EUROPEAN COMMISSION
Community Research

ESTEP

European Technology Platforms to support metals and materials

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Secretary General

European Steel technology Platform

SF2M, Nancy, 4 July 2011

Content of the presentation

- The role of European Technology Platforms (ETPs)
- ESTEP, the ETP for steel
- Innovation for materials within the FP7(2007-2013)
- The EU 2020 strategic challenges
- The answers from the ETPs to these strategic challenges and recommendations for the next Framework programme
- Conclusions

The European Technology Platforms (ETPs)

In 2003, the European Council created the ETPs to strengthen the European research and innovation era.

ETPs are industry-led stakeholder fora, in charge with defining strategic research priorities and actions plan in a number of technological areas.

There are 36 ETPs so far, spanning a wide range of technologies.

6 ETPs are dealing directly with materials: EUMAT (advanced engineering materials and technologies) , ESTEP, Suschem (chemicals) , FTC (Textiles), SMR (mining) and Manufuture (manufacturing).

more information : www.cordis.europa.eu/technology-platforms/

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ESTEP: European Steel Technology Platform

Among the first ETPs created in Europe

Financially supported by the EU steel industry only

Focused on Research, Innovation and Technology, with topics linked with EU Societal Challenges

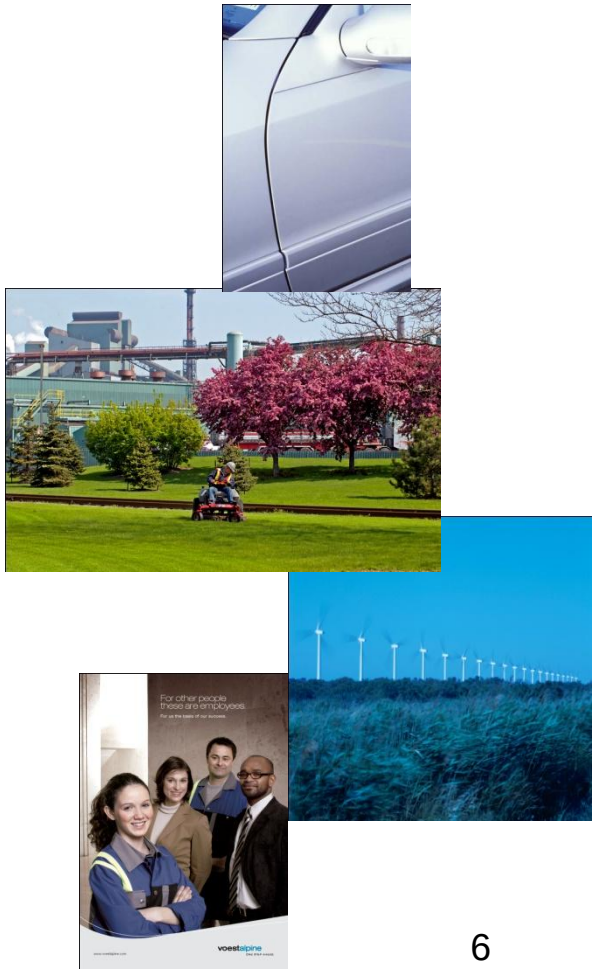
Living Strategic Research Agenda(SRA)

Wide panel of stakeholders (Steel industry, Academia, Research and Technology centers, European Commission, Member States representatives, suppliers, clients...)

