

Clean Energy and Industrial Competitiveness for Sustainable Development
Sofia, 11 April 2018

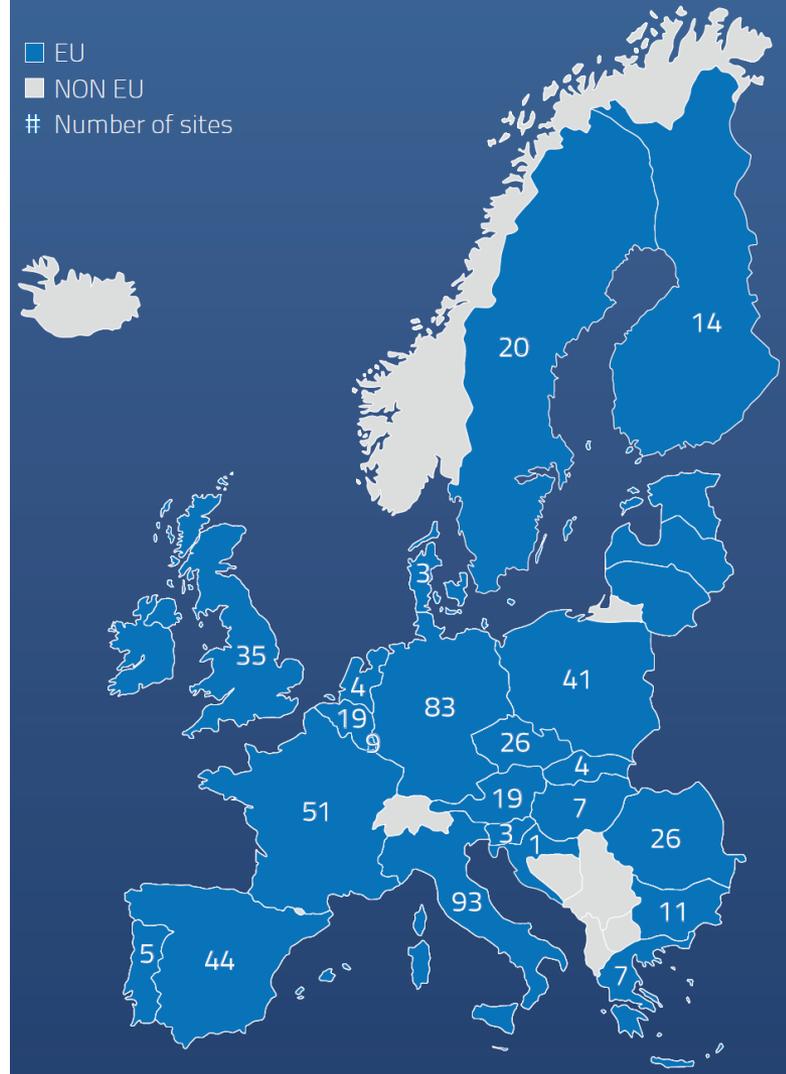
**BIG SCALE INITIATIVE ON LOW-CARBON STEELMAKING
TOWARDS AN EU MASTERPLAN FOR A LOW-CARBON AND
COMPETITIVE EU INDUSTRY**

