Opportunities in FP7 for the construction sector

ECTP Conference
Versailles 21-22 NOV. 2006
Content

Industrial Transformation
“Knowledge-based construction industries”

Strategic Research Proposition
“S & T model for change in a global economy”

FP7 Value Proposition

Opportunity to meet the Innovation challenges of the Construction sector,

Opportunities for collaborative research
Industrial Transformation
“Knowledge-based construction industries”
The challenge and the vision:
Building a knowledge-based, competitive
and sustainable construction industry

knowledge-based  client-focused  sustainable

Intelligent construction processes

Construction

High-added value materials

nano-developments

New strategies

Life-cycle  Safety

New process  New product/service
The response: SRA priorities

1. New technologies, concepts and high tech materials for efficient and clean buildings
2. Technologies for Healthy, Safe, Accessible and Stimulating Indoor Environments for All
3. Innovative Use of Underground Space
4. Reduce Environmental and Man-made Impacts of built environment and cities -
5. Sustainable Management of Transports and Utilities Networks
6. A Living Cultural Heritage for an Attractive Europe
7. Improve Safety and Security in the Construction Sector
8. New Integrated Processes for the Construction Sector
9. High Added Value Construction Materials
10. Nanotechnologies for materials in construction
11. Technologies and engineering for innovative added-value services offered by SMEs
Strategic Research Proposition
“S & T model for change in a global economy”
and
FP7 Value Proposition
Industrial Transformation
Role of Research, Science and Technology

Offensive

New Business Models

New Industrial Structures and Value Systems

Innovative Processes and New Products Opportunities

ETP : ToR, Vision Doc. & SRA, Implementation, Exploitation
Value proposition of FP7

- Strategic; Future biased; Knowledge creating; Multi-disciplinary; Skill enhancing; Highly adaptive.

- Create an infrastructure: Strategic; Value adding; Networking; Inter-disciplinary; Entrepreneurial.

- Value creating & adding; Strategic & competitive RTD system

- Adapt Education & Training

- Encourage innovation

- Promote knowledge generation

- Address Societal Values

- Financial; Fiscal; Regulatory, patents, IPR; Administrative; Demand oriented

- Ethics, Health, Safety, Security; Information, dialogue; Acceptance, Understanding.
Opportunity to meet the Innovation challenges of the Construction sector in FP7
| 1. | Health |
| 2. | Food, agriculture and biotechnology |
| 3. | Information and communication technologies |
| 4. | Nanosciences, nanotechnologies, materials and new production technologies |
| 5. | Energy |
| 6. | Environment (including climate change) |
| 7. | Transport (including aeronautics) |
| 8. | Socio-economic sciences and the humanities |
| 9. | Security |
| 10. | Space |
SRA Coverage by thematic programmes

- Theme 3: INFOSO
- Theme 4: NMP
- Theme 5: Energy
- Theme 6: ENV
- Theme 7: Transport
- Theme 8: Socio
# SRA Coverage by thematic programmes – Detail

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(X)= very relevant, x= relevant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part of NMP: 1=nano, 2=mat, 3=prod, 4=integration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Resource efficient and clean buildings</td>
<td>x</td>
<td>(X)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Technologies for Healthy, Safe, Accessible and Stimulating Indoor Environments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(X)</td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Innovative use of underground space</td>
<td>x</td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>4 Reduce Environmental and Man-made Impacts of built environment &amp; cities</td>
<td></td>
<td></td>
<td></td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Sustainable Management of Transports and Utilities Networks</td>
<td></td>
<td></td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 A living cultural heritage for an attractive Europe</td>
<td></td>
<td></td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Improve Safety and Security within the Construction Sector</td>
<td></td>
<td></td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Industrialisation through integrated processes</td>
<td>x</td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>9 High added value construction materials</td>
<td>x</td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>10 Nanotechnologies for materials in construction</td>
<td>x</td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Technologies and engineering for innovative added-value services offered by SMEs</td>
<td>x</td>
<td>(X)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ICT in FP7 Challenge Areas

