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THE EUROPEAN STEEL TECHNOLOGY PLATFORM : ambitious steel R&D programmes for the construction sector

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Project Coordinators
Versailles, November 21/22 2006



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Agenda

- RTD Programmes of ESTEP
(brief comments)
- RTD Programmes related to Construction
(objectives, structure, ongoing proposals)
- Conclusion



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Stakeholders

- The European Commission
- Major steel companies and the whole European steel industry represented by EUROFER
- The steel research centres and
- The whole steel R&D network coming from the ECSC (now RFCS): **8000 researchers**
- Industrial stakeholders linked to the industrial priorities of the Platform:
 - **Suppliers** (EUnited)
 - **Customers** (Automotive, **Construction**, Energy)
- Universities through a European network (T.I.M.E)
- Representatives of EU national governments
- Representatives of the trades unions and the Consultative Committee for Industrial Change (CCIC)

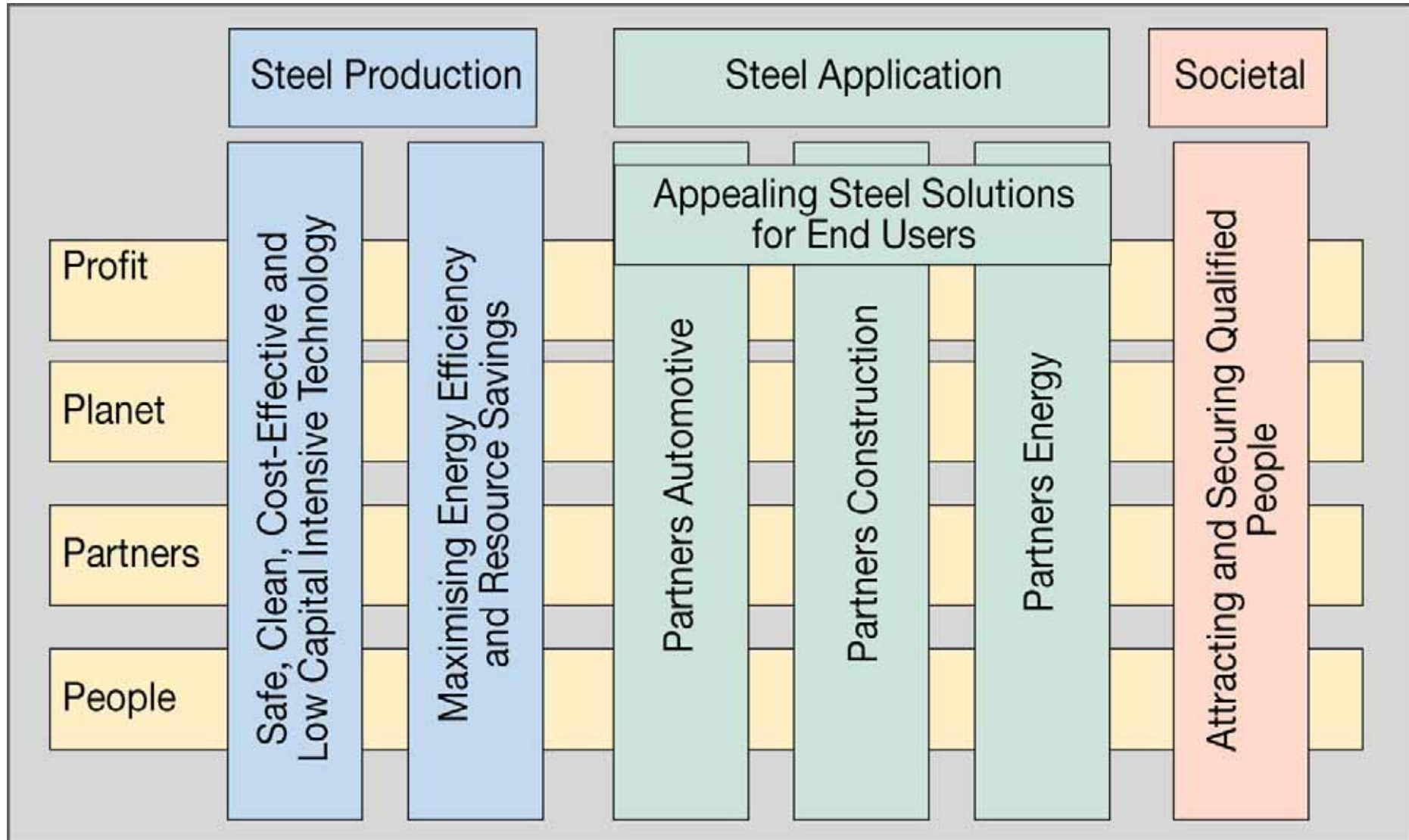


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Six ambitious programmes to meet the ESTEP's Ambition through a Sustainable Development Approach



