

Clean Steel Partnership's Monitoring Group

Scope

The relationship between the public side, i.e. the European Commission, and the private side, i.e. the European Steel Technology Platform (ESTEP), in the context of the Horizon Europe Clean Steel Partnership (CSP) is defined in the Memorandum of Understanding (MoU) signed by both parties on 9 August 2021. To pursue both sides' common vision – strongly based on the objectives of the European Green Deal – the purpose of the Clean Steel Partnership's Monitoring Group (CSP-MG) is to monitor the development status of these objectives, to recommend adjustment of research priorities and activities according to changing markets or policy orientation, based on the results of monitoring and evaluations, and to identify further ways to enhance collaboration with other European Partnerships and synergies with other funding programmes.

The aim of the CSP-MG is to explore the gaps and/or overlaps between what has already been achieved in the clean steel sector vis-à-vis the CSP's key performance indicators (KPIs), which are listed in the MoU and are defined in the CSP's Strategic Research and Innovation Agenda (SRIA). The identified gaps and/or overlaps should be presented to the CSP's Partnership Board and guide the definition of the future research topics. In this frame, monitoring is relevant not only for defining future call topics, but also for communication and dissemination activities to the steel sector, in guiding future actions, and in pushing for the further deployment of the results of European Union (EU)-funded projects in order to accelerate their market impact.

The aforementioned activities are intended to support the implementation status of European Partnerships according to the criteria in Annex III of Horizon Europe, in alignment with the Horizon Europe's monitoring and evaluation provisions, set out in Article 50 and Article 52, as well as Annex V on Key Impact Pathways.

The need for a specific monitoring approach and the creation of the CSP-MG is there because the CSP is the only Horizon Europe partnership with two sources of public funding:

- Horizon Europe – which follows the Horizon Europe regulations and monitoring requirements for the partnerships.
- Research Fund for Coal and Steel (RFCS) – which has a separate legal base. However, its project monitoring is fully aligned with Horizon Europe practices.

The twofold funding mechanism requires an overall monitoring body that conveys and processes information from different sources.

Members of the Clean Steel Partnership's Monitoring Group

The CSP-MG is composed by the following relevant stakeholders from the public and private side:

- *Public side:*
 - European Commission DGs: DG-RTD and DG-GROW.
 - European Commission's Executive Agencies: HaDEA and REA.
- *Private side:*
 - The European Steel Technology Platform (ESTEP).

- The five (5) TGAs in the RFCS programme.

In order to ensure transparency, mitigate risks and maximise the effectiveness of the decision-making process within this framework, the core groups listed above may reach out to additional technology experts and stakeholder groups for selected topics and/or to obtain decisional support. The stakeholder engagement role and responsibility is primarily covered by the CSP.

The composition of the CSP-MG is the following:

- Co-chair role shared by DG-RTD and ESTEP on a rotation basis.
- 1 member from DG-RTD (in addition to the co-chair).
- 1 member representing DG-GROW.
- 2 members representing HaDEA.
- 2 members representing REA.
- 4 members from ESTEP.
- 5 members from the TGAs (1 member from each TGA; this may be either the TGA Chair or another nominated TGA member).

Finally, the EU Member States represented by the States' Representative Group (SRG) under the CSP will support the exchange of information between its members on relevant EU, national, and regional funding programmes, supporting research and innovation in the area of clean steel, while avoiding gaps and overlaps. In fact the SRG's role is to ensure the exploitation of synergies between relevant EU, national, and regional funding programmes in order to accelerate the digital, green and circular transformation of the EU steel industry.

Structure of the Approach

The monitoring approach will be implemented across three (3) different levels of monitoring:

1. *Cluster Portfolio monitoring* – the portfolio monitoring will be done by the TGAs and it will offer an overall view of the technology development status in the area of each individual TGA. Such an assessment should be based on information from projects from the RFCS programme and the Horizon Europe programme for the area of Clean Steel. Furthermore, steel-related projects under the Innovation Fund and other Horizon Europe's domains should possibly be considered. The information to perform the cluster portfolio monitoring will be collected by the TGAs through dedicated yearly meetings with project coordinators. These meetings are organised by the REA.
2. *Monitoring towards meeting the CSP objectives* – based on the information provided by the portfolio level monitoring of the TGAs, the CSP-MG shall assess the status of fulfilment of the MoU in terms of achieving the common objectives established in collaboration with the European Commission. The information received by the CSP-MG shall ideally allow to feed the selected KPIs – see Annex I. The output of this process will be shared with the European Commission in the context of common meetings and to feed the Horizon Europe's monitoring requirements for the CSP.
3. *Monitoring towards meeting the European Commission policy objectives* – the monitoring activities performed by the CSP-MG have the final goal to provide an overall vision of the status of past and ongoing activities in the field of Clean Steel, along with suggestions to meet the European Green Deal objectives. Such information will provide relevant input to the CSP and, in particular, will help the European Commission in policy-related decision-making activities.