Axel Eggert, EUROFER



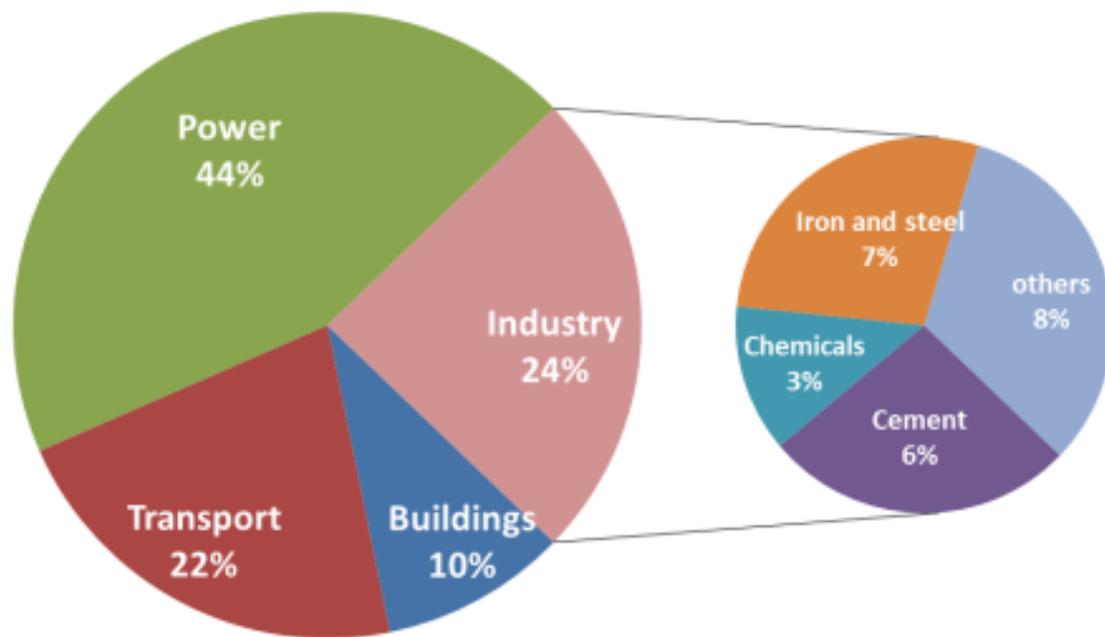
ABOUT THE EUROPEAN STEEL INDUSTRY

- 500 production sites
 - 160 million tonnes of steel produced per year
 - €166 billion turnover
 - 320,000 direct jobs
 - Multiplier effect: Millions of indirect jobs in value chain and related service sectors
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- 20% drop in employment since 2007
 - 28% drop in EU steel demand (2007-2014); gradual recovery has mostly benefitted importers
 - EU steel faces relatively high energy prices
 - Unfair trade practices from non-EU countries undermine EU
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- 100% infinitely recyclable - Steel is a permanent material
 - 50% reduction in CO₂ emissions and energy use since 1960s
 - 500 million tonnes of CO₂ can be saved in other sectors per year by 2030 with innovative steel applications



A GLOBAL CHALLENGE – CAN THE EU LEAD BY EXAMPLE ?

- 1.7 billion tonnes of steel are produced globally every year - and it continues to increase
- Direct emissions from global steel production represent almost 7% of the global total

