
Industry Transformation

State of play, key strategies, policies to
limit global warming to 1.5 degrees

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Agora Industry is the third member of the Agora Think Tank family, we are working in cross-sector teams to create political and regulatory synergies

Our vision: We are independent, and non-partisan think tanks aiming at a prosperous and carbon-neutral global economy by 2050

Who we are: 180 experts across all brands and offices in Brussels, Berlin, Bangkok and Beijing, 30 experts on industry

What we do: developing science-based solutions and advising decision-makers to deliver clean power, heat and industries – in Germany, Europe and around the globe

Scope: addressing the biggest emitter countries in power, heat, industry, transport and land use



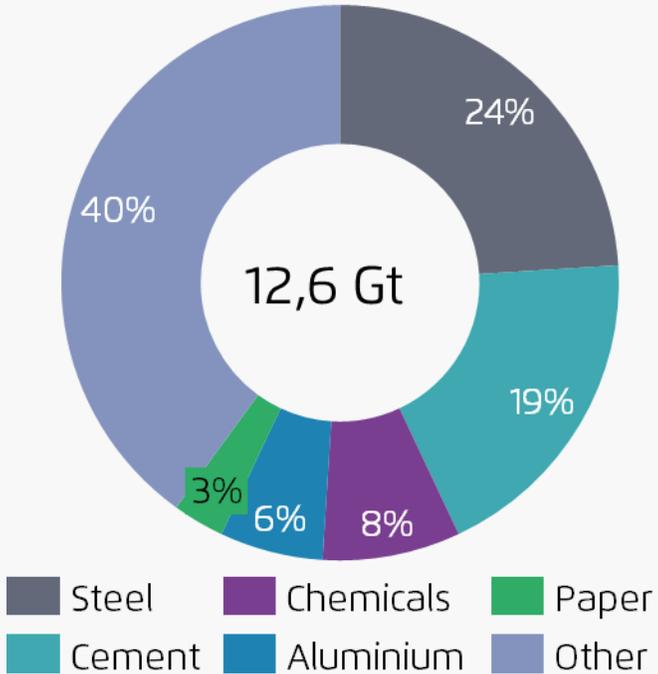
Agora Industry is a German based international organization to support the industry transformation, known for its deep expertise-based sound analysis



State of play industry transformation

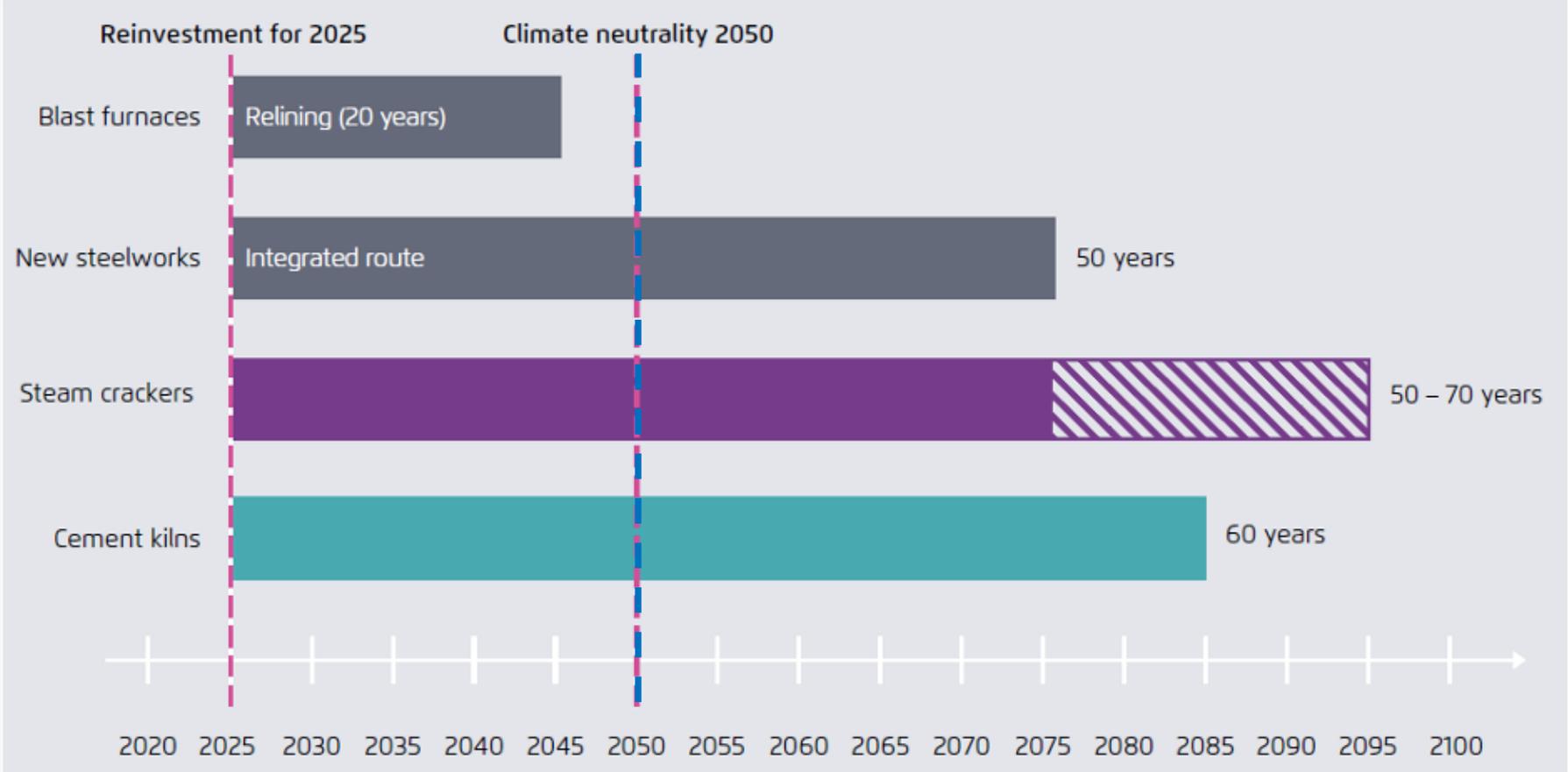
Industry emissions are dominated by 5 sectors and 5 countries

