HIGHLIGHTS 2020

EUROPEAN STEEL TECHNOLOGY PLATFORM

Neuer Zollhof

With its versatility, steel is everywhere and is at the heart of delivering innovative solutions. The usage of steel in construction and infrastructure is one example among many other steel applications. One inspiring project is the Neuer Zollhof (the New Zollhof), a structure being part of a three buildings complex in the Media Harbour of Düsseldorf.

Designed by the architect Frank O. Gehry, the building complex consists of three separate constructions with each different materiality, floorplan and facade. The completely clinkered building facing the harbor is angularly deformed, while the central structure has a wavy stainless-steel facade that reflects the surroundings and the shape of the white-plastered edifice is determined by the nested building volumes and large-format curves. The central building's stainless-steel reflects material and shapes of its two neighbours. It completes the shimmering character of this unique building.

Foreword

We jointly take this opportunity to highly thank all those who supported, and cooperated with, the European Steel Technology Platform (ESTEP) in 2020.

The year 2020 was a thoroughly disruptive and transformative year. Despite the challenging times of the COVID-19, it was ESTEP's most productive year yet. Indeed, we could only master the new way of working and confront the challenges thanks to the flat hierarchy in ESTEP, the open and transparent communication as well as the great level of activities from the members. Strong collaboration helps us achieve more together than we can ever do separately.

ESTEP continued to provide suggestions about how to further improve the European framework in order to facilitate the sustainable transition of the European steel industry towards carbon neutrality. We have mastered the preparation of the Clean Steel Partnership as well as the inclusion of the steel topics in the Horizon Europe Framework Programme. The ESTEP community also mastered to transform the thematic workshops into a successful and attractive digital format. ESTEP, together with its increasing membership, has also continued to be engaged in European public funded projects as both beneficiary and partner.

We look forward to a challenging business year in 2021 with several important decisions ahead. Specifically, these include the signature of the Memorandum of Understanding of the Clean Steel Partnership under Horizon Europe, along with other European instruments such as the ETS Innovation Fund or Important Projects of Common European Interest (IPCEI). We would be delighted if the ESTEP community could count on your contribution within the Focus Groups, the Steering Group and beyond.

This report describes the main activities and meetings held in 2020. It then outlines the Focus Groups' efforts and engagements, as well as ESTEP's involvement in different platforms, initiatives and programs. It finally gives a brief overview of activities and actions planned for 2021.

On behalf of ESTEP,

Klaus Peters, Secretary General, ESTEP

Carl De Maré, Chairman, ESTEP

Activities in 2020

January

GREENSTEEL Kick-off meetings

As the Green Steel for Europe (GREENSTEEL) project, a European Parliament Pilot Project on Research on reduction of CO_2 emissions in steel production, was set to start in January 2020, kick-off meetings with the Consortium and the stakeholders were organized in order to raise awareness of the project and to engage relevant stakeholders, also beyond the steel industry.

The kick-off meeting with the Consortium was held on 9 January and two other kick-off meetings with the stakeholders, namely the Steering Committee and the Advisory Board took place on 16 January at CEPS.

February

SPIRE-SAIS Kick-off meeting

The SPIRE-SAIS project, a 'Skills Alliance for Industrial Symbiosis – A Cross-sectoral Blueprint for a Sustainable Process Industry ', had its kick-off meeting on 6 and 7 February 2020 at ESTEP/EUROFER's offices in Brussels.

The meeting brought together the stakeholders across the SPIRE community, with the steel sector as one of the eight SPIRE sectors involved. 5 of 24 partners - such as ESTEP - represent the steel industry and will contribute to the project. The project coordinator is Antonius Schröder from TU Dortmund, and member of ESTEP's Focus Group People.

March

ESTEP Steering Group meeting

The Steering Group meeting was held on 3 March 2020. The Chairman Michael Steinhorst from Tata Steel stepped down due to the start of his retirement. ESTEP members thanked Michael Steinhorst for his devotion towards the progress of ESTEP and his leadership of the Steering Group.

As successor, Franz Androsch from voestalpine has been nominated as the new chair of the Steering Group. Members welcomed him and wished him good luck for the continuation of the ESTEP activities.

March 2020 was also marked by the start of the COVID-19 pandemic. This was also the start of a yearlong remote meetings.

May

Steel Sector Career Conference

The Steel Sector Careers Final Conference from the project Steel Sector Careers - More Opportunities Than You Can Imagine, took place online on 15 May.

The goal of the conference was to bring together key steel sector stakeholders, including company representatives, worker and sector organisations, public authorities and education providers. ESTEP members from Sidenor, Felix Bayón, Tata Steel, Joanne Kuipers, and TU Dortmund, Antonius Schröder, contributed to various sessions.

The main discussions reflected the outcomes of the "Blueprint for sectoral cooperation on skills: Towards an EU strategy addressing the skills needs of the steel sector" initiative, the skills needs and jobs profiles as well as possible actions to decrease skills gaps in the steel sector.

June

ESTEP Ordinary General Assembly

The third ESTEP General Assembly took place on 25 June. The priorities and the activities for 2020 were discussed along with the new objectives and proposed future activities for 2021.

The top priority for 2020 was the preparation of the Clean Steel partnership (CSP) along with its impact on the Technology Platform.

July

ESTEP 's new logo

Since July 2020, ESTEP has a new logo. It is a bridge that symbolises the platform aspect of ESTEP by bringing people and future-oriented ideas together in order to foster the exchange of different views. The stars show the bonds to the EU and as they are arranged in a circle, they provide a link to the circularity of steel. It also represents the cut-edge approach with the vertical lines of the letters.

ESTEP
European Steel Technology Platform

September

Clean Steel Partnership: webinar on public consultation of the roadmap

On 8 September 2020, ESTEP organised its first webinar in order to support the public consultation of the roadmap of the Clean Steel Partnership (CSP).

The ambition of the Clean Steel Partnership is to accelerate the activities of the steel industry in order to upscale and implement low-CO_2-technologies while keeping the EU steel industry at the forefront of clean steelmaking (low CO_2 emissions) without losing its competitiveness.

The webinar provided a summary of the draft roadmap, which set out more details of the activities and the impact of the partnership itsef. The public consultation, a web-based questionnaire facilitated by ESTEP, enabled to gather views and inputs for a third draft of the roadmap (also called Strategic Research and Innovation Agenda). By end of September, the public consultation received almost 200 responses.

September

ESTEP Extraordinary General Assembly

On 29 September, an extraordinary ESTEP General Assembly took place on the re-election of the ESTEP Board of Directors.