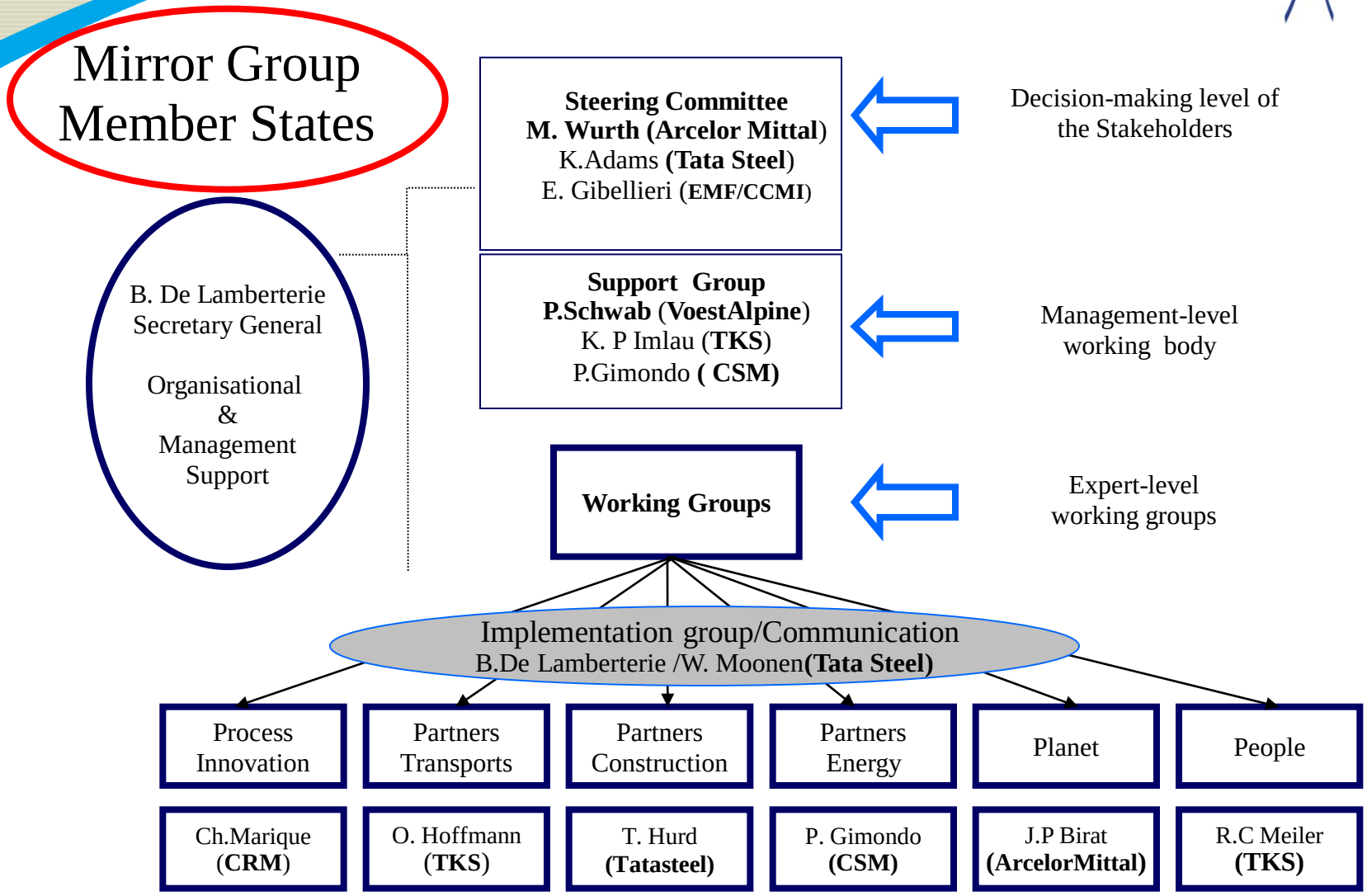
Strong involvement in People activities

The SRA of ESTEP answers the following challenges

- Development of Safe, clean, energy-efficient and cost-effective technologies
- Reducing the CO_2 emissions directly in steelmaking and indirectly by offering suitable steel solutions
- Promoting conservation of resources, recovery of wastes and societal value of materials
- Contributing to the development of Energy sources for the future
- Attracting and securing highly skilled people



Organisation



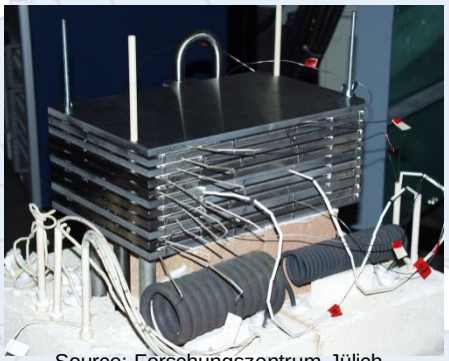
Steel is an advanced material (1)

- Steel is a structural material produced in very large quantities, because it is central to our economy, society and life style
- Its major features are strength, rigidity and price (cheap). It is by far the most important, versatile and adaptable material due to its wide range of mechanical, physical and chemical properties.
- Steel offers amazing properties with a range of tensile strength (Rm) from 200 to 1600Mpa, as well as elongation from 50 to 5%
- Steel grades are constantly re-invented to meet the needs of the market. Over time, steels have become thinner and lighter, stronger and safer, more weldable and formable. Stainless and coated steels offer a wide range of surface properties as well

Steel is an advanced material(2)

- Steel has a high adaptability as functional material and is therefore necessary in all new fields of applications:
  - **Offshore wind energy parks**
  - **Solar power stations**
  - **Solid Oxide Fuel Cells**
  - **High strength steel in cars for passenger safety**
  - **Safety components**