Governance

The CSP-MG will be integrated within the existing governance of the CSP, and their analysis and indications will be used to steer the CSP decisions and set the priorities for future topics and activities.

The CSP-MG reports to the CSP Partnership Board. The Partnership Board is responsible for providing deliverables in terms of supporting industrial demonstration/implementation, contributing to dissemination of the information, and providing input on the Horizon Europe and RFCS call topics implementing the CSP.

The CSP-MG will issue recommendations by consensus – where this cannot be obtained, the CSP Partnership Board will be informed about diverging opinions in the MG.

The CSP-MG will perform an impact analysis, and evaluate the status of achievement of the KPIs.

The CSP-MG meetings will be organised at least once a year. The meetings should be planned in such a way that the outcomes can contribute to the periodic revision of the SRIA by the CSP, while also leaving room for preparing actions or mitigation measures, if necessary.

Main Tasks of the Monitoring Group

The CSP-MG is expected to:

1. Maintain a comprehensive view of the steel research and innovation in the EU, ensuring the technical maturity/progress of technologies and applications in projects, and/or comment on reasons for specific delays. Aggregated monitoring is relevant for the formulation of future calls and their topics.
2. The monitoring shall focus on the impact and the contribution of projects to achieving the objectives of the CSP. It shall create a link between projects, funding programmes and targets in the aspects covered by the KPIs.
3. The monitoring shall be performed with the purpose of enhancing the technological impact and provide strategic input to the future implementation of the different work programmes in the context of the partnership.

Monitoring Information Workflow

The objective of setting up a monitoring information workflow is the provision of information on the gaps towards achieving the Clean Steel Partnership's objectives in a structured and compliant manner (using metrics such as KPIs, Objectives-by-2030) – for many of them expressed as combination of maturity level and technical progress level to be reached in a certain year.

This gap analysis is composed of two (2) levels:

- The KPI/Objectives-by-2030 level as defined in SRIA and MoU which can be linked to the cluster portfolio monitoring.
- The cluster level on which certain technologies/pathways/areas of intervention are positioned in terms of maturity and technical progress.

To feed the gap analysis the information will flow in the following way:

- The outcome of the cluster portfolio analysis from each TGA will be presented to the CSP-MG. The CSP will use this information to estimate its gap towards KPIs and its potential technical impact in the steel sector.

- Having defined the KPIs and having assessed the technical impact of all the portfolios of projects in advancing steel technologies, approaches and applications, a vision will be formulated about future programmatic interests of the RFCS and Horizon Europe programmes, as well as possible suggestions for policy improvements will be extracted.

