CONSTRUCTION

RESEARCH PRIORITIES

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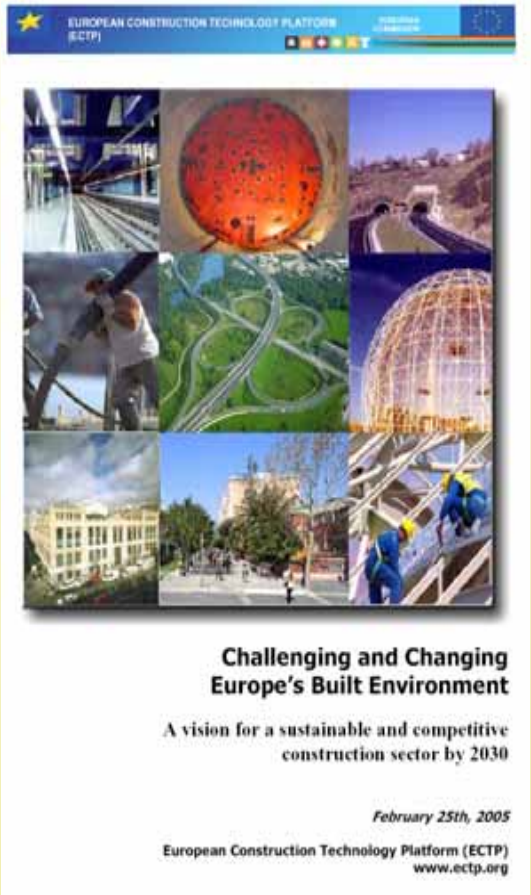
VISION and AGENDA 2030

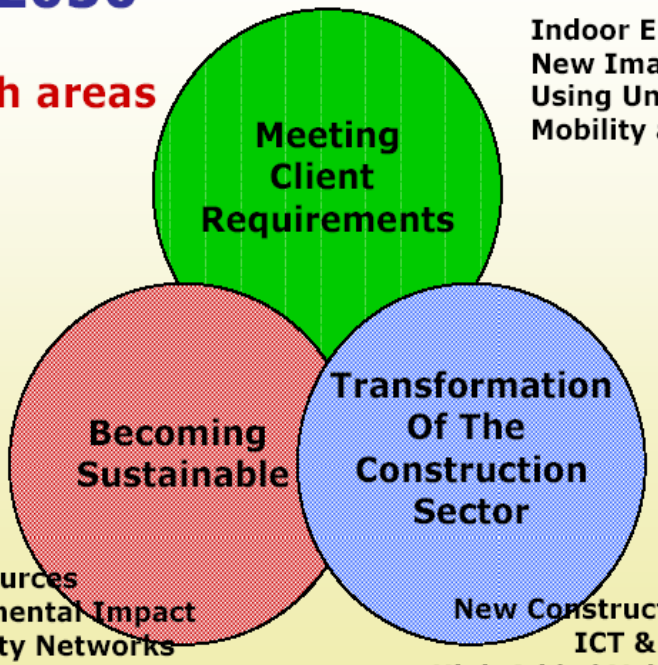
Vision 2030



February 2005

Agenda 2030

❑ Research areas



Indoor Environment
New Image of Cities
Using Underground Space
Mobility and Supply

Energy and Resources
Reduce Environmental Impact
Transport & Utility Networks
Cultural Heritage
Safety and Security

New Construction Process
ICT & Automation
High Added Value Materials
Attractive Workplaces

12

November 2005

PRIORITISATION PROCESS (I)

❑ Objective

To meet an agreement on an ordered/structured list of priorities selected from the SRA for the coming 5-7 years.