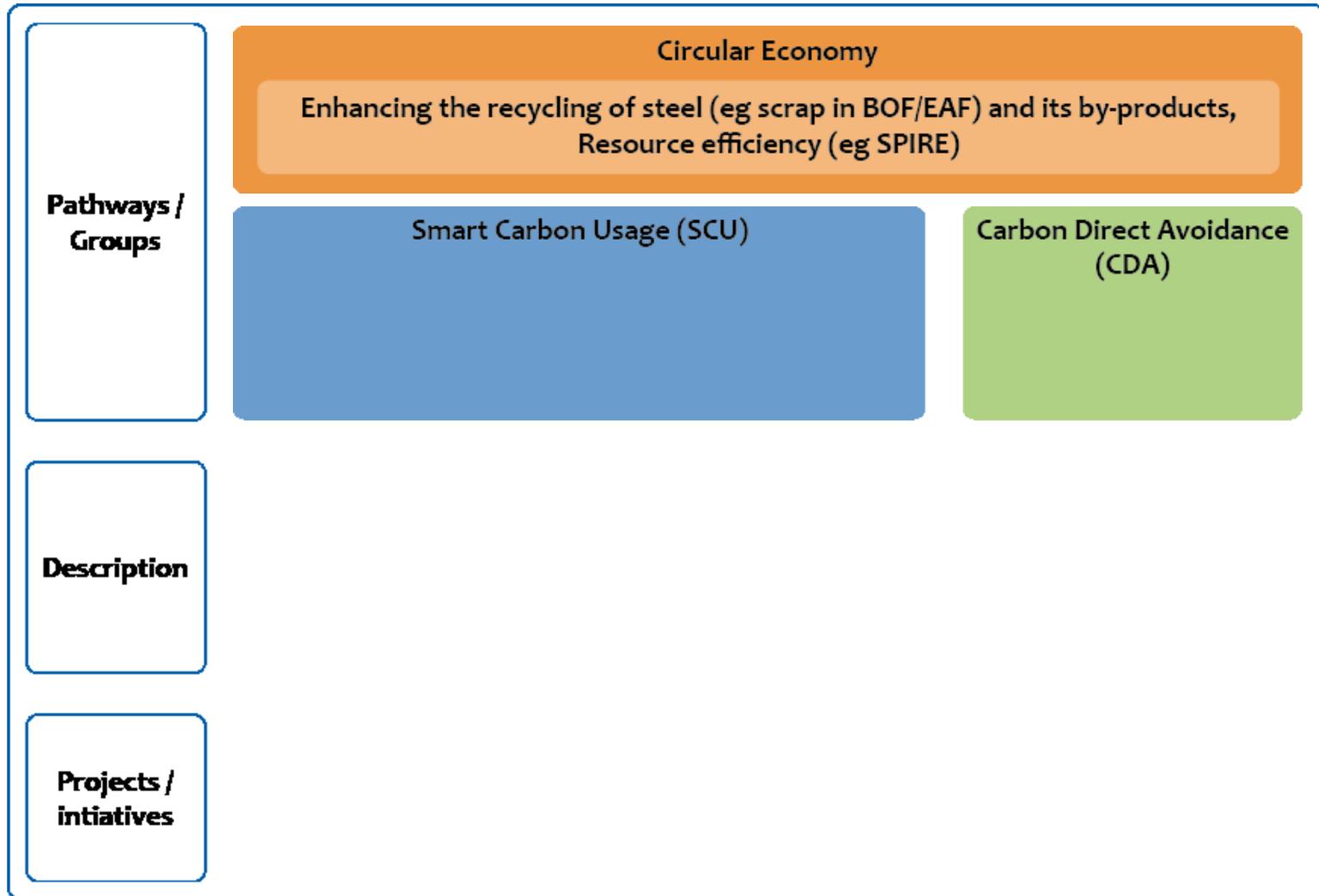


Direct CO₂ Emissions Sources 2014 (IEA)

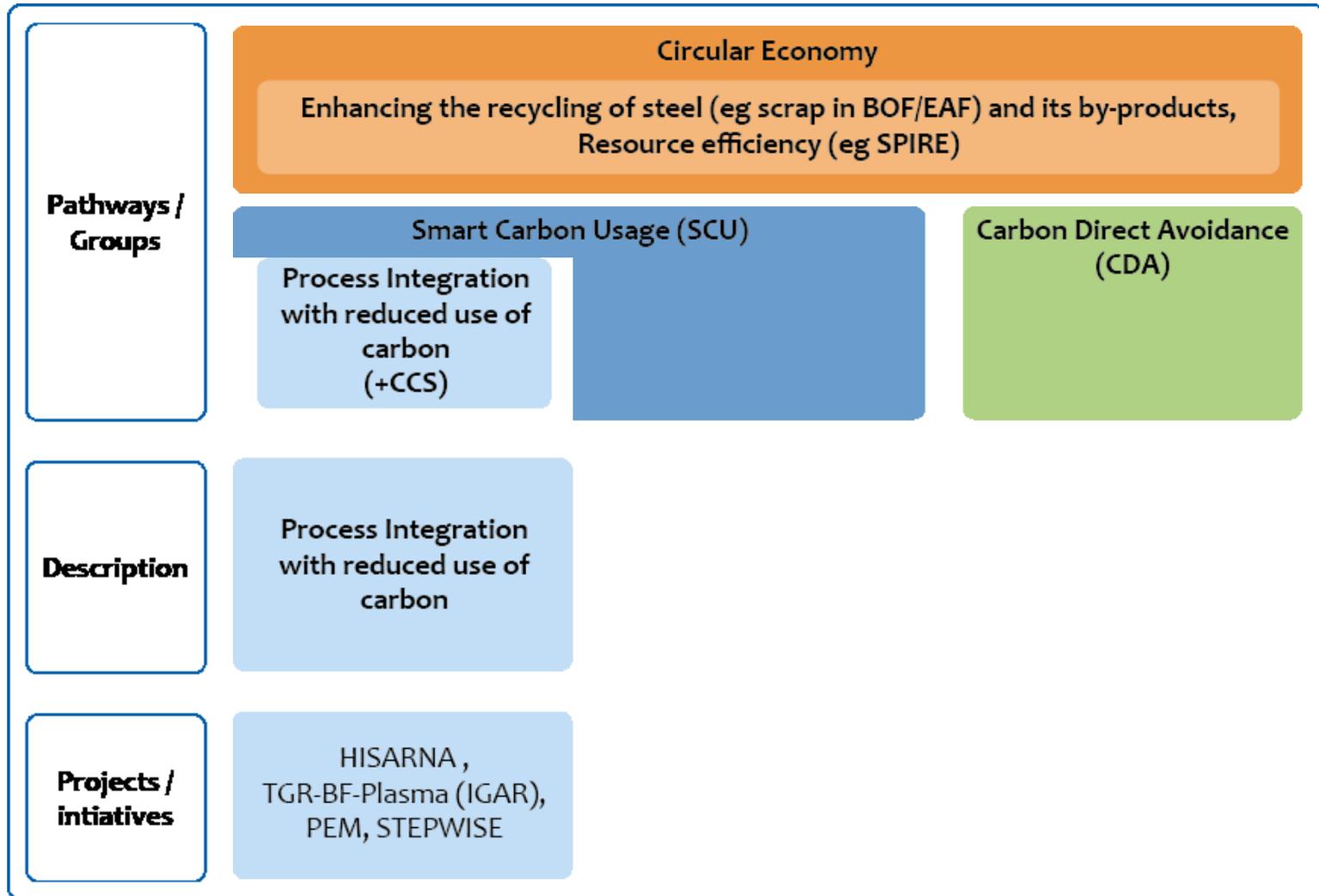
A GLOBAL CHALLENGE – CAN THE EU LEAD BY EXAMPLE ?