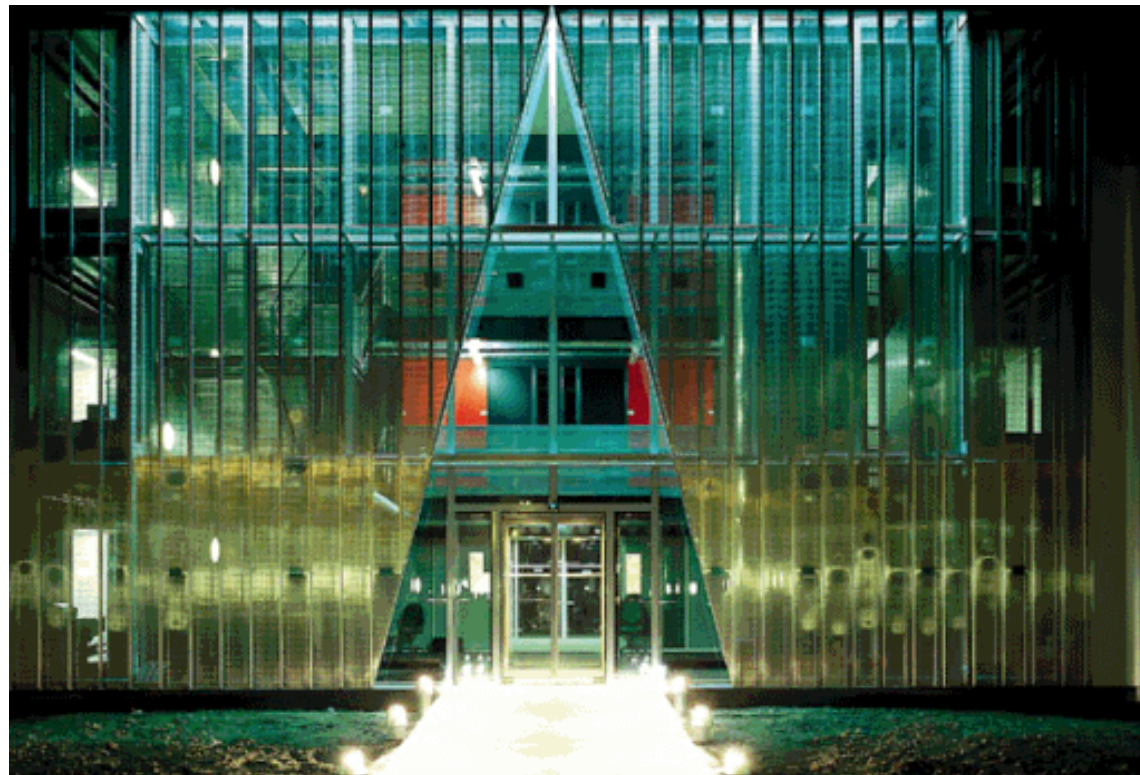


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POTENTIAL AND IMPORTANCE OF STEEL IN CONSTRUCTION



ECTP Conference.
Versailles, November 21/22 2006



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Steel in the European construction market



- Steel is one of the most important construction materials
- Construction is the biggest market for steel - the share of steel consumed in the European construction sector is around 30% of total consumption
- Competitive construction solutions and efficient use of modern technology
- Economic and environmental goals along with social desirability
- Resource savings and waste reduction
- Progress requires novel technologies and strategies



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Steel in the European construction market

The share of steel structures varies from country to country and from sector to sector, UK & Sweden appear as benchmarks :

In the UK: multi-storey office buildings 70% are framed in steel rather than competitor materials; in single storey industrial buildings 90% are framed in steel,

In Sweden: multi-storey buildings 65%, 1-storey warehouses and storages 80%, bridges 50%,

In Europe (globally) multi-storey office buildings 20%, single storey industrial buildings 60%, remaining 20%.



Steel structures facilitate the use of external insulation techniques which are favourable to the energy balance.

