



Development of Heating Technologies for the
Efficient Renewable Energy Consumption of
CO₂-Neutral Downstream-Processes

First D&C Report

Deliverable D6.3

Ismael Matino, Valentina Colla, Oliver Hatzfeld, Benedict Philippi

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1. Introduction

1.1 Purpose and scope of the present document

Dissemination and Communication play an extremely important role in the success of a project funded by the European Union (EU) to make external stakeholders aware of the project potential and relevant outcomes as well as to maximize project outreach by ensuring that its objectives, activities and results are known to the relevant audience. Therefore, the E-ECO Downstream Consortium is keen to communicate and disseminate the project results across the European steel sector and beyond.

This deliverable is the first of a set of three deliverables that are planned at the end of each reporting period to describe the dissemination and communication activities implemented by the E-ECO Downstream consortium during the concerned timeframe. All these three deliverables are also foreseen to assess the status of achievement of the different dissemination and communication targets established in the Dissemination and Communication Plan (*Deliverable D6.1*) and will identify possible revisions of the identified Dissemination and Communication strategy, wherever applicable.

The present document summarises the dissemination and communication activities carried out by the E-ECO Downstream partners in the First Reporting Period (FRP) of the project. It includes the activities carried out in its social media channels (such as LinkedIn) as well as the events targeted by the consortium for dissemination purposes.

During the first 18 months, the project was still in its initial stages, therefore most outcomes were not mature enough for dissemination. Moreover, the unforeseen difficulties faced by the Consortium due to the insolvency procedure involving one of the partners and caused a delay in part of the activities, which prevent dissemination and communication actions related to that part of the work. Nonetheless, the Consortium was active in raising awareness, curiosity, and interest towards the project in the European steel sector by means of the social network and the project website. Moreover, some analyses developed in WP2 were considered suitable to publication, therefore the preparation of some papers started in the first semester of 2026.

All the developed activities followed the Dissemination and Communication Plan (*Deliverable D6.1*), which proved to be well aligned with the aims and scope of the project. The overall strategy established in that document proved to be effective and presently does not need a revision, but only an intensification or initiation of some of the planned activities, which could not be carried out in FRP.

1.2 Structure of the document

This document is organised into four main sections:

- Section 2 focuses on the activities that were carried out to raise awareness and interest toward the project in the European steel sector and to disseminate some preliminary outcomes.
- Section 3 describes the developed communication activities.
- Section 4 overviews the future events that are targeted by the Consortium to disseminate and communicate the project outcomes.

- Section 5 provides some concluding remarks and considerations for a fine tuning of the established Dissemination and Communication strategy to amplify the project impact and meet the ambitious targets that were identified at the beginning of the project in the Dissemination and Communication Plan (*Deliverable D6.1*).

2. Dissemination activities

Dissemination is focused on the **public disclosure of the project results to specific target groups**, and has the following main Dissemination Objectives (DOs):

- DO1. to raise awareness and interest of potential users on the project results;
- DO2. to foster interaction with stakeholders and potential users (the ecosystem) to obtain key feedback and enhance exploitation opportunities.
- DO3. to transfer knowledge of the developed solutions to the scientific community and exchange experiences which can support improvements and refining of the research activities;
- DO4. to foster the acceptance of E-ECO Downstream solutions in the EU steel industry;
- DO5. to ensure a broad applicability of the project results also beyond the steel sector.

During the first year of the project, although only a few preliminary results were available for dissemination, the E-ECO Downstream consortium showed a positive attitude toward dissemination and tried to promote the project within the scientific, technical, and industrial stakeholders. To this aim, the following presentation introducing the overall concept of the project was provided by the project Coordinator during the *Annual Dissemination Event 2025 of the European Steel Technology Platform (ESTEP)*, which was held in Udine (Italy) on October 28-30, 2025 and gathered 200 participants from the European industries, research organisations and academia operating in the steel sector:

- V. Colla et al: “Decarbonizing steelmaking downstream processes with breakthrough heating technologies enabling efficient renewable energy consumption: the E-ECO Downstream overall concept”

The abstract of this presentation is provided in the following **Subsection 2.1**, while the D&C report related to the targeted event, prepared according to the template available in the Dissemination and Communication Plan, are reported (in chronological order) in **Appendix I** of the present document.

Moreover, in the first semester of 2026, thanks to the availability of some preliminary results derived from the work which was carried out within WP2 by Scuola Superiore Sant’Anna (SSSA), Feralpi Siderurgica SpA (FER) and Acciaierie D’Italia (ADI), the dissemination activity was intensified, and the following two abstracts were submitted and accepted for presentation in relevant scientific events that will take place in the second semester 2026:

- T. Grossi, V. Colla, A. Curci, M. Cutrignelli, L. Pontecorvo, P. Frittella, I. Matino: “Analysis of Heat Recovery in the Steel Industry: Thermal Mapping and Source Prioritization in the E-ECO Downstream Project”, *41st National Congress of the Italian Association of Metallurgy*, Brescia (Italy), September 9-11, 2026.
- I. Matino, V. Colla, A. Curci, T. Grossi: “Waste Heat Characterization and Recovery Strategies in Hot Strip Mill Downstream Processes,” *2026 China Symposium on Sustainable Ironmaking and Steelmaking Technology – CSST 2026*, Nanjing, (Jiangsu Province - China), November 3-5, 2026.

The abstracts of these presentations are provided in **Subsection 2.2** and **Subsection 2.3**, respectively. Both presentations are associated to full papers, which will be published in the proceedings of the two related events in the second semester of 2026.

The consortium also planned further dissemination actions for the Second Reporting Period (SRP). The consortium also planned further dissemination actions for SRP.

The following keynote presentation is planned on the *European Oxide Scale Conference OXI 2026*, which will be held in London (UK) on November 30- December 1, 2026, (<https://www.iom3.org/events-awards/european-oxide-scale-conference-2026.html>)

- “Keynote 2: High-pressure water descaling: mechanisms, process parameters, and the impact on future CO₂-free reheating processes, M. Wunde, VDEh-Betriebsforschungsinstitut GmbH (BFI), Germany

Moreover, the following the following two further abstracts have just been submitted for possible presentation in relevant scientific events and are under evaluation at the date of the delivery of the present document:

- V. Colla, I. Matino, P. Frittella, A. Curci, T. Grossi: “Mapping and Prioritizing Waste Heat Recovery Opportunities Across Electric and Integrated Steelmaking Routes: The E-ECO Downstream Project at Feralpi and Acciaierie D’Italia,” *ESTEP Annual Dissemination Event 2026*, Gent (Belgium), October 20-22, 2026.
- T. Grossi, V. Colla, P. Frittella, L. Angelini, A. Landini, C. Di Cecca, F. Fredi, P. Giacomuzzi, A. Curci, M. Cutrignelli, L. Pontecorvo, R. Atrotto, I. Matino: “Waste heat recovery strategies and heating technologies for CO₂-neutral steel downstream processes” *AISTech 2027 - Iron and Steel Technology Conference*, Nashville (TN, USA), May 3-5, 2027.