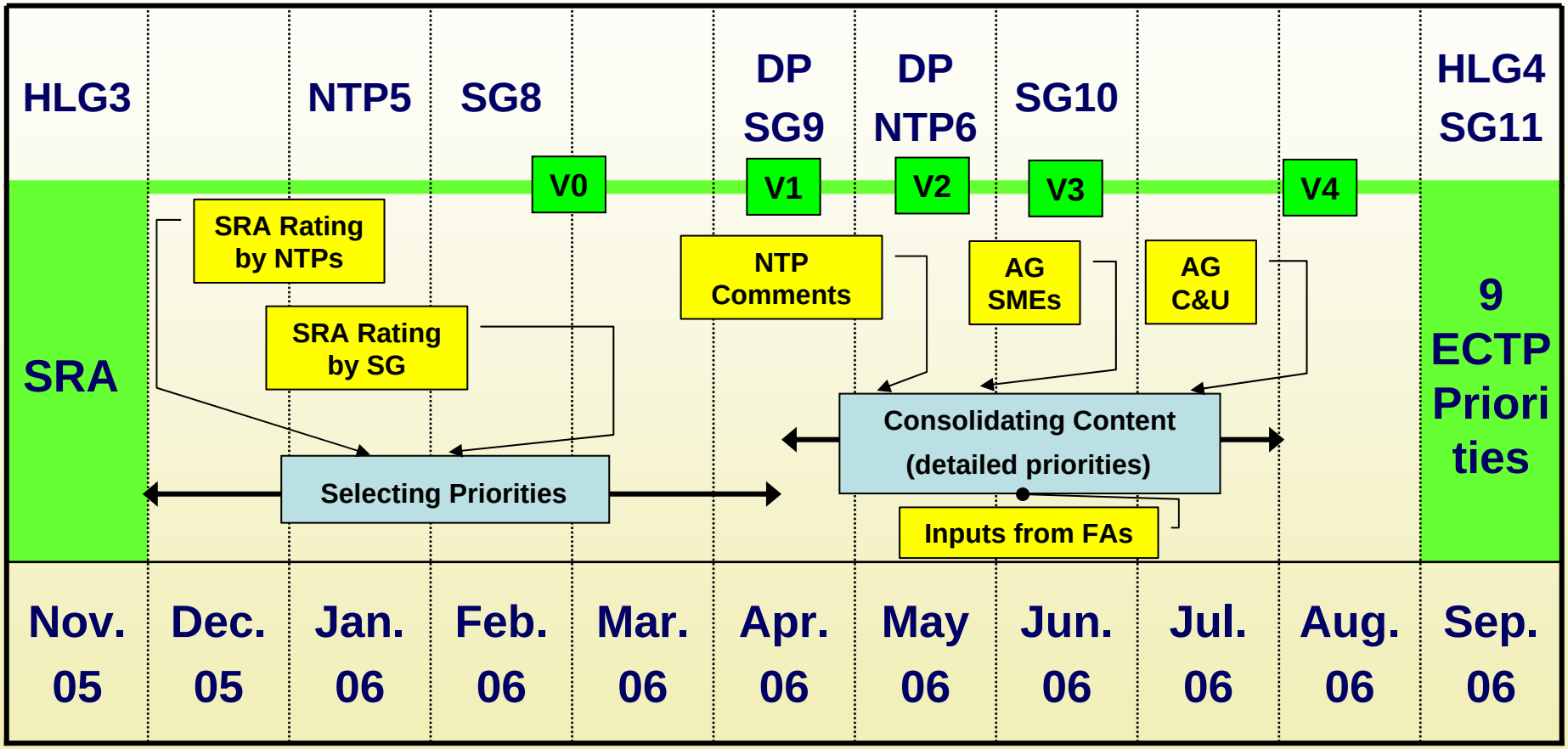
❑ From the SRA structure *(towards 2030)*

- 3 Pillars
  - 13 Research Areas
    - ~160 detailed Priorities
      - » ~100 mid-term priorities (5 to 7 years)
      - » ~67 long-term priorities (up to 2030)

❑ To 9 ECTP Selected Priorities *(2007-2013)*

- 9 main Priorities
- 60 mid-term focused detailed priorities (5 to 7 years)