Their lightness allows the construction of

- buildings having a low inertia which reduces heating needs (when required this inertia may be increased using composite floors or phase change materials, for instance)
- more luminous spaces \Rightarrow quality of life, comfort, use of natural light and heat
- efficient natural ventilation systems (and optimized integration of networks in floors)



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ESTEP – WG Construction



Two main **objectives**:

- **safe and healthy steel construction** and
- **sustainable steel construction.**



The strategic research areas present challenges of **manufacture** and **construction.**

Progress is also needed in education and life-long learning related to the construction sector.



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**SAFE AND HEALTHY
STEEL CONSTRUCTION**

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Structural safety

- i.e, Strategies related to natural and man-made hazards

Improved health and comfort

- i.e, Application of functional materials

Advanced prefabrication & execution technologies

- i.e, Advanced mixed building technologies



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SUSTAINABLE STEEL CONSTRUCTION

Energy-efficiency of steel construction

- Concepts for low-energy buildings & Energy efficient buildings in steels

Structural quality in renovations

- Upgrading technologies for existing works

Improvement of urban environment

- Improving security of the built environment

Recyclability and durability

- Verification methods of durability and design life



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Two main topics of interest for FP7 proposals

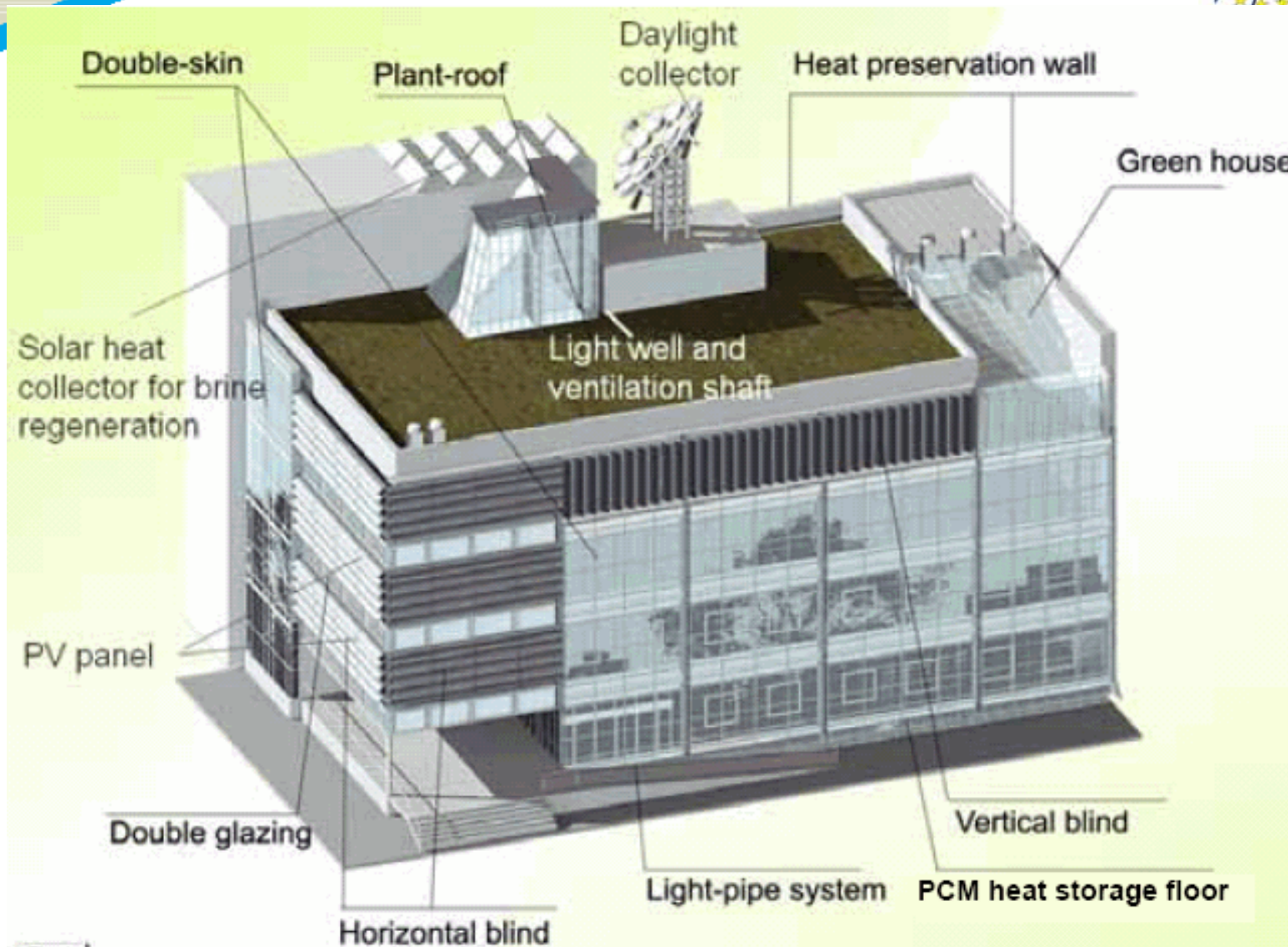
- Resource Efficient and Clean Buildings
- Advanced Technologies for Structural Safety and Extension of Service Life