Finally, the following journal paper authored by SSSA and FER has just been submitted to the *Journal of Sustainable Metallurgy* and is currently under revision:

- T. Grossi, I. Matino, L. Angelini, A. Landini, P. Frittella, C. di Cecca, F. Fredi, P. Giacomuzzi V. Colla: “Short-term Waste Heat Recovery Analysis for EAF-Based Steel Downstream Processes: Experimental Thermal Mapping, Exergy Assessment, and Technology Prioritization toward Decarbonization”

2.1 Decarbonizing steelmaking downstream processes with breakthrough heating technologies enabling efficient renewable energy consumption: the E-ECO Downstream overall concept

V. Colla, I. Matino, T. Grossi, M. Niero, F. Albano, F. Cecchi – Scuola Superiore Sant’Anna, Italy

O. Hatzfeld, J. Schindhelm, M. Wunde, D. Reche, T. Ümit, F. Mintus, S. Bialek, N. Holzknecht, A. Wolff, Z. Kargar, V. Diegerlmann, B. Stranzinger, W. Adler – VDEh-Betriebsforschungsinstitut, Germany

A. Johnsson, J. Falk – Swerim AB, Sweden

C. Somsen, B. Nowak, B. Gehrman – VDM-Metals, Germany

P. Zica, A. Curci, L. Pontecorvo, M. Cutrignelli, R. Attrotto, G. Fiorenza – Acciaierie d’Italia in Amministrazione Straordinaria, Italy

P. Frittella – Feralpi S.p.A., Italy

M. Stöver, J. Weyer – Küppers Solutions, Germany

D. Chandrasekaran, P. Dömstedt, E. Strom, J.F. White – Kanthal, Sweden

According to the European Green Deal, climate neutrality is expected to be reached by 2050 with significant GreenHouse Gases (GHG) emissions reduction by 2030. Due to the ambitious

goals, it is mandatory that energy intensive industries, like steelworks, move away from fossil-resources.

The steel sector contributes to significant GHG emissions with its primary, secondary and downstream processes. Among downstream processes, the reheating and heat treatment of steel are the main energy consumers. Fueled mainly by natural gas, they are CO₂ intensive with approximately 83 kgCO₂/t_{steel} by reheating furnaces alone. Efforts have been made to improve downstream processes efficiency mainly focusing on off-gas heat recovery, oxyfuel combustion, insulation, etc., but these efforts alone are not sufficient to reach zero GHG emissions. Among new key technologies, fossil-fuels replacement with renewable energies receives an ever-increasing attention. This is the main research topic of recently started Horizon Europe project entitled “*Development of heating technologies for the efficient renewable energy consumption of CO₂-neutral downstream processes – E-ECO Downstream* (G.A. 101178210)”. The main objective is to contribute to a green steel production (Figure 1) with low carbon footprint by developing advanced and breakthrough technologies for the downstream processes, by focusing on the efficient utilization of hydrogen, biogas and electricity to replace fossil-fuels.

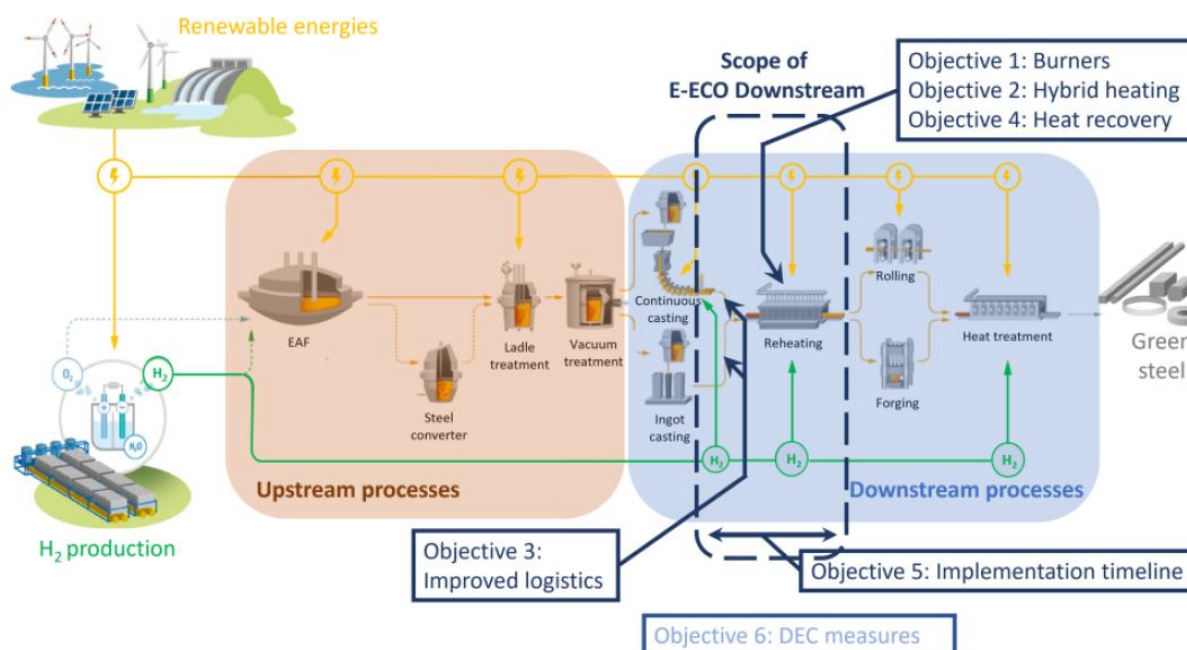


FIGURE 1. EXEMPLARY PRODUCTION ROUTE OF GREEN STEEL WITH THE INTERVENTION POINTS OF E-ECO DOWNSTREAM.

Four technical research topics are investigated in E-ECO Downstream: hydrogen heating, hybrid heating, hot charging and waste heat recovery for future fuels. Six specific objectives are defined to make a major step towards decarbonization of steel industry downstream processes:

1. *Enable currently installed burners to utilize green fuels*: currently installed reheating furnaces burners will be enabled to utilize green H₂ by integration of newly designed and 3D-printed burner components instead of replacing entire burner systems. New heat-resistant materials are investigated for the applied 3D-printing.