Global industry related GHG emissions, 2019



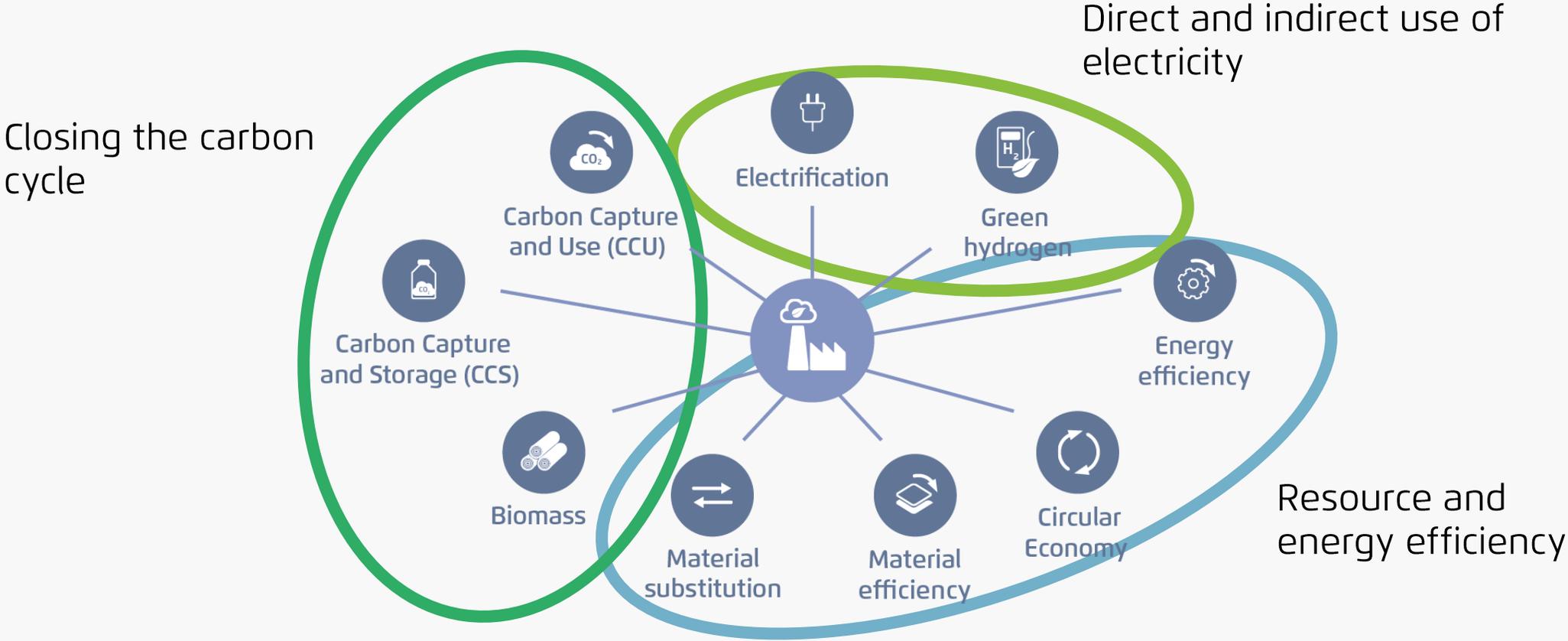
- If the electricity and heat requirements of industry are taken into account, industry is responsible for almost 40 percent of global CO₂ emissions (33 Gt).
- The 5 basic material industries steel, cement, chemicals, aluminum and paper alone account for 20 percent of global CO₂ emissions.
- Asia will represent almost 80% of the global industrial production by 2030. While China will have the biggest existing fleet of assets, India and SEA will be regions of major growth.
- Europe will still serve as a front runner of technology and strategy testing. Therefore, it remains a focus area of our policy work.