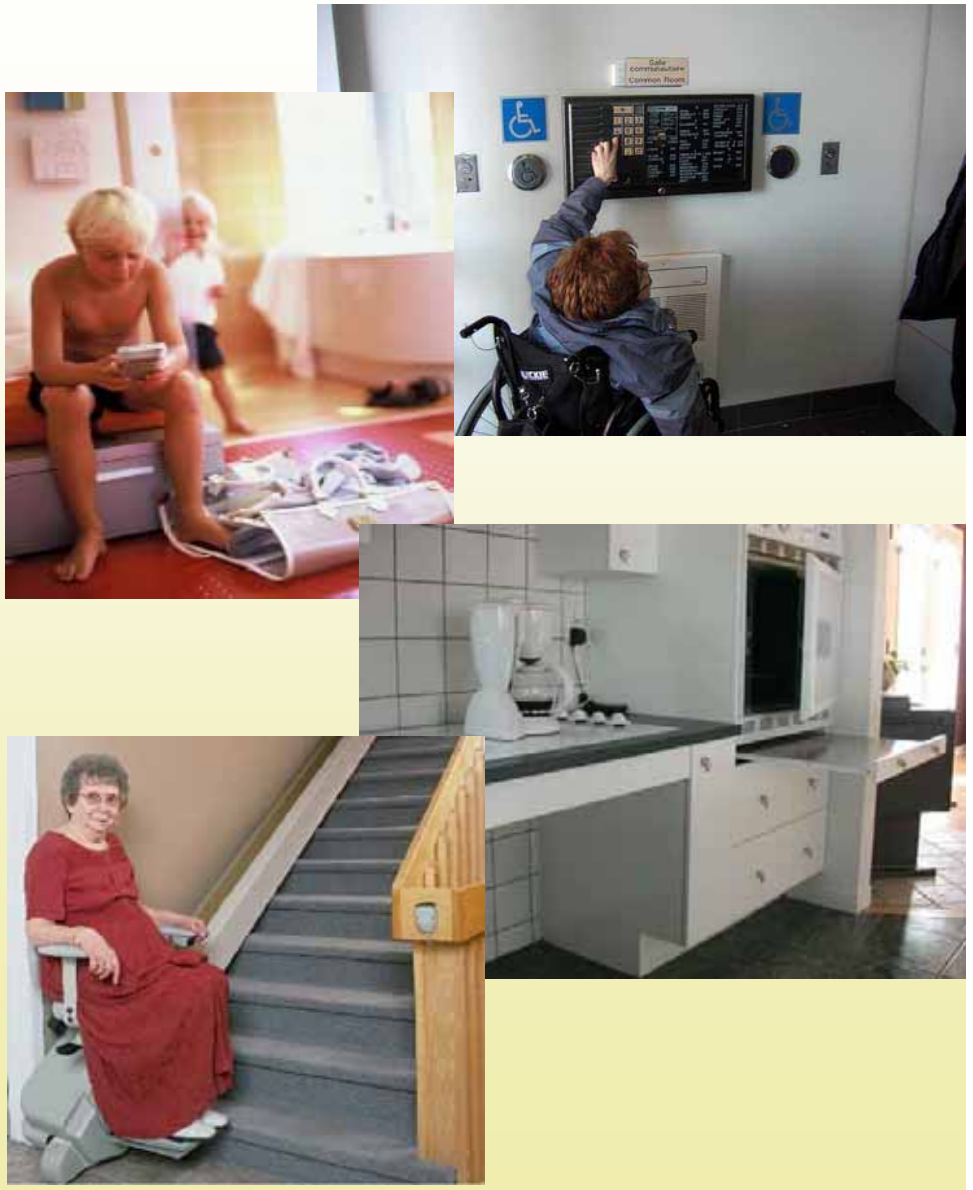
PRIORITISATION PROCESS (II)



