



## SSDC Plenary meeting

# Current activity of ESTEP: Contribution to the low-carbon Economy and Recovery Plan

J.C Charbonnier

E. Gibellieri



# Organisation



**Mirror Group  
Member States**

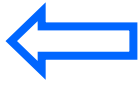
J.C Charbonnier  
Secretary General  
  
Organisational  
&  
Management  
Support

**Steering Committee**  
M. Wurth (Arcelor Mittal)  
P. Erkillä (Outokumpu)  
E. Gibellieri (EMF/CCMI)



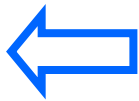
Decision-making level of the Stakeholders

**Support Group**  
P.Schwab (VoestAlpine)  
K. P Imlau (TKS)



Management-level working body

**Working Groups**



Expert-level working groups

Implementation group/Communication  
J.C Charbonnier/W. Moonen(Corus)

Profit  
Innovation

Partners  
Automotive

Partners  
Construction

Partners  
Energy

Planet

People

Ch.Marique  
(CRM)

C.Wuppermann  
(Stahl Zentrum)

T. Hurd  
(Corus)

P. Gimondo  
(CSM)

J.P Birat  
(ArcelorMittal)

R.C Meiler  
(TKS)



## Five RTD programmes and a horizontal programme to meet the ESTEP's ambition

- Safe, clean and energy-efficient technologies
- Rational use of Energy & residues management
- Appealing steel solution for end-users: Automotive
- Appealing steel solution for end-users: Construction
- Appealing steel solution for end-users: Energy
- Attract & retained qualified people: horizontal programme



## How steel will contribute to the future EU low-carbon economy and PPP\* initiatives

- **With energy savings, recycling of products, breakthrough technologies (e.g ULCOS) and light-weight products the steel industry offers a complete set of long term solutions to contribute to the low-carbon economy**
- **Through innovation initiatives, the steel sector will be a key partner in the PPP initiatives of the EU Recovery Plan**

PPP=Private Public Partnership



# Sustainable and lean-energy processes, strong customer-oriented R&D

- **Scale-free and energy-efficient processes**
- **Sustainable use of resources**
- **Ultra-low steelmaking (ULCOS)**
- **Intelligent manufacturing (with MANUFUTURE)**
- **Energy-efficient building (with ECTP)**
- **Lightweight steel solutions for the Automotive Industry (EUCAR and ERTRAC)**
- **Advanced steel solutions for Energy production and transportation (Wind Platform)**





