interoperation of these systems with other ICT-based sub-systems (e.g. for security, safety, comfort) will be considered an asset.

The proposed system shall cover in an integrated way the inside of buildings as well as the exterior and surrounding space. Examples of such spaces may include: a motorway service area, a football stadium with its surrounding parking space, a university campus, a shopping mall.

In addition to systems integration, proposals shall include a substantial validation phase focussing on the operation of the building(s) and surrounding space in real user conditions.

During this phase, proposals shall record evidence of energy savings, total cost of operation, scalability of the solutions, and benefits that accrue, and extract lessons for those planning to deploy and finance such systems. Consortia must be compact with partners each making substantial contributions.

b) Coordination and Support Actions: Bringing together relevant stakeholders including process engineering specialists, ICT software and equipment providers, RES providers, energy companies (including ESCOs - Energy Service Companies), building and construction sector companies, as well as local and regional authorities, to:

- Extend the notion of energy-positive performance from homes and buildings to large areas including neighbourhoods and extended urban/rural communities in a holistic dimension;
- Analyse the relationship between producers, distribution companies and consumers of energy, new business models, opportunities for SMEs, and identify best practices and opportunities for knowledge transfer;
- Identify ICT standards related to the building and construction domain, and analyse their relevance and possible evolution;
- Support the establishment of European-scale actions spanning research, innovation, standards-setting and deployment of ICT infrastructures for energy-positive neighbourhoods"

The tasks shall include drafting and up-dating public documents, organising expert's hearings and workshops, dissemination and networking events.

Expected Impact

- Contribution to the opening up of markets for novel ICT-based customized solutions for buildings operation and maintenance, integrating numerous products from different vendors.
- Quantifiable and significant reduction of energy consumption and CO2 emissions achieved through ICT
- Establishment of a collaboration framework between the ICT sector, the buildings and construction sector, and the energy sector.

- Identification of areas where standardisation work is required.

Funding schemes:

a) STREP; b) CSA

Indicative budget distribution

STREP: EUR 19 million

CSA: EUR 1 million

Call FP7-2011-NMP-ENV-ENERGY-ICT-EeB.

Open 20/7/10, deadline 2/12/2010

6. Objective EEB-ICT-2011.6.5 ICT for energy-positive neighbourhoods

Target Outcomes:

Projects supported under this objective shall contribute to the European Energy-Efficient Buildings Initiative by developing management and control systems, and decision-support systems addressing the dynamics of energy supply and demand in neighbourhoods and extended urban/rural communities. These systems shall optimise the use of energy beyond the buildings (considering for instance street lighting, urban heat production, electrical vehicles), and they shall include the integration of renewable energy sources and the connection to the electricity distribution grid in order to take advantage of variable tariffs and diversity of supply.

In addition to technical developments, projects shall consider appropriate business models, how to split incentives, and engage end users and public authorities to deploying such systems.

Interoperation of these systems with other ICT-based systems (e.g. traffic management systems, Geographical Information Systems) that may be deployed in the area will be considered an asset.

In addition to systems integration, proposals shall include a substantial validation phase. During this phase, projects shall record evidence of the benefits and total cost of operation, as well as the potential for scaling up solutions, for potential users.

Consortia must be compact with partners each making substantial contributions.

Expected Impact

- Contribution to the opening of a market for ICT-based district/community energy management systems.
- Establishment of a collaboration framework between the ICT sector, the buildings and construction sector, and the energy sector.
- Quantifiable and significant reduction of energy consumption and CO2 emissions achieved through ICT.

Funding schemes

STREP

Open 20/7/10, deadline 2/12/2010

7. Objective ICT-2011.6.6 Low carbon multi-modal mobility and freight transport

Target Outcome:

a) ICT for low-carbon multi-modal freight and logistics covering technologies and services for multi-modal freight and logistics, and using new technologies such as RFID, wireless sensor networks and common platforms and architectures. The focus is on:

- Integration of different transport modes (road, rail, air and sea transport), following Europe's transport policy principle of co-modality, in particular between road transport and other modes
- Intermodal interoperable logistics management and tracking systems and Intelligent Cargo systems which support the decarbonisation of transport by

providing real-time process and status information on cargo and its movements to users, for increased transport efficiency and timeliness and the integration of the intelligent cargo systems into the multi-modal transport data infrastructures.

b) ICT for clean and efficient multi-modal mobility for further improving energy efficiency and reducing CO₂ emissions in all modes of transport for passengers and goods:

- New tools, systems and services supporting energy-efficient driving and driver behaviour adaptation
- Environmentally aware route and access planning, intelligent road infrastructures, definition of digital map attributes for eco-routing and advanced multi-modal travel and traffic advice and information systems for individual and collective transport
- Methodologies for assessing the impact of advanced ICT in energy efficiency and CO₂ reduction, and in instantaneous emission models which take into account driver behaviour.

c) Coordination and Support Actions

- In the framework of the Intelligent Car Initiative, support to the eSafety Forum activities such as stakeholder consultations, road mapping and organising events and dissemination.
- Support to research agendas for energy efficiency, international cooperation, user awareness raising and dissemination of research results, international standardisation and harmonisation.
- Support the establishment of European large scale actions spanning research, innovation and deployment of service infrastructures for sustainable mobility and transport.

The Coordination and Support Actions should include relevant stakeholders in the domain.

Expected Impact

- Strengthened position of Europe's logistics and freight industries in the marketplace for low-carbon products and services
- Significant improvements in efficiency and environmental friendliness of mobility and transport in Europe; target: 25% reduction in GHG emissions in transport
- Full integration of intelligent cargo items into the multi-modal transport infrastructure, with special emphasis on urban multi-modal logistics
- Widening the market for new ICT-based mobility and transport services in Europe and worldwide.

Funding Schemes

a) and b): IP, STREP; c): CSA

Indicative budget distribution 10

- IP, STREP: EUR 46 million, with a minimum of 50% to IPs and 30% to STREPs
- CSA: EUR 4 million

Call : FP7-ICT-2011-7 Published 28/9/10, deadline 18/1/11

8. Objective ICT-2011.6.7 Cooperative Systems for energy efficient and sustainable mobility

Target Outcome

a) Cooperative Systems for low-carbon multi-modal mobility covering cooperative applications and services for energy efficiency and eco-friendly mobility based on the harmonised European Communications Architecture³⁰ and bidirectional vehicle-to-vehicle (V2V), road-to-vehicle (R2V) and vehicle-to-infrastructure (V2I) communication technologies:

- Design, development and testing of new cooperative and pro-active traffic and travel management and control strategies based on the availability of reliable real-time systemwide data, including handling of special events and recovery after incidents.