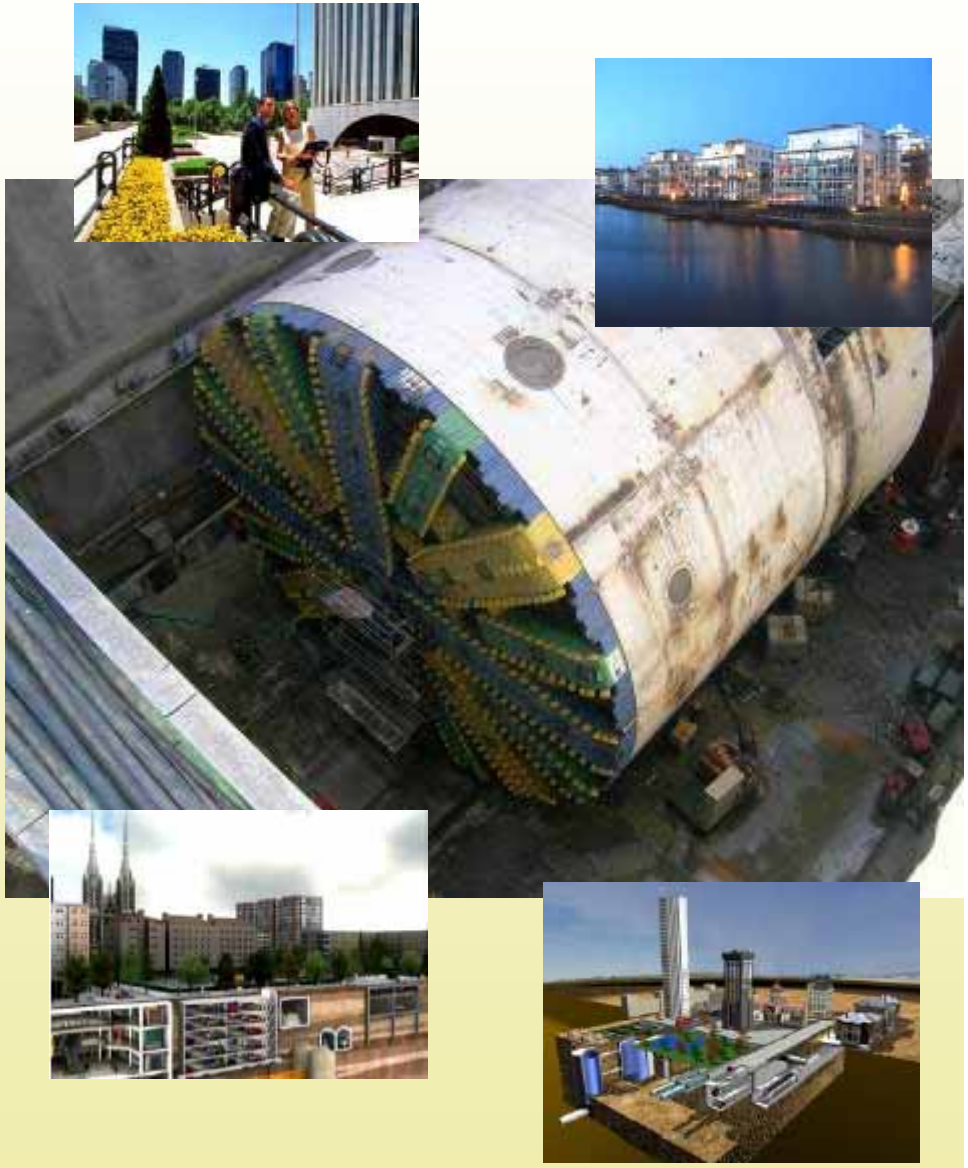
9 ECTP RESEARCH PRIORITIES

- **Technologies for Healthy, Safe, Accessible and Stimulating Indoor Environments for All (sra 1.1)**
- **Innovative Use of Underground Space (sra 1.3)**
- **New Technologies, Concepts and High-tech Materials for Efficient and Clean Buildings (sra 2.1)**
- **Reduce Environmental and Man-made Impacts of Built Environment and Cities (sra 2.2-1.2)**
- **Sustainable Management of Transports and Utilities Networks (sra 2.3-1.4)**
- **A Living Cultural Heritage for an Attractive Europe (sra 2.4)**
- **Improve Safety and Security within the Construction Sector (sra 2.5)**
- **New Integrated Processes for the Construction Sector (sra 3.2-3.1-3.4)**
- **High Added Value Construction Materials (sra 3.3) (and Nanotechnologies for Materials in Construction)**
- **+ 1 transversal topic for SMEs**
    - **Technologies and Engineering for Innovative Added-value Services Offered by SMEs in the Construction Sector**

- Better understanding of the impact of the built indoor environment on health, comfort, feeling of safety and positive stimulation
- To improve this built indoor environment for all people.
  - Improved knowledge of relevant demands, needs and desires
  - Harmonised assessment methods
  - Methods, tools and strategies to ensure the design-for-all approach, through the delopment of adapted products



- New business concepts
- Retrofit and upgrade of existing underground structures
- New tunnelling technologies
- Processes and ICT
- Ground knowledge and environmental impact
- nD modelling in tunnelling
- New materials



