



# Resource efficient steel production

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# ESTEP's main characteristics

- Among the first ETPs created in Europe
- Financially supported by the EU steel industry only
- Focused on topics linked with Societal Challenges for Europe
- Living Strategic Research Agenda( SRA)
- Wide panel of stakeholders ( Academia, Research and Technology centers, E .Commission, Member States representatives, suppliers, clients...)
- Strong involvement in People activities



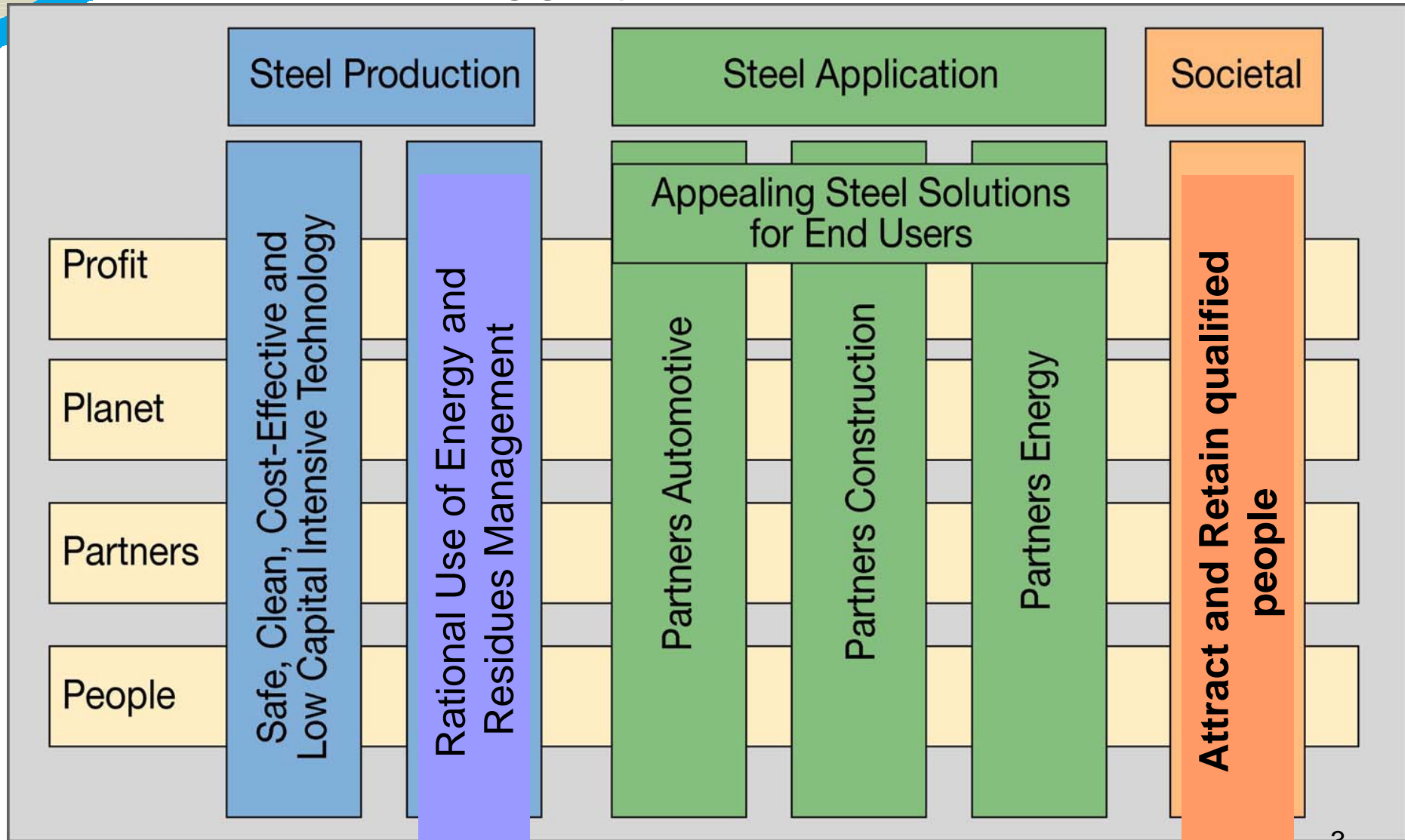
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# Research Areas to meet the aims of Sustainable Development