    in aerospace applications
  - **Advanced surgery**
  - **…**



Source: Forschungszentrum Jülich

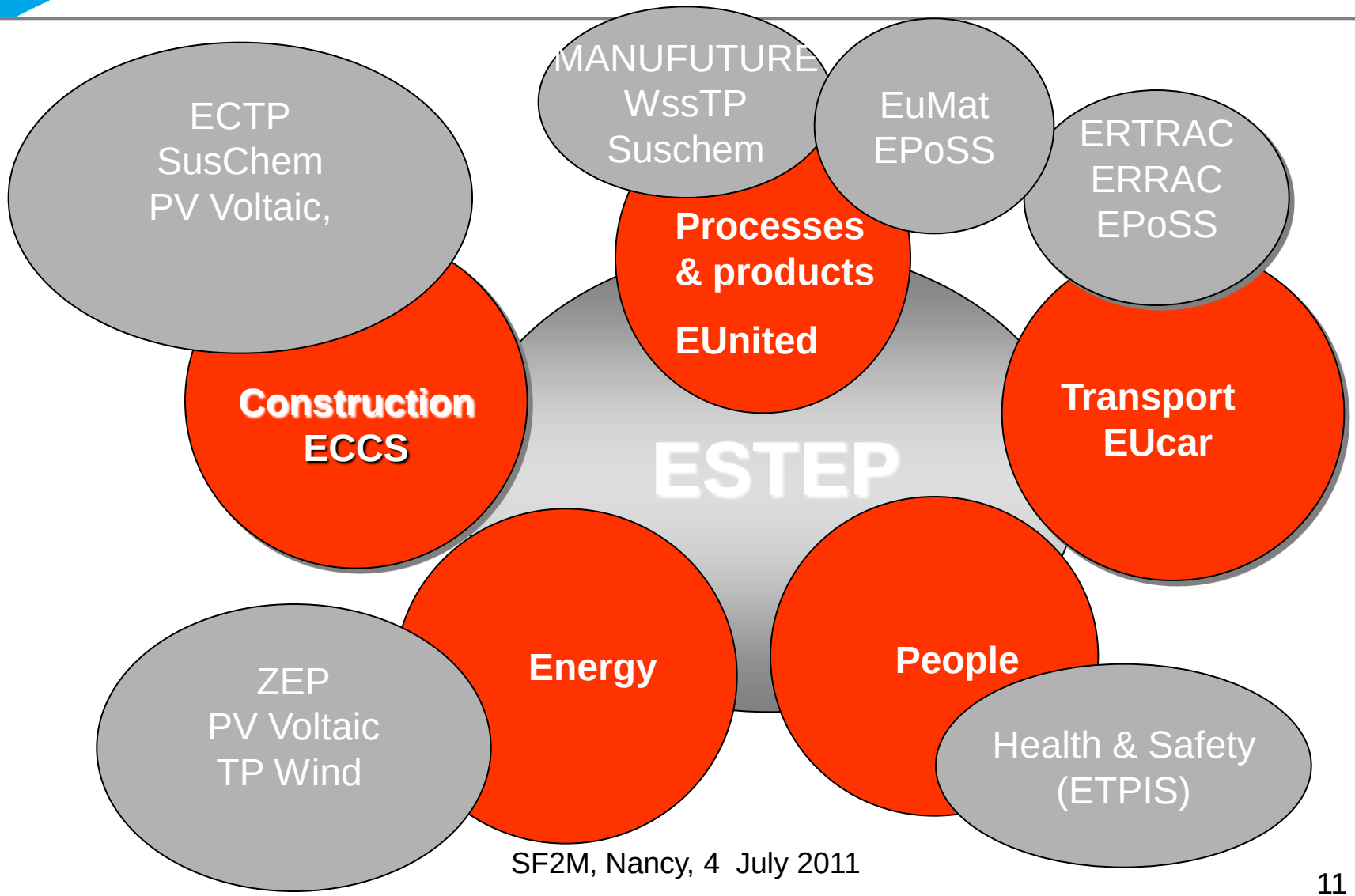
Source: Deutsche Edelstahlwerke GmbH

- The increasing use of steel combined with the unrivalled recycling properties and rates shows the strategic importance for every economy.

Steel Products contribute to CO2 reduction in key sectors

- Steel products offer CO2 savings over the life cycle that are greater than the CO2 emitted during their production
  - Energy Sector
    - Efficient fossil fuel power plants (high T° resistant alloyed steels) ; ratio between CO2 reduction/emission over 100:1
    - Efficient transformers (electrical steel sheets) ; ratio 14:1
    - Wind power plants(tower, gearbox, offshore foundations..); ratio 30:1
  - Automotive
    - Advanced high-strength steels for lightweighting ; ratio 1.3 :1
    - Efficient electrical motors ; ratio 3:1
  - Construction
    - Innovative steel solutions for envelope retrofitting
    - Holistic building approach for energy-efficient new steel constructions
- Total Life Cycle Assessment (LCA) for steel applications
  - Ongoing studies of GHG emissions resulting from all steel life phases.

European Platforms with specific Synergies to ESTEP



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EU: Innovation from Materials

Some 70 percent of all technical innovations hinge directly or indirectly on the properties of the materials they use.

Material innovations can be used in practically all technology sectors and branches of industry.

Material innovations have the potential to reduce environmental pollution, save energy, conserve resources, make mobility less dangerous and improve the quality of life.

Source: ACATECH, 2009,
http://www.research-in-germany.de/dachportal/en/downloads/download-files/9554/high-tech-strategy-2006-112-pages-.pdf

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Impact of Advanced Material Technology

ESTEP

Impact of advanced material technology on ICT, Energy & Biotechnology (% growth attributable to advanced materials)

	1970	1980	1990	2000	2010	*2020*	*2030*
ICT	15	25	40	55	65	*75*	*85*
Energy	10	15	30	45	55	*65*	*70*
Biotechnology	5	10	20	30	45	*55*	*65*

Advanced materials have an earlier & greater impact in ICT (incl. electronics), followed by Energy (incl. construction) and Biotechnology (incl. health)

Source: Sanford M. Moskowitz, « The Advanced Materials Revolution », John Wiley & Sons Inc, 2009

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Advanced Materials
Market Potential

	Advanced Materials
Current total market size 2010 *(Sources: Hammond, The World in 2030, Editions Yago; Moskowitz, The Advanced Materials Revolution, 2009, John Wiley & Sons)*	**approx. 100 bn$**
Expected market volume 2020 *(scenario based)*	150 – 300 bn$
Expected growth rate *(scenario based)*	5 – 12 % / year
GDP world 2010-2012 *(Source: Worldbank)*	***3.3 % / year***
GDP EURO zone 2010-2012 *(Source: Worldbank)*	***1.4 % / year***