- **Only** if the EU can demonstrate that the decarbonisation of the industry is possible without the sector losing market share or profit margins, other regions will follow the EU's path

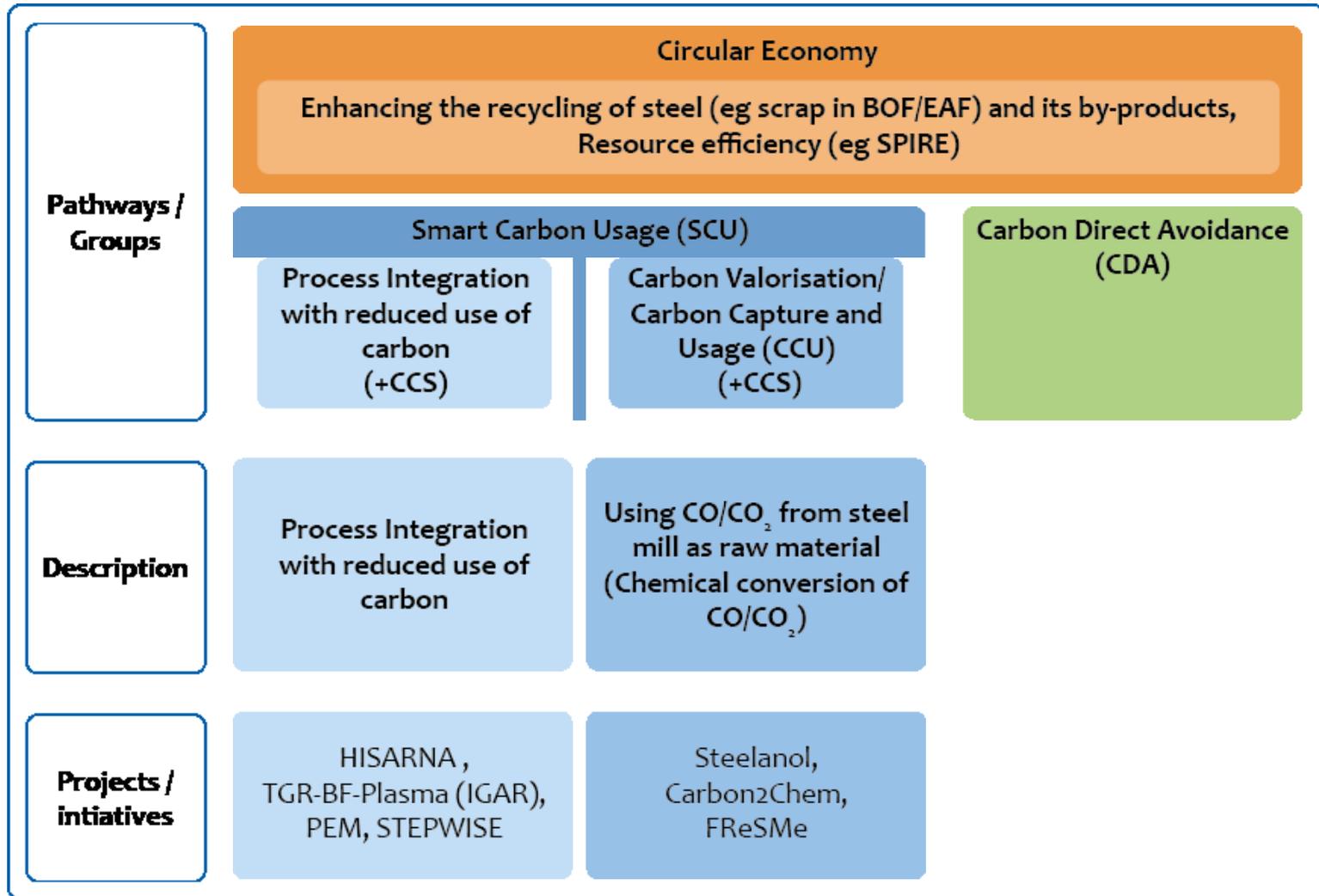
TECHNOLOGICAL PATHWAYS TO CO₂ REDUCTION IN STEEL



