EU Clean Steel Partnership (CSP)

15 July 2021

Klaus Peters
Secretary General ESTEP

ESTEP
European Steel Technology Platform

CSP
The Clean Steel Partnership

EU Clean Steel Partnership
Objective

Until 2030, the Clean Steel Partnership will

- Develop lean CO2-technologies
- Test technologies at large scale and high TRL
  - technologies required to reduce CO2 emissions from EU steel production by 80-95% compared to 1990 levels by 2050
  - ultimately leading to carbon neutrality
  - while preserving the competitiveness of the EU steel sector
- Ensure a coordinated, sustainable approach across
  - stakeholders
  - technologies
  - production routes and countries
- Leverage private investments
- Open and inclusive approach
- Provide the needed support to accelerate demonstration projects
  - 2 demonstrators leading to 50% CO_2 reduction by 2027
  - 2 demonstrators leading to 80% CO_2 reduction by 2034

EU Clean Steel Partnership
Characteristics

- Partnership in the frame of Horizon Europe (2021-2027)
  - Unique setting due to synergies of public financial pillars
- Projects
  - size: € 10-100 million
  - Developments starting at TRL 6 to end up with TRL 8
    exceptional start at 5 to end up with at least TRL 7
- CSP-Budget: € 1.4 billion
  - €350 million from assets of the ECSC in Liquidation (source of RFCS funding)
  - €350 million from Horizon Europe
  - At least matched by steel sector (expected €1.000 million)
- ESTEP organises the private side
- Total need for large R&D&I projects on low-carbon steelmaking technologies
  - € 2.55 billion (estimate)
  - Funding gap outside the partnership financed with other EU and national instruments.

EU Clean Steel Partnership
Strategic Research and Innovation Agenda (SRIA)

3 Technology Pathways

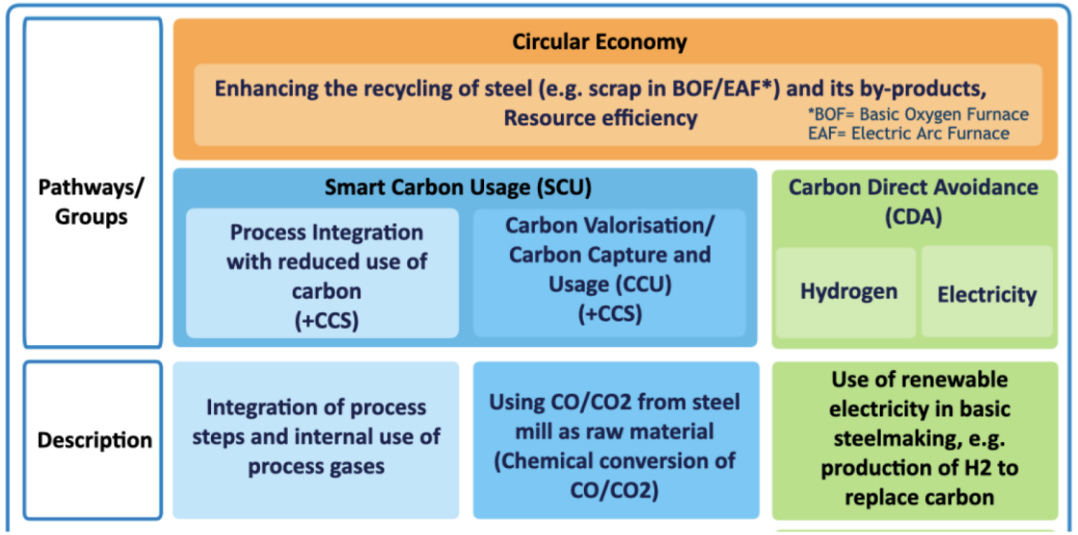
- Carbon direct avoidance (CDA)
- Smart carbon Usage (SCU)
- Circular Economy (CE)

6 Areas of Intervention

- Integrating BB into the 3 Pathways
- CDA, SCU-PI, SCU-CCUS, CE, combination
- Include enablers (Digitisation+Social Innovation)

12 Building Blocks

- Bring to TRL8 at large scale



CSP roadmap (SRIA): www.estep.eu/clean-steel-roadmap

Clean Steel Partnership calls 2021/2022

Horizon Europe

- 60% funding rate for IA, applies to all CSP calls
- 2021 deadline: 23 September; 2022 deadline: 30 March