The regular term of the Board of Directors is 2 years. However due to the COVID-19 pandemic and the non-possibility to hold physical meetings, this Extraordinary General Assembly on the election of the Board of Directors was being held remotely. The four members of the Board of Directors members, i.e. Carl De Maré (ArcelorMittal), Axel Eggert (EUROFER), Roberto Pancaldi (Tenova) and Göran Carlsson (SWERIM) have been re-elected for a shortened term. The shortened term of office ends at the latest with the next Ordinary General Assembly of ESTEP, which is planned for June 2021.

October

Digital Conference IndTech 2020

Under the auspices of the German Presidency of the Council of the European Union, the digital conference "Industrial Technologies 2020 – Transition to Sustainable Prosperity" (IndTEch2020) took place from 27th - 28th October 2020. This virtual workshop was mainly organised by the German Federal Ministry of Education and Research (BMBF), Project Management Jülich together with other partners such as the European Commission.

The ESTEP President, Carl De Maré participated at a first session called 'European Green Deal: Carbon Neutrality in Industrial Technologies – Is this possible?' He also contributed at a second session entitled 'Horizon Europe Partnerships - How They Create Opportunities for New EU Collaborations and How They Can Enable the Transition to Economic, Social and Environmental Sustainability'.

October

Artificial Intelligence & Machine Learning workshop

The ESTEP Focus Group Smart Factory hosted its second workshop on 'Artificial Intelligence (AI) and Machine Learning (ML): Impact and opportunities of artificial intelligence in the steel industry'. The workshop was successfully held online under four sessions in October and November 2020. It has reached more than 100 participants.

The topics were focused on 'Enablers & Barriers: Case Studies from steel and other sectors', 'the needs and impact of AI & ML on the steel industry', 'Implementation, IT-OT links, Cybersecurity, HMI & M2M' and as last session 'Examples of AI in steel operations'.

November

Resi4future workshop

In November 2020, the ESTEP Focus Group Circular Economy organised its second workshop called 'Resi4future: Residue valorization in iron and steel industry - sustainable solutions for a cleaner and more competitive future Europe'. The workshop was also successfully held online under four sessions.

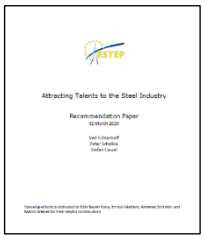
The topics dealt with 'EU Green Deal, Circular Economy and REUSteel Project', Iinternal residue recycling', 'Secondary resources from non-steel sectors' and as last 'slag valorization'.

Suggestions for further reading

At ESTEP we consider research as well as publications very important. Several ESTEP members are publishing papers, articles and reports. Here are some suggestions that reflect the work done by ESTEP members as well as other publications that we consider valuable for the steel industry.

ESTEP Focus Smart Factory: Impact and Opportunities of Artificial Intelligence Techniques in the steel industry: ongoing applications, perspectives and future trends, (2021), Springer, Editors Valentina Colla & Costanzo Pietrosanti

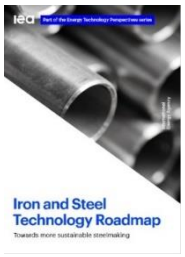
ESTEP Focus Group Circular Economy: Report on Resi4Future: residue valorisation in iron and steel industry: sustainable solutions for a cleaner and more competitive future Europe (2020)



ESTEP Focus Group People: Recommendation paper on Attracting talents to the steel industry (2020)

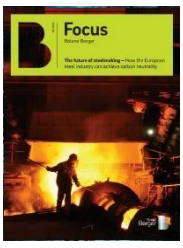
Some recent studies that show their estimates of production costs with breakthrough technologies in the steel and other energy intensive industries by 2050

Report on 'Energy Technology Perspectives' 2020, by the International Energy Agency



Report on 'Industrial transformation 2050 – Pathways to Net-Zero Emissions from EU Heavy Industry', by Material Economics (2019)

Study on 'Climate neutral industry: key technologies and policy options for steel, chemicals and cement' (in German) by Agora Energiewende and Wuppertal Institute (2019)



Report on 'The future of steelmaking – How the European steel industry can achieve carbon neutrality', by Roland Berger

ESTEP Focus Groups

The Steering Group, which is in charge of piloting the overall ESTEP research programme and reviewing the activities of the Focus Groups, held three meetings in 2020. The exchange between the Focus Groups (FG), the Heads of Research of steel producers and key representatives of steel stakeholders, allowed to provide valuable feedback to the work programme of the Focus Groups. The chairman of the SG strongly supported the cooperation between the Focus Groups as today's challenges are often broader than the scope of one single focus group. Michael Steinhorst stepped down, while Franz Androsch took over the chairmanship of the SG.

In 2019, the Focus Groups continued to work under a task approach. The tasks are divided under three categories depending on the efforts and resources needed. A well-defined task can either represent a mini-conference or a pre-study. More complex tasks can be defined as a project that needs a contract among task members.

Focus Group Circular Economy

The main focus in 2020 for the Focus Group (FG) Circular Economy were the training and Innovation/Uptake pillars.

Online workshop

The FG Circular Economy organized an online workshop on 'Resi4Future – Residue valorisation in iron and steel industry: sustainable solutions for a cleaner and more competitive future Europe', which was finalized in collaboration with the RFCS dissemination.

During the four days web event in November 2020, technical solutions contributing to the overall goals defined in the Circular Economy Action Plan and the Green Deal of the European Union were presented. The needs, best practices and innovative solutions was shared between 80 participants and 23 companies representing steel producing companies, universities, and RTOs from Europe as well as from other parts of the world. The main takeaways of the four different sessions dealt with the following aspects:

- EU Green Deal, Circular Economy & RFCS Project REUSteel
- Internal residue recycling
- Secondary resources from non-steel sectors
- Slag valorization

The main area of activities has been clustered and their link to the building blocks of the Clean Steel Partnership Road Maps has been identified.

Dissemination action

In addition, the FG Circular Economy, in collaboration with the FG Smart Factory, continued ESTEP dissemination actions with the participation at a webinar on Future Steel Forum Digital and with a publication in the Journal Matériaux & Techniques.