Elaboration by Dr Helge Wessel, DG R&I G3 "Materials", European Commission

EU: FP7 (2007-2013) Specific Programme Cooperation

10 Themes

(funding: million €)

1. Health	6 100
2. Food, agriculture and fisheries, and biotechnology	1 935
3. Information and communication technologies (ICT)	9 050
4. Nanotechnologies, **Materials** and Production (NMP)	3 475
5. Energy	2 350
6. Environment	1 890
7. Transport	4 160
8. Socioeconomic research	623
9. Space	1 430
10. Security	1 400
Total	**32 413**

*** Not including non-nuclear activities of the Joint Research Centre: €1 751 million**

ADVANCED MATERIALS

a strategically relevant Key Enabling Technology

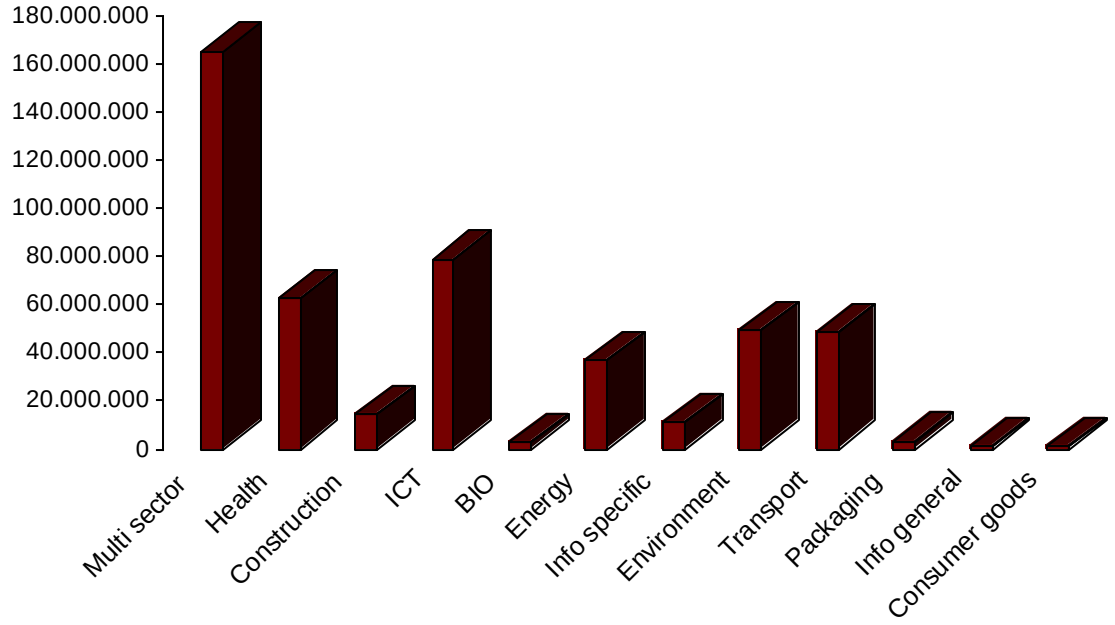
1. **Enabling research and development**
   - Meeting the Grand Challenges (Lund declaration)
   - Multidisciplinary Research & Development for all sectors
   - Better control of materials properties

2. **Innovative materials for advanced applications**
   - Addressing 5 main industrial sectors: HEALTHCARE, ICT, TRANSPORT, ENERGY (see the Strategic Energy Technology plan), ENVIRONMENT (incl. availability of critical raw materials)
   - Research & Development on application-oriented materials
   - Unlocking the potential of technological applications

3. **Structuring actions**
   - Building up and exploiting the potential of the ERA
   - Fostering cooperation at the European (ERA-NET) and international (SICA) levels
   - Creating synergies and networks in materials research

Materials R&D:

FP7-NMP contribution (cumulative data 2007-2009)



FP7-NMP spends about 37% of its contribution on Materials R&D
Average EC contribution for Materials: 160 million € / year