EUROPEAN  
COMMISSION

Community Research

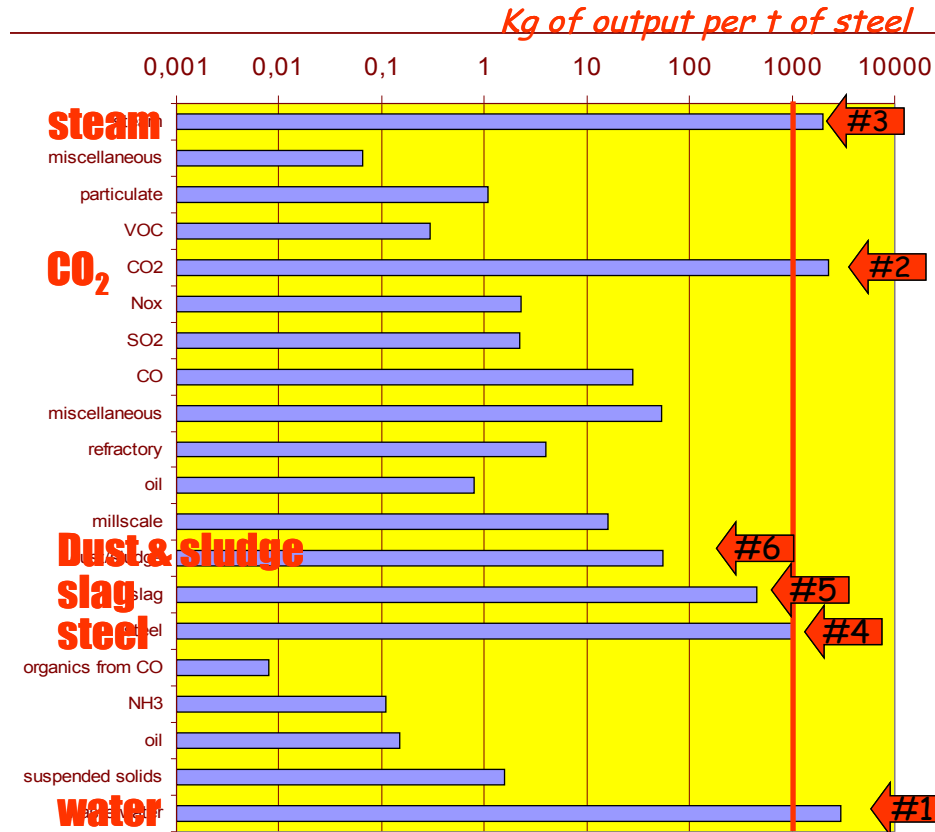


- **Sustainable use of resources programme**



# Sustainable use of resources: Recovery of wastes is key issue

- What enters and what leaves the steel mill represents several times the mass of steel itself





# Several projects to address the sustainable use of resources...

Foresight vision of resources

Inventory of resources (MFA,SRA)

Methodology for sustainability assesement

Increase energy efficiency  
Improve, integrate  
Energy networks

Surestep  
Global Village  
Intercare  
Enemelt

ROSES  
Scrap  
Protect

Iron ore

Reuse & Recovery of residues

Global Warming ULCOS

Logistics

Water

Air quality

Biodiversity



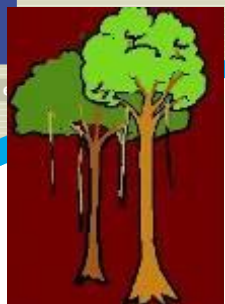




- **Towards ULCOS phase 2: 4 possible routes will be further investigated. Three of them require CCS (carbon capture and storage)**

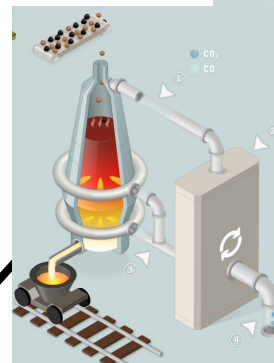


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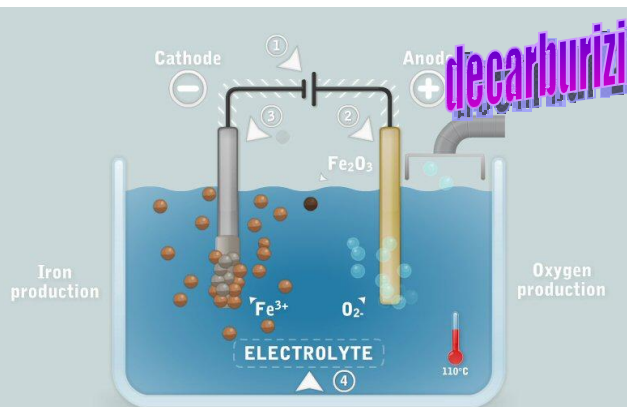
**Biomass-based steel production**