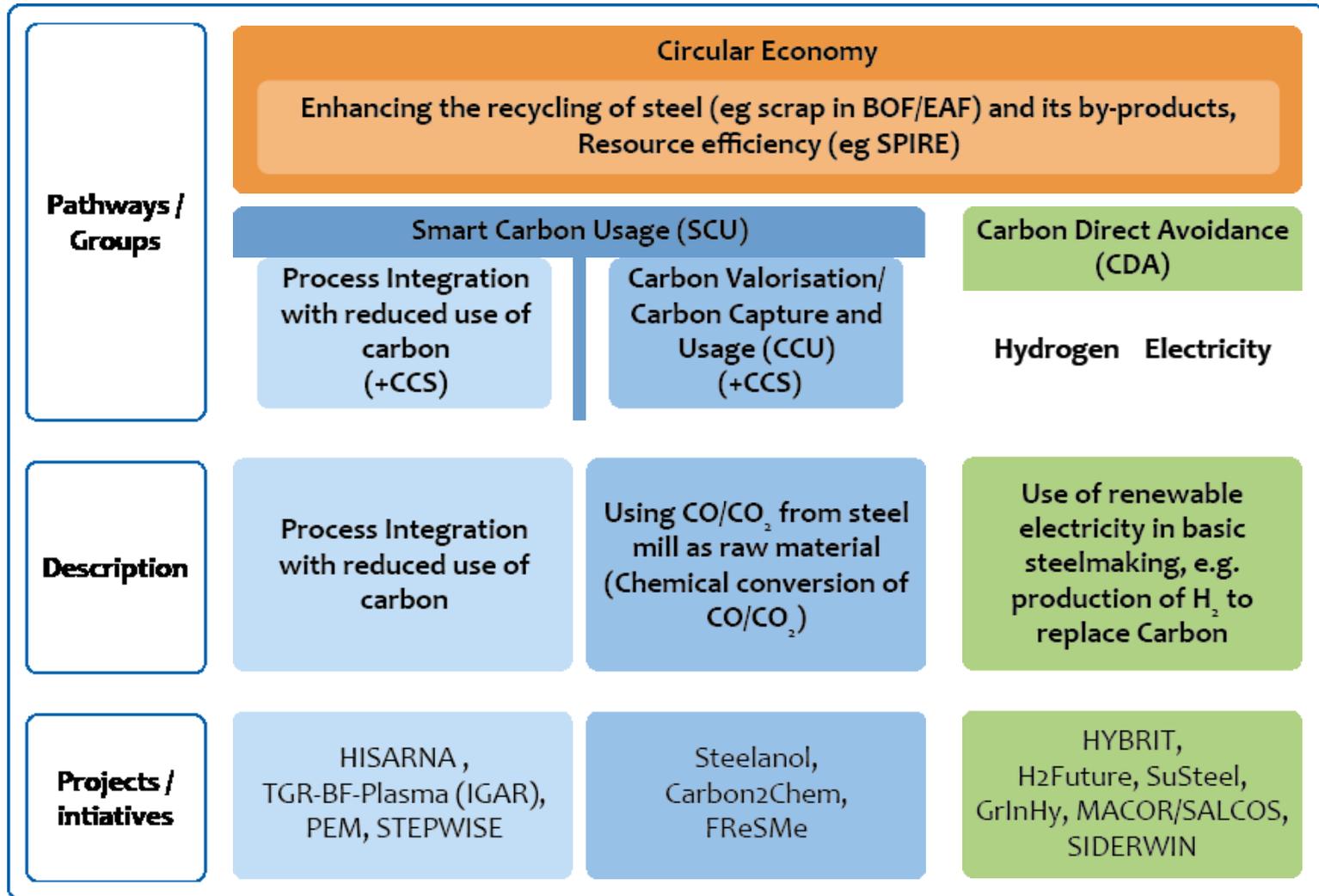
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TECHNOLOGICAL PATHWAYS TO CO₂ REDUCTION IN STEEL



CREATING NEW MARKETS FOR ...