2. *Elaboration of hybrid heating concepts to increase fuel flexibility*: to increase fuel flexibility hybrid heating concepts (H_2 and electricity) will be investigated in a pilot walking beam furnace studying also the impact and countermeasures of new fuels and hybrid heating on materials and product.
3. *Improved logistics to decrease heat losses and increase energy efficiency*: energy efficiency potentials of downstream processes will be evaluated by case studies for the application of warm and hot charging from casting to hot rolling, i.e. by covering of the slabs with passive and active panels.
4. *Adapt waste heat recovery systems to future fuel boundary conditions for increased energy efficiency*: based on industrial partners processes waste heat recovery concepts will be developed and recuperators are tested regarding their suitability to new fuels, oxidizers and off gases.
5. *Implementation timeline*: after dedicated techno-economic-environmental analyses, an implementation timeline for the investigated decarbonization technologies/solutions and process adaptations to enhance existing steelmaking plants for the transition to decarbonization will be generated on a European level.
6. *Dissemination of project results among relevant stakeholders to maximize impact and benefits*.

The contribution will provide a project overview and some insights into currently ongoing activities.

2.2 Analysis of Heat Recovery in the Steel Industry: Thermal Mapping and Source Prioritization in the E-ECO Downstream Project

T. Grossi, V. Colla, I. Matino – Scuola Superiore Sant’Anna, Italy

A. Curci, M. Cutrignelli, L. Pontecorvo – Acciaierie d’Italia in Amministrazione Straordinaria, Italy

P. Frittella – Feralpi S.p.A., Italy

The European steel industry is undergoing a profound transformation aimed at reducing its environmental impact. Among the available strategies, maximizing heat recovery in current and future process configurations can yield significant environmental and economic benefits. This contribution presents the results of an analysis of short-term heat recovery opportunities carried out within the European project E-ECO Downstream at two Italian steelmaking plants: Feralpi Siderurgica and Acciaierie d’Italia. The goal is the prioritization of residual thermal energy sources in view of decarbonization and compatibility with innovative fuels. The methodology relies on continuous monitoring and on energy and exergy balances. For Feralpi, the priority source is the EAF primary off-gas upstream of the quenching tower; for Acciaierie d’Italia, the strategy focuses on reducing radiative losses during transfer between rolling stands by means of insulating shields.

2.3 Waste Heat Characterization and Recovery Strategies in Hot Strip Mill Downstream Processes

I. Matino, V. Colla, T. Grossi – Scuola Superiore Sant’Anna, Italy
A. Curci – Acciaierie d’Italia in Amministrazione Straordinaria, Italy

The decarbonization of the steel industry requires a multi-faceted approach, where maximizing energy efficiency in downstream processes plays a pivotal role. This study presents a systematic methodology for the characterization of residual thermal energy and the identification of heat recovery opportunities in hot strip mill plants, demonstrated through its application to an integrated steelworks within the framework of the EU-funded project entitled “*Development of heating technologies for the Efficient renewable Energy Consumption of CO₂-neutral DOWNSTREAM-processes*” (Ref. E-ECO Downstream, Grant Agreement No. 101178210).

The proposed methodology combines a thermal mapping campaign with a thermodynamic evaluation framework based on both sensible heat and exergy analysis. The thermal mapping quantifies heat losses across the main process stages — including the transfer phase between roughing and finishing stands, coil cooling during warehouse stocking, and skid beam cooling systems of the reheating furnaces. Exergy analysis is then applied to prioritize recovery strategies according to their thermodynamic quality and technical feasibility, enabling a ranking of heat sources that goes beyond raw thermal power.

Application to the hot strip mill yields concrete insights into the methodology. The most significant recoverable loss occurs during the bar transfer after the sixth roughing stand, with specific losses above 60 kJ/kg. The high material temperature (exceeding 1,000°C) results in exceptional exergy content, making heat loss avoidance via active or passive insulating covers the most effective strategy. Coil cooling during warehouse stocking reveals a multi-megawatt aggregate potential, recoverable through dedicated thermal tunnels with heat exchangers. Skid beam cooling water, despite its large sensible heat content, is classified as low-grade due to its near-ambient temperature, directing it toward district heating applications.

The methodology provides a transferable and technically grounded roadmap applicable to large-scale hot rolling plants, supporting fuel consumption reduction and CO₂ emissions mitigation in the transition toward carbon-neutral downstream steelmaking.

2.4 Achievement status of the established dissemination targets

Dissemination actions mostly rely on the availability of at least partial outcomes of the project. Therefore, the dissemination actions which were carried out in FRP were quite limited, and a much more intense dissemination is expected in SRP. Nonetheless, some progress can be registered in the achievement of some target values for the Key Performance Indicators (KPIs) of dissemination actions, which were established within the Dissemination and Communication plan (*Deliverable D6.1*), such as summarized in **Table 1**.

TABLE 1. COMPARISON BETWEEN TARGET AND ACTUAL VALUES OF THE ESTABLISHED KPIs FOR THE DISSEMINATION ACTIVITIES.

Dissemination activity	KPI Dissemination	Target	Actual value	% vs. target	Status
Scientific and technical papers	15 articles in well reputed scientific Journals in Open Access mode	15	0	0%	
	Overall no of downloads of the published papers	9000	0	0%	
Presentations, lectures, posters in conferences, congresses and workshops	No of papers published in proceedings of international conferences and workshops	12	0	0%	
	No of presentations/posters discussed in international scientific events	18	1	5.5%	
	Total no of persons in the general audience reached in the attended scientific events	10000	200	2%	
Internal seminars and dissemination events	No of internal partners' events;	8	0	0%	
	No of pilot training sessions related to the outcomes of the project and some of the developed tools	4	0	0%	
Webinars and seminars on E-ECO Downstream outcomes	No of webinars and seminars	3	0	0%	
	Total no of persons attending the held webinars and seminars	150	0	0%	
Attendance to exhibitions/trade fairs	No of posters/presentations within exhibitions or trade fairs attended	3	0	0%	
	Overall number of people in the audience of the attended exhibitions and trade fairs	3500	0	0%	
Presentations in events promoted by EU initiatives, platforms, and associations	No of presentations	4	1	25%	
	A total audience of at least 200 experts and industrial representatives reached in the presentation events	200	200	100%	
Collaboration and synergies with other CSP and HEU projects	No of projects contacted for potential synergies in terms of knowledge exchange and future project scale-up	10	0	0%	
	No of joint activities put in place with some of the previously identified and contacted projects	5	0	0%	
E-ECO Downstream final Workshop	No of presentations held during the Workshop both by E-ECO Downstream beneficiaries and by external experts	6	0	0%	
	No of attendees	100	0	0%	

For SRP, beyond the already planned dissemination actions, which have been discussed in Subsection 2.1, the Consortium plans to start establishing synergies with other EU-funded projects, by also exploiting the network of contacts of some of the partners (e.g. SSSA, BFI and SWERIM), which are very active in the EU-funded research and will be committed to favouring synergies and collaboration opportunities.