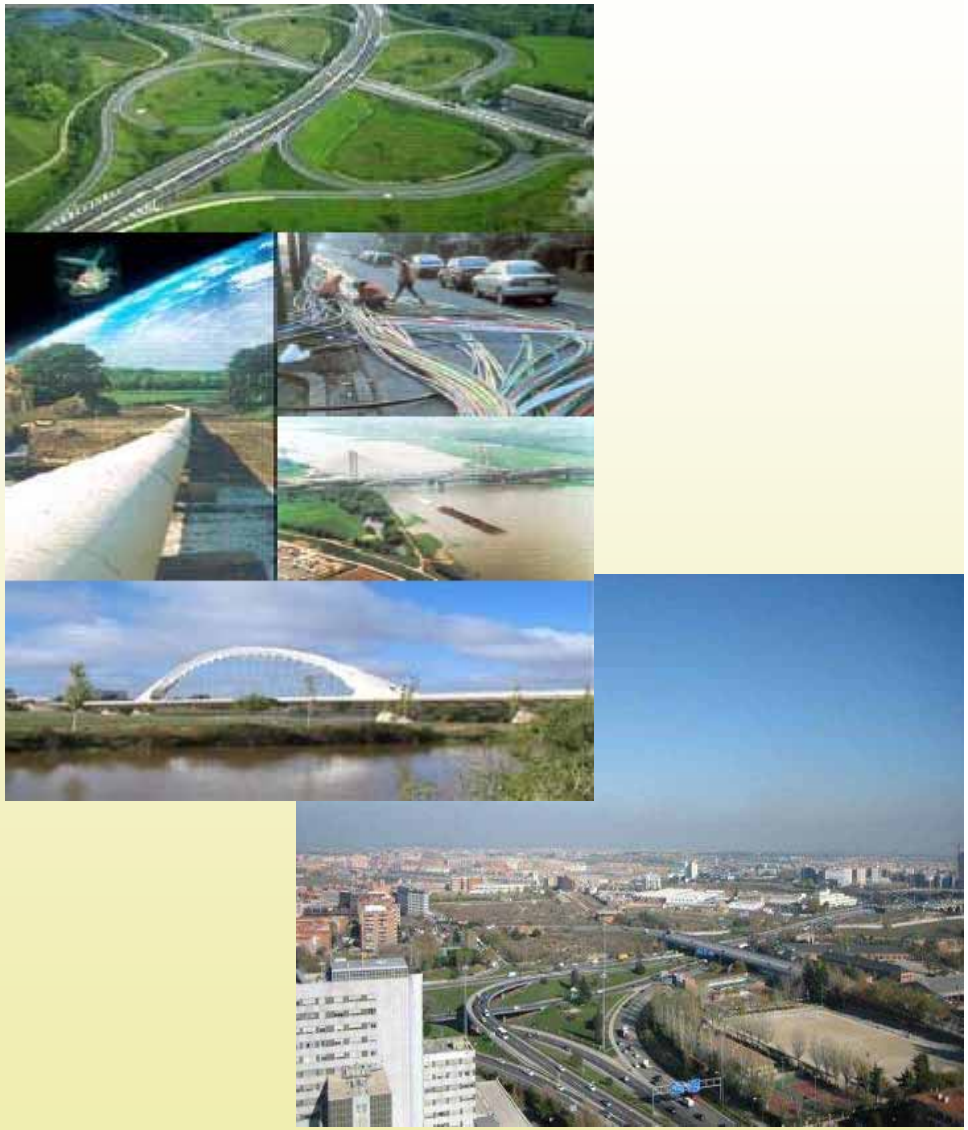
- New concepts, technologies, design tools and business models for:
  - Retrofit
  - Low energy new buildings
  - Zero-energy buildings
- New and improved materials and structures
- Integrated design tools
- New information systems
- Construction materials manufacturing process

Reduce Environmental and Man-made Impacts of Built Environment and Cities

- Design concepts, materials and technologies for the reduction of damage to environment
- Improve processes to make them more sustainable
- Knowledge on material and energy flows
- Reduction of impact of transport and utility networks
- Reduction of impact of accidents
- Technologies for contaminated soils and groundwater
- Reuse and recycling of debris and waste materials
- Protection and optimised exploitation of water resources

Sustainable Management of Transports and Utilities Networks

- New methods/tools for the comprehensive management of infrastructure
- Standards, models and databases for LT performance
- New concepts to extend the life time of structures
- New testing methods for early detection of damage
- Develop, design, build and operate with efficiency
- Integrated life-cycle assessment systems
- ICT systems to optimise traffic, serviceability and security of networks



- Development of an integrated approach to the natural and man-made environment
- Foreseeing and managing changes
- Developing assessments and controls
- Innovating in the creation of materials and structural components for cultural heritage
- Preserving urban and built environment

Improve Safety and Security within the Construction Sector

- European guidelines and codes for performance-based and innovative design
- Systems, models and tools for risk and safety management against natural and man-made hazards
- Systems for the management of risk and emergencies and partial functionality of networks
- Systems to monitor and controll all security/safety parameters for infrastructures and buildings
- Technologies for mitigating natural and technologic risks
- Means to improve safety and reduce accidents on work places






New Integrated Processes for the Construction Sector

Value-driven business processes

ICT for customer centric product & service definition, requirement management & compliance assessment. Performance based contracting.