- Carbon-neutral steel
- Hydrogen from carbon-lean electricity
- Carbon feed-stocks for the chemical industry
- Secondary fuels
- By-products
- Carbon Capture and Storage
- Energy storage
- Increased demand-supply flexibility
- Enhanced and new skills

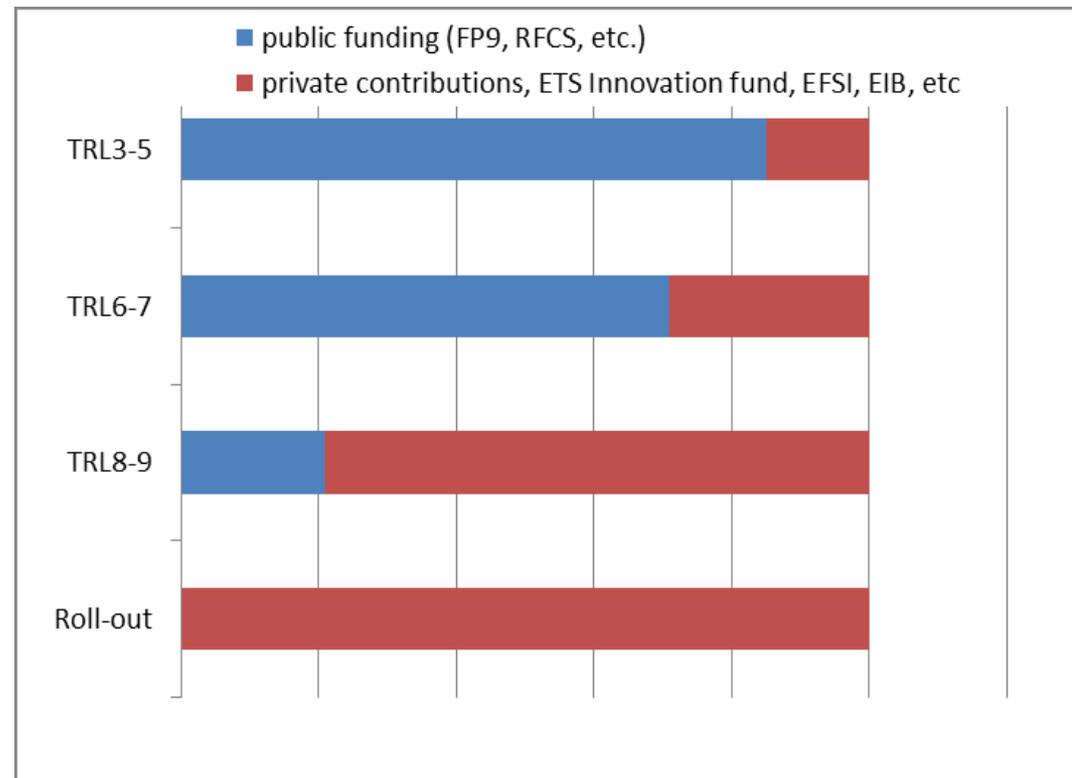
POTENTIAL CO₂ REDUCTION IN THE EU STEEL INDUSTRY

Steel sector's low-carbon innovation - Milestones and targets

	Smart Carbon Usage (SCU) 80% or more CO ₂ reduction		Carbon Direct Avoidance (CDA) 95% CO ₂ reduction	
	Process integration	Carbon Capture and Usage	Hydrogen based steelmaking	Electricity based steelmaking
By 2020	<i>1 large scale pilot plant (including tests) completed</i>	<i>2 feasibility studies completed</i>	<i>3 feasibility studies completed</i>	<i>1 feasibility study completed</i>
By 2030		<i>2 large scale pilot plants (including tests) completed</i>	<i>3 large scale pilot plants (including tests) completed</i>	
By 2035	<i>3 industrial Demonstration plants implemented</i>	<i>2 industrial Demonstration plants implemented</i>	<i>3 industrial Demonstration plants implemented</i>	<i>1 large scale pilot plant (including tests) completed</i>
By 2050	<i>Market roll-out if CAPEX & OPEX are competitive & infrastructures beyond site borders in place</i>			