Moreover, by also relying on the intermediate project results which will become available in SRP, the Consortium plans to start organising internal seminars and dissemination events. In such a context, SSSA supported by its subcontractor Letomec has already planned an online seminar to be held in Autumn 2026 (exact date still to be decided), which is entitled: “*Hydrogen*

Embrittlement phenomena in steel: theoretical background and experimental testing procedures". The purpose of the seminar is to provide all the members of the consortium with more detailed information of the experiments that will be conducted within the project.

On the other hand, both the webinars/seminars on the project outcomes and the final workshop are mostly foreseen for the Third Reporting Period (TRP), as they will rely on mature and consolidated results of the research activity that will be carried out in the project.

To sum up, at the present status of the project, the dissemination strategy appears appropriate and does not need revision.

3. Communication activities

Communication activities mostly aim at **promoting the project itself and its impacts among the identified target groups**. The following main Communication Objectives (CO) have been defined within the Dissemination and Communication plan (*Deliverable D6.1*):

- CO1. to raise awareness in the steel community of the benefits of the E-ECO Downstream technologies and solutions in terms of socio-economic and environmental sustainability of the steel production cycle;
- CO2. to raise awareness and favour opportunities for transferability of concepts in other industrial sectors;
- CO3. to raise awareness among European Commission (EC), Public Authorities and Policy Makers to foster cooperation in spreading the benefits of the E-ECO Downstream technologies and solutions;
- CO4. to involve workers and young talents in further development and deployment of the E-ECO Downstream technologies and solutions and create among them awareness on their impact by also promoting connected career opportunities;
- CO5. to promote gender equality and integrate gender dimension in Research and Innovation (R&I) activities.

Based on the strategy elaborated at the very beginning of the project, the communication activities implemented by the Consortium were mostly aimed at raising awareness of the project objectives and potential benefits in the steel community.

The Consortium made the choice to keep a “technically focused” profile in Communication activities, i.e. implementing communication actions which mostly refer to technical objectives, activities, and outcomes of the project. Consequently, communication activities were limited in number due to lack of mature results to showcase. However, especially in the first semester of 2026, communication via social media was intensified to spread newsletters mainly on the first results achieved in the project.

The communication strategy mostly exploited the project website and the social media (LinkedIn). Four newsletters were issued so far, providing either general-purpose presentations of the project (e.g. basic information on project objectives and Consortium and updates on the general status of the activities) or more focused communications related to specific aspects of the developed research work.

3.1 Project website

The E-ECO Downstream website (<https://e-eco-downstream.eu/>) is available online since June 2025 (see *Deliverable D6.2*), according to the project schedule. Visitor and download tracking were only implemented in mid-2026, meaning that comprehensive on-site engagement data is not yet available for the full reporting period. Therefore, the analysis currently relies on Google Search performance data as the most consistent source for assessing visibility and user interest. By the end of May 2026, the project website was visited via Google by a total of 66 clicks from Google Search. The development of clicks, impressions and the Click-Through-Rate (CTR) over time is presented in **Figure 2**. Clicks indicate how often users clicked through to the website from Google Search, impressions show how often the website appeared in search results, and CTR represents the percentage of impressions

that resulted in a click. Considering that very few technical results, documents or papers are so far available on the project website, the results can be considered adequate.

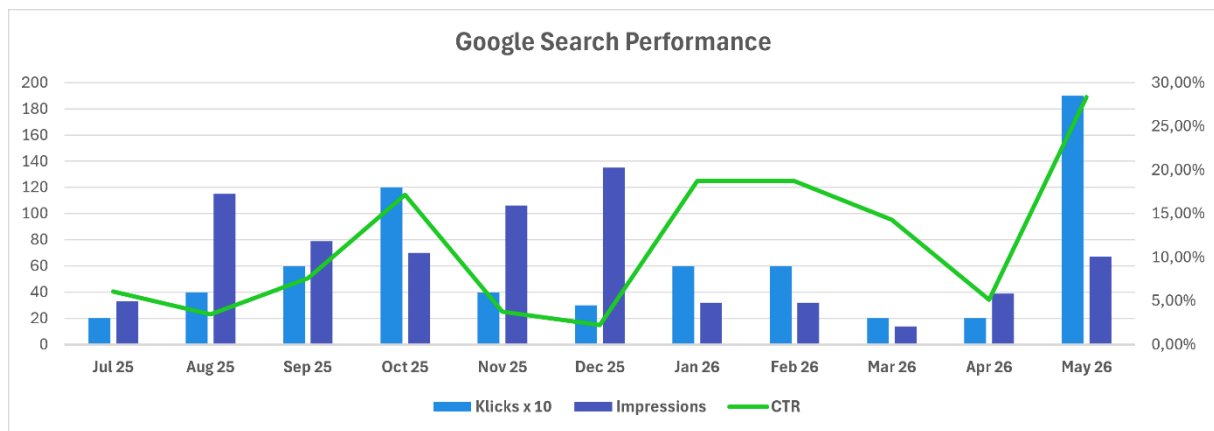


FIGURE 2. TIME TREND OF THE DEVELOPMENT OF CLICKS, IMPRESSIONS AND THE CLICK-THROUGH-RATE SINCE JULY 2025.

Public documents produced within the project, including public deliverables and newsletters, are made available through the project website. As of the reporting date, reliable download figures cannot yet be provided, as download tracking has only recently been activated and the volume of downloadable content available during the reporting period was still limited.

A more intensive promotion of the project website is planned for SRP, for instance, by introducing the link to the website (also in the form of a QR code) in the last slide of all presentations/posters related to the project. Moreover, the newly introduced performance tracking functionalities will enable a more punctual monitoring of the website performance, so that corrective actions can be timely implemented, if needed.

3.2 LinkedIn Account

A LinkedIn account was created for the project at the end of March 2025 (see *also Deliverable D6.1*) and presently holds 230 followers. 8 posts were published, which gathered a total of more than 2000 views. The time trend of the visitors who accessed the E-ECO Downstream page on LinkedIn so far (based on the LinkedIn analytics) is shown in **Figure 3**, while the distribution of their professional profiles is shown in **Figure 4**.