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Energy-efficiency of steel construction



ECTP Conference.
Versailles, November 21/22 2006



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Structural Safety of new and existing Constructions



Safety of new or existing construction is of great importance for several European Countries. Moreover it becomes strategic in seismic areas where great efforts are made in order to reduce vulnerability of new and existing constructions.

To this purpose **suitable methodologies, design rules and intervention techniques must be determined, assigning to each technique times and costs and finally defining a possible politic line of solution to be verified in terms of economic planning and company organization.**





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FP7 proposal on energy efficiency

- Sustainable and Energy Efficient Light-Weight (dry) Construction
 - leading organisation VTT, co-ordinator Ms Heli Koukkari
 - kick-off meeting November 29 in Brussels



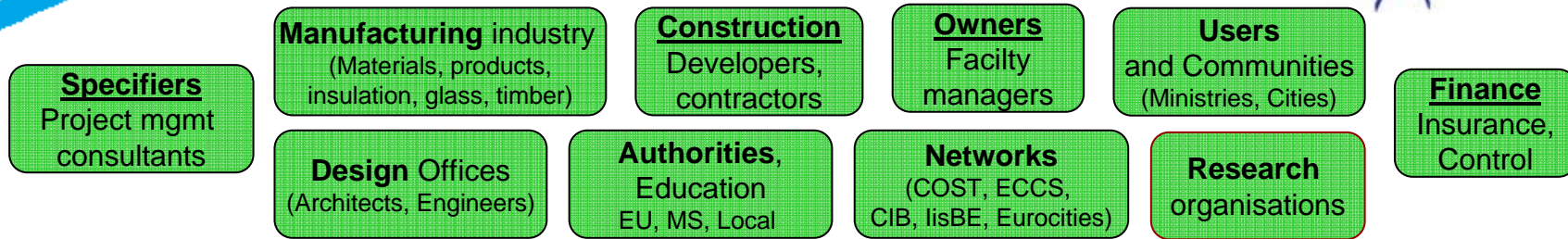
Sustainable & Energy Efficient Light-Weight (dry) Construction

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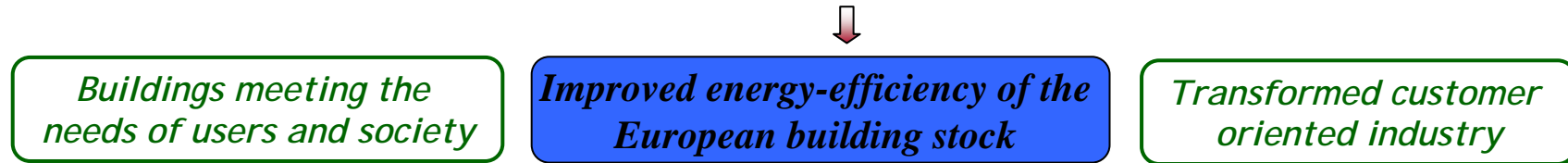
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Consortium