Elaboration by Dr Monique Levy, DG R&I-G3 "Materials", European Commission

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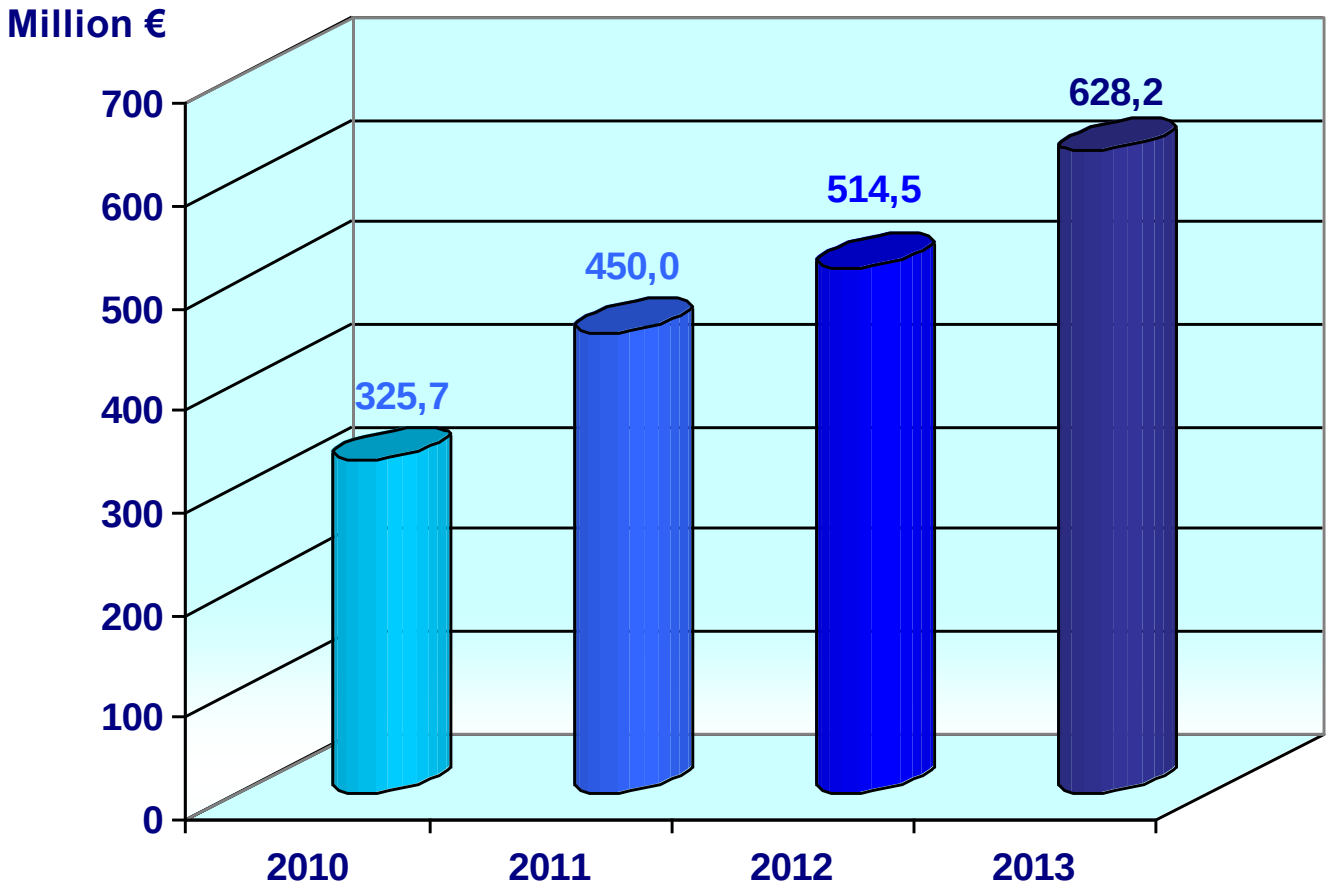
FP7: 2011-2013 NMP

Indicative Budget



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European Commission : new Innovation and Industrial Policy

Important documents have been published in 2010 & 2011

- Need for a new industrial policy, endorsed by the European Council in March 2010,
- EUROPE 2020, a strategy for smart, sustainable and inclusive growth, March 2010,
- Europe 2020 Flagship Initiative " Innovation Union", Oct 2010
- Europe 2020 Flagship initiative " an industrial policy for the globalisation era", October 2010
- Europe 2020 Flagship initiative " Resource Efficient Europe", January 2011
- Key Enabling Technologies, February 2011
- Energy Efficiency plan 2011, March 2011

New trends for the European Research Area

To achieve 2020 targets for climate change and energy

- 20% reduction of GHG vs 1990
- 20% of renewable energy sources in the final energy consumption
- 20% increase of energy efficiency

To move towards a low-carbon, knowledge-based economy, when improving our competitiveness

To promote MT & LT investments in R&D, with co-operations and public-private partnerships.

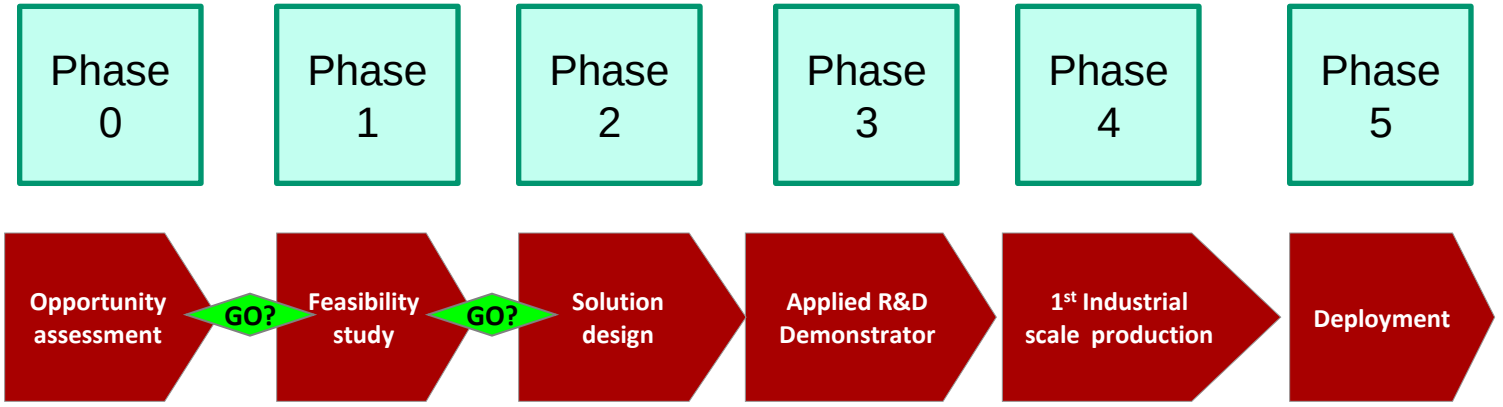
European Commission : The need for a new industrial policy