ICT enabled business models

New ways for sustainable exploitation of ICT as a key part of business strategy in the open European / global construction marketplace.

Industrialised production

ICT for modular provision of customised constructions, logistics, assembly & services. Digital sites.

Enterprise

Process

Vision for Processes & ICTs

Product

Project

Knowledge sharing

ICT for transforming project experiences into corporate assets. Object repositories. IPR protection of complex shared data. Context aware applications.

Digital models

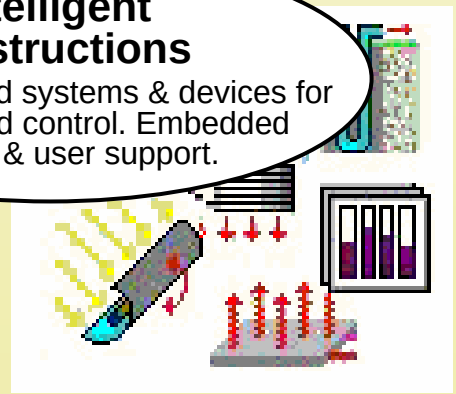
nD models. Access to life time information for all stakeholders anywhere anytime. ICT for design, configuration, analysis, simulation, visualisation.

Collaboration support

ICT tools for information sharing, project steering, negotiations, decision support, risk mitigation, etc.

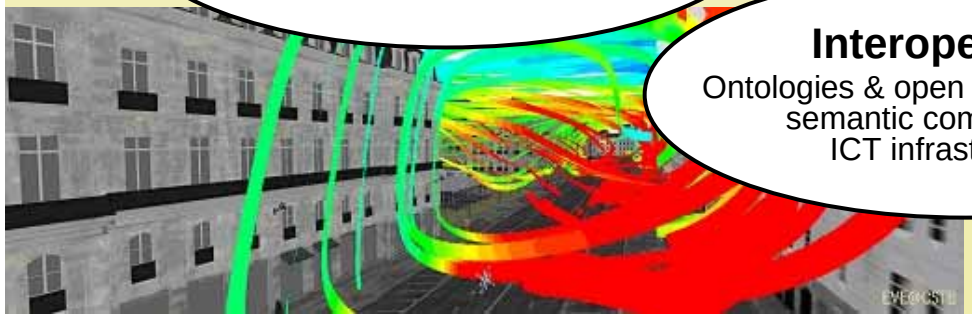
Intelligent constructions

Smart embedded systems & devices for monitoring and control. Embedded learning & user support.



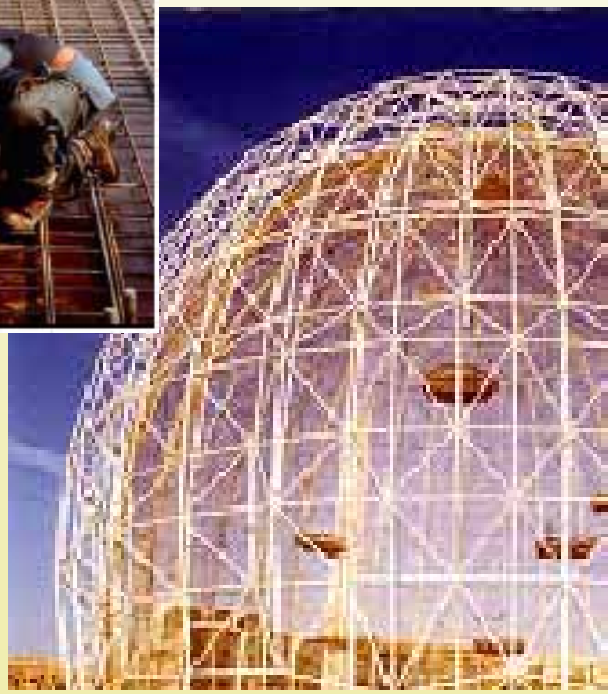
Interoperability

Ontologies & open ICT standards for semantic communication. ICT infrastructures.



High Added Value Construction Materials (+ Nano)

- Multifunctional construction materials
- Predictable, flexible and efficient building material production
- Durability and reliability of construction
- Easy to use and install building materials
- Prediction and management of building material behavior in service



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Thank You

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