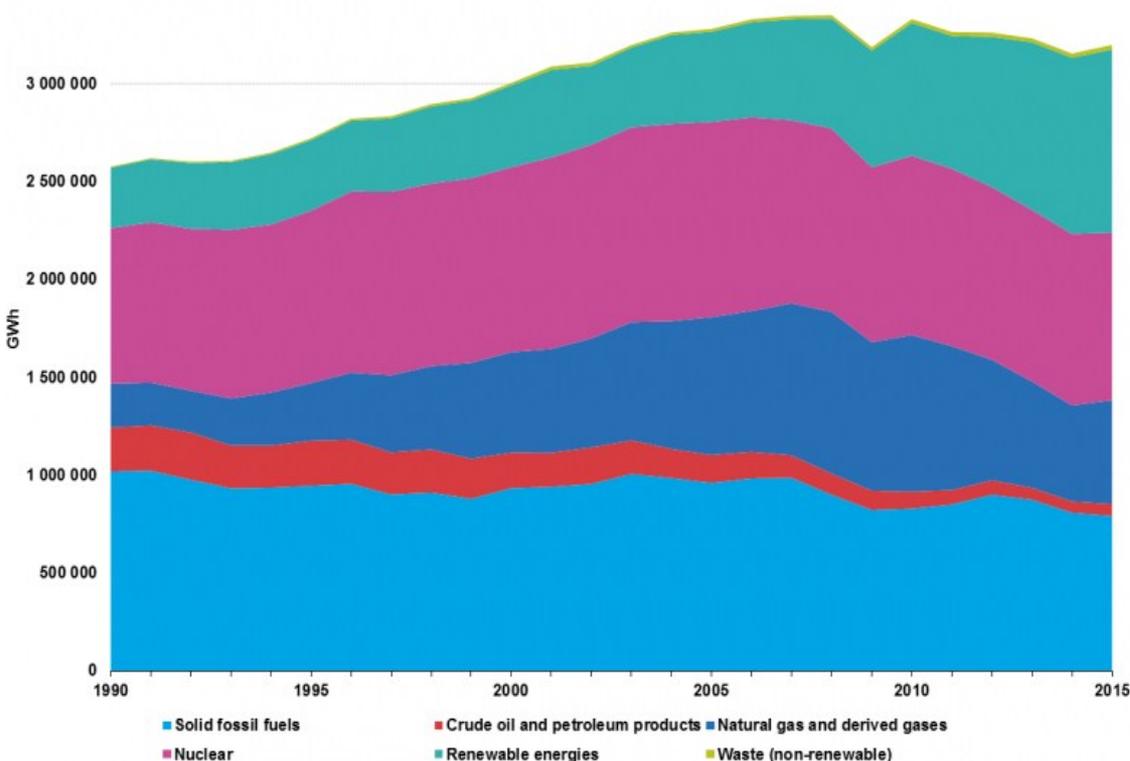
BRIDGING THE “VALLEY OF DEATH”

- Without funding no low-carbon breakthrough technology for steel will emerge
- Adequate funding of the projects under a Big Scale Initiative for steel
- **Framework Programme 9**
 - Adequate budget for FP9 overall, and carbon-neutral industry in particular
 - A mission for low-carbon steel and its value chain
 - **Interoperability** between, and financing from several EU and national funding programmes must be possible to tackle the challenge of R&D and upscaling



INFRASTRUCTURE NEEDS & OPERATIONAL COSTS

3 500 000 Gross electricity production by fuel, GWh, EU-28, 1990-2015 (Eurostat)



WHAT WILL THE EU ELECTRICITY MARKET LOOK LIKE IN 2030/40?

- Amount of Electricity needed?
- Share of renewables?
- Infrastructures?
- Prices globally competitive for industry?
- Which will be the right legal framework to shield industry from carbon leakage?