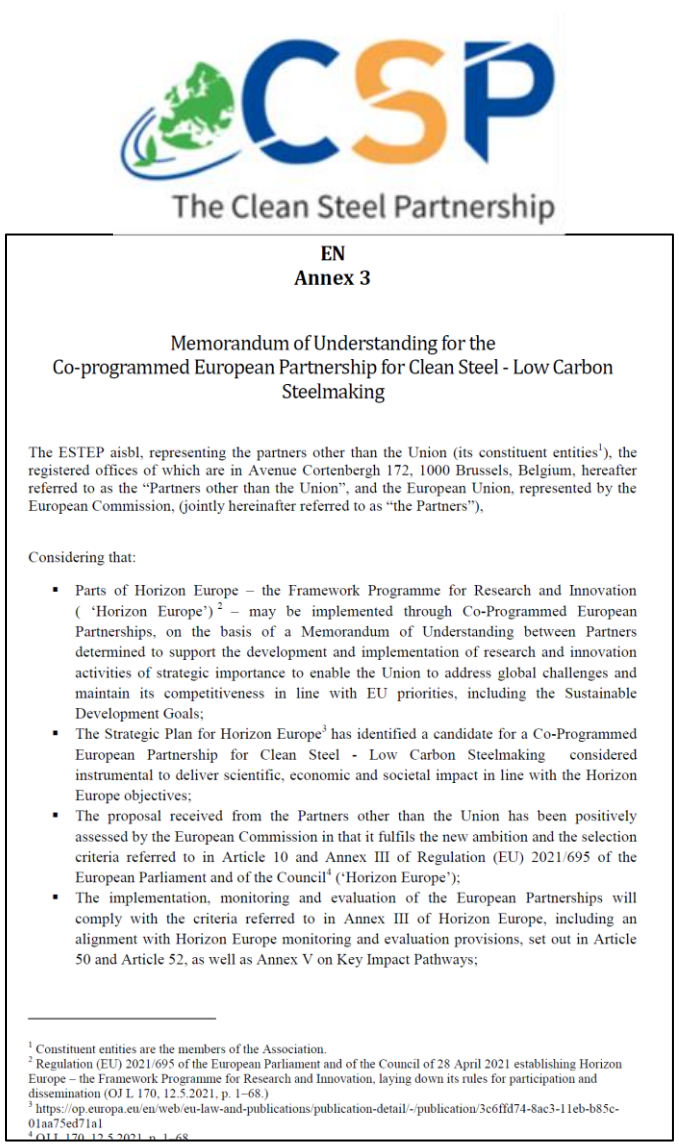
RFCS (annual CSP call)

- modernization package well proceeding
- Call(s) in autumn 2021 with deadline Jan 2022

AoI area of intervention	2021	2022	No.	EU con-tribution	TRL	HEU CL4-Twin-Transition	RFCS Big ticket "steel"
CE	14		**1**	4-5	6-8	19: Improv. of the yield of the iron and steel making route by recovering of metal contents from metal oxides	
		14	**2**	4-5	6-8	13: Raw material preparation for clean steel production	
	0	0	3			Circular Economy to decarbonize the steel industry embedded in RFCS topics	
CDA	28		**4**	6-8	5-8	18: CDA Carbon Direct Avoidance in steel: Electricity and hydrogen-based metallurgy	
		26	5	6-9	5/6-8	CO2 neutral iron ore reduction (Increasing the use of pre-reduced iron carriers)	
SCU-PI			./.			Updated approach after 2022: TWIN-TRANSITION-42-2022: Utilisation of biomass as coal and/or gas substitute in e	
		10	**7**	3	5-7	16: Modular and hybrid heating technologies in steel production	
	26		8	6-9	5/6-8	Process integration in steel plants to reduce the use of fossil carbon and associated CO2 emissions	
SCU-CCUS		0				P4P and other: Valorisation of CO/CO2 into added-value streams of industrial interest [P4P+Clean Steel Broad Topi	
	26		9	6-9	5/6-8	Appropriate preparation of steel CO/CO2 gases for CCUS purposes	
COMB	14		**10**	4-5	6-8	22: Adjustment of Steel process production to prepare for the transition towards climate neutrality	
		26	11			Developing technologies to reduce the specific energy required to produce steel	
	56	24				Horizon Europe	80
	52	52				RFCS	104 (52 mio. € / year)
SUM	108	76				total	184