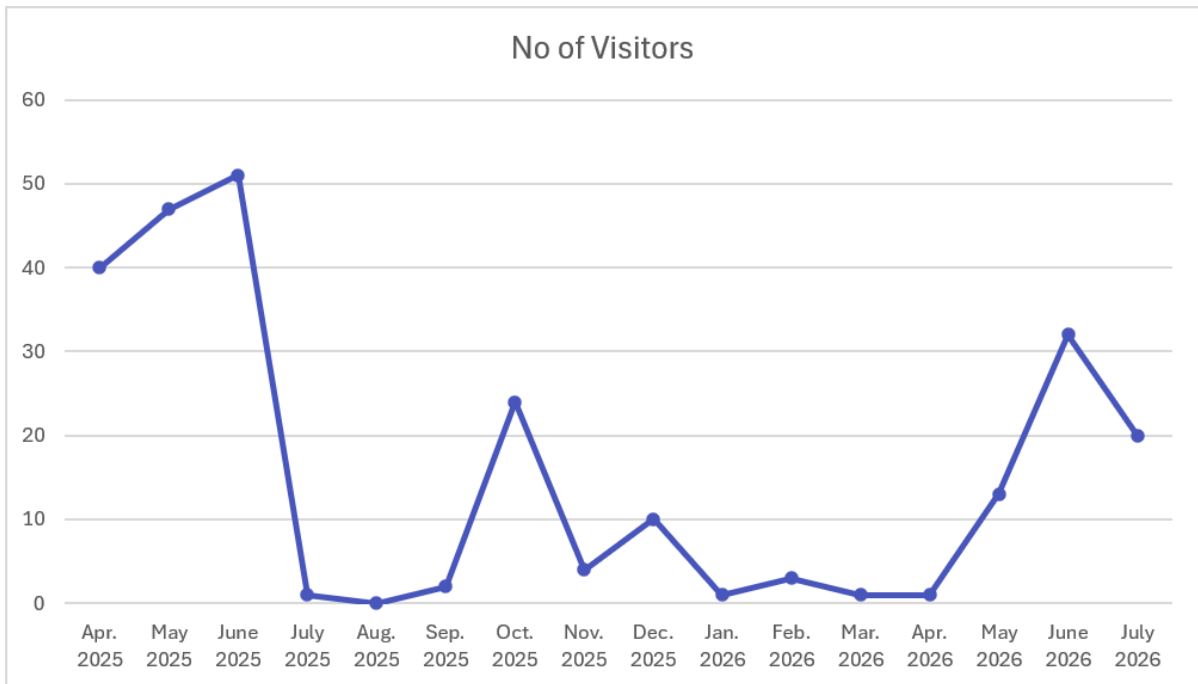


FIGURE 3. TIME TREND OF THE VISITORS OF THE LINKEDIN PAGE OF THE PROJECT.

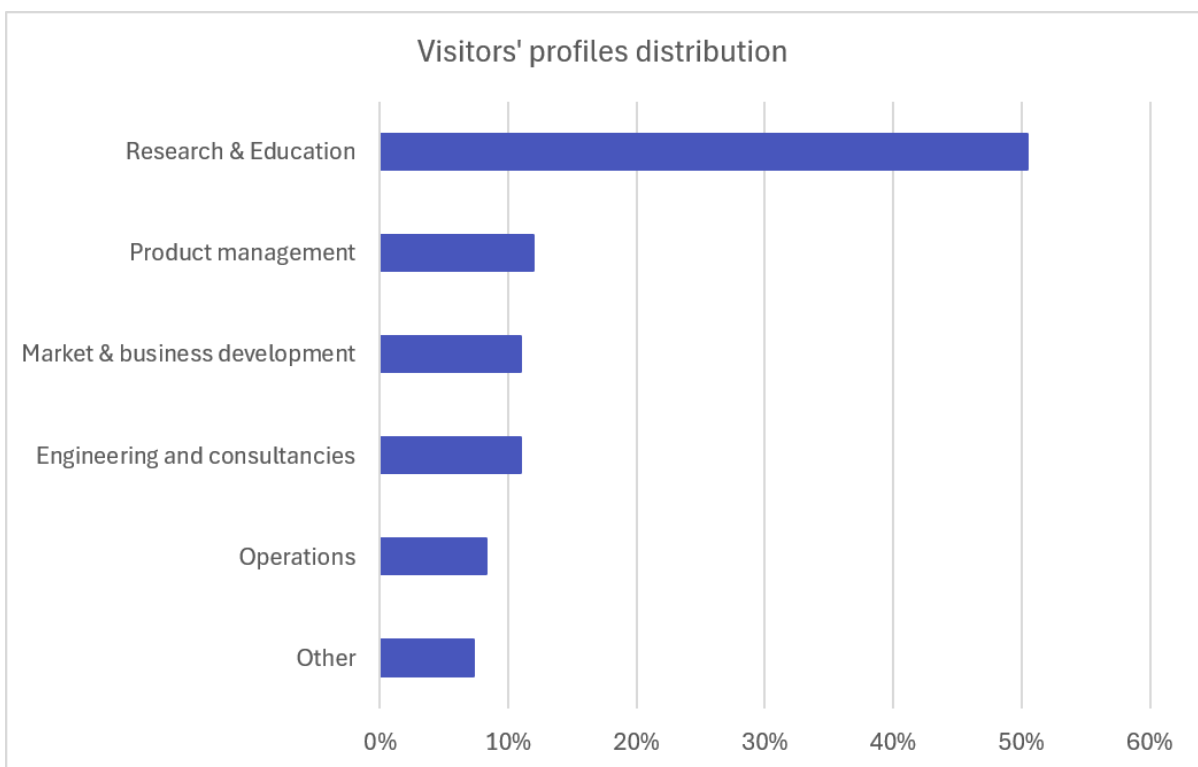


FIGURE 4. DISTRIBUTION OF THE PROFILES OF THE VISITORS OF THE LINKEDIN PAGE OF THE PROJECT.

3.3 Newsletters

Four newsletters mostly focused on the work carried out in FRP were released so far: the first one presents the overall objective of the project, its workplan, and the Consortium; the second one provides a deeper insight on the concept and approach of the project; the third one presents the methodologies adopted for material testing, while the fourth one overviews the results achieved so far by SSSA and FER in the analysis on heat recovery and utilisation carried out in WP2. The newsletters were spread through the project website and the project LinkedIn page. The publication of the newsletter was not as regular as it should be, but the Consortium is committed to release newsletters on a more regular basis in SRP, by also benefitting from the upcoming intermediate research results.

3.4 Achievement status of the established communication targets

Table 2 presents the current value of the established KPIs for communication activities and compares them with the target values established in the Dissemination and Communication Plan (*Deliverable D6.1*). Such values are very ambitious, and their trend cannot be “linear” throughout the project duration, as communication initiatives are expected to be more numerous and effective as soon as more concrete results become available. Moreover, the unforeseen difficulties faced by the project due to the insolvency procedure of one of the partners had an impact on the communication activities, as some results expected in FRP were delayed. Nonetheless, some progresses are registered in the achievement of some target values, with three of them formally reached, although this fact does not imply that the corresponding activities will be slowed down or suspended.

Such as already stated, in the future, newsletters should be published on a more regular basis and the consortium must focus also on press releases, which were not produced in FRP, as it is not easy to reach attention of press and media when a few and very specific results are available. More efforts should also be devoted to increase the visibility and track the performance of the project website. On the other hand, the publications in EC’s communication channels and the communications and seminars dedicated to students and young minds as well as to gender equality are clearly foreseen mostly for second half of the project, as they need mature and consolidated research results.