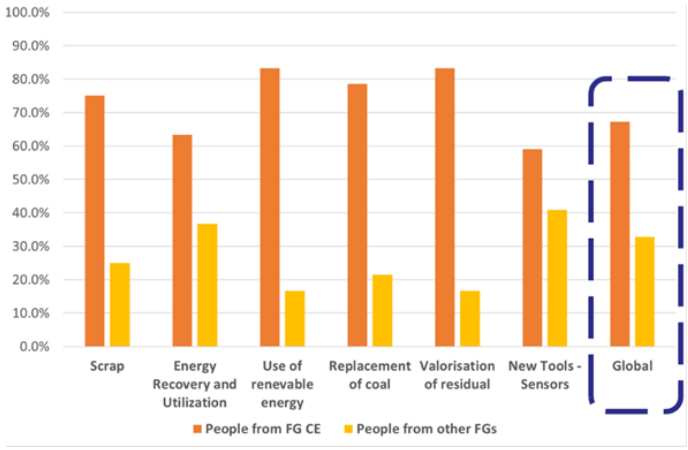
Big Data and Artificial Intelligence: two major enablers of the environmental and social sustainability of steel production processes
Valentina Colla, Costanzo Pietrosanti, Enrico Malfa

Matériaux & Techniques

Environment 4.0: How digitalization and machine learning can improve the environmental footprint on the steel production processes
Valentina Colla, Costanzo Pietrosanti, Enrico Malfa, Klaus Peters

Innovation/Uptake

In the frame of Innovation/Uptake pillar, the roadmap on 'Improve the EAF scrap route for a sustainable value chain in the EU Circular Economy scenario' has been prepared under the coordination of Scuola Superiore Sant'Anna. This task is a good example of the collaboration within ESTEP. Indeed, it involved 19 ESTEP members (8 steel producer, 4 technology providers, 6 RTOs, 1 Association) with a total of 38 peoples. The draft of the document has been completed and is now under consultation with the various Focus Groups before receiving the final approval step of Steering Group.



Participation of FGs in the execution of EAF Road Map

Moreover, the FG Circular Economy has identified three ambassadors inside its FG, and who will capitalize and improve the collaboration with other FGs. The idea is also to find further synergies in the preparation of new tasks of common interest and in the execution of cross-FG tasks. The FG CE Ambassadors are Valentina Colla for the FG Smart Factory, Filippo Cirilli and Ismael Matino for the FG Low-Carbon & Energy Efficiency.

Focus Group Transport & mobility

During 2020, the Focus Group Transport and Mobility finalized the ESTEP model contract for ESTEP projects. This contract will serve as template for future projects in ESTEP, which due to its size require a contract between the partners.

The FG also started its first two ESTEP projects in 2020. The project on 'Measurement of Local Ductility for AHSS' is a joint project with the VDA (Verband der Automobilindustrie). The objective of the project 'Local Ductility' is the generation of a common understanding of local ductility measurements via tensile tests and to show the added value of such a characteristic for material characterization. The second project "Hydrogen Embrittlement" should generate a scientific basis for an EN–standard that will allow testing hydrogen embrittlement in cold formable steel grades. Both projects are on track even if the COVID-19 pandemic and the short-time working of most of the partners caused some delay in the project plan.

In the past year, all FG and project meetings were held remotely because of the COVID19 restrictions. For the near future, the Focus Group is looking at the future challenges and opportunities for steel in transportation under the circumstances of reducing greenhouse gases, autonomous driving and other future trends.

Focus Group Construction & Infrastructure

During 2020, the Focus Group Construction & Infrastructure had several meetings in order to continue to develop the task 'Smart Dual Function Building Envelop'. The main aim of the proposal is to develop a steel intensive active, adaptable, intelligent dual function building envelop that is capable to generate and capture the energy needs of a building.

Focus Group People

2020 was characterised by an intended growth of members of the Focus Group People. From about 10 to now 24 members represented companies, i.e. thyssenkrupp, Tata Steel, Sidenor, Voestalpine, ArcelorMittal, SMS Group, Celsa. The FG members raised awareness and spread the mission of proactive skills adjustments especially concerning digital and green transition. This was mainly done by engagement of most of the members in the two Skills Flagship Projects: ESSA (European Steel Skills Alliance) and SPIRE-SAIS (Skills Alliance for Industrial Symbiosis).

Within the ESSA+ task, not only first project results but also the people-driven approach of ESTEP was disseminated both at European and worldwide levels, and not only across the steel industry but also to other sectors. The steel sector successfully integrated the people perspective in the new SPIRE programme 'Processes for Planet', where next to other non-technological and social innovation issues, human resources (especially skills) became an innovation topic.

Moreover, as part of the ESSA+ task, the FG People started to build a close cooperation with the FG Smart Factory by combining the technological with the people perspective. The FG People also contributed at the workshop on Artificial Intelligence & Machine Learning, but also organised common workshops, meetings, and tasks with FG Smart Factory.

ESSA and SPIRE-SAIS were presented to the audiences of various workshops and conferences, amongst others in the final conference of the "Steel Sector Careers: More opportunities than you can imagine" project .

The common ESTEP/ESSA Midterm Conference will take place online at in May 2021, with the aim of conducting a broad and high-level speaker integration of steel industry actors.

Finally, within the frame of the task on 'Attracting People to the Steel industry (ATS)', the FG published a recommendation paper, which was based on an article and survey that the FG People already conducted in 2015 .

Focus Group Low-Carbon & Energy Efficiency

In 2020, Marten Sprecher from HKM, assumed the new role of chairman of the Focus Group Low-Carbon & Energy Efficiency. The members of the FG thanked Jean Borlée for his strong commitment and work for the previous years as chairman.

In the first months of 2020, the FG had three remote meetings where overall 20 ideas of workshops, research and studies were submitted to the chairman. As the Focus Group accounts up to 70 members, in order to have a better and more efficient way of working on the various topics, four blocks (sub-groups) within the FG have been created. The subgroups are divided as such:

- Decarbonisation of steel making (BF-BOF route and EAF-Route)
- Carbon capture storage and utilization
- Circular Economy
- Energy Efficiency and CO_2-Mitigation (recovery and energy storage) in heating applications

However, there are interconnections to the other Focus Groups of ESTEP which are discussed in detail in order to have a coordinated approach and procedure for generating tasks and projects, and to avoid duplication of tasks.

In 2020, the work of the Focus Group on Low- Carbon & Energy Efficiency also supported the Clean Steel Partnership with the pathways of Smart Carbon Usage (SCU) and Carbon Direct Avoidance (CDA).

Focus Group Energy Market Applications & Engineering

In 2020, the Focus Group Energy Market has started to revitalize by generating some ideas and initiatives in order to propose new tasks for 2021. Topic ideas such as Energy as enabler for the steel industry are brought forward and were preliminary discussed. The task generation will continue in 2021.