- Addressing the interaction between the driver, the vehicle and the infrastructure, user acceptance and deployment of cooperative energy efficiency services, taking into account the needs of Fully Electric Vehicles such as integration with charging networks. Liability, privacy, reliability, security and Human Machine Interaction should be addressed as well. The focus should be on road transport, as this sector presents the largest challenges. Projects could also address all transport modes according to the principle of comodality, and include smart urban mobility.
- b) European Wide Service Platform (EWSP) for cooperative system enabled services, aiming at providing to the drivers and other users a large variety of energy efficiency, mobility, comfort and safety related services:
- Intelligent combination of wireless communication technologies, development of network and transport communication protocols and security and control mechanisms, and support to their standardisation.
 - Development of the necessary EWSP subsystems for service development, discovery, provision and administrative operations
 - Development of interoperable innovative services for the EWSP, based on Future Internet technologies and in coordination with activities under the Future Internet PPP of Challenge 1.
- c) Coordination and support actions
- Dissemination of results, user awareness campaigns, assessments of socio-economic impact and training.
 - In accordance with the specific cooperation agreements with Japan and the USA: active exchange of information and results, and international standardisation and harmonisation.
 - The coordination and support actions should include relevant stakeholders in the domain.

Expected Impact

- Decarbonisation of transport. Significant improvements in energy efficiency and environmental friendliness of transport and mobility in Europe
- Improving the competitiveness of the European transport industry as a whole, and enabling them to continue to address global markets successfully. World leadership of Europe's automotive industry in the area of Cooperative Systems.
- Opening new markets for mobility, safety, energy efficiency and comfort services in Europe. Ensuring market leadership by Europe's industry in green products and services.

Funding Schemes

a) and b): IPs, STREPs; c): CSA

9. SiS.2011.2.2.3-2 European events to bring together young researchers with distinguished scientists as role models.

The aim is to stimulate interest in research careers in science and technology among students at university or in higher education institutes within EU Member States or Associated Countries, who are studying for a masters or doctoral degree or equivalent. The focus is on bringing them in direct contact with distinguished scientists, such as Nobel Prize laureates, so that they can gain useful insight and advice from those who are pursuing successful and rewarding careers.

Grant support will be offered to complement the costs of scientific gatherings that are already scheduled, and for which core funding has already been or will be secured from other sources, to help support the participation costs of selected students at such gatherings. The proposals should describe in detail the mechanisms through which the students will be able to meet and interact with distinguished scientists. Where such mechanisms are not already included in the programmes of the scientific

gatherings the associated additional costs involved in organising them may be eligible for support.

The proposal should include plans to ensure that students from across Europe are made aware of the possibility to participate in such gatherings. The procedure for selecting candidates should be described and should respect the principles of transparency and fairness as well as ensuring a balanced participation in terms of country and gender. Consideration should also be given to the use of audiovisual and internet media as a means of broadcasting the meetings between the students and distinguished scientists to a wider public. In consequence, an appropriate communication strategy shall also be described, designed to ensure proper and full visibility to European Union Research policies and programmes and to the concrete opportunities offered to young researchers. It should include precise deliverables, to be implemented during the event, and in all communication activities and materials preceding and following the event.

Only one proposal covering three identified scientific gatherings taking place in 2011, 2012 and 2013 will be financed. Please note that this call topic is open under a dedicated call for proposals: FP7-SCIENCEIN- SOCIETY-2011-EVENTS.

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria. Please also refer to the call fiche for details of these limits

Funding Scheme: Co-ordination and Support Actions (supporting). Only one project will be financed.

Additional eligibility criterion: the maximum requested EU contribution shall not exceed EUR 300 000.

Expected impact: To provide added impetus to students studying for a masters or doctoral degree or equivalent in science and technology; to encourage them to pursue careers in research and broaden their knowledge and understanding of science and technology and of the latest scientific breakthroughs.

Date of publication³⁸: Tuesday 20 July 2010

Deadline: Thursday 25 November 2010 at 17.00.00, Brussels local time.

10. Reinforcing cooperation with Europe's neighbours in the context of the ERA (FP7-INCO-2011-6, ERA-WIDE)

The reinforcement of the cooperation with Europe's neighbours in the context of the European Research Area (ERA) is an important part of the EC communication on the Strategic Framework for international S&T cooperation¹. In order to promote closer scientific cooperation with the European Neighbourhood Policy (ENP) countries and to prepare their possible association to the Framework Programmes, dedicated activities aimed at improving the cooperation capacity of these countries should be carried out under the Specific International Cooperation activities of FP7. This should complement the Research and Innovation activities described in the National Indicative Programmes and covered by the European Neighbourhood and Partnership Instruments (ENPI).

Technical content/scope

The objective of this action is to reinforce the cooperation capacities of research centres located in the ENP countries, which are not associated to FP7 at the time of the publication of the call². The call will give these countries the possibility to improve the research activities of their highest quality and/or promising centres in a scientific field addressed by the thematic priorities of FP7.

Proposed activities

The activities covered by the call are:

- twinning with research centres in Member States or Associated Countries in view of exchanging knowledge and good practices, disseminating scientific information, identifying partners and setting up joint experiments through short-term visits or exchange of staff, meetings, seminars, and similar activities;
- developing training modules to build competency and facilitate the participation of these centres in FP7;
- developing research centres' strategy in order to increase their scope and visibility (regional coverage, activities), to develop comparative advantage and to improve their competitiveness by enhancing their responses to the socio-economic needs of their countries and of the region.

The ERA-WIDE activity does not support directly research work but contributes to improve the centre's capacities in a given research area. The activities proposed should form a coherent plan and therefore they should be described in details and justified. Preference should be given to activities with a regional impact.

Funding scheme(s)

The funding scheme that applies is the 'Coordination and Support Actions' (supporting action). The requested European Union contribution for each project is expected to be about EUR 0.5 million. The typical duration of the project would be between 2 to 3 years. Eligible costs: travel and subsistence costs for short-term staff exchange or scientific visits, meetings and seminars, consumables, studies, depreciation of equipment. The requested European Union contribution to consumables and equipment costs should not exceed 30% of the total requested European Union contribution.

Participants

This call is addressed to research centres of high level S&T capacities, which are located in an ENP country not associated to FP7 at the time of the publication of the call. The research centre is defined here as an existing working unit, either independent or functioning within a locally established research organisation of one of the countries concerned, having preferably distinct organisational and administrative boundaries. The centre should not be a subsidiary or branch of an organisation established in another country.

The proposal must target only one such centre, the consortium must however include one or more additional participants, in particular from the Member States and/or Associated Countries so as to fulfil the objectives of the activity.

The research centre targeted by the proposal must be the coordinator of the proposal. When multiple eligible proposals targeting the same research centre are submitted, only the eligible proposal, which has been submitted last will be evaluated. Only one ERA-WIDE grant targeting the same research centre can be active at any time.