**Technology-driven Challenge Areas**

1. Pervasive and trusted infrastructures
3. Components, subsystems & embedded systems

**Socio-economy-driven Challenge Areas**

1. Content & Knowledge
2. ICT for Health
3. Transport - energy efficiency
4. Inclusive society, governance & independent living

**Additional Areas**

- Critical Infrastructure Protection
- ICT for the Enterprise
- International Collaboration

Technology pillars

Integration Environments

Applications research

- Nano-electronics, photonics and micro/nano-systems
- Communication Networks
- Embedded systems, computing and control
- Software, Grids, security and dependability
- Knowledge, cognitive and learning systems
- Simulation, visualisation, interaction and mixed realities
- New perspectives in ICT, drawing on other science and technology disciplines
- Trust and confidence
- Business and Industry
- Creativity and personal development
- Content, cognitive and learning systems
- Interaction and mixed realities
- Critical Infrastructure Protection
- ICT for the Enterprise
- International Collaboration
ICT for Environmental management and energy efficiency

Budget 54 M€  Implementation call 2

✓ Collaborative Systems for Environmental Management aim to integrate environmental monitoring and management with an enhanced capacity to assess population exposure and health risks to alert targeted groups and to organise efficient response.

✓ New and affordable ICT for energy-intensive systems for:

1. Design and simulation of energy use profiles covering the entire life-cycle of energy-intensive products (manufacturing, use and disposal), of services and processes;

2. Intelligent and interactive monitoring of energy production, distribution, trading and use, e.g. intelligent metering, network management; innovative tools, business models and platforms for energy efficiency;

3. Service provision providing continuous and accurate information to decision makers, in industry and policy making.

The focus is on energy-neutral new or renovated living and working environments and efficient management of local power grids.

Contact: brice.lepape@ec.europa.eu

SRA prior.1&4
Development of NMP work programme

Proposal for a multiannual implementation plan

Agreed call topics for 200X
+ indicative priorities for future calls

Programme Committee

Advisory Group

FEEDBACK

Proposal

ANALYSIS & DIALOGUE

Agreed call

Platform SRAs

Other foresight material + requirements of other stakeholder groups

FP 6 project portfolio (including specific roadmapping/foresight studies)

Budget 2007: 543 M€
STRUCTURE

FUNDING SCHEMES

DELIVERABLES

Area 1: Nanosciences & Nanotechnologies

Area 2: Materials

Area 3: New Production

Area 4: Integration of technologies for industrial applications

Collaborative projects
NoEs
Coordination actions
Supporting actions

ERANET
ERANET+
JTI
IMS

Strategic research topics implemented through a range of instruments

Knowledge intensive industry
High value added products & services
New production paradigms & efficient production systems
Sustainable industrial production & consumption

Aimed at delivering industrial transformation

Strengthening of leadership fields & integration of knowledge

Area 1: Nanosciences & Nanotechnologies

Area 2: Materials

Area 3: New Production

Area 4: Integration of technologies for industrial applications

CT/DGRTD/G2 21 NOV 2006
Integration of technologies for industrial applications (1)

Objectives:

Several cross-cutting dimensions could be considered while handling the vast array of sectors and applications and could further inspire the emergence of topics:

- **Transforming traditional industry**, which faces the challenge of low-cost competition. It should increase its productivity through new processes, high-added value products and new business models;

- **Fostering scale-intensive and specialized suppliers industry** through the adoption and integration of new advanced technologies thus enabling the improvement of its leadership in the global market;

- **Promoting Science-based Industry** which will play a key role in establishing a high-value European industry.