Focus Group Smart Factory

Throughout 2020, the Focus Group Smart Factory continued its activities and enhanced it close cooperation with other Focus Group of ESTEP. This was namely done with holding joined workshops and meetings.

In terms of publication, the FG published an article on 'Environment 4.0.: How digitalization and machine learning can improve the environmental footprint of the steel production processes'. Authors are Valentina Colla, Costanzo Pietrosanti, Enrico Malfa and Klaus Peters.

The FG Smart Factory also organised in 2020 its second workshop on 'Artificial Intelligence (AI) and Machine Learning (ML): Impact and opportunities of artificial intelligence in the steel industry'. The event aimed at analysing the diffusion of AI technologies in steelworks and at providing indications for future research, development and innovation actions addressing the sector demands. The perceptions, experiences and needs expectations concerning the application of the Artificial Intelligence and Machine Learning in the steel sector are collected in the book entitled ' Impact and Opportunities of Artificial Intelligence Techniques in the steel industry: ongoing applications, perspectives and future trends' (Springer 2021). Editors of the book are the FG Smart Factory members: Valentina Colla and its chair Costanzo Pietrosanti.

In addition, next to providing contributions to the Clean Steel Partnership, the FG also further worked on the 'Steel Smart Factory Roadmap'. The 2020 edition of the ESTEP Smart Steel Factory Roadmap focuses the role of the digital transformation to enable the achievement of the competitive & sustainable steel manufacturing according to the Europe 2020 Agenda.

Clean Steel Partnership

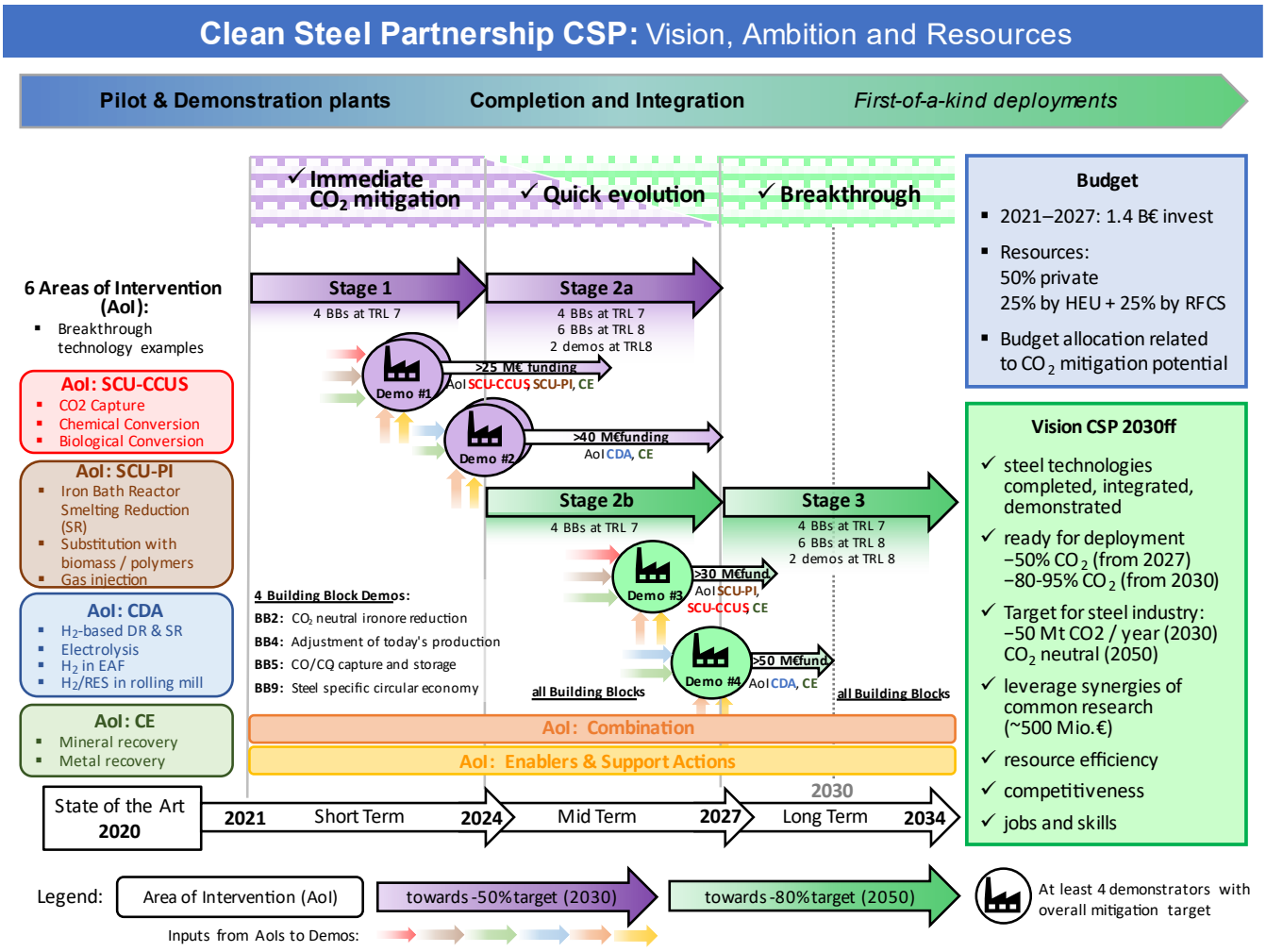
Proposal for the Clean Steel Partnership

In February 2020, ESTEP adopted a final template for the proposal for the Clean Steel Partnership (CSP) under the Horizon Europe.

The main objectives of the partnership until 2030 will be to develop and test at large scale and high TRL the technologies required to reduce CO2 emissions from EU steel production by 80-95% compared to 1990 levels by 2050, while preserving the competitiveness of the EU steel industry. The Clean Steel Partnership will ensure a coordinated, sustainable approach across stakeholders, technologies, production routes and countries, leverage private investments, and provide the needed support to accelerate demonstration projects.

In July 2020, ESTEP released the Clean Steel Partnership proposal for the purpose of ensuring transparency of information on the current status of preparation (including on the process for developing the Strategic Research and Innovation Agenda/ Roadmap). As such, it aims to contribute to further collaboration, synergies and alignment between partnership candidates, as well as more broadly with related R&I stakeholders in the EU, and beyond where relevant.