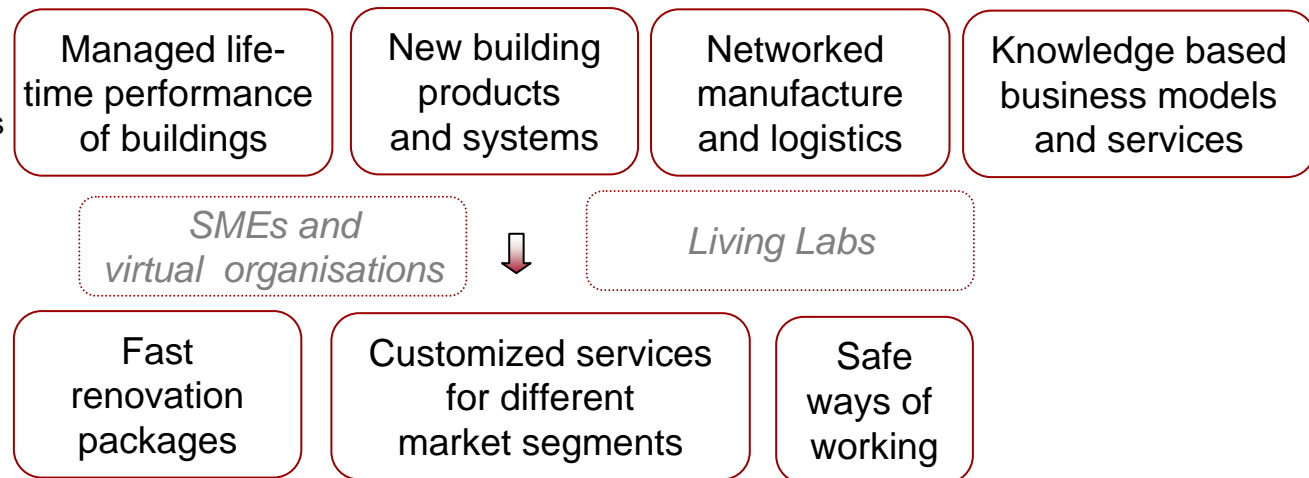
Objective



through

Deliverables

- Demonstrated design process
- Demonstrative building projects
- Indicators and metrics for building performance
- Design tools for sustainability and customer-orientation
- Supportive methods for sector-specific innovation processes





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FP7 proposals in safety under consideration

- **Vulnerability of Existing Constructions: NETworking For Evaluation Assessment and Reduction (VEC NET FEAR)**
 - leading organisation RIVA Group,
contact person Walter Salvatore, University of Pisa
- **Robustness of Structures**
 - leading organisation ARCELOR Research Lux., co-ordinator Louis-Guy Cajot
- **Harmonisation Process of Structural Design**
 - leading organisation RWTH Aachen, co-ordinator prof. Gerhard Sedlacek



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TITLE

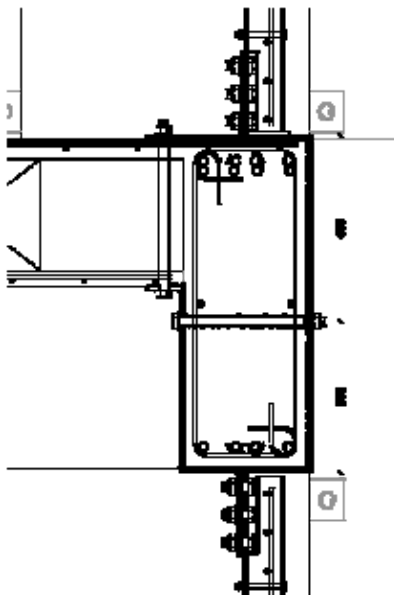
VEC-NET-FEAR. *Vulnerability of Existing Constructions: NETworking For Evaluation Assessment and Reduction*



OBJECTIVES:

Methodologies and strategies of intervention for retrofitting, refurbishment and rehabilitation of existing strategic buildings and infrastructures subjected to live loads, variable loads (wind, snow, temperature), accidental loads (fire, explosions, impacts, outrages) and earthquake

Suitable methodologies and intervention techniques will be determined, assigning to each technique times and costs and finally defining a possible politic line of solution to be verified in terms of economic planning and company organization.



To these purposes a strict collaboration between Public Authorities, Researchers and Productive World will be necessary.