Areas open to this call

The call will be open to the fields of science addressed by the thematic priorities of FP7 and will target centres located in the following regions:

- Area 1: Eastern Europe and South Caucasus: Moldova, Georgia, Ukraine, Belarus, Armenia, Azerbaijan,
- Area 2: Mediterranean Countries: Morocco, Algeria, Tunisia, Libya, Egypt, Jordan, Palestinian-administered Areas, Lebanon, Syria

It is important to ensure that as many countries as possible can be covered under the call while rewarding the best proposals in each Area. For this reason, the following scheme for selection of projects will be applied: At least one project per country covered by the areas of the Activity 7.6 of the work programme will be funded, provided that it has passed thresholds of all evaluation criteria.

Therefore, the highest ranked proposal for a given target country will be considered for funding, subject to the result of the evaluation and availability of the budget. After allocating a budget to the best projects in this way, all remaining projects in each

Area will be ranked together in one list according to the marks obtained during evaluation. The remaining budget will be allocated to the projects according to their position in this overall ranking without further concern for country coverage. The panel of experts evaluating the proposals will apply this rule when recommending a priority order for the proposals, in particular for proposals with the same score.

Socio-economic dimension of research

Where relevant, account should be taken of possible socio-economic impacts of research, including risks and opportunities. A sound understanding of where such benefits might arise and their nature should be demonstrated, both at the level of research design and of project implementation and/or research management. In this context, and where appropriate, the proposal should ensure engagement of relevant stakeholders e.g. user groups, civil society organisations, policy makers or the media. A multi-disciplinary approach should be adopted through the involvement of researchers from social sciences and /or humanities. Foresight and other forward looking activities should be integrated within the proposal wherever appropriate. Proposals raising ethical or security concerns are also encouraged to pay attention to wider public outreach.

Gender dimension

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, all projects are encouraged to have a balanced participation of women and men in their research activities and raise awareness on combating gender prejudices and stereotypes. When human beings are involved gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality. In addition, specific actions to promote gender equality in research can be financed as part of the project, as specified in the Appendix 7 of the Negotiation Guidance Notes.

Expected impact

The outcomes of the activity should be:

- contribution to RTD capacity building and management in the target country,
- enhanced participation of the country in the Seventh Framework Programme,
- increased visibility and scope (regional coverage, subjects, activities) of the centres with increased linkage with economic and social environment,
- networking with other research centres in Member States or Associated Countries (mobilising the human and material resources existing in a given field, disseminating scientific information as well as the results of research, facilitating communication between the centres having similar scientific interest),
- Increased job opportunities that encourage gender equality in the country, in particular for young scientists (measures to avoid 'brain drain' phenomena: better career opportunities, better work conditions, access to research infrastructures).

Deadline2: 15/03/2011,

[11. Topic SEC-2011.1.3-1 Improvised Explosive Device \(IED\) neutralisation in urban /civil environment - Capability Project](#)

Description of the topic:

The main objective is to re-visit the actual practices of forces dealing both with human borne and static explosive devices just discovered and to propose new and innovative methods in order to improve the actual practices for their neutralisation before being triggered, or to drastically limit the consequences of their explosion. Scenarios of the last years terrorist attacks in EU that involved explosives should be taken into account.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact: To help police forces agencies to react more efficiently to explosive devices, to facilitate the emergence of a common European approach.

12. Topic SEC-2011.1.4-2 Innovative techniques for safe external control of non cooperative vehicles – Capability Project

Description of the topic:

Organised crime is always using new means to perpetrate its unlawful activities. One example is the use of high speed car to smuggle unlawful merchandise from one country to another.

The action should investigate innovative means for the police/security/border guard forces to control, slow and stop, non-cooperative vehicles (e.g. motorcycles, cars, trucks, boats) at distance. Safety and security of people, other vehicles and environment in nearby public or private areas should be taken into account as well as of the people inside the vehicle to be controlled. Secured and controlled usage of this new means should be included by design.

Legal implication of the use of such new means should be studied. Support and collaboration of vehicle manufacturers could be sought.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact: to raise the awareness of policy- makers and help developing the proper legal framework (if needed); to demonstrate to the law enforcement agencies the added value of new technologies in specific areas in relation with their daily operations; and to demonstrate to the citizens that the use of new technologies by security forces in their daily mission could increase their security without endangering their safety.

13. Topic SEC-2011.2.2-2 Protection of Critical Infrastructure (structures, platforms and networks) against Electromagnetic Attacks - Capability Project

Description of the topic:

Future civilian critical infrastructures could be exposed to deliberate attempts at disruption/destruction by non-nuclear EMP (electromagnetic pulse) or HPM (high power microwave) means. This not only means conventional and novel hardening, but also systemic resilience features as well as methodologies and instruments for detection and verification of attacks capabilities. With the danger being perceived as abstract at best, a thorough risk assessment and database on the costs of such attacks should be created, as this would strongly underpin the necessary legislative incentives and enforcement of such hardening measures.

Therefore, a regulatory and organisational framework should be implemented that would also provide methodologies and procedures, designate responsibilities and offer help to affected parties. Particularly security and emergency services should use hardened equipment wherever possible. All of these capabilities represent gaps today and in the near future. There are neither regulations nor organisations in place, and detection means are non-existent. No assessment or evaluation methodologies are readily available, and threat awareness is mostly missing.

Objectives:

- Threat analysis and risk assessment of the occurrence of such events and their most likely modalities.

- Investigations of high power microwaves (HPM) pulses influence on various civil objects: buildings, energy units, transport, banks, communication systems, computer networks, computers and electronic units.
- Investigate to what extent the current protection is efficient.
- Prepare HPM detection, diagnostic system and risk management, mitigation, reference HPM pulse power sensors and standards.
- The project should provide recommendations tools, of the shell materials and redundancy architectures, for protecting civil objects against microwave radiation.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected impact: Provide a clear view for the policy makers on the possible threats of an electromagnetic attack, i.e. assessing the vulnerability of Critical Infrastructures and indicate tools and materials to improve the resiliency against EMP/HPM attacks

14. Topic SEC-2011.2.5-1 Cyber attacks against critical infrastructures – Capability Project

Description of the topic:

The objective of this topic is to successfully prevent cyber attacks issued by criminal organisations against telecommunication networks and SCADA (Supervisory Control And Data Acquisition) systems supporting critical infrastructures. To reach this objective it is necessary to develop efficient and real-time monitoring, detection, diagnosis and reaction approaches to increase critical infrastructures reliability, resiliency and security. ICT (information and communication technologies) systems supporting critical infrastructure (e.g. energy plants, water plants, financial entities, public administrations, transport networks, etc) are no longer separated and isolated entities. The interconnection with other public and open networks causes security problems, and successful attacks may have significant effects, such as, for example, energy blackouts. Moreover, the crucial information from monitoring systems may be delayed or even lost, preventing early warning systems from proper and ontime reaction.