Clean Steel Partnership multi-stage approach



Clean Steel Roadmap

A key precondition for the Partnership is the existence of an agreed Strategic Research and Innovation Agenda (SRIA) / roadmap. The launch of the Partnership is also conditional to partners signing up to a final, commonly agreed objectives and committing the resources and investments needed from their side to achieve them.

The ESTEP members decided on the structure of the roadmap in December 2019: four chapters on the vision, innovation & research, impact and governance.

In the first quarter of 2020, 17 steel producers, representing all production routes in the EU, provided input on around 200 foreseen activities following the building block approach the technological pathways. They presented a first draft of the roadmap to the steel community during ESTEP and EUROFER meetings.

During the second quarter of 2020, the Clean Steel Partnership Task Force updated the roadmap in consultation with the European Commission Services. CEO's of the steel producers shared their views, in particular on KPIs and targets. The second version of the roadmap then saw the light.

A public consultation of the draft roadmap started in September. ESTEP hosted a web-based event. After an evaluation effort of the consultation feedback, ESTEP could publish a third version of the draft Roadmap.

Throughout the whole process of establishing the Clean Steel Partnership, ESTEP and EUROFER continued their close cooperation. EUROFER Director General, Axel Eggert, and ESTEP Secretary General, Klaus Peters, send a letter to Jean Eric Paquet, Director General DG RTD, for a meeting request.

EUROFER
From the Director General

ESTEP

Mr Jean Eric Paquet
Director General DG RTD,
European Commission

Wednesday, 23 September 2020

Dear Mr Paquet,

In light of the proposal for a European partnership on "Clean Steel – Low Carbon Steel Making" is now entering in its final stage of the decision-making process, we kindly request the opportunity of a web-meeting to discuss some important elements and ensure that the partnership will be fit for the challenges it is called upon to answer.

We have experienced good cooperation with the services of DG RTD and progress in the drafting of both the Clean Steel partnership proposal and roadmap; however, we are concerned about a number of issues stemming from the budgetary set up of the partnership, which calls for a more detailed discussion and stringent cooperation, in particular as regards the shaping of the Horizon Europe work programme and its future impact on the daily functioning of Clean Steel.

We are very pleased to see that the importance of RED&I for low carbon steelmaking, and its potential contribution to the realisation of the European Green Deal, has been recognised by President von der Leyen in her state of the Union address at the European Parliament on 16 September 2020. We also recall the recent initiative of the German government, which has launched a holistic sectorial proposal for the transition of the European steel industry[1].

We would also like to discuss among the Commission legislative proposal on ECSC and RFCS, which requires a swift adoption to make part of the public funding to Clean Steel operational, and further elaborate on our contribution to the Horizon Europe work programme, which is currently in its drafting phase.

We thank you for considering this request.

Kind regards,

Axel Eggert,
Director General
The European Steel Association (EUROFER)

Klaus Peters
Secretary General
European Steel Technology Platform (ESTEP)

[1] For a strong steel industry in Germany and Europe: The Steel Action Concept, German Federal Government, July 2020

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The European Steel Association (EUROFER) AISBL | Avenue de Cortenbergh, 172, 1000 Brussels, Belgium
+32 2 738 79 20 | mail@eurofer.eu | www.eurofer.eu | EU Transparency Register: ID 93550671153-83

The four chapters of the roadmap are described in a comprehensive way:

- The Partnership's vision and ambition in the context of the climate change and sustainable growth in the EU, the R&D&I issues and needs for the partnership, renewable energy, and the European Green Deal as a just transition
- The research and innovation strategy based on areas of intervention, building blocks, a timeline and budget distribution
- Expected impact on the resources needed to implement the roadmap, the expected impacts on industry and society of carbon avoidance and smart usage of carbon, and EU added value
- The governance model of the Partnership aiming at openness and transparency

Prospection

One of the objectives of the ESTEP Clean Steel Partnership is to broaden and widen the membership. In 2020, efforts in attracting new steel producers from the Electric Arc Furnaces sector were successful.

Staff perspectives

In 2020, the ESTEP Board of Directors decided to hire a dedicated Clean Steel Programme Director. The selection process took place in the last quarter. Patrick Lafontaine will join the team on January 2021.

"Decarbonisation will need an industrial revolution, in particular effecting process industries like the steel industry in the upcoming years and decades. Since most processes and supply chains will be affected, this is a process of maximum complexity. Taking into account the huge pressure of time and the long investment cycles in the steel industry, the demonstration and the scale-up of decarbonisation technologies are the very important next steps of Research & Development. The Clean Steel Partnership can significantly support this vital step and can become a major enabler on the road to a carbon neutral steel production, with focus on the European industry but with potential for a global lighthouse. As head of department "Process Optimisation Iron- and Steel production" at VDEh-Betriebsforschungsinstitut my main role in the CSF Task Force is to support with the view of applied research and as work package leader of the project "Green steel for Europe" with the view on the mid- and long-term roadmapping of industrial decarbonisation."

(Thorsten Hauck, VDEh-Betriebsforschungsinstitut)

"This CSP initiative results from intense preparatory work accomplished in 2018 and 2019 by EUROFER and ESTEP members, notably in the frame of the Working Group Process/Focus Group Low-carbon & energy efficiency of ESTEP and supported by the Low Carbon Future RFCS"

(Jean Borlée, CRM)

Dissemination project Partners of the LowCFuture project (BFI, CRM, CSM, K1-MET and SWERIM) pictured on a project meeting at CRM, early 2019

"Make not so obvious things happen. It is fascinating that a small group of people representing the EU steel sector managed to align on a common vision towards demonstration of decarbonisation of steelmaking and to finally share this 10 years vision with representatives of the European Commission. It is nice to recognise that team spirit made it".

(Franz Hörzenberger, ArcelorMittal)

"The steel industry is a crucial asset for the EU economy. Decarbonising the steel industry is essential to achieve the 2030 EU climate and energy targets and implementing the 2050 long-term strategy for a climate-neutral Europe. Decarbonising the steel industry is also essential to preserve the competitive position of EU steelmaking, the number of jobs created, and its technological leadership. Decarbonising the steel industry requires, however, major investments. While part of the investment can be made directly by steelmakers, public support is needed, especially if one considers the high-risk profile of low-carbon steelmaking projects and the large societal benefits that can stem from the decarbonisation process. The Clean Steel Partnership represents a significant step in the right direction and can effectively position the EU as a leading provider of low-carbon products, services, and advanced technologies in steelmaking, ultimately supporting the green transition and fight against climate change on a global scale".