- **Towards a sustainable supply industry** is another key objective in supporting product & productivity innovation, especially for sectors with a large environmental footprint.
Year 1  Activity 4.4  Integration of technologies for industrial applications

4.4.-1  Advanced wood-based composites and their production - LA

4.4.-2  Application of new materials including bio-based fibres in high-added value textile products – LA for SMEs

4.4.-3  Multifunctional materials for the future vehicles – LA

4.4.-4  Substantial innovation in the European medical industry: Development of nanotechnology-based smart multi-tasking targeted agents for diagnosis and therapy (“theranostics”) – LA

4.4.-5  Resource efficient and clean buildings – LA

4.4.-6  Innovative added-value construction product-services – LA for SMEs

4.4.-7  ERA-Net on Construction – ERA-net

Call publication December 2006
4.4.-5 Resource efficient and clean buildings – LA

The main development issues and targets are: new concepts, technologies, design tools and business models for “intelligent buildings”, able to significantly reduce or even meet their own energy consumption; improvement of the building energy performance (through cladding and ventilation technologies, sensors and pervasive computing systems, utilisation of embedded renewable energy sources…) at building and at district levels.

4.4.-6 Innovative added-value construction product-services – LA for SMEs

The main development issues and targets are: development of knowledge-based construction processes and products deployable by SMEs (in terms of investment costs and human resources), especially for the retrofit, refurbishment and maintenance of buildings; new manufacturing systems (e.g. robots and automation) and ICT infrastructures and tools to develop ubiquitous SMEs access to competitive knowledge; development of new “full” services with a high added value for clients.

Contact: christophe.lesniak@ec.europa.eu
dominique.planchon@ec.europa.eu
4.4.7 ERA-Net on Construction – ERA-net

The Era-net on Construction aims at stepping up coordination of research programmes in the fields of construction and operation of buildings. A step towards this aim is identifying RTD priorities in view of implementing joint initiatives, including joint calls and setting up a transnational European programme in the field, by for example the preparation of an Era-Net +

ECTP → Vision → SRA → Implementation (JTI, IP, ...)

↓ Contents ↓
(industry view)

ERA-Net → Transnational programme
(Platform for collaboration using national funding)

Contact: christophe.lesniak@ec.europa.eu
Years 2 & 3: *indicative* themes for construction

### 4.3 NEW PRODUCTION

- Industrialisation through new integrated processes
  - Industrialized interoperable production systems for off-site and on-site production

### 4.4 INTEGRATION

- Multifunctional construction materials
- Sustainable Management of Transports and Utilities Networks
- Integrated life-cycle assessment cost-efficient systems for easy-to-maintain networks
- Methods/tools for the management of transport & utilities networks in order to improve the serviceability, security and lifetime of the structures
- Retrofit and upgrade of existing underground constructions – Sme
- Advanced technologies for structural safety and extension of service life
- Technologies for Healthy, Safe, Accessible and Stimulating Indoor Environments
ECTP : SRA coverage for theme 4 NMP

LA - Resource efficient & clean buildings

SME - Added values construction services ex: retrofitting

Eranet cooperation of national programmes

LA - Management transports & utilities

SME - Retrofit/upgrade underground construction

LA - Multifunctional construction materials

LA - Industrialisation of construction processes

LA - Health, safe, accessible… indoor environment

FP7 timeline

= First call

= Second call

CT/DGRTD/G2 21 NOV 2006
Objective

Transforming the current fossil-fuel-based energy system into a more sustainable one based on a diverse portfolio of energy sources and carriers combined with enhanced energy efficiency, to address the pressing challenges of security of supply and climate change, whilst increasing the competitiveness of Europe’s energy industries.

- Hydrogen and fuel cells
- Energy savings and energy efficiency
- Renewable electricity generation
- CO₂ capture and storage technologies for zero-emission power generation
- Renewable fuel production
- Clean coal technologies
- Renewables for heating and cooling
- Smart energy networks
- Knowledge for energy policy-making
Activity Energy.8: Energy efficiency and savings

Area 8.3: Large-scale integration of renewable energy supply and energy efficiency in buildings: *Ecobuildings*

1. Innovative integration of external energy supply with large self-supply from renewable energies and radical approaches for energy efficiency measures suited to different building types, in different climate zones and under different regional conditions will be supported.

2. This should included design and planning, followed by the construction phase of the building and the integration of energy efficient technologies such as co-generation/trigeneration.

For this Area, no topics are open in calls published in 2007.