The targeted tools would also aim at analyze, test and benchmark the performance capabilities of ICT infrastructures supporting critical infrastructure (example: Firewalls, IPS/IDS, anomaly detection systems, threat forecasting systems, network access points, anti spam, antivirus system). This could include the exposure of shortages in actual systems in their respective interconnections.

Thus, there is a need for novel solutions and systems assuring protection of ICT/SCADA systems supporting critical infrastructure, with particular focus on cyber defence.

Related existing activities funded notably under the FP7 Security and ICT themes have to be taken into account. The consequences of the various national and international legal contexts, such as respect for fundamental rights and in particular the protection of personal data as well as related policy initiatives are important and should be taken into account as well.

The action should be an opportunity for networking and exchange between the stakeholders to facilitate the emergence of common European solutions. The active participation of end users (e.g. public authorities, relevant EU agencies) is essential.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected Impact: This work should enhance reliability and resilience of ICT systems supporting critical infrastructures.

15. Topic SEC-2011.4.2-4 Enhancing crisis response abilities of the public – Coordination and Support Action

Description of topic:

While a lot of efforts are made in strengthening professional crisis response forces like first responders and crisis managers how to react in crisis situations like natural disasters or terrorist attacks, the knowledge of what individuals and the public as a whole who are affected by such an incident could actively contribute to contain and overcome the crisis still needs to be developed. Driven by the overarching key message of ESRIF (European Security Research and Innovation Forum) on *societal resilience*, i.e. that “[...] security research and innovation should focus on strengthening Europe’s inherent resilience and ability to efficiently recover from crises [...]”, it is evident that Europe’s ability to efficiently and quickly as possible recover is particularly determined by the reaction or non-reaction of everyman in case of an incident, especially in a large scale disaster.

In a long-term approach security research should analyse how the public as a “prime responder” could be best enabled to actively contribute to crisis containment and overcoming, and deliver appropriate measures (e.g. education and training) and tools to support this goal.

As a first step, a study should be carried out thoroughly identifying and assessing potential key enablers enhancing individual and community based crisis response abilities.

This action should include:

- Surveying the state-of-the-art in integrating individuals, social groups, volunteers communities and the public as a whole into crisis preparedness and response, identification of worldwide centres of excellence and best practices,
- Assessing potential key enablers for human resilience and exploration of appropriate measures and tools for enhancing individual, family and community crisis response (e.g. self-help abilities, education of public how to behave in certain situations, involvement of public in large scale exercises, use of social network tools (twitter, facebook), dissemination of training material through Internet connected mobile devices, etc.),
- Technology Acceptance Models to assess the acceptance and ease-of-use of novel devices and means of communications for a wide variety of individuals and communities for the purposes of crisis management,
- Roadmapping of further R&D and other implementation needs towards the long-term goal of an “enabled European public”, and/or
- Awareness raising among and dissemination of project results to relevant stakeholders, i.e. public authorities, first responders, emergency management practitioners, specialised education and training professionals, identified centres of excellence and the public itself.

Funding schemes: Coordination and Support Action

Expected impact: This study should prepare the ground for further research activities to reach the long-term goal of an “enabled European public” by achieving awareness about this concept and approach among relevant parties to be involved as described, and by describing and sequencing further R&D and other needs delivering a full concept.

16. Topic SEC-2011.5.3-4 Video archive search– Capability Project

Description of Topic:

Today many infrastructure operators (airports, railway, underground, etc.) are using video surveillance systems for security purposes. All these systems gather high volumes of data which are stored up for a specific period of time, usually legally defined. The exploitation of this huge amount of information, in a legal framework, is technically difficult for law enforcement agencies, due to different compression formats, indexing systems, data storage formats, access systems and proprietary systems.

The aim of the action is to analyze the existing technical constraints and to look for appropriate search solutions. The action should make recommendations for interoperable standards, common practices and procedures taking properly into account the legal, ethical and democratic challenges of the use of video surveillance. Given the sensitivity of video surveillance, close links should be established with the projects to be selected after the topics in coordination with the FP7 theme SSH (Socio-economic Science and the Humanities) 23.

Funding schemes: Collaborative Project (small or medium-scale focused research project)

Expected Impact: Higher crime detection rates, better interoperability between video systems, ideas of video exchange and access standards, lower European dependency on non - EU-Systems, more secure and legally and ethically acceptable systems ('privacy by design' concept).

17. Topic SEC-2011.6.2-1 Best practices for enhancing security policy in urban zones

Description of the topic:

Crime and instability in urban areas emerge from a variety of factors, for example, economic decline; poor urban planning; pre-existing ethnic/religious divides; endemic organised or gang crime; tensions due to immigration; etc. Such problems persist in many European cities and are likely to be amplified by the recent economic downturn. There is a need to identify and tackle these underlying problems as soon as possible to prevent undesirable security scenarios arising.

Tackling such security issues requires actions which are interlinked in a complex way. In order to mitigate these undesirable security scenarios the task is to examine best practice in successful urban zones – especially those that already have managed a successful transformation - and thereby to develop metrics that can inform local policymakers in distressed environments.

These metrics will consider the economic, environmental, educational and social actions which need to be orchestrated to suit local issues and context. It is expected that the metrics will be adopted and implemented by representative urban areas and that progress will be benchmarked throughout the course of the project.

The task might also consider the provision of an early warning system where metrics are used to alert authorities to the above dangers.

Funding schemes: Collaborative Project (small or medium-scale focused research project) or Coordination and Support Action

Expected Impact: The outcome of the project should be a systematic methodology that offers the prospect of a measurable increase in the resilience of some of Europe's distressed urban areas while taking account of variables such as culture, geography, etc. This best practice will be implemented for selected urban areas leading to a demonstrable increase in economic prosperity, security and citizens' perceptions of security.

18. ENV.2011.1.3.2-1 Building societal resilience to disasters in Europe

In the frame of an interdisciplinary context involving social and natural sciences, research should develop a conceptual and methodological approach to clarify how the resilience capacity of a society confronted with natural hazards and disasters can be characterized, defined and measured. Based on well analysed and representatives case studies or given situations, one should develop a way to assess the state of resilience and propose strategies and support measures to enhance it. Attention should be paid to scale (spatial and temporal) and their integration. Further consideration and clarification need also to be given to associated concepts like preparedness, risks governance, capacity building.

Funding scheme: Collaborative Project (small or medium-scale focused research project)

Expected Impact: New clarified and largely accepted concept(s) and methods to define and measure the resilience of a society to disasters. Framework for a more comprehensive approach to be shared and tested in Europe and elsewhere. Identification of mechanisms and measures to enhance resilience, change human behaviour/perception and improve prevention and recovery.