Long asset lifetimes in the carbon intensive industries are a challenge for the net-zero targets in Europe, Japan, China and even India



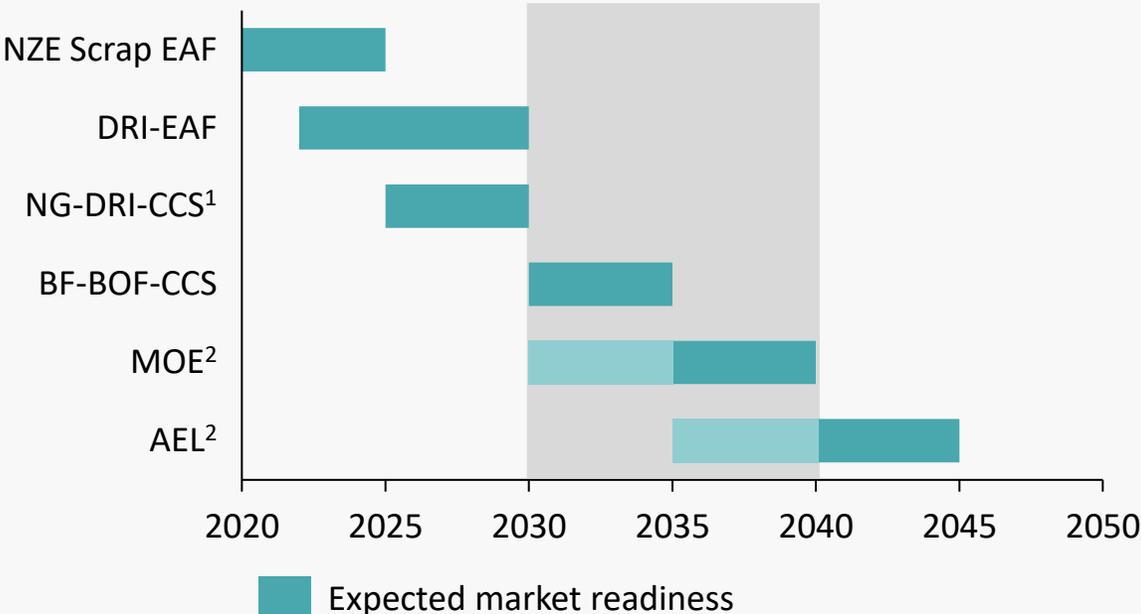
Key strategies and policies

The technologies and strategies for the industry to reach net-zero are well understood