CSP - Memorandum of Understanding

- MoU – the 17-page-document establishing Clean Steel Partnership (CSP)
  - 6 chapters
    - Objectives, Contributions, Governance, Activities by public side, Activities by private side, Monitoring & Reporting
    - Intense negotiation between private side of many partnerships and coordinating unit of COM (competition compliance, data availability, reporting effort)
  - 700 mio. € public contribution (may increase due to 3rd countries, fn7)
  - Up to 1.000 mio. € private contribution at least matching public
  - Private side represented by members of ESTEP in Partnership Board
  - Strategic Research Innovation Agenda (SRIA) to be endorsed by Partnership Board
- MoU signing
  - Signing ceremony (1st R&I Day, 23 June 2021) was shifted to celebration, CSP explicitly mentioned by DG RTD
  - E-signature by
    - ESTEP President Franz Androsch and
    - ESTEP Vice-President Axel Eggert
- Some details to be clarified after signature of MoU



EN
Annex 3

Memorandum of Understanding for the
Co-programmed European Partnership for Clean Steel - Low Carbon Steelmaking

The ESTEP aisbl, representing the partners other than the Union (its constituent entities[1]), the registered offices of which are in Avenue Cortenbergh 172, 1000 Brussels, Belgium, hereafter referred to as the "Partners other than the Union", and the European Union, represented by the European Commission, (jointly hereinafter referred to as "the Partners"),

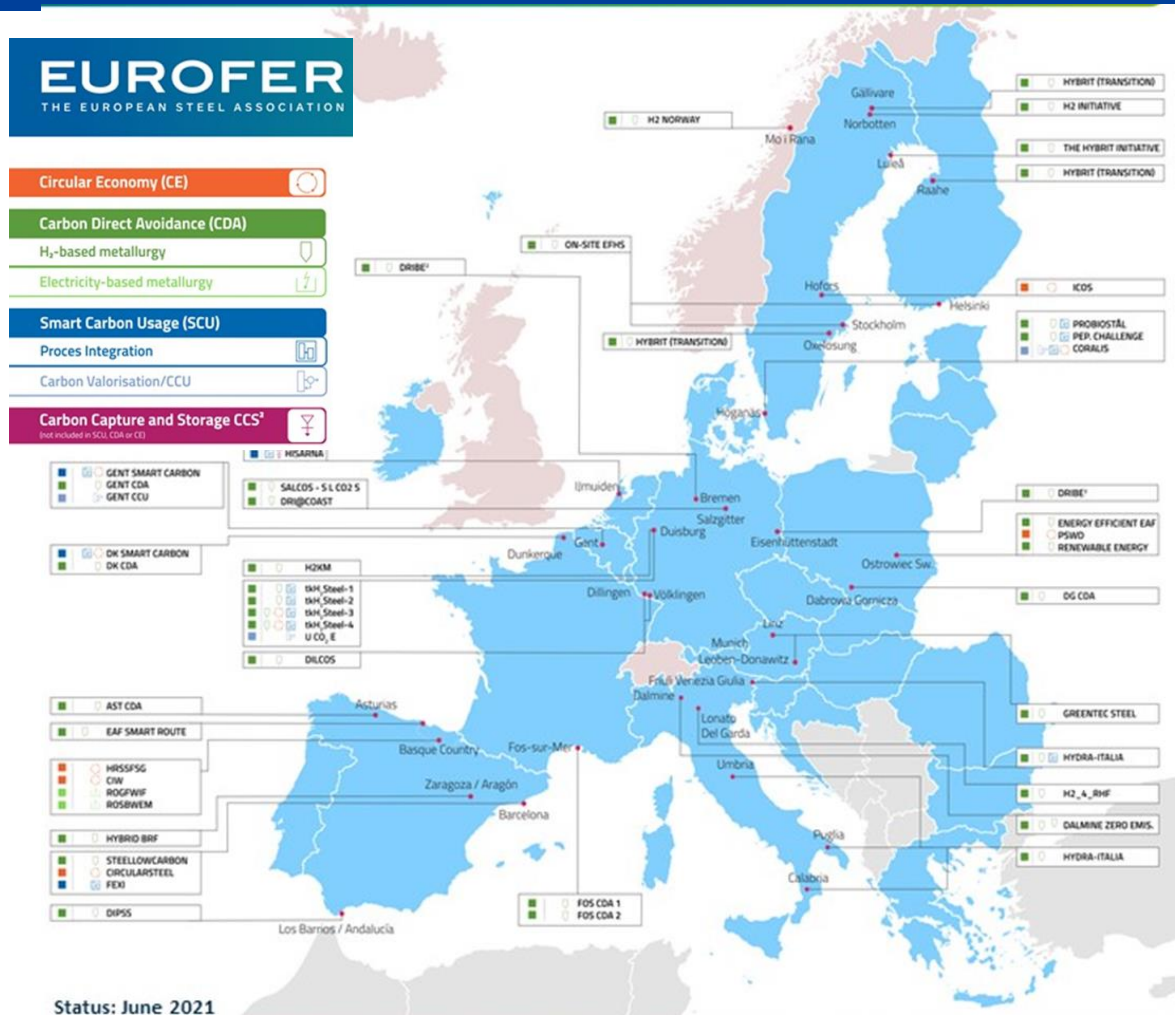
Considering that:

- Parts of Horizon Europe – the Framework Programme for Research and Innovation ('Horizon Europe') [2] – may be implemented through Co-Programmed European Partnerships, on the basis of a Memorandum of Understanding between Partners determined to support the development and implementation of research and innovation activities of strategic importance to enable the Union to address global challenges and maintain its competitiveness in line with EU priorities, including the Sustainable Development Goals;
- The Strategic Plan for Horizon Europe[3] has identified a candidate for a Co-Programmed European Partnership for Clean Steel - Low Carbon Steelmaking considered instrumental to deliver scientific, economic and societal impact in line with the Horizon Europe objectives;
- The proposal received from the Partners other than the Union has been positively assessed by the European Commission in that it fulfils the new ambition and the selection criteria referred to in Article 10 and Annex III of Regulation (EU) 2021/695 of the European Parliament and of the Council[4] ('Horizon Europe');
- The implementation, monitoring and evaluation of the European Partnerships will comply with the criteria referred to in Annex III of Horizon Europe, including an alignment with Horizon Europe monitoring and evaluation provisions, set out in Article 50 and Article 52, as well as Annex V on Key Impact Pathways;

[1] Constituent entities are the members of the Association.
[2] Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination (OJ L 170, 12.5.2021, p. 1–68.)
[3] https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/3c6ffd74-8ac3-11eb-b85c-01aa75ed71a1
[4] OJ L 170, 12.5.2021, p. 1–68.

EU Clean Steel Partnership
Impact – Follow-up activities

- Innovation Fund (estimation)
  - 16 large scale projects responded to the first call
  - Objectives of projects: -25% to -45% CO2 by 2025 to 2030
- IPCEI proposal
  (estimation as of June 2021)
  - 54 steel projects
    - Start before 2030
    - Technology Readiness Level (TRL) at least 7
  - Capex needs: 25 billion EUR
  - Opex needs: 45 billion EUR
  - Potential annual CO_2 abatement in 2030
    - 76 Mio tons CO_2/year
    - Equal to 1/3 of total direct and indirect CO_2 emissions of EU steel
  - Hydrogen needs: 0.6 to 1.2 Mt hydrogen/y and 10 to 12 TWh/y (tbc)
- The success of these projects and their envisaged emission reductions require a legislative framework that effectively addresses carbon leakage both during and after the projects implementation



Thank you for your attention!

www.estep.eu
klaus.peters@estep.eu

Back-up slides

Timeline of developing the Clean Steel Partnership

2004
- ULCOS
- Launch ESTEP

Sep 2017
- Large Scale Research Project
- 1 high TRL collaborative project

Nov 2017
- Big Ticket
- ESTEP Steering Committee (former General Assembly)
- EUROFER Vice-President letter to EC President Juncker

2018
- Big Scale
- EU Partnership
- More than 1 sector
- Steel high on policy agendas
- ESTEP legal entity