(Felice Simonelli, CEPS)

"The definition of the Clean Steel Partnership SRA has been an intensive and challenging work aimed to address the main challenges that steel producers, technology providers and RTOs are facing in terms of Research & Development & Innovation (R&D&I) to reach climate neutrality by 2050. As Chairman of the Focus Group Circular Economy, my main role in the CSF Task Force is to contribute to the definition of a proper framework that embraces the development of new technologies enabling the smart use of resources and the valorization of residue. The steel sector has already a relevant role in the Circular Economy in EU, however the CSP is an important opportunity for ESTEP members, among which Tenova's contribute as technology provider, to build an holistic view of possible contribution to facilitate and accelerate the transition towards sustainable steel production."

(Enrico Malfa, Tenova)

CSP activities outlook for 2021

Brokerage event

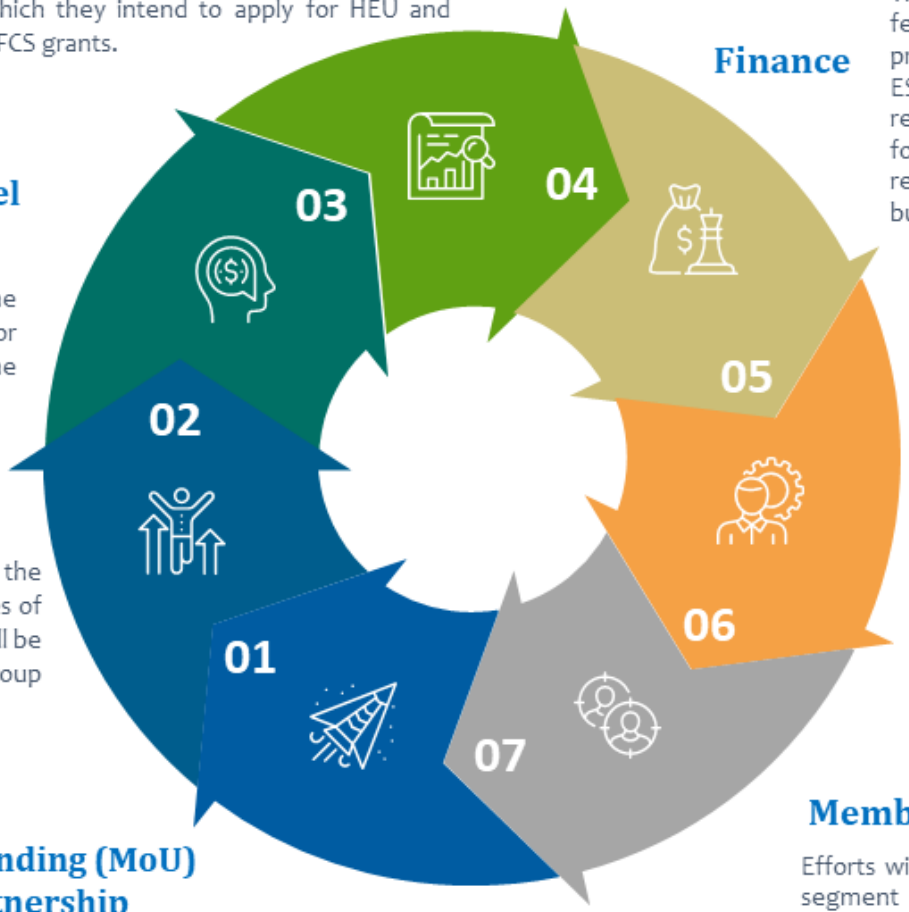
A brokerage event will be organised where members will present their projects for which they intend to apply for HEU and RFCS grants.

Finance

The CSP will mainly be financed by additional membership fees (AMF). The AMF for each member will be calculated in proportion to the EU funding granted from the CSP to the ESTEP member and will only be charged to members, who received funding from the CSP. The first AMF income is foreseen for 2023. Pre-financing in 2021/22 from ESTEP reserves is foreseen following conservative and cautious budgeting of activities.

Horizon Europe (HEU) and Research Fund for Coal and Steel (RFCS) calls 2021/22

A follow-up of the HEU draft call documents and the further development of ideas for RFCS calls for proposals will be carried out in collaboration with the Commission.



Roadmap

The roadmap will be further fine-tuned as a result of further insights on the development of the expected HEU and RFCS calls, exchange of ideas with the Commission .

Governance

A CSP Partnership Board with representatives of the various Commission services and of the representatives of the Partnership will be established. The Partnership will be assisted by a Program Office, an Implementation Group and various Task Forces.

Membership development

Efforts will be made to attract new members in the SME segment with activities related to R&I. Special attention will be paid to countries in Eastern Europe and gender equality of representatives.

Memorandum of Understanding (MoU) for the Clean Steel Partnership

A co-programmed MoU describing the general terms regarding the objectives, the contribution and activities by the private partners and the European Commission, the governance, monitoring and reporting will be developed in 2021.

ESTEP's projects & contributions

ESTEP is involved in a number of initiatives and has continued its involvement in various activities in 2020 in order to strengthen the position of the steel sector. The activities are based on the ESTEP membership in the relevant committees and bodies.

Research Fund for Coal and Steel (RFCS)

In addition to the regular annual RFCS call, it was a top priority in 2020 to adapt the needed Council regulations of RFCS to support the proposed Clean Steel Partnership. Three Council decisions were affected:

- COM(2020) 319 on Decision 2003/76/EC establishing the measures necessary for the implementation of the Protocol
- COM(2020) 320 on Decision 2008/376 on the adoption of the Research Programme and on the multiannual technical guidelines
- COM(2020) 321 (DG BUDG) on Decision 2003/77 laying down multiannual financial guidelines for managing the assets of the ECSC in liquidation

In 2020, two ad-hoc SAG meetings were held in order to timely follow-up on the progress of the RFCS issues. Due to COVID-19, the meetings were organised as remote meetings. One took place in April and the other in July 2020.

RFCS had its annual SAG meeting in December 2020. It was the last meeting with Hervé Martin as Head of Unit, as he retired 31 December 2020. The SAG members wished him all the best and acknowledged with pleasure the achievements: The RFCS modernisation package is well progressing to support the Clean Steel Partnership, which is well positioned.

For the first time, the SAG members proposed to not use an annual priority for steel. In addition, ESTEP and EUROFER announced to provide strategic input for the modernization of the RFCS programme in the coming weeks.