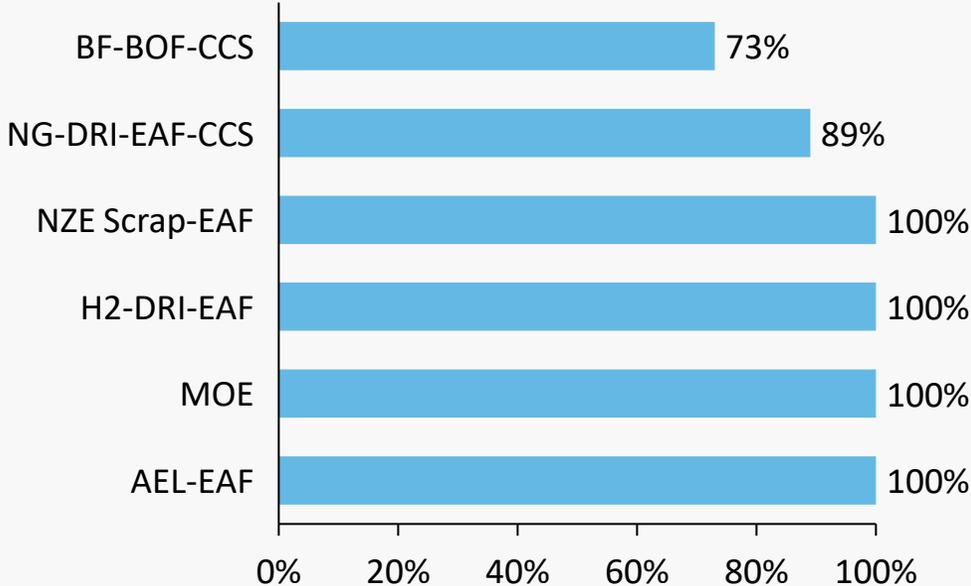
Before 2030, we expect only the already mature scrap-based EAF route and the DRI-based routes to be available

Expected market readiness of different breakthrough technologies for steelmaking



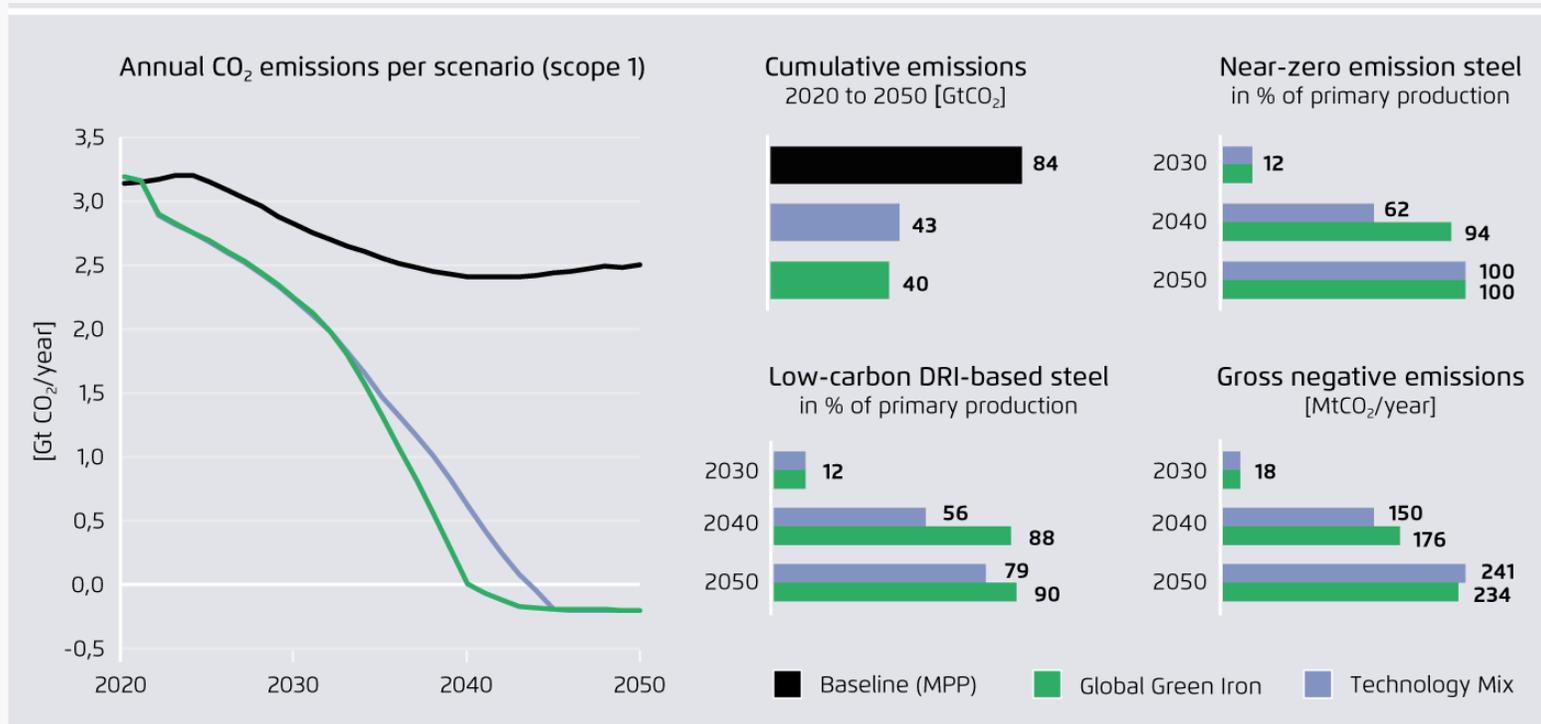
¹ Current commercial NG-DRI-CCS projects are not considered breakthrough technologies since they do not achieve large CO₂ emissions reduction rates.
² Due to their low TRL at the time of modelling, MOE was not foreseen to reach market readiness before 2035 and AEL before 2040.