19. ENV.2011.2.1.5-1 Sustainable and Resilient Green Cities

Urban resilience relates to a city's ability to respond to a number of combined "grand challenges": natural resource shortage ("peak oil", water, etc.), climate change adaptation and mitigation, and unprecedented urban growth; in ways that are socially, economically and environmentally acceptable and feasible. The aim is to develop positive transition strategies and scenarios to enable cities (and their rural interface) to meet these combined "grand challenges" by reducing their urban ecological footprint, via the innovative development of: public and private green infrastructure (ie: green walls and green roofs) and spaces, organic materials/products and green processes – inspired by nature (ie: biomimicry); rehabilitation of ecosystem services and urban biodiversity, urban/industrial regeneration, land use planning and creative design; shortcircuit economies (increased reliance on local goods and services), improved climate-neutral infrastructure for sustainable waste, water, energy and transport management, while also fostering greater equity and social cohesion, and mitigating negative environmental impacts. The strategies must also limit urban sprawl to privilege compact and polycentric approaches, so as to reduce transport and energy costs, retain valuable agricultural land and natural areas, and protect landscape value, while limiting the negative effects of densification (ie: increased vulnerability to risk, noise, stress, safety). Lastly, the research should develop novel methods to enable adaptive governance, collaborative decision-making, and behavioural change to assist local authorities and citizens implement the transition from today largely unsuitable reality to tomorrow's resilient and sustainable European cities.

The research will integrate expertise from the following disciplines: architecture, urban planning and design, bio-physical sciences, public health, socio-economics, decision-making and governance, technology, and art. It should to the extent possible adopt a wide geographical distribution of cities (case studies) representative of all European regions. The research will extend well beyond the traditional combination of scientific disciplines exploring the interface between art and science.

Funding scheme: Collaborative Project (large scale integrating project)

Additional eligibility criterion: The project will only be selected for funding on the condition that the estimated EU contribution going to SME(s) is 10% or more of the

total estimated EU contribution for the project as a whole. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected Impact: Provision of visions, feasible strategies, spatial scenarios and guidance tools that would enable adaptive governance, collaborative decision-making and behavioural change towards resilient and sustainable European cities. The results of research in this topic should clearly be of interest and potential benefit to SMEs, and will create a beneficial economic impact to the sector concerned. A strong participation of SMEs in the project itself should help contribute to the realisation of that impact

20. ENV.2011.5.1.0-1 Uptake of climate related research results through knowledge platforms with African collaboration partners

After many years of international dialogue and collaboration, several research networks have been established between European and third country researchers in the area of environmental research. The proposed activity should identify and promote good practices for use of research results in decisions and action by these networks and their constituencies through creative and efficient means, including e-tools. Particular emphasis should be given to past and on-going research projects with a strong international component. The project will establish knowledge platforms involving all types of stakeholders, including researchers from past and current EU funded projects, local authorities, NGOs, SMEs, handicraftsmen, artists and educational partners.

Priority should be given to the transformation of knowledge (including indigenous knowledge) into climate change adaptation and mitigation activities in Africa. The broad participation of information multipliers from EU and third countries as well as coordination with National Contact Points is necessary.

Funding scheme: Coordination and Support Action (supporting action)

Additional eligibility criterion: A minimum of one partner from an EU Member State or Associated Country and two African partners in the consortium is required. This requirement will be applied as eligibility criterion.

Expected Impact: Increased uptake of research results through involvement of stakeholders in early stages of new projects and in dissemination of results from mature projects. Evidence of how research has informed policy and action in the field of climate change adaptation and mitigation in Africa.

21. AREA 7.2.5.2. Competitive surface transport products and services

The objective is to develop innovative products and systems concepts (for vehicles, vessels and infrastructures) meeting end-users expectations and ensuring high quality services enabling Europe to strengthen its global position or to regain competitiveness. Particular attention will be given to the role of SMEs in the innovation process and the supply of components, systems and equipments within the transport sector. Therefore, the involvement of SMEs in project partnerships is important.

Expected impact

- Maintain European share of ultra large cruise ship world production.
- Develop new generations of transport products that are highly competitive, emit less CO₂ and other pollutants and tailored to customers expectations.
- Create new niche markets for high technology added value products and services and take full advantage of eco-innovations.

- Improve the quality and competitiveness of surface transport services considering features such as price attractiveness, environmental friendliness, punctuality, frequency, real time information or leisure and work during travel time¹.
- Drastically reduce maintenance and inspection costs².
- Sustain economic development in Europe, create job opportunities and technology skills, with special focus on green technologies.
- Promote the start-up and emergence of new high-tech SMEs, particularly in the advanced transport technologies and 'services-related' activities specific to Transport.
- Proposals must ensure at least a neutral impact on climate change.

22. SST.2011.5.2-2. Advanced and cost effective road infrastructure construction, management and maintenance

There is increasing economic and political pressure to extend the serviceability and lifetime of road transport infrastructure in both Europe and developing countries. The purpose is not only to save on the cost of maintenance or replacement, but also to avoid the high indirect costs associated with disruption of passenger and freight transport (due to congestion, weather effects and traffic incidents), energy consumption and CO₂ emissions. As a consequence, new processes, technologies and tools for management, monitoring, construction, rehabilitation and maintenance of road infrastructure are needed. These processes will aim at high level of service to the road user, cost effectiveness, energy efficiency, low resource consumption and long service life taking into account life cycle performances, durability, and impact on traffic (in particular safety and mobility) with appropriate consideration of environmental performance.

The main development issues are targeted at improving the service level, and extending the life-cycle, of transport networks by highly efficient management and operation, using advanced technologies and tools for construction, monitoring, assessment and maintenance. These include:

- New methods and technologies for construction, repair, maintenance, demolition and replacement of road infrastructure (including civil engineering structures) which improve serviceability and reduce the impact on the environment.
- Innovative systems, models and tools for reliable risk based monitoring, assessment and control of performance of infrastructure related to safety, service level, the service life of the road network.
- New methods, tools and technologies for multi-functional smart and safe infrastructure monitoring, generating real-time data for road user support, to enhance efficiency and road safety, enabling better change management with reduced risk of errors.
- Reduced vulnerability of transport networks to natural hazards and incidents, through development of appropriate models, materials, monitoring systems, components, and design and construction techniques.
- Optimising road infrastructure, through the development of methods and models, to lower the CO₂ emissions associated with its use, such as fuel consumption, the impact of vehicle wear and rolling resistance, and increase the energy efficiency (recovery/utilisation) of the system.

Integration of all stakeholders in the implementation is strongly recommended: owners and operators, contractors, material and technology suppliers, research institutions and SMEs.