TABLE 2. COMPARISON BETWEEN TARGET AND ACTUAL VALUES OF THE ESTABLISHED KPIs FOR CHE COMMUNICATION ACTIVITIES.

Communication activity	KPI Communication	Target	Actual value	% vs. target	Status
Project website with dedicated contents. Link to partners' website. Sharing public deliverables, reports, and training material	No of views and people in the total audience reached	70000	tbd	-	
	No of public website news	10	0	0%	
Newsletters and bulletins	No of press releases (target 2/year)	3	0	0%	
	No of Newsletters (2-3/year)	4	4	100%	
	No of readers	5000	150*	3%	
Press releases to newspapers and social media.	No of 500 social media followers	500	235	47%	
	No of news via social media	10	0	0%	
	No of view of posts	1500	2080	139%	
	No of people in the total audience reached	5000	250 [#]	5%	
Presentations in clustering events organized by or relevant to EU, platforms, and associations. Publications on EC's communication channels	No of clustering events at EU level	1	1	100%	
	No of publications on EC communication mean	1	0	0%	
Communications and seminars dedicated to students and young minds	No of students in the overall audience reached	300	0	0%	
Communications and seminars dedicated to women's role	No of presentation on gender equality in project event	1	0	0%	
	No of session on career opportunities	1	0	0%	

* This value is estimated by assuming that 20% of the viewers of the LinkedIn posts of the newsletters read them.

[#] This value corresponds to the number visitors of the LinkedIn page of the project.

Overall, considering the current status of the project, the communication strategy appears appropriate and does not need any substantial revision, but only an intensification of some activities, which will be possible in SRP based on upcoming results of the work to be carried out in the project. The only minor revision needed concerns the change in one of the focal points for communication for SSSA. The new complete and updated list of focal points for all partners is reported in **Table 3**.

TABLE 3. LIST OF THE FOCAL POINTS FOR COMMUNICATION FOR EACH BENEFICIARY OF THE PROJECT.

Beneficiary	Focal point	Role	email
1	SSSA	Valentina Colla Lorenzo De Marinis	Coordinator Communication manager of TeCIP institute
2	BFI	Oliver Hatzfeld	Communication manager of BFI
3	SWERIM	Andreas Johnsson Margaretha Sönnernaard	WP 4 leader Communication manager of Swerim
4	FERALPI	Piero Frittella	WP2 leader and responsible of the project for FERALPI
5	ADI	Antonio Curci	ADI reference for Project Communication management
6	KAN	Erik Ström	Contact person at Kanthal
7	VDM	Christina Somsen	VDM reference for Project Communication management

4. Future targeted events

During each General Assembly and, more in general, during the project execution, the E-ECO Downstream consortium periodically analyses the events being planned and update the list of potential targets for the project. The target events include conferences, workshops, exhibitions and other dissemination and communication opportunities, where the consortium can make presentations to share the results of the work carried out in E-ECO Downstream, as well as trade fairs, exhibitions and dissemination and communication initiatives organised by the EU.

In the Dissemination and Communication Plan established at the beginning of the project (*Deliverable D6.1*) an initial list of events was provided. In such list 1 out of the 2 events initially identified for 2025 were attended, while 2 of the 6 events targeted for 2026 are still in the plans of the consortium, which however identified two additional events (the *2026 China Symposium on Sustainable Ironmaking and Steelmaking Technology* and the *European Oxide Scale Conference*) that will be attended by representatives of SSSA and BFI, respectively.

The last version of the list of potentially relevant events revised in the General Assembly held in June 2026 is reported in **Table 4**.

TABLE 4. LIST OF RELEVANT EVENTS AT THE DATE OF DELIVERY OF THE PRESENT DOCUMENT: QUESTION MARKS ARE INCLUDED WHEN THE EXACT DATES OR LOCATIONS ARE STILL NOT DEFINED.

Event	Date	Location	Description
ESTEP Annual Event 2025	28-30.10.2025	Udine (IT)	E-ECO Downstream overall concept and first developments
41 th Congress of the Italian Association of Metallurgy	09-11.09.2026	Brescia (IT)	Results related to WP2
ESTEP Annual Event 2026	20-22.10.2026	Gent (B)	Results related to WP2
2026 China Symposium on Sustainable Ironmaking and Steelmaking Technology	03-05.11.2026	Nanjing (China)	Results related to WP2
European Oxide Scale Conference OXI 2026	30.11-01.12.2026	London (UK)	Results related to WP4
American Iron & Steel Technology Conference and Exposition (AISTech) 2027	03-05.05.2027	Nashville (TN, USA)	Results related to WP2
European Conference on Heat Treatment and Surface Engineering ECHT 2027	14-17.04.2027	Milan (IT)	Main outcomes related to WPs 3-4
European Steel and Application Days METEC-ESTAD 2027	21-25.06.2027	Dusseldorf (D)	Preliminary results related to WPs1-4
Life Cycle Management (LCM) 2027	??.09.2027	Europe	Preliminary results related to LCA (WP5)
ESTEP Annual Event 2027	??.10.2027	Europe	Main outcomes related to WPs 1-4
16 th European Conference on Industrial Furnaces and Boilers INFUB-16 2028	??.04.2028	Portugal	Main outcomes related to WPs 1-4
American Iron & Steel Technology Conference and Exposition (AISTech) 2028	??.05.2028	?? (USA)	Main outcomes related to WPs 1-4
2028 Congress of the Society of Environmental Toxicology and Chemistry SETAC 2028	??.05.2028	Europe	Final results of LCA (WP5)
42 th Congress of the Italian Association of Metallurgy	??.09.2028	??? (IT)	Final project outcomes,
ESTEP Annual Event 2028	??.10.2028	Europe	Final project outcomes

5. Conclusions

In FRP, also considering the limited availability of concrete results, the E-ECO Downstream consortium developed a good Dissemination and Communication activity. The elaborated Dissemination and Communication plan proved to be effective and, in general, all the partners showed a positive and collaborative attitude in spreading research objectives, ambitions, concepts and preliminary outcomes. This enabled an appropriate progress on the achievement of the established target values of some of the identified KPIs for Dissemination and Communication despite the unforeseen difficulties faced by the Consortium.

No publications on international Journals have been issued so far, but there are concrete plans and opportunities for the rest of the project.

The consortium identified relevant margins for improvements to be stressed for communication activities, also based on the expected development of activities and availability of partial results, especially as regard to:

- development of press releases, also with a national and international visibility;
- more “regular” publication of newsletters, also focused on specific topics;
- enhancement of the visibility of the project website;
- intensification of the frequency of the LinkedIn posts.