2019
- Clean Steel Partnership
- Preparation of documents

2020
- CSP Proposal
- CSP Roadmap

2021
- CSP MoU
- CSP Brokerage
- Start of CSP

EU Clean Steel Partnership
Governance

Private side

- ESTEP
- Members:
  EUROFER
  Producers
  Plant Builders
  Research
  others

Partnership Board

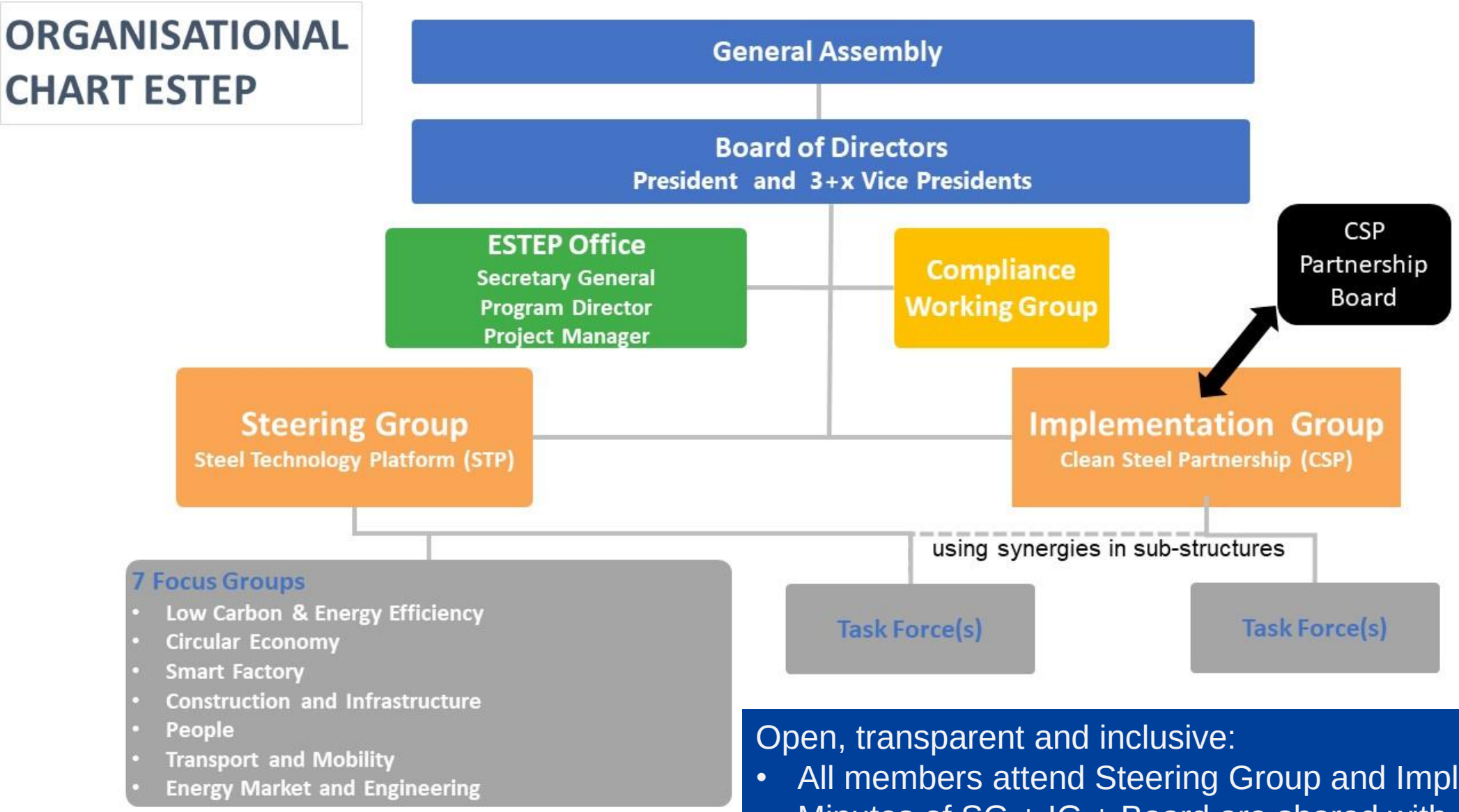
1x / year

Public side

- COM
- Horizon Europe
  - leading –
- RFCS

Up to 2 external advisory groups

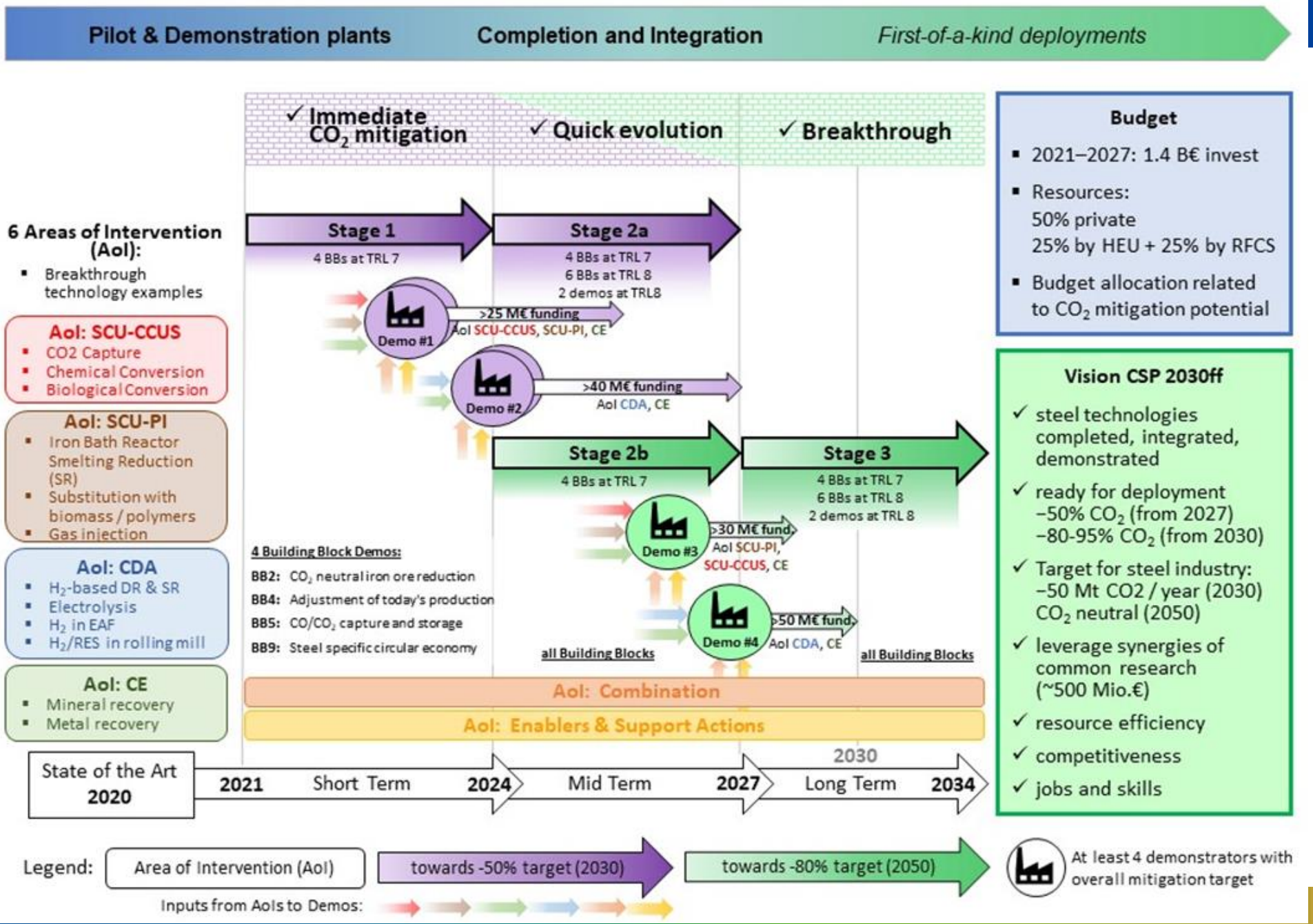
Organisational Chart



Open, transparent and inclusive:

- All members attend Steering Group and Implementation Group
- Minutes of SG + IG + Board are shared with all members

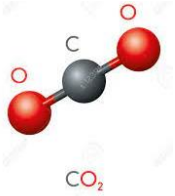
Clean Steel Partnership CSP: Vision, Ambition and Resources



Vision for EU steel industry

Be the first climate **neutral** industry sector in the EU by reducing the CO_2 emissions

One single CO_2 molecule can make the difference!