ANNEX I: KPIs/objectives 2030 for the CSP MG following the MoU

General Objectives	Specific Objectives	Operational objectives		KPIs	Objective by 2030
CLIMATE					
GO 1.- Develop climate neutral solutions for the steel production. The transformation of the EU steel industry towards climate neutrality requires the development and deployment of technologies at high technology-readiness-level. The implementation of these technologies enables the steel producers to reduce their CO ₂ emissions by 80-95% compared to 1990 levels by 2050, ultimately leading to climate neutrality.	SO1.- Enabling steel production	OO1.- Replacing carbon by renewable energy	KPI1	Decrease of scope I and II CO ₂ emissions proven at a demonstration scale	TRL8 > 40% CO ₂ reduction compared with reference operation at TRL 6
		OO2.- Development of H ₂ -based reduction and/or melting processes	KPI2	a.-Reduction degree of iron oxide b.-Replacement rate of fossil carbon by hydrogen injection c.-Replacement rate of natural gas by H ₂ in the feed of the direct reduction plant	a.-TRL8: > 90 % reduction degree of iron oxides b.-TRL8: > 10 % replacement rate of fossil carbon at the injection point c.-TRL8: > 50 volume-%
		OO3.-Electrolytic reduction	KPI3	Electric efficiency of the electrolytic cell	TRL8: > 85% electric efficiency
	SO2.- Fostering SCU technologies in steelmaking routes	OO4.-Improving process integration with reduced use of carbon (e.g. gas injection in BF) upstream + downstream	KPI4	Decrease of process-related CO ₂ emissions proven	TRL8: > 25 % reduction compared with reference operation
		OO5.- Increasing the use of non-fossil carbon	KPI5	Share of non-fossil carbon proven in reducing and/or melting process	TRL8: > 20 % of non-fossil fuels/ reducing agent
		OO6.-Capturing CO ₂ for CCU and/or CCS	KPI6	CO ₂ capture rate from process/off-gases	TRL8: > 95 % from dedicated gas stream
		OO7.-Conditioning of metallurgical gases (containing CO ₂ , CO, CH ₄ , etc.) to meet specifications to finally produce chemical feedstock/alternative fuels (the "use" part supported by the P4P partnership)	KPI7	Share of the carbon content of the process gas (CO ₂ /CO) provided to be transformed into products	TRL 8: more than 65 % of C
	SO3.- Developing deployable technologies to improve energy and resource efficiency (SCU Process Integration)	OO8.-Increasing the use of pre-reduced iron carriers	KPI8	Share of pre-reduced iron carriers out of total Fe carriers	TRL8: > 20 % pre-reduced Fe carriers in iron and steelmaking process
		OO9.-Developing technologies to reduce the energy required to produce steel	KPI9	Decrease the use of energy per tonne of steel for clean steel making	TRL8: > 10 % specific energy consumption reduction for a dedicated process
CIRCULAR					
GO2.-Developing and deploying technologies aiming at closing the feedstock and energy loops	SO4.-Increasing the recycling of steel scrap and residues to increase smart resources usage and further support a circular economy model in the EU	OO10.-Enhancing the recycling and re-use of industrial residues of the steel production process	KPI10	Re-use and recycling of solid residues generated during the steel production process and reduction of their landfilling rate	TRL8: internal and external recycling and re-use rate > 85 % (in total)
		OO11.- Enhancing the recycling of steel scrap	KPI11	Scrap pre-treatment and cleaning technologies and scrap yard management procedures and techniques for: Progressively increasing the uptake of low-quality scrap grades (post-consumer) into high quality steel-grades Progressively replace the use of pre-consumers grades with post-consumer grades Progressively replace the use of solid pig iron with post-consumer grades	TRL8: Low-quality scrap input share over the total scrap input increased by at least 50% or more compared to the usual practice for a specific steel quality
COMPETITIVENESS					
GO 3.-Preserve the competitiveness and viability of the EU steel industry – both for BF-BOF and EAF routes and including the wider steel value chain – and making sure that EU production will be able to meet the growing EU demand for steel products.	SO5.-Demonstrating clean steel breakthrough technologies contributing to climate-neutral steelmaking, in line with the European Green Deal	OO12.-Achieving TRL 8 by 2030 in at least 12 building blocks funded by the Partnership	KPI12	Percentage of projects that reach high TRL	Share of projects with TRL7 in CSP : >85% Share of projects with TRL8 in CSP: >75%
		OO13.-Implementing by 2027 at least two demonstration projects leading to 50% CO ₂ emission reduction compared to 1990 levels. Ensuring the construction by 2030 of at least two demonstrations of a technological pathway (CDA, SCU-Carbon Capture, SCU-Process Integration, Circular Economy) leading to 80% CO ₂ emission reduction compared to 1990 levels if the demonstration technology is fully implemented.	KPI13	Number of demonstration projects	TRL8: 2 projects > 80% CO ₂ reduction compared with reference operation
	SO6.- Strengthening the global competitiveness of the EU steel industry in line with the New Industrial Strategy for a globally competitive, green and digital	OO14.-Creating a new market for 'clean steel' products that would benefit from a labelling/certification scheme for clean steel based on a life-cycle assessment approach	KPI14	% of clean steel out of total EU steel demand	Start of the roll-out of clean steel and its products
		OO15.-Contributing to the EU's efforts towards ensuring growth and jobs with long-term stability	KPI15	GVA generated by the steel industry and key steel-supplied value chains	Increase GVA by 2% compared to 2020 (target needs to be revised after COVID19)
		OO16.-Establishing the EU steel industry as a leader in low-carbon steel and ensuring standardisation and global market uptake of successful technologies developed in the EU	KPI16	Global market share of EU technology providers	+10% in global market share of EU technology providers
		OO17.- Fostering R&D collaboration between EU companies and science in the clean steel value chains	KPI 17	a.-Number of visiting periods of external researchers working on projects funded by the Partnership b.-Number of calls in collaboration with other Partnerships	a.- > 10 visiting periods (CDA, SCU, CE) b.- > =5 linked or joined calls
		OO18.-Upskilling steel workforce -Training of the steel plants workforce on the new technologies for low CO ₂ steelmaking and high level automation	KPI18	Number of supporting dedicated programmes (EU, national), with which the Partnership operates in synergy	>= 3 dedicated supporting programmes