Contact: jean-marie.bemtgen@ec.europa.eu
Theme 5 Energy

Activity Energy.8: Energy efficiency and savings

Area 8.4: Innovative integration of renewable energy supply and energy efficiency in large communities: Concerto

1. An innovative integration of the external supply together with large self-supply measures in communities will be supported. An integrated design and planning process, the utility supply and construction activities of the communities as well as energy efficient technologies such as cogeneration/tri-generation should be demonstrated with high EU visibility.

2. The CONCERTO initiative will apply for both new and retrofitted communities and municipal zones, with the objective of a drastic reduction in the specific and overall consumption of energy, especially conventional energy.

For this Area, no topics are open in calls published in 2007.

Contact: Jean-Marie.Bemtgen@ec.europa.eu
Environment (inc. climate change)

- **Environmental Technologies**
  - Environmental technologies for observation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment
  - Technology assessment, verification and testing

- **Earth observation and assessment tools**
  - Earth observation
  - Forecasting methods and assessment tools

- **Environmental Research to support EU International commitments such as:**
  - Kyoto Protocol
  - UN Convention on Biological Diversity
  - World Summit on Sustainable Development
  - Intergovernmental Panel on Climate Change (IPCC)
  - Global Earth Observation Initiative (GEO)

Call publication December 2006
Area 6.1.3: Natural Hazards  14 M€

6.1.3.2 Frame for better vulnerability assessment

Area 6.2.1: Urban development  30 M€

6.2.1.5 Urban metabolism and resources optimisation in the urban fabric – ME

Devising innovative strategies for *decoupling* physical (resources and energy) flows from economic development and optimising urban planning and design in order to accommodate increasing demand for space and resources while reducing material and energy consumption.

New strategies and tools for a more sustainable use of energy and materials in urban planning. These achievements should be considered by urban planners, infrastructure developers and social networks.

Contact: adele.lydon@ec.europa.eu
Area 6.3.1.5: Built Environment (1)

- Low resource consumption in buildings and infrastructure – coordination and support action

**Identify, promote and facilitate** the uptake of new or improved technologies for the built environment which result in reducing substantially, throughout the life cycle of structures, the use of multiple, natural and non-renewable resources which reduce waste by facilitating waste separation and re-use/recycling materials.

Projects should be able to demonstrate how and to what extend their activities will realistically contribute in the short, medium and long term to the promotion and up-take of sustainable environmental technologies for reducing resources consumption in building and infrastructure according with IPPC, WFD and other regulations.

SME participation is requested (Sme relevant topics in theme IV)

Contact: adele.lydon@ec.europa.eu
Area 6.3.1.5: Built Environment (2)

> Performance indicators for health, comfort and safety of the indoor building environment – 1 coordination and support action

Draw-up of an inventory of current performance indicators used in design and construction and develop recommendations which incorporate the effects of indoor environmental aspect on comfort, health and safety.

Projects should be able to demonstrate how and to what extend their activities will realistically contribute in the short, medium and long term to achieve both an optimal, healthy and comfortable indoor environment and a sustainable, low-energy built environment in an integrated effective way.

SME participation is requested (Sme relevant topics in theme IV)

Contact: adele.lydon@ec.europa.eu
Area 6.3.2: Cultural heritage  7 M€

6.3.2.1

- Damage assessment, diagnosis and monitoring for the preventive conservation and maintenance of the cultural heritage (movable and immovable cultural heritage in their environment)

- Consolidation and dissemination of results related to cultural heritage
  - promote the exploitation of EU research results, through demonstration of new technologies, tools and devices developed by the SMEs and industry

- ERA-NET for the preservation of the tangible cultural heritage (to promote the harmonisation and acceptability of technologies and methodologies applicable to cultural heritage).

Contact: michel.chapuis@ec.europa.eu
Overall Objectives

- Develop ‘greener’ and ‘smarter’ transport to:
  - Benefit citizens and society (mobility, safety...)
  - Respect the environment and natural resources
- Secure and develop the leading role of European industry in the global market

Proposed Objective-Oriented Research Themes

1. Creating greener surface transport
2. Encouraging modal shift and decongesting transport corridors
3. Ensuring sustainable urban mobility
4. Improving safety and security
5. Strengthening competitiveness

Contact: frederic.sgarbi@ec.europa.eu
Area Sustainable management of transports & utilities network

The specific programme will focus on developing and integrating new knowledge and technologies on nano, materials and production in industrial sectoral and cross sectoral applications.