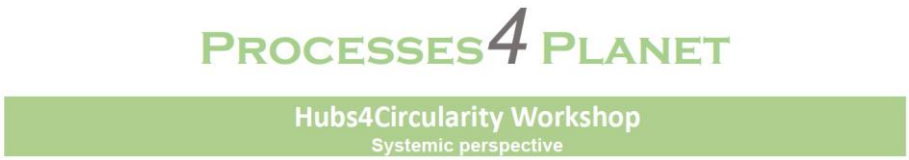
Sustainable Process Industries through Resource and Energy Efficiency (SPIRE)

In 2020, SPIRE was very busy to prepare the continuation of funding support for the process industry by a new EU partnership under Horizon Europe. The final version of the proposal was generated and the new partnership roadmap was prepared. A new name for the Horizon Europe partnership was decided: Processes4Planet along with a new logo. By the middle of 2020, the negotiation with the European Commission started about the Memorandum of Understanding, which will establish the Processes4Planet partnership.

The roadmap introduced marbles as large size and high TRL follow-up activities of A.SPIRE members to SPIRE funded projects.

Furthermore, SPIRE finalised the update of its statutes to comply with the new Belgian Company law. By this occasion, the number of sectors represented in the Board was increased. The 8 founding sectors were complemented by another 2. In March 2020 the Vice -Presidency for ESTEP was confirmed.

Another key element was the concept of Hubs for Circularity (H4C). A dedicated workshop was organized on 07 October 2020, in which Patrick Lafontaine gave a presentation.



REUSTEEL

ESTEP is beneficiary of the RFCS project 'REUSTEEL: project dissemination of results of the European projects dealing with reuse and recycling of by-products in the steel sector.'
The proposal aims at developing an extensive action of dissemination and valorisation of the most important research results on the reuse and recycling of by-products derived from the steel production cycle as well as the exploitation of by-products coming from other industrial sectors within the steelmaking cycle. The project started in June 2019 and was set to last for a total duration of 24 months (until mid-2021). However, a prolongation of the project (for 6 months) has been requested since COVID-19 made dissemination activities challenging.

Nevertheless, the REUsteel project has been successfully presented in various online conferences, amongst others the Resi4future workshop. The project will be part of the ESTAD symposium in 2021 and ESTEP will organise in 2021 webinar series in order to put forward the project.

SPIRE- SAIS

The proposal on the 'Skills Alliance for Industrial Symbiosis – A Cross-sectoral Blueprint for a Sustainable Process Industry (SPIRE – SAIS)' project was successfully submitted and approved in 2019. The project falls under the Erasmus+ Programme (Key Action 2).

The SPIRE-SAIS project brings together stakeholders from across the SPIRE community, including industry sector associations, education and training providers, research & technology organisations, research institutions, regional institutions, companies and others, to enable and accelerate the uptake of industrial symbiosis and energy efficiency by developing a comprehensive cross-sectorial blueprint for skills.

Erasmus+ Programme (Key Action 2)
Skills Alliance for Industrial Symbiosis - A Cross-Sectoral Blueprint for a Sustainable Process Industry (SPIRE-SAIS)

The project counts 24 partners, out of which ESTEP represents the steel sector along with other steel representing companies. The project had its kick-off meetings in February 2020 and will last for a total duration of 4 years.

Every three months, the whole project consortium meets at the General Assembly meetings, which makes it possible to follow the continuity of the project as well as the progress of activities across the various work packages.

European Parliament Pilot Project – Green Steel for Europe (GREENSTEEL)

On 25 April 2019, the European Commission adopted a financing decision to implement the European Parliament Pilot Project on 'Research on reduction of CO_2 emissions in steel production'. The Pilot Project GREENSTEEL explores the feasibility of implementing breakthrough technology

options, deployment paths and investment strategies for clean steelmaking in Europe with almost zero CO_2 emissions. It has the overall objective of contributing to the sustainable decarbonisation of the steel industry, helping to position the EU as a leading provider of low-carbon products, services and advanced technologies in steelmaking.

The project started in January 2020 for a total duration of 18 months (until June 2021), but it has been extended for four extra months as a consequence of the COVID-19. Its consortium comprises 10 partners, including ESTEP and EUROFER, and is coordinated by the Centre for European Policy Studies (CEPS). The deliverables of this project are pressing as they are intended to support the preparation for the Clean Steel Partnership.

Throughout the year 2020, intensive work was done by the whole consortium in order to complete the following work packages: technology roadmapping (WP1), analysis of investment and funding (WP2), impact assessment (WP3) and the dissemination and stakeholders' engagement (WP4). In 2021, a final conference will be held in order to present the project's results.

SET Plan action 6

The Set Plan action 6 Implementation plan was finalized in 2018 and the community decided to continue the Implementation Working Group 6 (IWCG6). Two sectors are set by default for actions and priories in the IWG6: chemicals and steel.

The first IWG6 meeting was held on 24 March 2020, in which the achievements of the SET Plan action 6 was recalled and the alignment of the action 6 with the new EU policies, such as the Green Deal was also addressed.

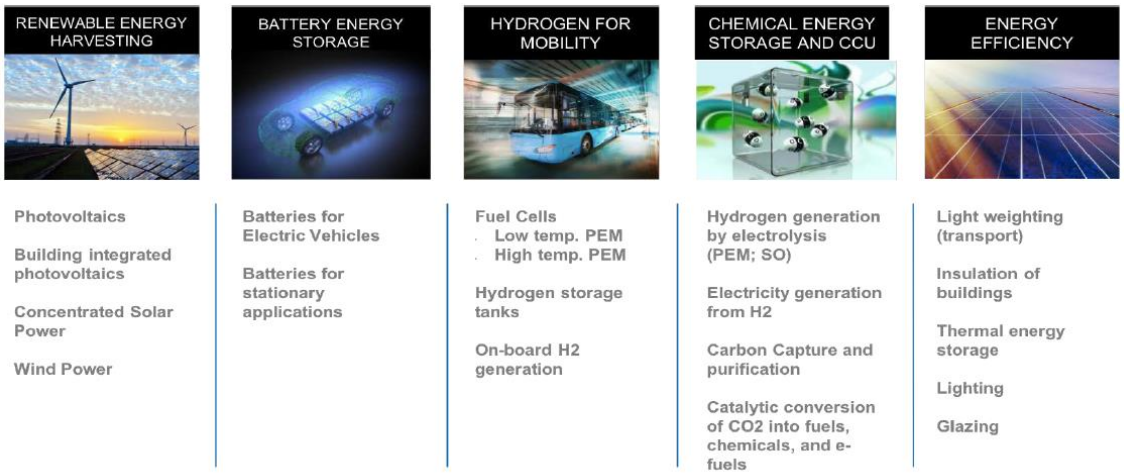
Moreover, the IWG6 secretariat presented the follow-up actions of the 2019 networking event. The one-to-one support to finance action 6 projects was still ongoing and possible. The steel sector was quite active by for example providing advice on how to secure funding from different EU and Member States sources, as well as on how to obtain large amount of funding from multiple programmes with different eligibility criteria.