CO₂ abatement potential of different breakthrough technologies compared to the integrated blast furnace route (BF-BOF)



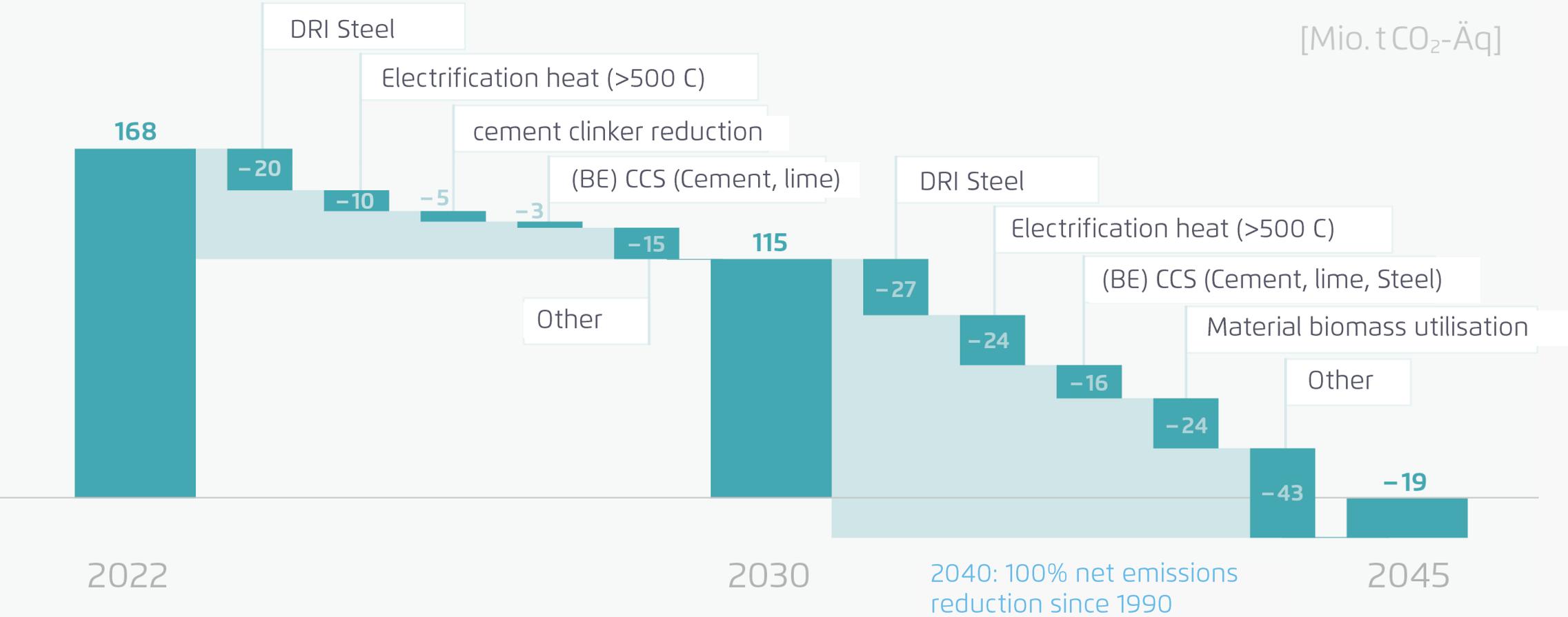
Industry sector can contribute massively to increase mitigation ambition, example steel