Appendix I: D&C Report Template

I.1 ESTEP Annual Dissemination Event 2025

Event information	
Event name (and acronym)	ESTEP Annual Event 2025: How decarbonisation, digitalisation and circular solutions forge the sustainable European steel future
Type of event	Conference
Date	October 28-30, 2025
Location	Udine (Italy)
Geographic coverage	Europe
Type of audience	Steel Companies, OEMs, RTOs, Academia.
Approximate size of audience	≈200
Short description	The ESTEP Annual Event 2025 aims at bringing together the European steel community to explore research and innovation in decarbonization, digitization, and circular solutions that will shape the sustainable future of the European steel industry. Achievements, challenges, and future perspectives will be examined through contributions from diverse European steelmaking stakeholders and presentations of ongoing projects under the Clean Steel Partnership. The event will foster dialogue between the steel sector and other key industries engaged in the European Green Deal—such as for e.g. cement, water, and aluminium—to promote industrial symbiosis and cross-sector collaboration. The topics of the event were: • Decarbonisation • Digitalisation upskilling and social innovation • Circular economy • Resource and energy efficiency Industrial symbiosis and sector coupling
Information about dissemination activity	
Presentation title	Decarbonizing steelmaking downstream processes with breakthrough heating technologies enabling efficient renewable energy consumption: the E-ECO Downstream overall concept
Presenter	Valentina Colla (SSSA)
Other partners involved	BFI, Swerim, VDM, ADI, Feralpi, KUP, Kanthal
Hashtag(s) for Social Media	#steel #decarbonisation #hydrogen #furnace #heating #RenewableEnergy #HorizonEurope #research, #event
Attachments (e.g. agenda, invitation)	Program of the event

ESTEP Annual Event 2025 Programme 28-30 October 2025		Programme DAY 1	
How decarbonisation, digitalisation and circular solutions forge the sustainable European steel future		How decarbonisation, digitalisation and circular solutions forge the sustainable European steel future	
WEDNESDAY 29 - DAY 1		DIGITALISATION, UPSKILLING & SOCIAL INNOVATION	
08:30 - 09:00 09:00 - 09:30	Registration Opening and welcome Marco Omotto, Conference Chairman, Danieli Automation Klaus Peters, Secretary General, ESTEP Angelo Montanari & Roberto Pinton, Rector & past-Rector, University of Udine Alessandro Brusi, President, Danieli Group Guido Nassimbeni, Vice President, Friuli Foundation Cosmo Di Cecca, Vice President, AIM - Associazione Italiana di Metallurgia	11:30 - 11:50	Luca Piedimonte, Session chairman, ORI Martin Ladle furnace optimization through artificial intelligence-based methodologies: a case study of the ALCHEMIA project Stefano Pede, Scuola Superiore Sant'Anna Pisa
09:30 - 09:50	Valentina Colla, Session chairwoman, Scuola Superiore Sant'Anna Pisa	11:50 - 12:10	Driving quality innovation in steelmaking through digital solutions Luca Cestari, Danieli Automation
09:50 - 10:10	A multidisciplinary discussion on the future of steelmaking in the Triveneto region by 2050: the think tank experience Alex Lanzutti, University of Udine	12:10 - 12:30	Enhancing steelmaking operations through advanced computer vision and machine learning within the iSteel-expert project Giovanni Bavestrelli, Tenova
10:10 - 10:30	Artificial intelligence governance, economics, and manufacturing: an overview Costanzo Pietrosanti, Danieli Automation	12:30 - 12:50	Skills4Energy intensive industries: Game changer profiles and urgent skills demands for the steel industry Antonius Schröder, TU Dortmund
10:30 - 10:50	Digitalization: The universal environmental data model - the PRISMA project Eric Chiquito, Luleå University of Technology	12:50 - 13:10	The RACE programme: Bridging students and industry to foster innovation and reframe perceptions of steel DI-TRODE: An AI-Powered approach to securing the future of electrodes in the steel industry Fabio Ferri, EIT Raw Materials Philemon Adeyemi, Ahmed Aldawaybi, Julia Kulpa & Leonidas Spandagos, RACE programme
10:50 - 11:10	ALCHIMIA: Federated and continual learning for sustainable and competitive steelmaking David Blazquez, CELSA	13:10 - 14:30	Lunch break
11:10 - 11:30	Forging the future. The evolution of automation in steel manufacturing (1974 to present) James Kellams, Metaltus	INDUSTRIAL SYMBIOSIS AND SECTOR COUPLING	
	Coffee break	14:30 - 14:50	Enrico Maffa, Session chairman, Tenova Automated copper identification in ferrous scrap using advanced machine learning for sustainable steel production Alice Petruccioli, Scuola Superiore Sant'Anna Pisa
		14:50 - 15:10	SLAG2BUILD: State of the art in dry granulation of ladle furnace slag Edoardo D'Amazio, RINA-CSM
		15:10 - 15:30	Insights from current steel and slag production for next-generation processes Agnieszka Morillon, FEBS Marta Guzzoni, Tenova
		15:30 - 15:50	MemKoWi & sector coupling with Power4Steel: New findings with pilot-scale CO₂- and H₂-separation by membrane technology from industrial gases from steel-, cement- and biomass-plants. Torsten Bräunemann, Hiltner Susanne Bethlehem-Seldel, Dillinger
		15:50 - 16:10	Intelligent water management in steelmaking: Automation for process efficiency and sustainability Marcelino Fornasier, Danieli & C. Officine Meccaniche Enrico Stefanel, Danieli Automation
		16:10 - 16:30	Coffee break