**TGR-Blast Furnace**



**ulcos**

**decarburizing**



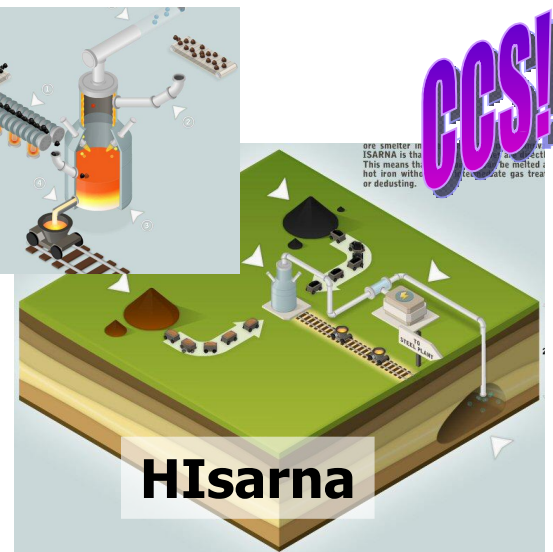
**ULCOLYSIS  
ULCOWIN**

**Hydrogen**



**decarburizing**

**ULCORED**



**HI sarna**

**ulcos**



# Towards industrial demonstration

- The Top Gas Recycling Blast Furnace (TGR-BF) is the most promising and the quickest available technology
- ESTEP's Steering Committee decided to support a pilot and demonstration project to demonstrate its technical and economic viability



# TGR-BF pilot & demonstrator

- ArcelorMittal will be launching a comprehensive programme, part of **ULCOS II**, to scale-up the process and demonstrate it at a scale suitable for further quick and risk-free deployment – beyond 2020.
- the **programme** will include **2 steps** and **2 dimensions**:
  - 1<sup>st</sup> step scales up the TGR-BF concept to the size of a small production Blast Furnace (Ø 6.1m, 550 kt/y), at BF#3 of Eisenhüttenstadt AM plant. No storage yet. **PILOT**.
  - 2<sup>nd</sup> step scales up further to P6 Blast Furnace in Florange AM plant (Ø 8.5 m, 1,400 kt/y). **DEMONSTRATOR**.
  - storage of CO<sub>2</sub> in a nearby deep saline aquifer planned in parallel and built up to connect with the BF experiments and their timeline (2<sup>nd</sup> dimension).
- programme supported by **two coordinated consortia**:
  - the **TGR-BF consortium**, stemming from ULCOS I's consortium
  - the **storage consortium**, focused on storage in the Lorraine area



- **Steel will contribute to the 3 PPP initiatives of the Recovery Plan**



- **Factories of the future**

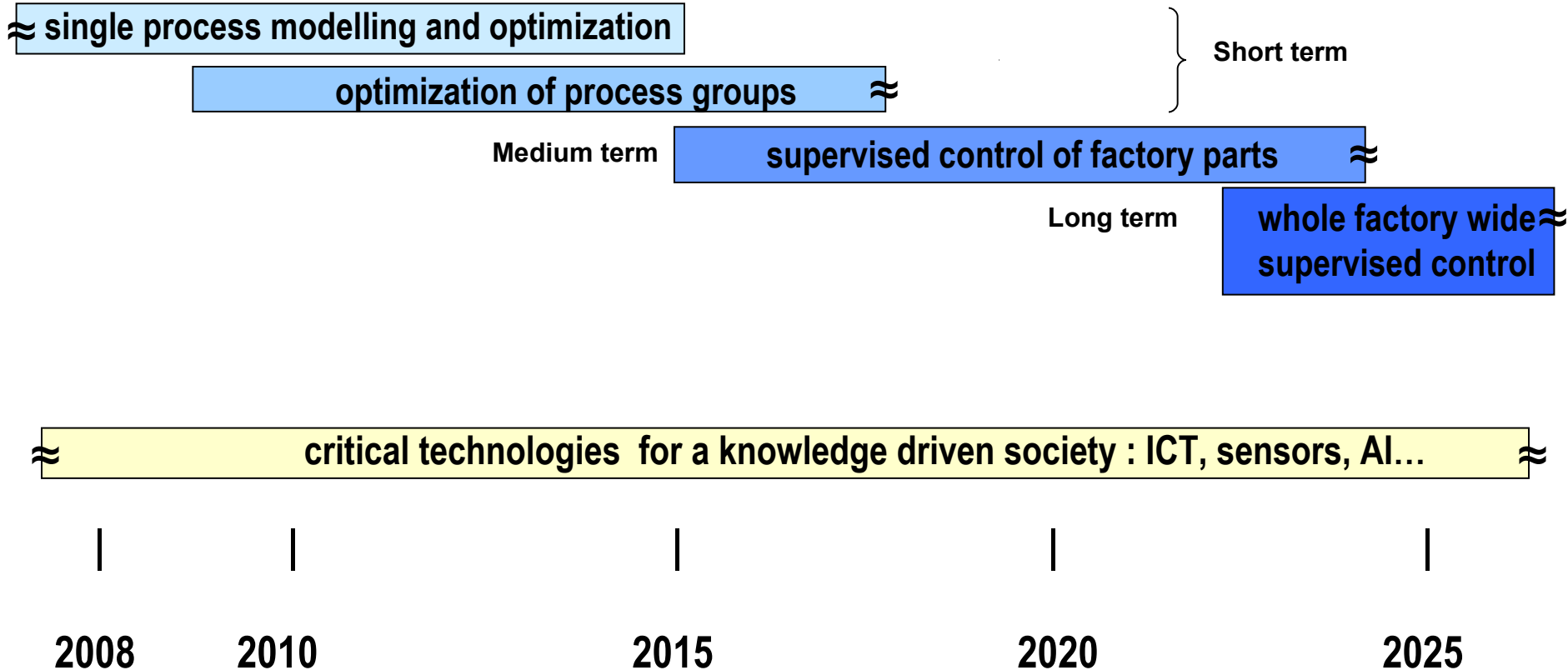
## **Intelligent Manufacturing roadmap**