Pathways to net-zero: annual CO₂ emissions in the steel sector (left) and key metrics (right)

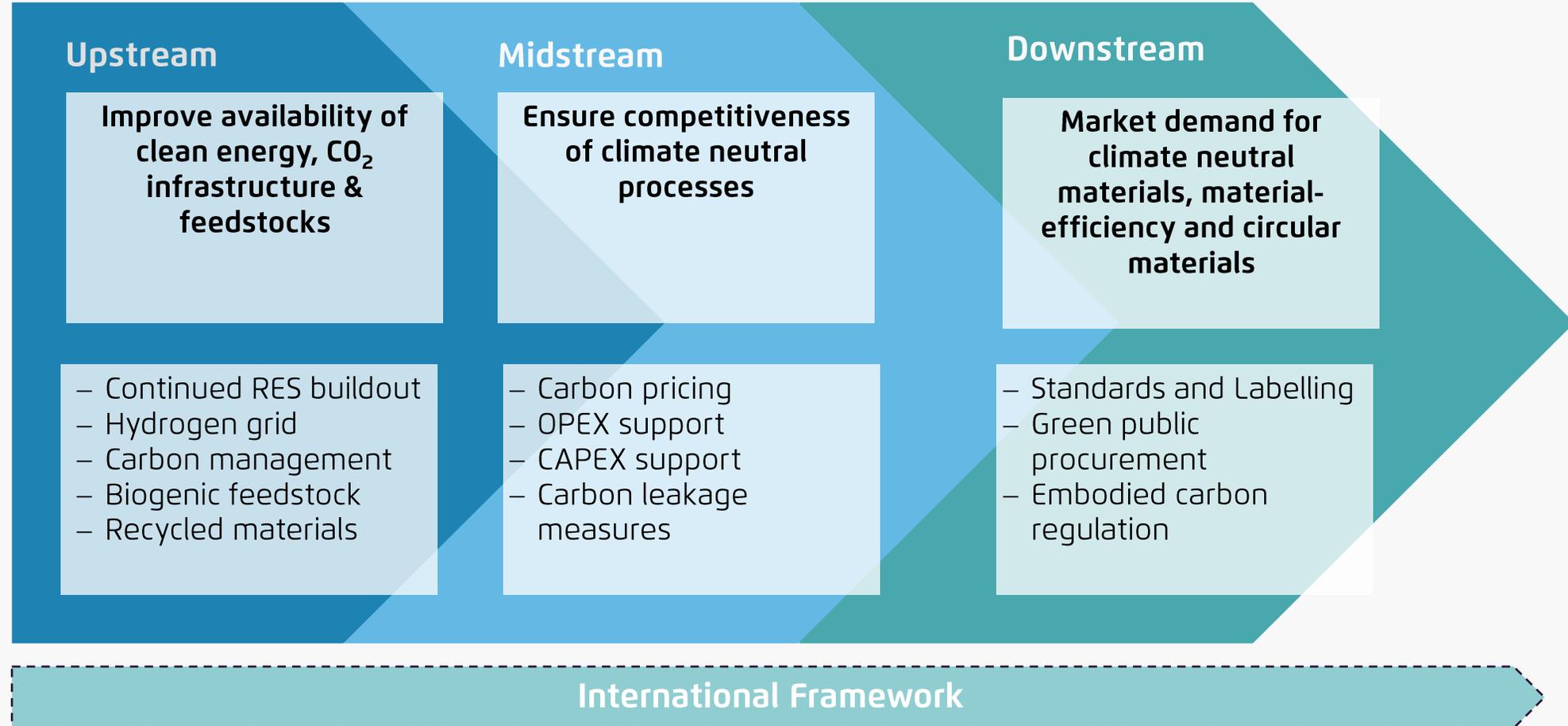


- two 1.5°C compatible scenarios
- technology mix net-zero reaches by 2044
- Global Green Iron reaches net-zero is reached by 2040
- A strong role for DRI as the flexible key technology in our scenarios
- Negative emissions: the steel sector could start to generate negative emissions