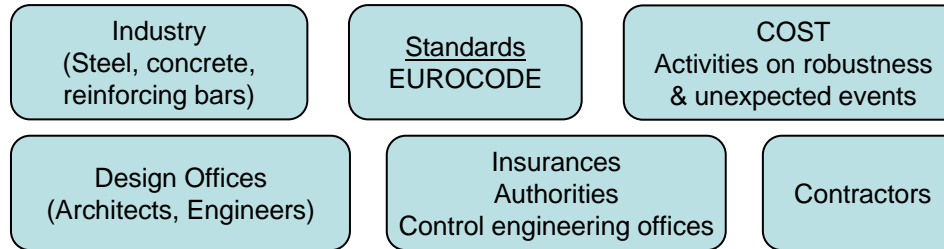
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Robustness of Structures



Consortium
Objective

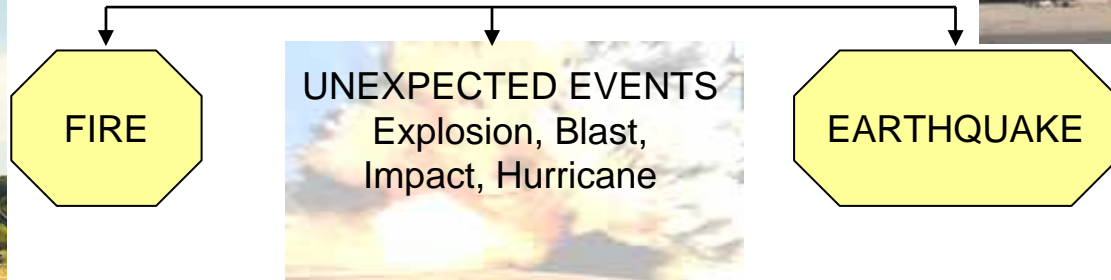


Improved Safety of Construction

through

ROBUSTNESS
REQUIREMENTS
for Structure

leading to practical design rules ensuring robustness
in case of



Deliverables

- Principles
- General Design rules
- Specified Design rules





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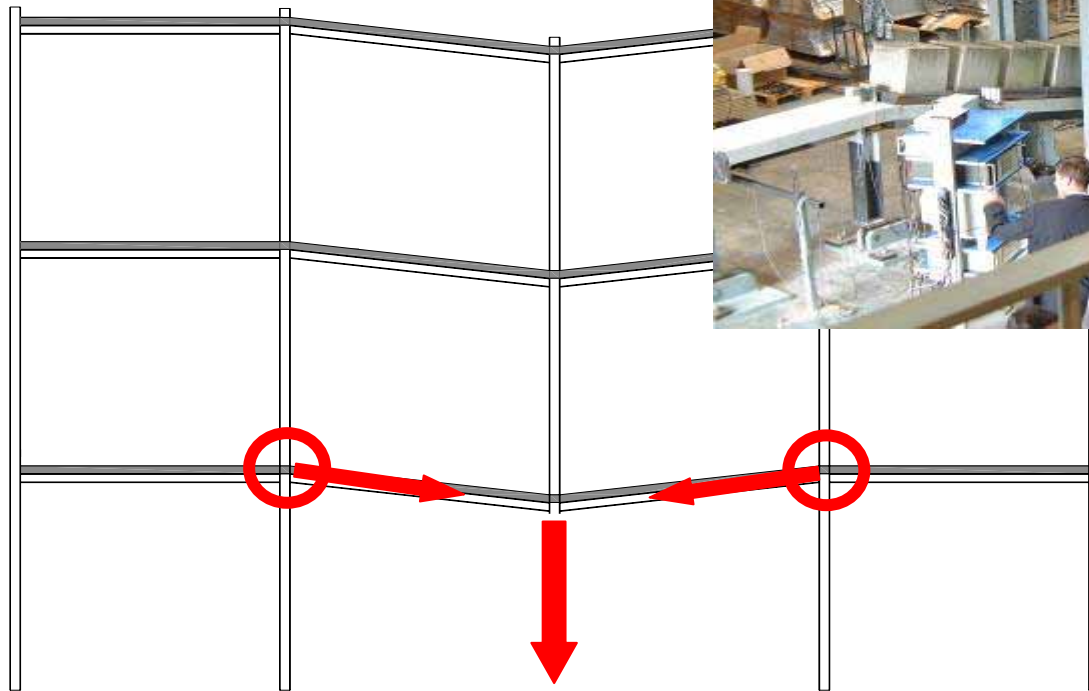
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Robustness of Structures

Main objective of the substructure test

Loss of a column
further to an impact





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Conclusion: ESTEP....

- one of the first and more advanced European Platforms
- With a strong and dynamic contribution to R&D construction programmes
- should increase the competitiveness of the whole Steel Sector including Construction through Innovation
- addresses social issues to attract & secure qualified people
- a dynamic structure to facilitate & to boost the European collaborative Research
- Is open for collaboration on construction topics
- Participates in the “ Construction Inter-Working Groups”