## 6 working groups for the 6 vertical areas





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# The SRA of ESTEP answers the following challenges

- Development of Safe, clean, energy-efficient and cost-effective technologies
- Reducing the CO<sub>2</sub> emissions directly in steelmaking and indirectly by offering suitable steel solutions
- Promoting conservation of resources, recovery of wastes and societal value of materials ( SOVAMAT)
- Contributing to the development of Energy sources for the future
- Attracting and securing highly skilled people



ETPs conference , May 11&12 2010

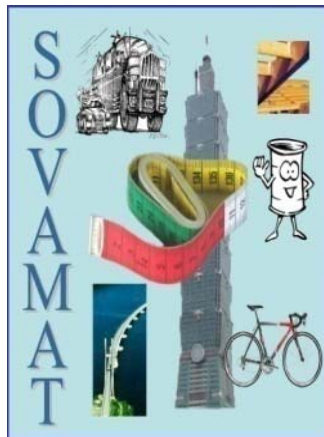


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# ESTEP's Roadmap on sustainable use of resources



Foresight vision of resources

Inventory of resources (MFA,SRA)

Methodology for sustainability assesement

Improve, integrate Energy networks

Global Village

Scrap

Iron ore

Reuse & Recovery of residues

Global Warming

Water

Air quality

Sustainability

Logistics

*Areas of Research for the resource sustainability roadmap*



## Iron ores and scraps

- Optimising the use of lower grade ores
- Recovering Fe units from in-plant residues in dedicated tools ( field for R&D and demo projects)
  - BF and BOF dusts and sludges
  - Electric Arc Furnace (EAF) dusts, oily mill scales
- Optimising scrap recycling
  - Today 40% of crude steel within EU27 is produced by the scrap + EAF route
  - Still a potential to increase gradually this rate up to 50% in the next 20 years thanks to larger available quantities and better control of scrap qualities



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# Resources issues and R&D areas



## Energy efficiency (1)

- Energy Intensive Industries ( EII's)
  - EII's are key actors in today's European Economy
  - In 2008 was established informally a R&D network with material producers ( steel, non ferrous, glass, cement, chemicals, paper..) and equipments suppliers ( represented by EUnited)
  - Steel industry is in favor to reinforce this EII's R&D network in order to :
    - Exploit the potential of EII's in European research, fully integrated in the Framework Programme
    - Strengthen the role of EII's in the PPP Factory of the Future
    - Promote demonstrations projects
    - Deploy key technologies
    - Coordinate skills development within EII's



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# Resources issues and R&D areas

## Energy efficiency (2)



- Energy efficiency in the steel industry
  - adoption of the SET-Plan methodology, with a single format of the definition and the follow-up of energy consumptions
  - To address both integrated BF/BOF and scraps+EAF plants
  - Identification and evaluation of potential gains
    - Carbon needs for reduction
    - Energy efficiency of the equipments and processes : roadmap « intelligent steel manufacturing » in the frame of the PPP FoF
    - Energy recovery
    - Maximizing the use of scraps
    - Process yield improvement
    - Application of steel products : transport, construction, steel for energy





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# Resources: issues and R&D areas

## Ecological services



- Ensure the water supply for the long term
  - Improvement of water intake, water discharge, close loop concept, minimization of water use/waste
  - EU steelmakers active in the Worldsteel water project
- Monitor and improve the air quality
- Prevention of the noise
- Steel industry very active in the BREFs and IPPC approach.
- Preservation of the biodiversity and the land quality & use
- Ecological village : synergy between industries and communities.



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# Resources: issues and R&D areas