In cooperation with the German Presidency of the Council of the EU, the 14th SET Plan conference was organised remotely in November 2020. The 'Implementing the SET Plan – 2020'progress report was released on the occasion.

As the European Green Deal is a central point for the SET Plan, EUROFER and ESTEP decided end of 2020 to bring the Clean Steel Partnership perspective in the IWG6. The planning of actions and follow-up with targets should be aligned with the CSP roadmap.

Energy Materials Industry Research Initiative (EMIRI)

In 2020, EMIRI updated its technology roadmap, which fully considered the elements of the European Green Deal. The roadmap explains how advanced material technologies enable a prosperous, sustainable and climate-neutral EU economy by 2050. The roadmap focusses on 5 priority technology areas R&I sectors, in which advanced materials make the difference.



ESTEP is member of the Steering Group of EMIRI as an observer. EMIRI successfully worked on the progress of a battery dedicated European partnership. Along with other partnerships, The proposal was published on 15 June 2020 on the European Commission website.

High-Level Group on Energy Intensive Industries (HLG EII)

The High-Level Group concluded in 2020 that as a follow-up of the 2019 Masterplan of the HLG on EII priorities, which is a mapping of the needed industry sites transition with the available and planned energy vectors (renewable electricity, non-fossil Hydrogen, biomass, etc), is necessary. This was mainly discussed in the HLG meeting in July 2020.

Masterplan of the HLG on Energy Intensive Industries
Strategic priorities

Creation of **Markets** for Climate-neutral, **Circular Economy** Products	Developing Climate-neutral **Solutions and Financing** their Uptake	**Resources and Deployment**	**Social Dimension**
Demand-side measures fostering demand and competitiveness	**Developing industrial demonstrators** of breakthrough technologies	Availability of **climate-neutral energy at globally competitive prices**	Empowering **consumers to make informed choices**
Alternative or complementary options for **carbon pricing** mechanisms	**R&D&I programmes** bringing solutions closer to the market	Access to **alternative feedstock** sources	Equipping workers with **new skills** to deal with the transformation
Empowering customers and consumers	Facilitating **access to private capital**	**Mapping** of energy and non-energy **infrastructure and supply**	**Helping communities** dependent on the EIIs to face the transition

In November 2020, the HLG EII presented their sectorial view on the decarbonisation efforts and pathways. The contribution from the steel sector was well perceived. The European Commission announced to continue with the HLG EII, which need a re-application for membership. ESTEP applied again for membership in the EII.

Outlook 2021

Looking ahead at what 2021 might bring, it goes without saying that steel will continue to be high on the agenda with an increasing level of activities regarding the Clean Steel Partnership and the Technology Platform. At ESTEP we will continue to push for a more ambitious rethink, deepen support for our members, and accelerate the creation of the necessary framework conditions for our industry to grow.

ESTEP is not just involved in research and is not only connected with the European Commission through the Horizon Europe and RFCS programs. It is also a European Technology Platform and will as such, continue to work on its visibility and on providing input for the decision-making process at European level. It will also continue to search for opportunities for its community in order to provide topics of the highest interest for its members. ESTEP will carry on going to EU events and meetings in order to establish new links with key European actors and to attract new potential members.

Now that the preparation of the Clean Steel Partnership preparations is mastered, 2021 will be the year to start deliver results. Indeed, call topics will be published and will need to be answered with impactful project proposals in order to tools to achieve the targets set out in the European Green Deal.

In the context of RFCS and Horizon Europe, ESTEP will continue to submit collaborative proposals, disseminating results via workshops and leading the informal follow-up meetings of the Steel Advisory Group – a voice for steel stakeholders. ESTEP's Focus Groups will play a key role. Several workshops in the area of 'Waste Heat Recovery' and 'Hydrogen' will be organised during 2021. ESTEP will also continue to engage in European-funded projects such as a dissemination partner.

Furthermore, in order to increase awareness of steel success stories, ESTEP will participate in, and contribute to, several initiatives and high-level events during the course of 2021. One of the main activities will be the signature of the Memorandum of Understanding of the Clean Steel Partnership at the European Research and Innovation Days as well as the conference ' EU Energy Sustainable Energy Week 2021' .

ESTEP members

ESTEP has 52 members as of June 2021

Glossary

AISBL	Association Internationale sans but lucratif (internationally non-for-profit acting association)
CEFIC	European Chemical Industry Council
CEMBUREAU	European Cement Association
CCU	Carbon Capture and Usage
CCS	Carbon Capture and Storage
CSP	Clean Steel Partnership
DG GROW	Directorate General for Internal market, Industry, Entrepreneurship & SMEs
DG RTD	Directorate General for Research & Innovation
EIIs	Energy Intensive Industries
EMIRI	Energy Materials Industry Research Initiative
ESSA	European Steel Skills Agenda
ESTEP	European Steel Technology Platform
EU	European Union
EUCAR	European Council for Automotive R&D
EU ETS	EU Emissions Trading System
EUNITED	European Engineering Industries Association
EURAMET	European Association of National Metrology Institutes
EUROFER	European Steel Association
FG	Focus Group
FP9	9th Framework Programme for Research & Innovation
GREENSTEEL	Green Steel for Europe project
H2020	Horizon 2020
HEU	Horizon Europe
HLG EII	High Level Group of Energy Intensive Industries
ICT	Information and Communication Technology
IPCEI	Important Projects of Common European Interests
LCA	Life Cycle Assessment
MEP	Member of the European Parliament
PPP	Public Private Partnerships
R&D	Research & Development
R&D&I	Research & Development & Innovation
RFCS	Research Fund for Coal and Steel
RTO	Research and Technologies Organisation
SET	Strategic Energy Transition
SPIRE	Sustainable Process Industries through Resource and Energy Efficiency
SPIRE-SAIS	Skills Alliance for Industrial Symbiosis - A Cross-sectoral Blueprint for a Sustainable Process Industry
SRIA	Strategic Research Innovation Agenda

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ESTEP - European Steel Technology Platform
Av. de Cortenbergh, 172
B-1000 Brussels
secretariat@steelresearch-estep.eu
http://www.estep.eu

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