¹ ERRAC SRA.

² ERRAC SRA and ECTP SRA.

Funding scheme: Collaborative Projects - small or medium-scale focussed research.

Group of topics N° 4

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2011-RTD-1

Ideas:

Many elements of this are linked with FOR

Based on EC paper on Simplification, the idea to run a prize may also be an option
A number of projects (note the call is part of overall limit of €10M and includes also TRA and other CP

Interested Parties:

Everyone

23. SST.2011.5.2-6. Cost-effective improvement of rail transport infrastructure

A large proportion of railway civil engineering structures and track forms across Europe are old and are now expected to safely and economically carry ever increasing loads of traffic volumes, vehicle (and axle) weights and speeds. Older earthworks were not designed to modern standards and can quite quickly deteriorate in adverse weather conditions. Rail infrastructure in particular within Eastern Europe and developing economies has particular needs towards efficient improvement to enable integrated and effective European rail freight and passenger services.

Extensive renewal of track and structural assets by conventional methods on operational networks is likely to be unaffordable, cause serious congestion and interruptions to services, in addition to resources and carbon footprint issues from the projects themselves. Hence effective and efficient improvement of infrastructure must be based on whole life considerations.

The research aims will enable improved assessment and understanding of deterioration of infrastructure to extend the life and target infrastructure renewal and improvement needs. Work will investigate new rapid/cost efficient/ effective construction techniques and logistics to extend the life of existing track and infrastructures. The needs of developing rail freight and passenger networks (such as within Eastern Europe and developing economies) that require substantial infrastructure improvement may be considered in particular.

Proposed scope of work:

- Application of new technologies to extend the life of elderly infrastructure.
- Rail transport infrastructure, improve existing degradation and structural models to develop realistic life cycle cost and safety models that demonstrate safe service life and can be used to plan improvement programmes.
- Investigate new construction methods and logistics for transport that minimise the time and cost required for the replacement of obsolete infrastructure.
- Investigate the use and cost effectiveness (planning, replacement programmes etc) from application of advanced monitoring techniques to complement or replace existing examination techniques for elderly rail infrastructure.
- Develop a tool that works with existing widely utilised asset management tools to assess whole life environmental and economic impact from track and infrastructure maintenance and renewal.

Proposals shall utilise expertise from both the rail sectors and draw upon related experience and expertise from other sectors, client organisations, research

institutions etc. The project shall demonstrate a clear plan for implementation, drawing upon client needs in order to maximise benefits in the relatively short term.

Funding scheme: Collaborative Projects - small or medium-scale focussed research

Group of topics N° 1

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2011-RTD-1

<u>Ideas</u>
FEHRL institute to lead?
<u>Interested parties</u>
IGH to lead AIT, ZAG, VTI, NTUA, EPFL, LCPC, UCD, CEDEX, CDV, KTI, IBDiM Railway companies Possible to work with EURNEX (Lyon declaration partner)?

7.2.6. CROSS-CUTTING ACTIVITIES FOR IMPLEMENTATION OF THE SUB-THEME PROGRAMME

24. SST.2011.6-1. Supporting the organisation of the TRA 2012 conference and other research relevant events

Activities will include in particular the support of the organisation of the TRA Conference (Transport Research Arena) in 2012. The aim is to have a follow-up of the previous TRA conference with a larger scope that will cover all surface transport modes: road transport, rail transport, waterborne transport and their interfaces. The idea is to have a high standard scientific European conference as the first Transport event in the world covering all aspects of R&D: from basic sciences, socio-economic research to applied sciences and demonstration activities. The intention is to assure a long-term commitment to develop and maintain a European high standard scientific conference. The conference should have a systemic approach to building sustainable transport especially aiming at greener, safer and smarter transport. It will concern European and national research activities. The link to European Technology Platforms related to transport (e.g. ERTRAC, ERRAC and Waterborne) is necessary. Finally, it should also be complemented by an early-stage research student competition with the goal of stimulating the interest among young researchers in the conference.

Funding scheme: Coordination and Support Actions aiming at supporting research activities

Group of topics N° 4

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2011-RTD-1

<u>Ideas</u>
<u>Interested parties</u> FEHRL BRRC, ZAG, LCPC,UCD NTUA (+ CEDR) ECTRI

25. GC.SST.2011.7-11. Green corridors and supply chain management

The European Commission in its Freight Logistics Action Plan introduces the e-Freight concept. The Freight Logistics Action Plan states the following aim: “To overcome the current and future transport problems Europe's transport system needs to be optimised by means of advanced logistics solutions that can increase the efficiency of individual modes and their combinations”. Transport administrations and the business community must share the responsibility for developing a common ICT application or e-freight framework in ways that serve transport policy goals, society's interests and have a convincing business case. From commercial, technical and business perspectives, there is a need for an open but clearly regulated efficient e-freight framework open to all partners in the transport supply chain. It must enable the management of goods movements into, out-of and around the Union that will operate within and across modes. It must be affordable, accessible, reliable, accountable and secure.

The aims of this topic are to:

- Demonstrate the interoperability of a wide range of e-logistic solutions that have been developed recently through various EU funded and national projects.
- Demonstrate that these solutions, while diverse in terms of concepts, information requirements and information management, fill the gap between data availability and data needs throughout the supply chain.

Specific issues to be addressed:

- To demonstrate the SME friendliness, giving SMEs access to easy-to-use and environmentally friendly co-modal transport options.
- To create a solid European transport e-logistic framework, which in its turn is solid partner for e-customs, e-health, etc. developments.
- To analyse possible new roles, opportunities and responsibilities of stakeholders in respect of accurate data provision and management; or alternatively to describe new transportation business models.
- To develop where needed legal structures and measures required to make the intelligent cargo and supply chain management operate in an efficient, accurate and secure way, protecting users.

Scope:

- Geographically: EU and global transport & distribution.
- Door to door consignments and TEU levels.
- All inland modes, possibly with air transport linking up with IATA business.
- Large stakeholders but also SMEs.

Funding scheme: Collaborative Projects

Group of topics N° 3. Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2011-RTD-1

Ideas:

Interested parties:

LCPC, VTI, AIT, CSIR, CDV, BRRRC, BAsT, KTI, IBDiM, DVS, (CEDEX)

Feedback to Steve before TRA
IRU interested to partner (lead?)

26. GC.SST.2011.7-2. Specific safety issues of electric vehicles

[**Note:** the focus of this topic will be further defined after the results of the 2010 call are known]

To facilitate widespread customer acceptance and use of Fully Electric Vehicles (FEVs), a series of potentially-critical safety issues specifically need to be addressed. Therefore, an analysis of the consequences of electrification with respect to safety requirements has to be made. In particular, the presence of high voltages and potentially hazardous chemicals necessitate the definition of specific design, usage and rescue guidelines, while the absence of engine noise requires in-depth assessment regarding interior and exterior acoustic characteristics during normal operation.