## Global warming



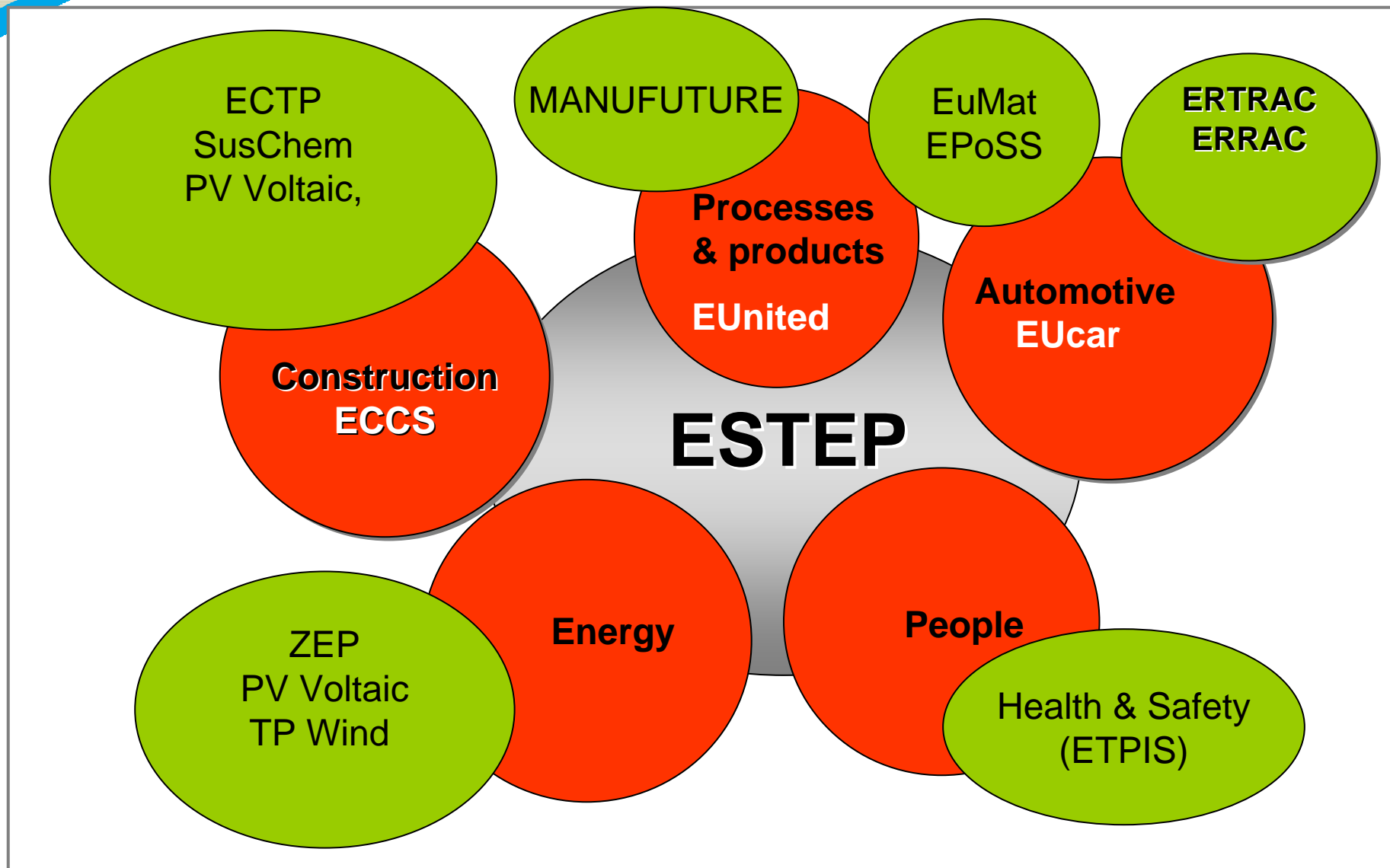
- Medium term approach
  - Strong link between energy efficiency and GHG issue: Energy savings induce reduction of CO<sub>2</sub> emissions
  - Increase scrap recycling : scrap route emits by the factor 5 significantly less CO<sub>2</sub> emissions, including carbon for electricity
- Long term approach: the ULCOS project
  - 2 demonstrations projects are planned so far:
    - the BF with TGR( Top Gas Recycling) and CCS with 50% reduction of CO<sub>2</sub> emissions
    - Hisarna ( direct reduction with pure oxygen ) with 80% reduction



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# European Platforms with specific Synergies to ESTEP





# Conclusions

- ❑ Steel industry offers a set of solutions to meet the long term needs of the EU low-carbon economy , both for steel production and for steel applications
- ❑ The research vision of ESTEP (SRA) has been updated in this field and a specific roadmap has been done on the sustainable use of resources
- ❑ The main topics for resource efficient production are: iron ore, scraps, residues & waste recycling and a global ecological approach
- ❑ ESTEP proposes to reinforce a R&D network with material producers representing Energy Intensive Industries (EIIs) in order to strenghten the role of EIIs in the Framework Programme
- ❑ Last but not least, ESTEP is strongly active for the global warming, with ULCOS and the promotion of steel solutions