- Europe should be transformed into a competitive, knowledge-based, inclusive, innovative and eco-efficient economy
- Need for an integrated approach to a competitive and sustainable industrial policy in the EU
- Achieving a successful transition to a competitive and eco-efficient economy, turning environmental challenges into business opportunities and high-quality jobs
  - emphasis to be given to resource and energy efficiency
  - emphasis on the deployment and support for safe and sustainable low GHG-emitting technologies.
- Continuing focus on sustainable growth and jobs
- Need for more efficient R&D investments

Innovation Union: key elements of the Communication

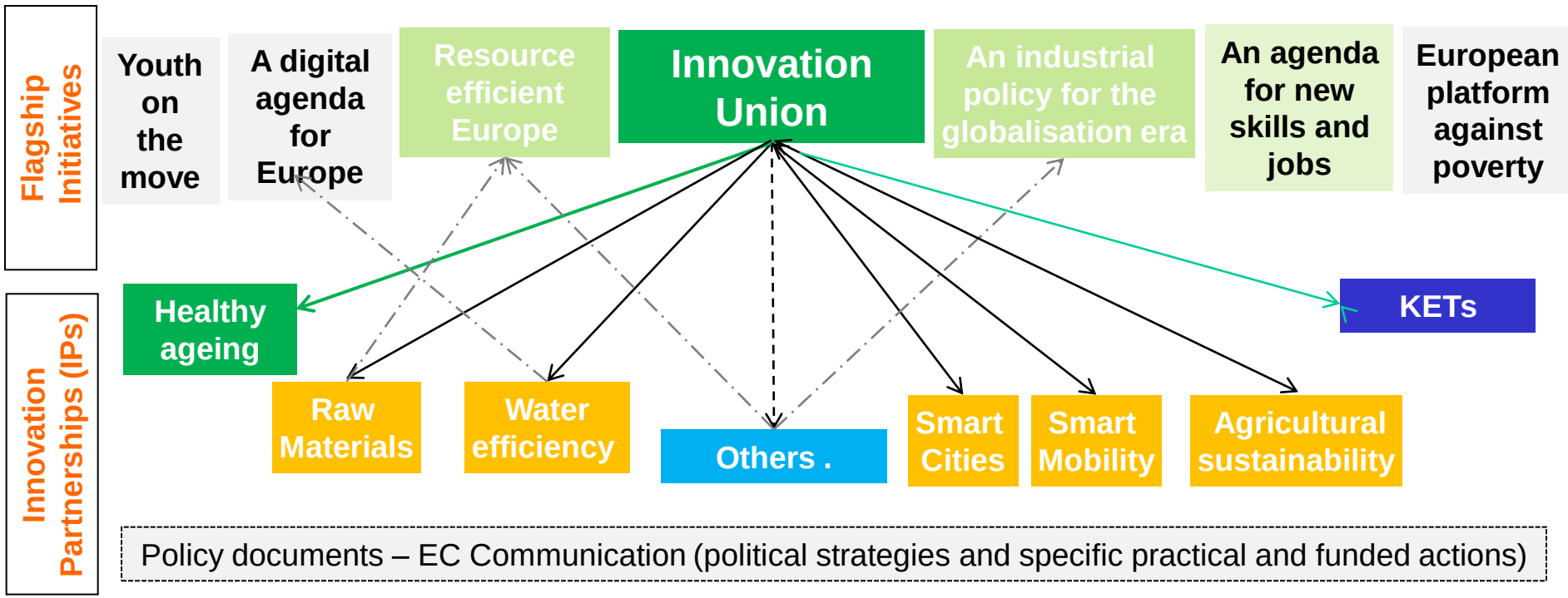
- Basic and societal questions are clearly addressed (EU 2020 societal challenges, competitiveness & sustainability...)
- Need for generic topics to meet the EU challenges
- The whole EU industry (incl. process industries) to be involved
- Development of knowledge alliances between education and business.
- New approach of European Innovation Partnerships i.e. for Raw Materials where ETPs are involved in the consultation process.
- Broad concept of innovation more results- oriented and driven by the market needs.
- Avoid fragmentation of R&D effort (Community, National and Regional systems)

The innovation chain in materials industry



Research has to cover the full innovation chain, addressing basic & applied research , industrialization and deployment. Driven by the market needs, this innovation has to bring new « products » into the market.

The new EU 2020 Strategy



After FP7 …
a new Common Strategic Framework?

Covering current funding for:

The 7th Framework Programme (FP7) for research, technological development and demonstration

€53 billion (2007-13). 4 main programmes on Ideas, Cooperation, People and Capacities.

The Competitiveness and Innovation Framework Programme (CIP)

€3.6 billion (2007-13). 3 programmes on enterprise & innovation, intelligent energy, and ICT policy support.