German case study on heavy industry: double down on available technology and provide technical sinks in the longer term



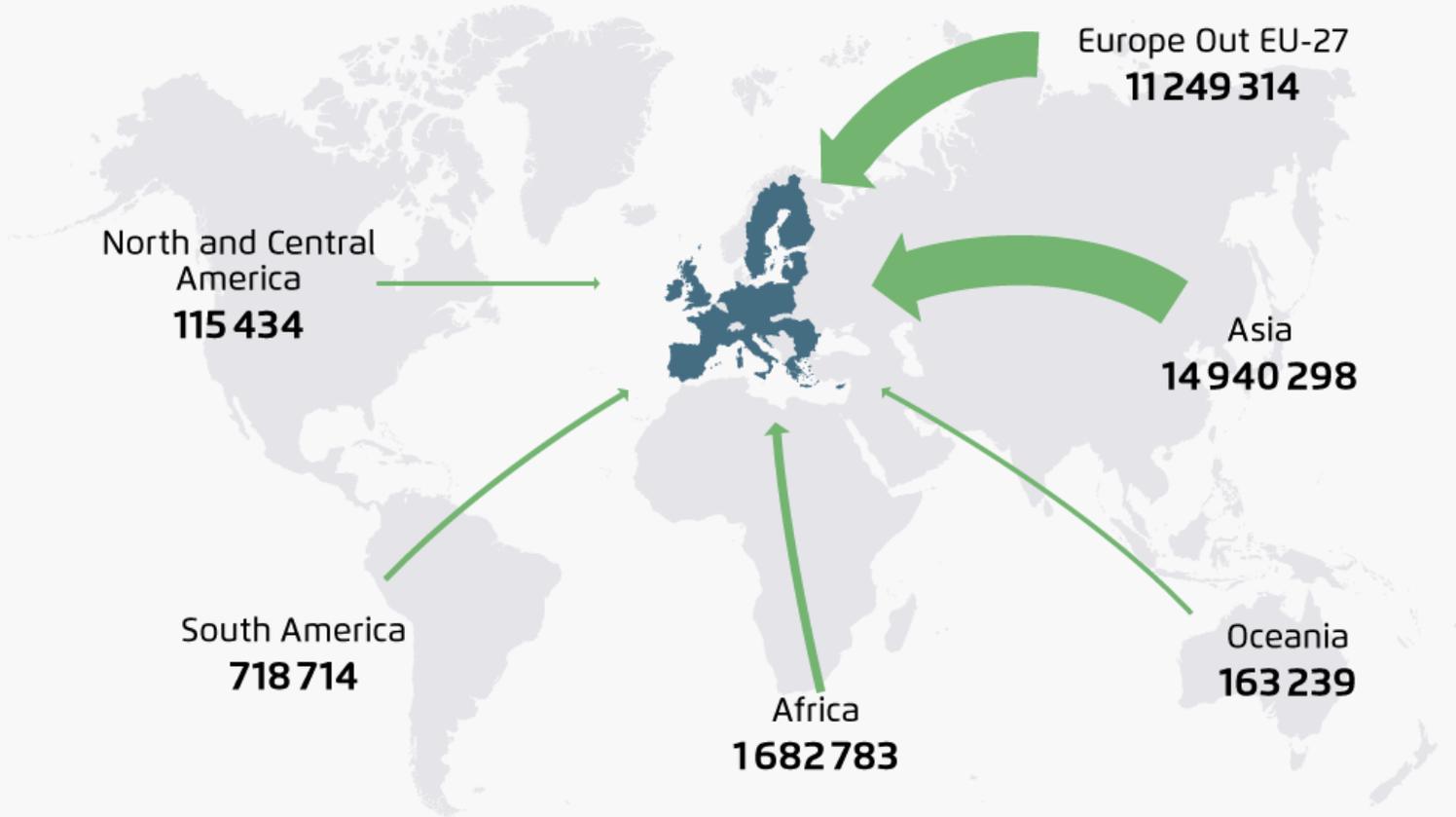
Transformative policy framework needed along the value chain



Thank you for your attention!