***“Towards the process industry lean factory  
of the 21st century”***



# ROADMAP

## A continuous progress with overlaps





- **Energy-efficient building**





# Roadmap Timelines

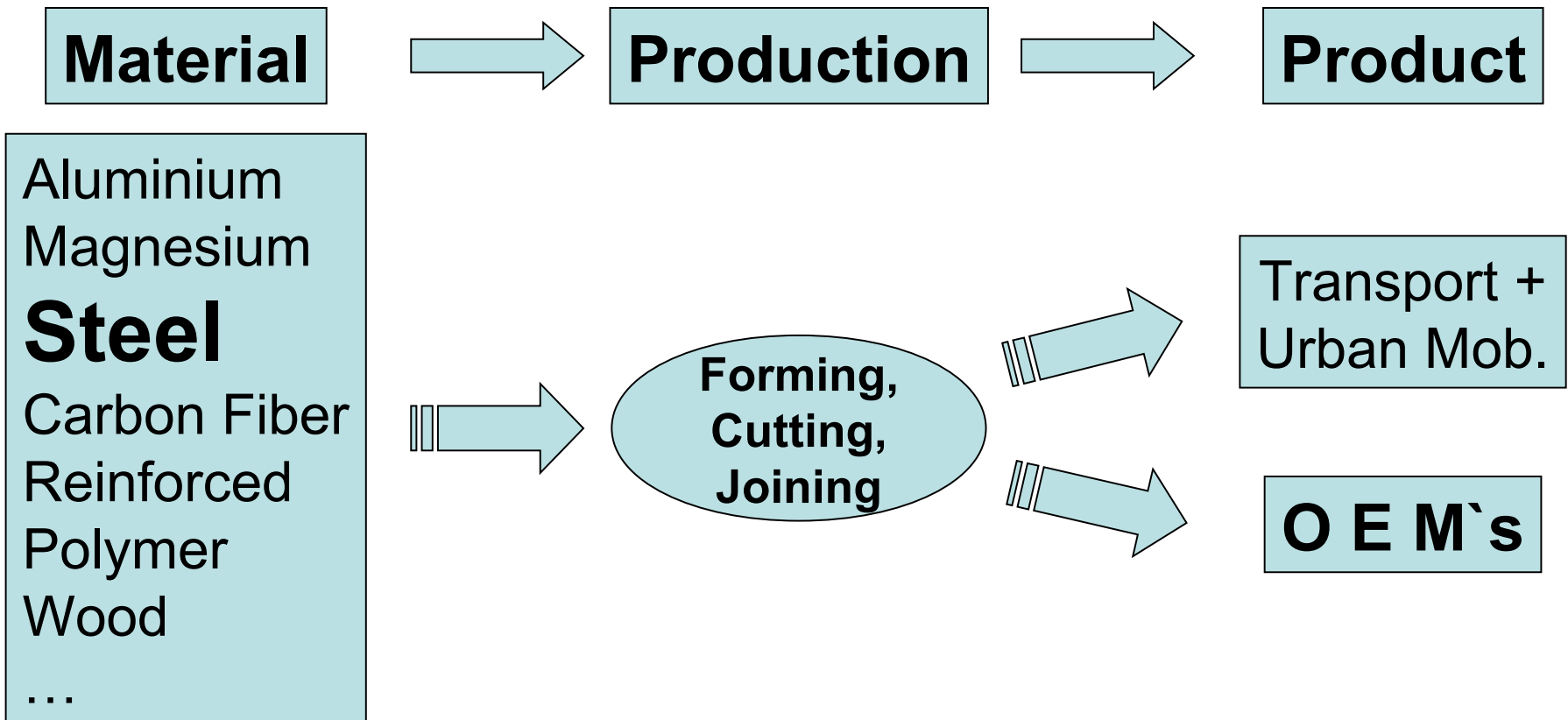
- **Short Term (2010/2)** concentrates on energy-saving technologies in service systems, renovation methodologies of at least 20% saving and advanced façade systems
- **Medium term** – adapted green technologies with passive and active systems for future compliance and optimization
- **By 2016** steel solutions are available for zero carbon new buildings and suited to MMC
- **To 2020**, the steel construction sector foresees technical solutions that fulfil the EU energy-efficiency requirements, low-intrusive renovation technologies leading to reduction of 50% of existing buildings as well as well-covering uptake of ICT in business and design and building (BIM)
- **2020 and beyond** holistic integrated approach to micro generating technology leads to energy generation on a mass scale
- **2050** Interactive and Intelligent contributory buildings