ESTEP Annual Event 2025 Programme 28-30 October 2025		Programme DAY 1 & 2	
How decarbonisation, digitalisation and circular solutions forge the sustainable European steel future		How decarbonisation, digitalisation and circular solutions forge the sustainable European steel future	
THURSDAY 30 - DAY 2		ENERGY EFFICIENCY	
08:30 - 08:45 08:45 - 08:50	Registration Opening and welcome Marco Omotto, Conference Chairman, Danieli Automation Klaus Peters, Secretary General, ESTEP	16:30 - 16:50	Alexander Thekale, Session chairman, Primetals Technologies Flex4Fact: Unlocking energy flexibility for a competitive and sustainable European steel industry Irene Garcia, CELSA
08:50 - 09:10	Opening lecture - European Commission Sebastiano Fumero, Head of Unit, European Commission (REA) Cyril Robin-Champigneulle, Deputy Head of Unit, European Commission (DG RTD)	16:50 - 17:10	From scrap to strip: Sustainable steel manufacturing with electrified direct casting and rolling Riccardo Conte, Danieli & C. Officine Meccaniche
		17:10 - 17:30	Decarbonizing steelmaking downstream processes with breakthrough heating technologies enabling efficient renewable energy consumption: the E-ECO Downstream overall concept Valentina Colla, Scuola Superiore Sant'Anna Pisa
		17:30 - 17:50	Applications of computational fluid dynamics simulations to hydrogen combustion in industrial-scale heating processes of the steel industry Johannes Losacker, RWTH Aachen
		20:00	Dinner - Casa della Contadinanza Address restaurant in the Udine Castle - Piazzale del Castello, 33100 Udine
DECARBONISATION SESSION 1		DECARBONISATION SESSION 2	
09:10 - 09:30	Ismael Martino, Session chairman, Scuola Superiore Sant'Anna Pisa High-temperature electrolysis for decarbonisation of the steel sector: the SYRUS project, a real-scale demonstration Stefano Campanari, Politecnico di Milano	10:30 - 10:50	Coffee break
09:30 - 09:50	Update on HydSmelt - Hydrogen-based direct reduction and smelting of ultra-fine iron ores to green hot metal Thomas Bürgler, KJ-MET Christoph Prietl, Primetals Technologies	10:50 - 11:10	Thomas Echterhof, Session chairman, RWTH Aachen Operation of a 1 TPD mobile CO₂ capture unit based on cryogenic desublimation in heavy industry plants in Belgium Jean Borlee, CRM Group
09:50 - 10:10	CUSTARD - carbon capture and use at a steel plant with an advanced solution to reach decarbonisation Giuseppe Giacometti, Accioboni Borsari Sefzu	11:10 - 11:30	Advancing decarbonization in ironmaking: progress and future directions of the electrically assisted syngas smelter (EASyMelt) Maryam Bantecadi, SME Group
10:10 - 10:30	Sustainable steel production: the role of carbon capture and utilization in a steelmaking plant Selena Tiburzio, Danieli Research Center	11:30 - 11:50	Demonstration of decarbonization approaches in EAF: current achievements and ongoing activities of GreenHeatEAF project Ismael Martino, Scuola Superiore Sant'Anna Pisa
		11:50 - 12:10	Hybrid technologies for sustainable steel reheating: HyTecHeat project Filippo Cirilli, RINA-CSM
		12:10 - 12:30	LIFE project H2Reuse: Highly efficient and sustainable decarbonisation of bright annealing process by recovery and reuse of H₂ Mauro Leali, DMV Italia
		12:30 - 13:50	Lunch break
		DECARBONISATION SESSION 3	
		13:50 - 14:10	Patrick Lafontaine, Session chairman, ESTEP Evaluation of hydrogen permeability and embrittlement in critical components for H₂ supply systems Eduardo Tabares, Tekniler
		14:10 - 14:30	Techno-economic assessment of H₂-DRI and NG-DRI-CCS - processes for low-emission iron production Sara Guazzi, Politecnico di Milano
		14:30 - 14:50	EU-project H2loop: Decarbonizing the EU steel industry through innovative carbon dioxide separation and hydrogen production from metallurgical gases Uwe Pahl, Rouge H2 Engineering AG
		14:50 - 15:10	Hydra project: status of activities and first operational results Filippo Cirilli, RINA-CSM
		15:10 - 15:30	Flexible DRI operation with high-temperature electrolysis for cost-effective iron decarbonization Marco Ficili, Politecnico di Milano
		15:30 - 15:40	Closing Marco Omotto, Conference Chairman, Danieli Automation Klaus Peters, Secretary General, ESTEP
		15:40	End of conference - Farewell coffee

    		    	
Programme How decarbonisation, digitalisation and circular solutions forge the sustainable European steel future		Programme How decarbonisation, digitalisation and circular solutions forge the sustainable European steel future	
POSTER SESSION		POSTER SESSION	
Monitor 1	MSCA Doctoral Network HELIOS - Using hydrogen in stainless steel production and process residue valorisation Annelies Mafflet, KULeuven	Monitor 10	Increased metallization in a shaft furnace equipped with a Christmas tree Antoine Marsigny, Université Lorraine - Institut Jean Lamour
Monitor 2	ABS Roads EVO - Sustainability and innovation in permeable pavements Mauro Socco, Acciaierie Bertoli Sefau	Monitor 11	A modular edge AI framework for industrial environments Nikolaos Matskanis, CETIC
Monitor 3	Development and successful full-scale implementation of hydrogen as a fuel in flameless oxyfuel combustion Mikhail Lukin & Joachim von Scheele, Linde	Monitor 12	TGA/MS analysis as a tool for assessing biomass utilisation in iron ore sintering process Paulina Copik, GfT-Lukasiewicz
Monitor 4	CISMA: Circular steel for mass market applications Jaume Pujante Agudo, EURECAT	Monitor 13	Upscaling at CRM to support EU iron- & steelmaking de-carbonization and circular economy roadmaps Jean Borlee, CRM Group
Monitor 5	Nozzle clogging in steel continuous casting: multi-phase multi-physics simulations Hadi Barati, K1-MET	Monitor 14	Production of low carbon H2 by nuclear powered electrolysis and implications for European clean steel production Dirk Rabelink, ULC-Energy
Monitor 6	Biocarbon for fossil-free metallurgy: Technical feasibility and pathways from the HabiMet project Tova Järnerud, SWERIM	Monitor 15	Predicting matrix phase composition and properties using CALPHAD-guided thermokinetic simulations with MatCalc Markus Fürstner, Technische Universität Wien
Monitor 7	Decarbonization solutions for the integrated steel plants: first of the kind installations Maryam Baniasadi, SMS Group	Monitor 16	AI support system for dimensional control in steel production Francesca Motta, Danieli Automation
Monitor 8	From copper to steel: on-site renewable biosyngas as a scalable pathway to decarbonise high-temperature processes Thomas Brück, Mevo Energy	Monitor 17	ProcTwin - A distributed AI platform for optimizing and visualisation of steel manufacturing process chains Gunnar Mathiasen, University of Skövde
Monitor 9	Hybrid AI approach for yield improvement and scrap mix optimisation in DRI-EAF steelmaking Vikas Goel, Tavant		
    		    	

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List of acronyms and abbreviations

Acronym	Full Name
ADI	Acciaierie D'Italia
BFI	VDEH-Betriebsforschungsinstitut GmbH
CO	Communication Objective
CSP	Clean Steel Partnership
CTR	Click-Through-Rate
DO	Dissemination Objective
EAF	Electric Arc Furnace
EC	European Commission
ESTEP	European Steel Technology Platform
EU	European Union
FER	Feralpi Siderurgica SpA
FRP	First Reporting Period
GHG	GreenHouse Gases
HEU	Horizon Europe
KPI	Key Performance Indicator
OEM	Original Equipment Manufacturer
RTO	Research and Technology Organisation
R&I	Research and Innovation
SRP	Second Reporting Period
SSSA	Scuola Superiore Sant'Anna
TRP	Third Reporting Period
WP	Work Package