The European Institute for Innovation and Technology (EIT)

Autonomous EU body bringing together higher education, research and business to stimulate innovation in Knowledge and Innovation Communities. EU budget contribution of €309 million (2007-13)

And strengthening complementarities with the Structural Funds

€86 billion allocated (2007-13) to R&D and innovation, entrepreneurship, ICT and human capital development

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Materials are indispensable constituents of a developed economy

- Nano and advanced materials should put Europe at the forefront of competition for future markets but...
- The EU economy has also to preserve its leadership in key markets (transport, construction, energy, etc.)
- Structural materials should have a more important role to play in the Recovery Plan and in future RTD programmes (FP8,...)
- Young researchers have to be attracted to advanced structural materials so that Europe will stay competitive in a global scale.
- With several ETPs and under the leadership of EUMAT a position letter was published last december on the enabling role of materials for industrial innovation under FP8 : Alliance for Materials (A4M). We propose concrete initiatives on how to align the value chain consisting of the supply of materials, their processing and the manufacturing needs. First initiative launched for materials for energy
- Dedicated calls for materials should be envisaged

More emphasis should be placed on production processes of materials and LCA

- It requires high usage of energy and other resources
- Very important issues are concerned (CO_2, Energy efficiency, water, waste & residues, environment..)
- LCA(Life Cycle assessment) approach should be enlarged within the FP programme.
- For the Community, the whole value chain has to be covered: process industries producing materials and the downstream manufacturing of our products
- It is the purpose of our position paper on Resource and energy Efficient Partnership, finalized in Sept. 2010 with other material producers (chemicals, non-ferrous, glass, ceramics...)
- Need for innovation for the process industries should be more covered in the EU work programmes (dedicated calls)

Resource & Energy efficiency Partnership

"REP" is a group of European associations , ETPs, and organisations motivated to promote resource and energy efficiency in process industries .

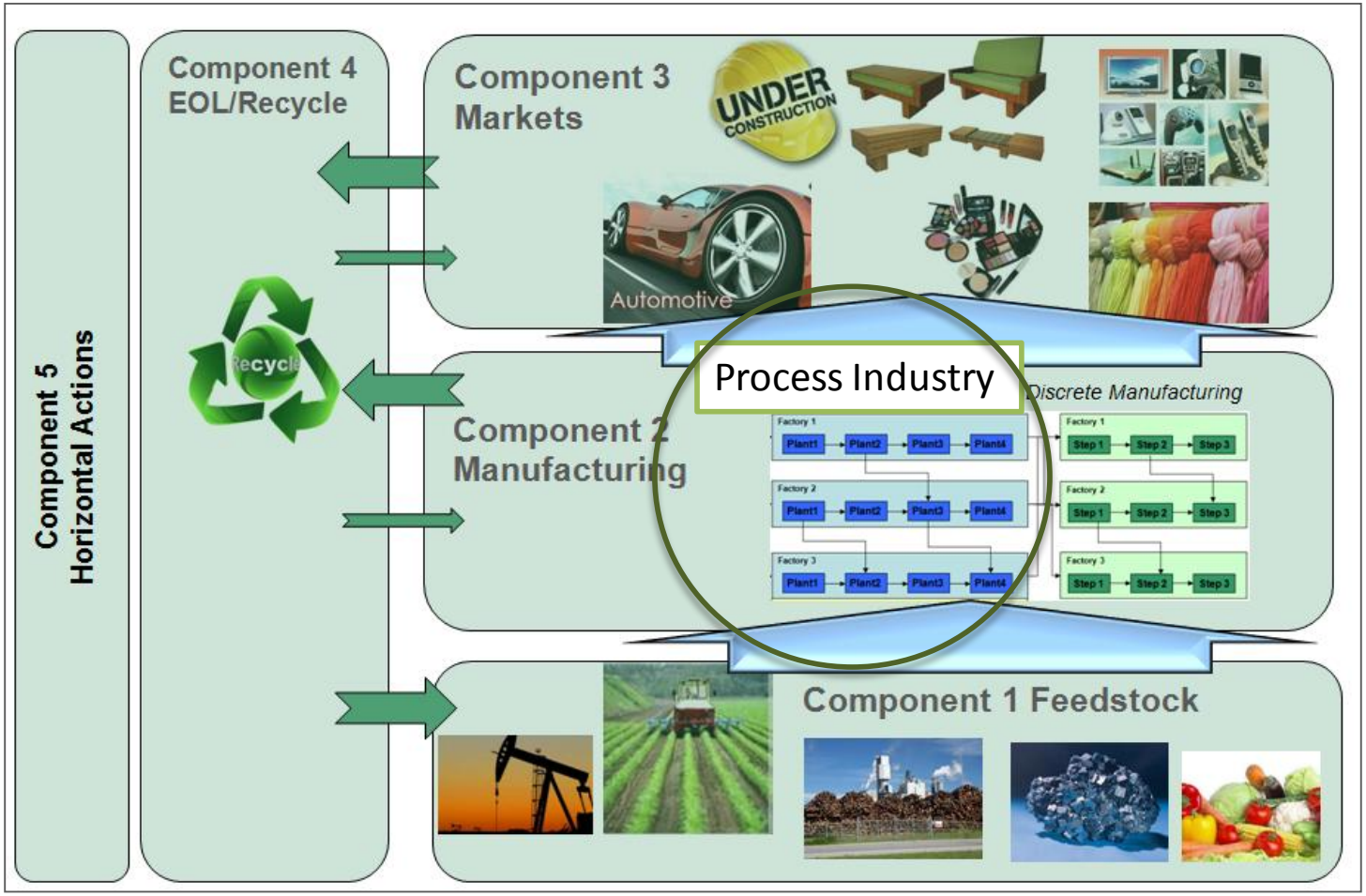
"REP" covers the domain of the process industries, producing materials, with a view on the whole supply chain of value creation.