Example Steel: Asia is the EU biggest trade partner for carbon intensive materials; therefore trade is important lever for transition policy

Steel imports to the EU in finished products in tons, year 2022



The EU imported **28.9 million tonnes** of finished steel products in 2022

Development of international low-carbon material standards and labels to amplify the international trade of green products

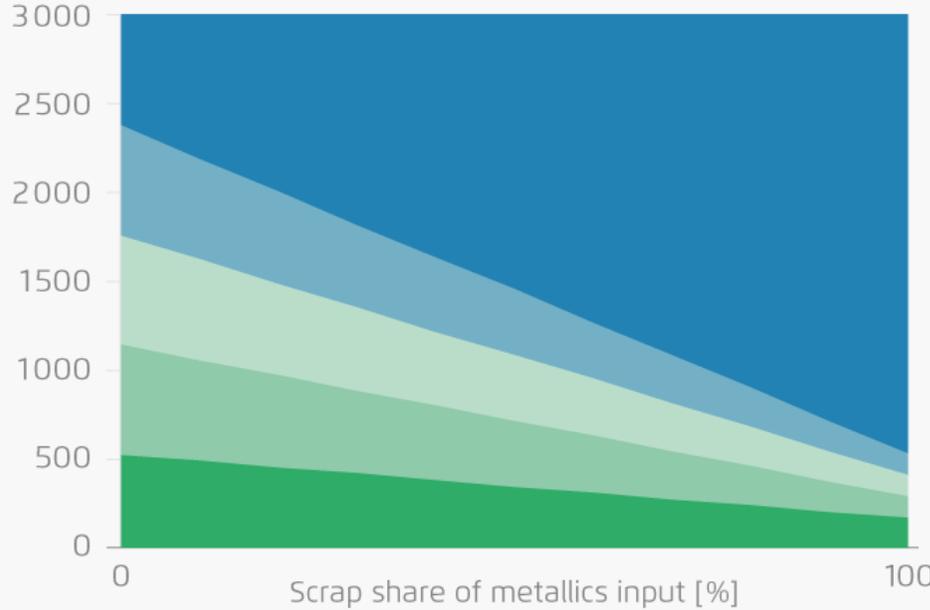
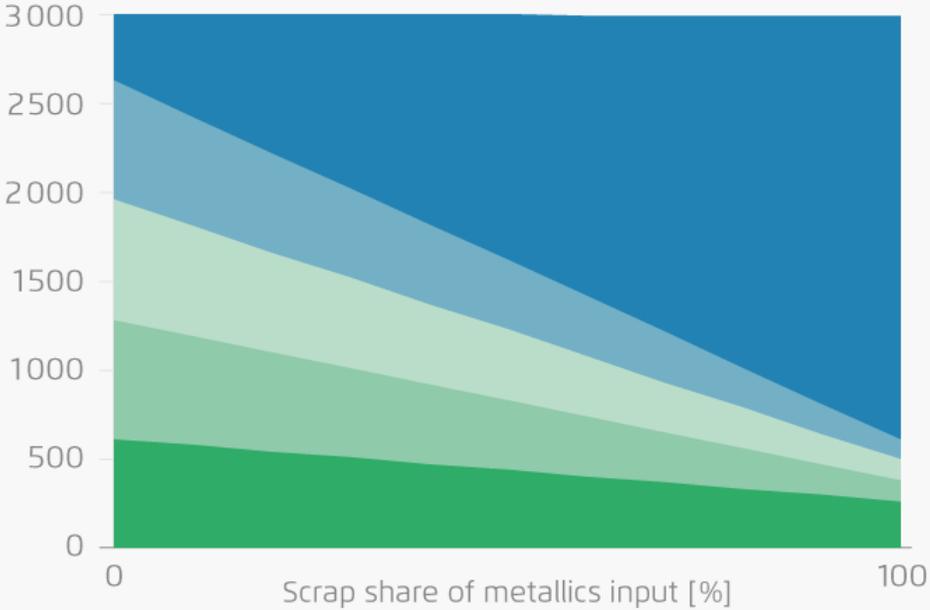
Example green steel standard suggested by the German steel association

for quality steel

for construction steel

[kg CO₂e/ton hot rolled steel]

[kg CO₂e/ton hot rolled steel]



- E
- D
- C
- B
- A

International green iron trade can lower the costs of global steel transformation – H₂ imports by ship are not competitive compared to green iron imports

Cost of delivered H₂ [USD/kg]