**Environmentally friendly industrial processes**

1. The greening of surface transport
2. End of life strategies for vehicles/vessels and infrastructures
3. Competitive industrial processes
4. Improving safety and security

Contact: herbert.thanner@ec.europa.eu
susana.martins@ec.europa.eu
Theme 7 Transport

AREA: 7.2.1.1 The greening of product and operation

TOPIC: 7.2.1.1.5 Vehicle/vessel and infrastructure technologies for optimal use of energy

Collaborative Projects, Coordination and Support actions

TOPIC: 7.2.1.1.6 Holistic noise and vibration abatement

Coordination and Support actions

AREA: 7.2.1.2 Environmentally friendly industrial processes

TOPIC: 7.2.1.2.2 End of life strategies for vehicles/vessels and infrastructures

1) ecological processes for clean and safe dismantling;
2) clean and safe disposal;
3) cost effective and clean recycling (in particular for hard-to-recycle materials such as composites) and re-use of vehicles/vessels and infrastructures including conversion and retrofitting.

Collaborative Projects, Coordination and Support actions

Contact: herbert.thanner@ec.europa.eu
susana.martins@ec.europa.eu
Theme 7 Transport

AREA: 7.2.5.1 Competitive industrial processes

TOPIC: 7.2.5.1.4 Advanced and cost effective infrastructure construction and monitoring concepts

Coordination and Support actions

7.2.6 CROSS-CUTTING ACTIVITIES

TOPIC: 7.2.6.1 ERA-NET Transport II

Coordination and Support actions

EC contribution: €3.5 million

Contact: herbert.thanner@ec.europa.eu
susana.martins@ec.europa.eu
FP7 Implementation of SRA research priorities

Meeting Client/User Requirements

Becoming Sustainable

Transformation of the Construction Sector

Theme 4

Year 1

A. New technologies, concepts and high tech materials for efficient and clean buildings
B. Technologies and engineering for innovative added-value services offered by SMEs
C. A Living Cultural Heritage for an Attractive Europe
D. Reduce Environmental and Man-made Impacts of built environment and cities

Theme 6

Year 2 & 3

- Sustainable Management of Transports and Utilities Networks
- New Integrated Processes for the Construction Sector
- High Added Value Construction Materials
- SME Retrofit/upgrade underground construction
- Technologies for Healthy, Safe, Accessible and Stimulating Indoor Environments for All

CT/DGRTD/G2 21 NOV 2006
CIP: The Intelligent Energy Programme

727 M€

- Energy efficiency & rational use of resources
  - Specific measures in industry & construction and for energy using products; legislative measures

  “SAVE” Energy efficiency & rational use of resources

- New & renewable energy sources
  - Support for integration of new and renewable energy sources; legislative measures

  “ALTENER” New & renewable energy sources

Work programme 2007 / Calls scheduled in spring 2007
Organisation: Executive Agency IEEA

Contact: vincent.berrutto@ec.europa.eu
Catering for the Innovation needs of the regions

10 Thematic Priorities
- Health
- Bio-
- IST
- NMP
- Energy
- Environment
- Transport
- Socio-Economic
- Space and Security research

FP7

ERANET & ERANET plus

REGIONAL PROGRAMMES

Project size/Partners size

R&D Ambition; Longer term perspectives

FP7

Catering for the Innovation needs of the regions
Summary

Value proposition as defined action

- Continuity with past activities
- Support industrial change;
- Collaborative research with industrial relevance;
- Multi-annual research planning linked to innovation;
- SME responsive;

"IDEA : Product/services"

Transfer function
Role of FP7

Knowledge
Value Chain
Capacity
Continuous Cost Evaluation
Management systems
Human Resources
...
Thank you for your kind attention

christos.tokamanis@ec.europa.eu