EU-28 gross electricity production 2015: 3 234 TWh

EU-28 final electricity consumption 2015: 2 741 TWh

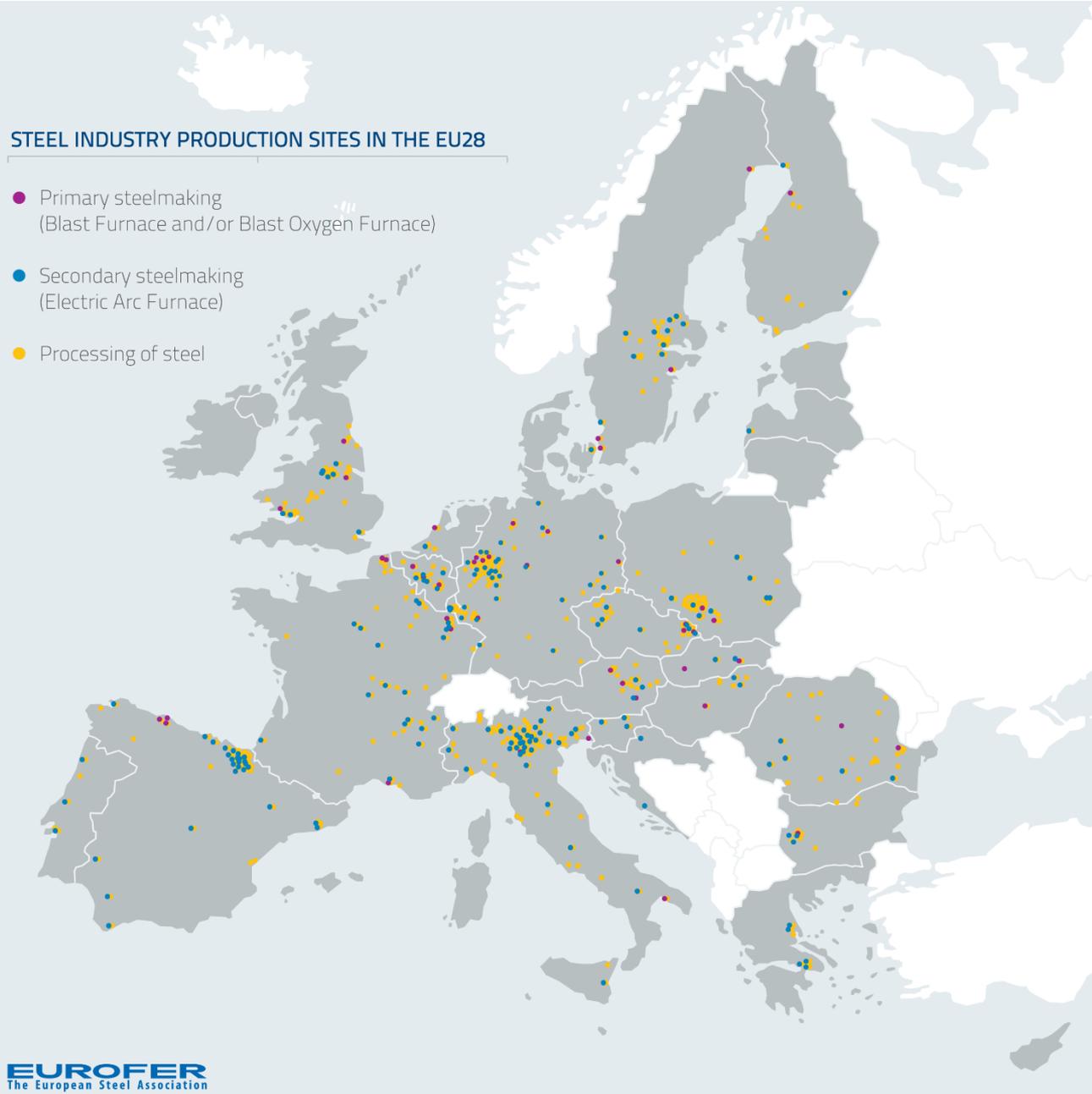
German final electricity consumption 2015: 514 TWh

EU steel electricity consumption (today): ~ 75 TWh

If 100% hydrogen/electricity/CCUS based: ~ 400-500 TWh

STEEL INDUSTRY PRODUCTION SITES IN THE EU28

- Primary steelmaking
(Blast Furnace and/or Blast Oxygen Furnace)
- Secondary steelmaking
(Electric Arc Furnace)
- Processing of steel



TOWARDS AN EU MASTERPLAN FOR CARBON NEUTRAL STEEL

- **EUROFER has highlighted its aims in a discussion paper**
 - *“Towards an EU Masterplan for a Low-Carbon, Competitive European Steel Value Chain”*
- **Coordinated, cross-sectoral approach**
 - EU institutions, sectors of the steel value chain, RTOs, unions, NGOs, ...
- **IDENTIFY:**
 - **facts & trends** in EU and global steel production, CO₂ emissions, energy consumption
 - key **R&D&I projects** and trends in the EU steel value chain
 - **raw material, energy and infrastructure requirements** up to 2050
 - **cross sectoral context** with the main energy consuming sectors
- **SET OUT:**
 - broad lines for an **EU Big Scale Initiative for steel** reflecting the interaction with other sectors
- **OUTLINE:**
 - the necessary **regulatory framework** up to industrial scale demonstrators and market roll-out to ensure that neither new technologies nor existing installations face competitive disadvantages in the internal market and vis-à-vis global competitors in the transition to the carbon neutral industry of the future

CONCLUSION

KEY MESSAGES FOR POLICYMAKERS

- **Foresee a powerful budget for Framework Programme 9 (FP9) with a strong element for industry as the driver of innovation and added value in Europe**
- **Foresee in the FP9 a mission for a low-carbon steel value chain**
- **Work out an EU Masterplan for a low-carbon, competitive European Steel Value Chain, addressing infrastructure and supply requirements, and the legal framework**
- **Promote circular materials which give a real benefit to society**
- **Continue to address vigorously steel trade distortions by non-EU countries and reduce EU regulatory burdens to keep our industry globally competitive and able to invest**

EUROPEAN STEEL IS HIGH TECH



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