Activities will focus on:

- Safe handling, rescue and maintenance including solutions to ensure safe plug-in/re-charging during normal operation, prevention of misuse/abuse, and protection against fire and electric shocks during maintenance and repair or in the event of a crash including rescue and towing operations in the post crash phase.
- Acoustic perception of the FEV, requiring solutions to warn vulnerable road users of the presence of a nearby moving vehicle while providing a means for heightening the awareness of drivers in critical situations. Including the application/adaptation of existing pedestrian protection systems (active safety) to the raised needs.

Different technologies and solutions shall be explored and assessed also from the perspective of overall effectiveness and acceptability, the objective being to develop FEVs which are optimized in terms of both energy efficiency and safety, a fundamental requirement to enable FEVs to become mass products in the future.

Funding scheme: Collaborative Projects

Group of topics N° 3

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2011-RTD-1

Ideas:

Interested parties :

BRRC, AIT, VTI, DVS,

27. GC.SST.2011.7-4. efficient drivelines for long distance transport – future power train concepts (includes: advanced combustion and after treatment)

The aim of this research is to contribute to the further reduction of the fuel consumption of heavy duty trucks. It is necessary to investigate the engine downsizing potentials, along with the possible integration of hybrid systems for boosting the power for acceleration and starting of heavy duty trucks on a hill. This approach also opens a potential for an emission reduction, due to reduced transient behaviour period of the truck engine. This sector is also facing the EU VI emission legislation in the next years. Therefore, this aspect is also part of the objective of these research activities. To meet this challenge, it is necessary to work on the development of improved combustion systems as well as on key components, such as the turbo charging system, the thermal management for the aftertreatment system and the efficiency of the Selective Catalytic Reduction (SCR) system. For the

realisation of this goal, advanced drive train control considering e.g. model based approaches is needed.

Scope of activities:

- Downsizing / downspeeding with advanced turbo-charging.
- Development of a new turbo charger system with higher pressure ration and wider area of high efficiency.
- Friction reduction: piston, crankshaft camshaft and auxiliaries (oil and water pumps).
- Faster combustion (e.g. high PCP, low EGR, VVA), supported by advanced injection strategies, using closed loop functionality as well as high thermal efficiency.
- Advanced air control systems for internal EGR and effective compression ratio management.
- Reduced thermal losses, with a possible integration of improved exhaust after treatment systems for cold start and transient conditions, considering new catalytic materials.
- Advanced NOx aftertreatment systems: SCR (Selective Catalytic Reduction) systems (e.g. new catalytic materials) and combinations with NO_x trap.
- Heat management for the aftertreatment system.
- Use of alternative fuels (focus on low carbon content and biofuels from renewable energy sources).

Expected impact: The expected improvement of efficiency from the power train, based on Euro 5 power train, could reach up to around 15% (without considering the reduction of CO₂ through blending bio fuels).

This activity will lead to new technologies for the next generation of truck powertrains.

Funding scheme: Collaborative Projects

Group of topics N° 3

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2011-RTD-1

Ideas:

Heavyroute outputs?
FOR?

Interested parties:

-

[28. SST.2011.4.1-2. Mitigation measures and good practice to reduce human fatalities and disruption of services resulting from suicides and trespasses on railways property](#)

Suicides and trespasses stand as major issue concerning safety and operations on European railroads leading to sustained breakdowns of traffic, severely affecting train staff, rescue services and passengers and uncounted related costs impacting on society. Currently, around 3.000 deaths/year occur in the EU, where the societal costs per year can be conservatively estimated around EUR 1.5 billion³. Recent research and implementation of good practice indicate that mitigation measures can be taken to reduce these numbers. Given the number of casualties, these measures

³ Source: European Railway Agency

can be cost-effective from the railway sector point of view and beneficial from a societal perspective. The research shall:

- Establish a qualification analysis of suicides and trespasses occurrence in railway environment. This analysis should be based on the most consistent as possible existing official data sources.
- Establish the state-of-the-art concerning previous and ongoing research on suicides and trespassers prevention in Europe and world-wide.
- Analyse current practice of mitigation measures with the aim to identify the most effective and cost-efficient practices appropriate to the need. Applying particular attention to measures to prevent suicides at level crossings and at any other critical point where accidents and suicides occur most (e.g. accessibility to vulnerable persons, etc.) A similar analysis shall be performed for trespassers.
- Demonstrate that preventive measures identified are feasible and cost effective.
- Design prevention campaigns, taking into account the research findings.
- Research activities will establish certain field pilot projects to evaluate the findings and refine measures identified in the previous phases.

Funding scheme: Collaborative Projects - small or medium-scale focussed research

Group of topics N° 1

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2011-RTD-1

Ideas
Interested parties VTI, CSIR, (FHWA?-FRA) EURNEX

29. TPT.2011.1-2. Transport needs for an aging society

Scope and expected results

An aging European society requires the elderly mobility issue to be addressed. While some aspects related to this group of transport users have already been addressed in research activities, an overall picture is missing. Therefore an effort should be undertaken to comprise current knowledge, identify research gaps, and develop an action plan on how to proceed ahead. Special attention should be paid to the gendered nature of the issue: a majority of the elderly will be women, due to the shorter life expectancy of men, and research has shown men and women to have to some extent different mobility needs and possibilities. The development of guidelines, requirements and specifications that allow a safe and adequate usage of different transport modes for this group can be one approach. The application of these results to other related special groups (e.g. disabled, e-illiterates) could also be considered. Generally the activity should take into account all relevant aspects including human and gender-related factors related to the use of transport (e.g. mobility patterns, driving ability, human-machine interface), safety and infrastructure needs. Geography and regional differences as well as welfare and cultural ones are also crucial for mobility issues of the ageing society which need to be investigated thoroughly. Also, possible goal conflicts between social sustainability and e.g. environmental sustainability, merit attention. This work would support a strategy for future transport in an aging society and specific research topics for European and national RTD programmes could be defined.

International cooperation is particularly encouraged in this activity either with international cooperation partner countries and/or other countries (e.g. USA, Japan, etc).