REP offers support through the development of adequate strategies & via a proposed public private partnership (PPP) dedicated to resource & energy efficiency for these process industries.

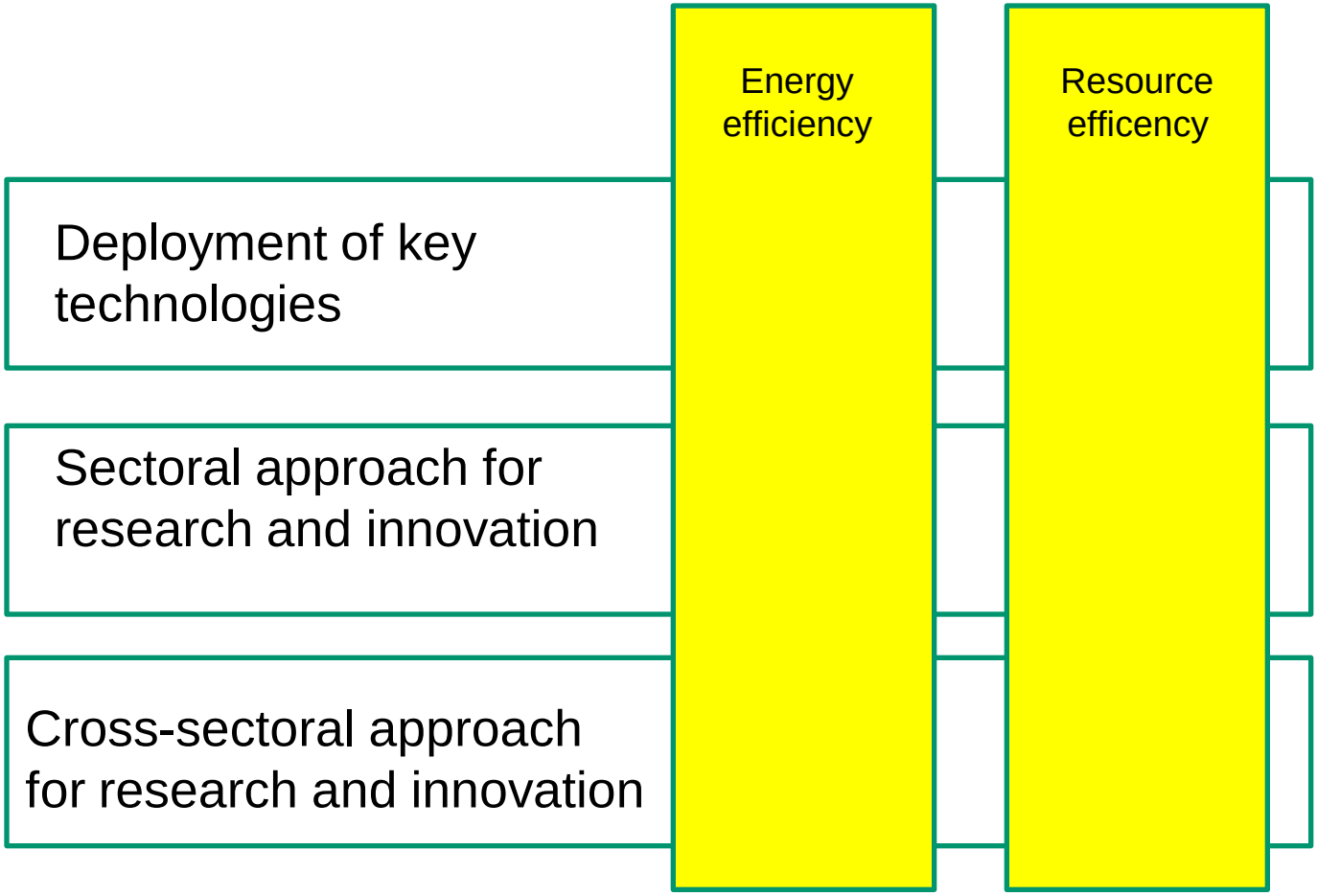
Main objectives of the proposed PPP:

- To develop , via research, innovation & knowledge exchange , new solutions to improve resource and energy efficiency in the process industries
- To develop solutions that demonstrate the advantages of industrial cooperation
- To explain and promote the current and future potential of industry in addressing the current challenges of employment creation , sustainable production, and energy policy.
- To provide a channel for a broad coalition of industry interests to dialogue with the EU institutions on methods of improving resource and energy use.

The Process industries within the value chain



REP: Research & Innovation areas



Conclusions

- The ETPs play a key role within the European Research Area, defining SRAs and developing roadmaps in conjunction with the European Commission.
- Materials innovation represents a significant part of the FP7, but strongly dedicated to advanced materials.
- The European Commission has launched in 2010 new initiatives for the improvement of research and innovation policy. Innovation has been placed at the heart of the EU 2020 strategy. ESTEP , like other ETPs supports strongly these initiatives.
- **In collaboration with other ETPs, ESTEP is ready to contribute to the improvement of the Community's RTD Policy and European Research Area for FP8 (CSF) : still progress to be done in order to emphasise the role of materials and process industries.**