- **Automotive:  
Steel partner of “green transportation vehicles”**



# Steel a key element in the value chain of green transportation vehicles

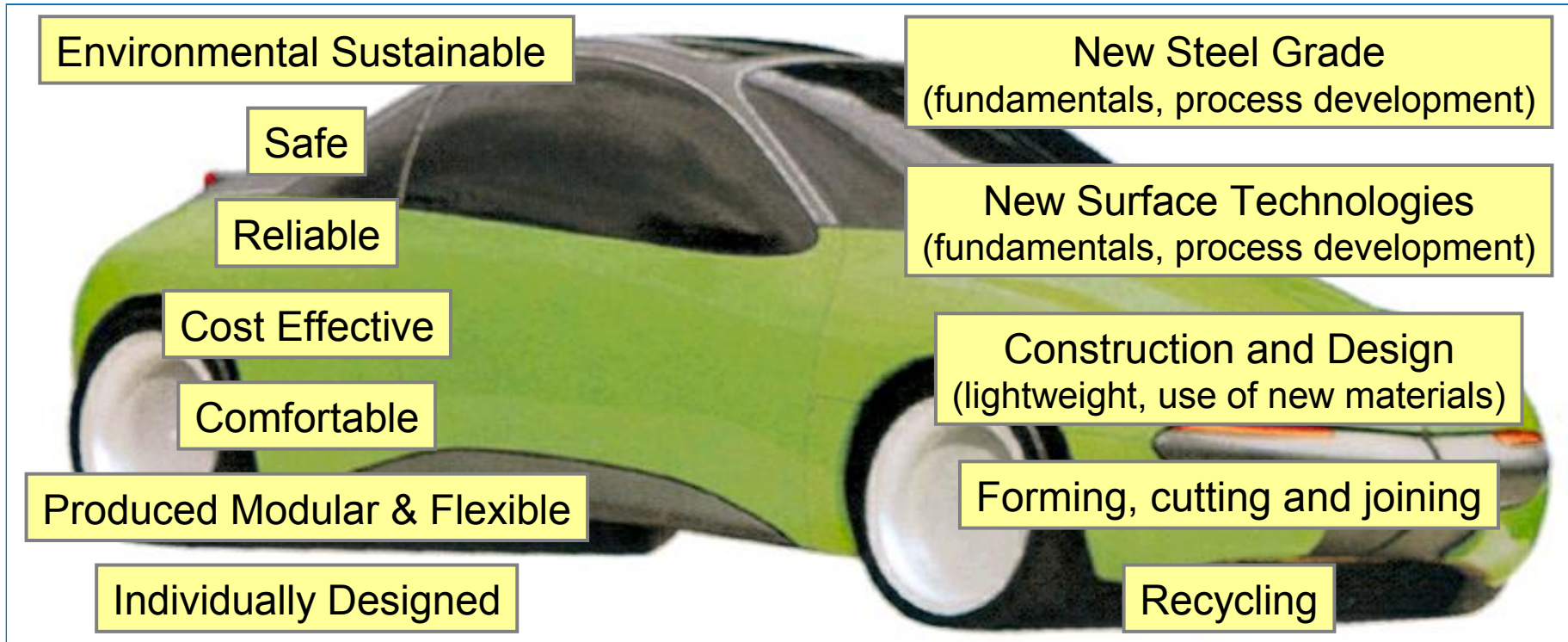




# Aims: From light vehicles to light environmentally enhanced vehicles (LEEV)

## Vehicles of the Future

## Contribution of „Steel“



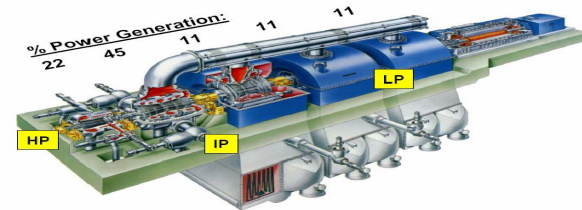
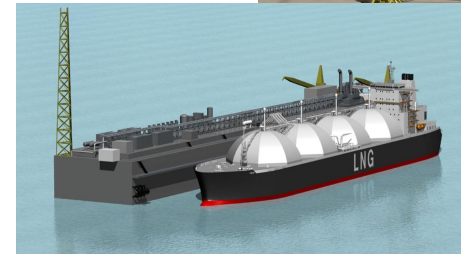
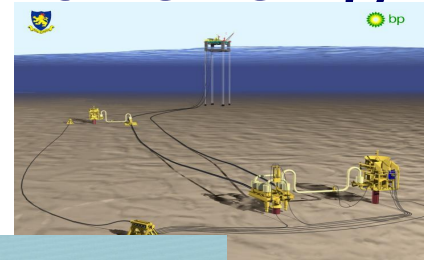


- **High performance steels for Energy exploration, production and transportation**



# Steel is used for many application for energy production

- Oil & Gas(exploration, production, transportation)
  - SAPCO2 submitted to FP7 (safe pipeline for CO2 transportation in Europe)
- Power Generation (ultra-super critical nuclear)
- Renewables (Wind Farms)





## Strong emphasis on « people »:

The “people” WG5 is developing an ambitious and dynamic policy

- ❑ Analysis of attracting and recruiting in the European steel industry
- ❑ Toolbox and exchange of best practices
- ❑ Proposal “steel cities” submitted to the Leonardo da Vinci EU programme in Feb. 2009
- ❑ Communication:
  - ESTEP presented at the 16<sup>th</sup> “Students day” in Ostrava (April 23/25)
  - Warsaw follow up “Talent Management”, to be held in Düsseldorf as soon as possible in 2010
  - 1<sup>st</sup> steel spring school in April 2011 ?

# Conclusions

- ❑ Steel industry offers a set of solutions to meet the the long term needs of the EU low-carbon economy and solutions for the short term Recovery Plan
- ❑ The long term research vision of ESTEP (SRA) has been updated to reinforce the development of breakthrough technologies (i.e ULCOS II) and customer-focused R&D programmes
- ❑ Ambitious “people” programmes are being carried out.