Funding schemes: Collaborative Project small or medium-scale focused research; Collaborative Project for specific cooperation actions (CP-SICA) dedicated to international cooperation partner countries; Coordination and Support Actions aiming at supporting research activities; Coordination and Support Actions aiming at coordinating research activities; Research for the Benefit of Specific Groups – Civil Society Organisations (BSG-CSO)

Open in call: FP7-TRANSPORT (TPT)-2011-RTD-1

Ideas:

Interested parties:

VTI, UCD, AIT, CEDEX, KTI, CDV, BAST? CSIR, NTUA, FHWA, DVS for CSA(SICA)

ECTRI

30. TPT.2011.3-1. A productive international cooperation to strengthening the European Transport research area and facing global challenges

Scope and expected results

Enacting a truly international or globalized transportation research regime faces significant problems and difficulties today which should themselves be studied and researched, by way of priority, in order to provide the means of enacting productive international transport research cooperation in the future. The main goal of international transport research cooperation should be to establish a framework for such cooperation without the potentially limiting considerations that e.g. such research is threatening existing domestic research and “own” product development networks, etc. This framework should be built upon the principles and orientations laid down in the Communication ‘A Strategic European Framework for International Science and Technology Cooperation’⁴

Many transport-related problems in countries like the U.S., Japan or Australia are similar to those of the European countries. Congestion, aging population, energy prices or environmental problems are a challenge for the transport systems and transport research. Solutions are often found in multidisciplinary strategies, for instance the use of mobile communication and navigation applications or regional transport planning tools.

Taking into account the experience of related previous projects, an expert dialogue between European experts and their international counterparts should be established. Proposals may include studies to analyse, compare, assess and link results from past and on-going research projects, comparative between the situation in the EU and those in other regions. International cooperation is encouraged in this activity including high-income countries.

⁴ COM(2008)588 final of 24.09.2008.

Funding scheme: Coordination and Support Action aiming at supporting research activities; Collaborative Project for specific cooperation actions (CP-SICA) dedicated to international cooperation partner countries

Open in call: FP7-TRANSPORT (TPT)-2011-RTD-1

Ideas
CERTAIN international - SHRP2?
Interested parties
All
Establish study tours
Link to TRA?

Materials and Production topics

31. NMP.2011.3.4-1 Eco-efficient management of industrial water

Technical content/scope: There is a great societal, environmental and economic need to develop new integrated approaches, methodologies and process technologies for a more efficient and sustainable management of water in industry. Water is used in many industrial processes, for instance as a solvent or as a coolant. Industry requires pure water for many applications and utilizes a variety of purification techniques both in water supply and discharge. To become more independent from scarce water resources, there is a large need in processing industries for a more integrated and energy-efficient use of water by minimising consumption and considering waste water treatment, re-use and recycling. The priority is research, development and demonstration of integrated and energy-efficient water management systems, including close-loop recovery, treatment and purification technologies.

The research focus is on:

- Application of novel tools (i.e. on-line sensor systems) for assessing water quality, recycling potential, and control of bio-fouling, scaling and corrosion, as well as sustainability aiming at optimal process efficiency.
- Innovative technologies to better allow closing of watercycles within processes like for instance selective adsorbents and membrane technologies, sterilisation technologies, electrodialysis, electrocoagulation, membrane microfiltration and desalination should be integrated and improved.
- Technologies for selective removal of raw materials from sludge and selective technologies for removal of contaminants from effluents.
- Integration of processes to allow residual heat, nutrients and minerals to be reused, including new low sludge treatment technologies and technologies for treatment of concentrated salt streams.

The rationalised management of water resources should be part of an integrated approach towards optimised process development and design that could allow a general (heat, solvents, raw materials, by-products) waste minimization, treatment and recycling coupled with the use of renewable energy sources. Water management within food processing is not considered a priority for this call.

The models and tools developed should be validated under real process conditions. In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners and the use of multidisciplinary partnerships represent an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding Scheme: Large-scale integrating collaborative projects.

Expected Impact: Project results are expected to: (i) lead to a 20% reduction in water and related energy usage, as well as in industrial wastewater production; (ii) enable industries to be fully compliant with the EU policies on water pollution and industrial emissions; and (iii) generate direct economic benefits for the process industry.

32. NMP.2011.4.0-2 Advanced underground technologies for intelligent mining and for inspection, maintenance and excavation

Technical Scope/content: There is a clear need for the development of new advanced underground technologies, in order to respond to the increasing societal demands related to underground activities, where a huge capital investment is required. The productivity in this field is very low compared to other industrial sectors. In addition, the underground activities are going deeper and longer and are thus highly damaging for the environment, as they become at the same time more dirty, difficult and dangerous for the workers. Advanced underground technologies can provide competitive solutions for access to new strategic mineral resources for the society and a quality improvement of surface space by transferring less desirable structures below the ground level.

The key research objective is to advance knowledge and practice in the field of underground construction and mining by identifying, developing, reporting, and stimulating industry adoption of the new methods and techniques, and by encouraging new approaches and research. Developing new advanced tools, methods and processes, and then transferring the technologies to industry is the final goal. In this way, a more competitive EU industry will gain access to resources, and routing traffic can be moved below the ground, offering a means to reduce urban congestion, noise and pollution. Breakthrough solutions are needed to transform the underground related industries into highly technological and competitive industries. The objective is to develop a set of technologies for clean intelligent underground activities based on new safe and eco-innovative intelligent diagnosis, extraction technologies, adequate materials and processes applicable to all underground activities, such as mining and exploitation and maintenance of the underground structures.

The research should aim at developing fully integrated underground technologies and processes for diagnosis and extraction. Proposals are expected to focus on the following areas, as appropriate for application in the mining and/or construction sector:

- New techniques and processes oriented to the clear detection of the ground ahead of the excavation front. In-situ on-line resource diagnosis for exploration, continuous extraction and recovery of by-products with new sensors for grade control, rock mechanics etc.; new drilling technology; integrated and automated data processing and analysis for 3D underground geology.
- New automated underground technologies for safe and “invisible” deep in-situ extraction to avoid negative impacts on health, safety and environmental including small-scale mechanical excavation and backfill systems and their maintenance.
- Extensive risk assessment modelling and simulation on existing surroundings in urban and non urban areas, model-based prognoses of damage on existing infrastructures and working sites, (flood) water storages, monitoring concepts, cost and risk models in line with new regulations.

- Development of master plans/concepts/technologies for inspection, maintenance and retrofitting efforts of existing and new underground structures. (e.g. mines, road or railways tunnels and utilities networks).

Deliverables include the development, integration and demonstration tests in the field of the above concepts, technologies and tools. In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners and industrially-oriented decision making represent an added value and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Funding Scheme: Large-scale integrating collaborative projects.

Expected impact: Project results are expected to: (i) increase the productivity of underground activities by at least 20%; (ii) enable mining and underground operations with zero impact on existing surroundings in urban and non urban areas; (iii) create inherently safe underground working and operating environments; (iv) strengthen the global competitiveness of the European mining and construction industries; and (v) increase the sustainable access to underground resources in Europe, with the related decrease of EU dependency on resource imports.

<u>Ideas:</u>
<u>Interested parties:</u>
IGH