Be the first climate **positive** sector in the EU

- We know the technologies for CO_2 reduction
- We can implement CO_2 negative approaches
  - Circular carbon
  - Bio-carbon
  - …

The Clean Steel Partnership

The European Steel Technology Platform: ESTEP

- European Technology Platform (EU 2020) dedicated to steel
  - Created in 2004 (ULCOS) and reconfirmed by EC in 2013
  - Legal entity (AiSBL): incorporation by 13 founders in March 2018
  - Members more than tripled by mid 2021

- ESTEP mission

  Collaborative EU actions (projects)
  on innovative technology
  to tackle EU challenges
  (renewable energy, climate change (CO_2), Circular Economy) in order
  to create a sustainable EU steel industry

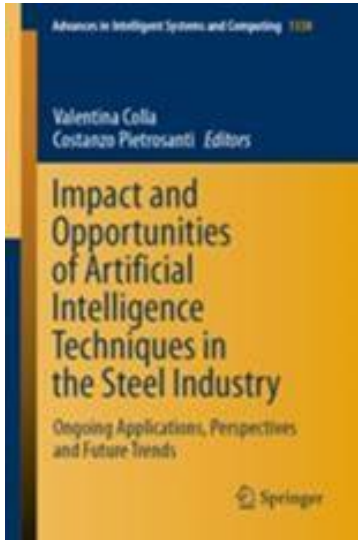
- How?
  - Align the Strategic research agenda for Europe (used to define funding from EU)
  - Active network of ESTEP community
  - Facilitating a supportive environment for collaborative projects
  - Disseminating of project results (publications, workshops, …)
  - Provide services and added value to members

ESTEP Services to its Members

- Information about supporting instruments of research and innovation at EU level
- Contribution to co-creation of roadmaps and European call texts
- Participation and contribution to ESTEP events
  - Face-2-face, webinar, hybrid
  - ESTEP internal:
    - Steering Group, Implementation Group, Focus Groups
    - Clean Steel Partnership – Brokerage event (Mar 2021)
    - Competition Compliance Training
  - Thematic workshops and mini-conferences
    - Digital twins (Charles Roi, 2018)
    - Scrap-EAF green steelmaking (Bergamo 2019)
    - Artificial Intelligence Techniques (4 zoom meetings, 2020)
    - Hydrogen based steelmaking (4 zoom meetings, 2021)
    - Waste heat recovery (4 zoom meetings, 2021)
    - …
- Project dissemination
- Access to extensive steel stakeholder platform
- Participation in ESTEP tasks & projects
  - Public funding (EU, national, …)
  - Industry funding

Highlights to be published in July ´21

REUSteel



EU Clean Steel Partnership
Summary

- Application done (July 2020) – 3 years of preparation
  - Main private contacts: ESTEP supported by EUROFER
  - Main public contacts: DG RTD unit D3, DG Grow unit C2
  - Guidance document (partnership template) & roadmap submitted 20 Apr 2020
- Broad stakeholder involvement
  - public consultation ended 27 Sep 2020 (almost 200 responses; recorded webinar)
- Modification of RFCS legal package ongoing (modernisation of RFCS)
  - 3 Council decisions: use part of assets for annual call and for CSP
  - In Q3 2021
- Memorandum of Understanding (only signed document)
  - European Commission + Private Side (ESTEP)
  - In Q3 2021 (July 2021)
- First calls of Clean Steel Partnership
  - Horizon Europe WP 2021/22 published (deadlines 23 Sep 2021, 30 Mar 2022)
  - RFCS Big Ticket Steel call in preparation (publish: Oct 2021, deadline Jan 2022)

Photo by Dan Azzopardi on Unsplash

EUROFER
THE EUROPEAN STEEL ASSOCIATION

Key steel low-CO_2 projects for the IPCEI Low-CO_2 Emissions Industry

Impact

Circular Economy (CE)

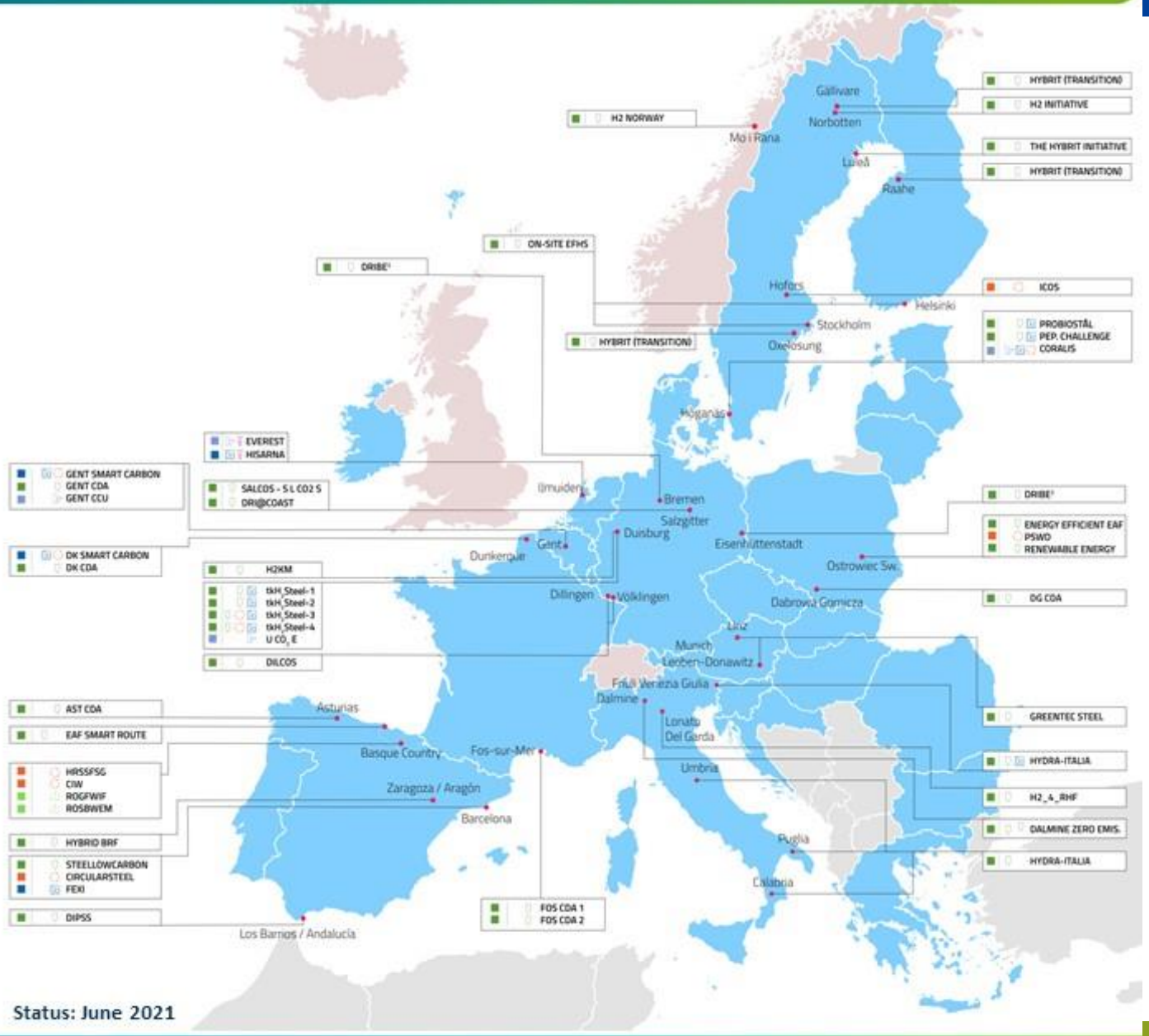
Carbon Direct Avoidance (CDA)
- H_2-based metallurgy
- Electricity-based metallurgy

Smart Carbon Usage (SCU)
- Proces Integration
- Carbon Valorisation/CCU

Carbon Capture and Storage CCS²
(not included in SCU, CDA or CE)

- Number of low-CO_2 projects: 54
- Technology Readiness Level (TRL): at least TRL 7
- Starting year: all projects start before 2030
- Potential annual CO_2 abatement in 2030: 76 Mio tons CO_2/year (1/3 of total direct and indirect CO_2 emissions of EU steel)
- Capex needs: 25 billion EUR
- Opex needs: 45 billion EUR

The success of these projects and their envisaged emission reductions require a legislative framework that effectively addresses carbon leakage both during and after the projects implementation.



Status: June 2021