Blueprint “New Skills Agenda Steel”:

Industry-driven sustainable European Steel Skills Agenda and Strategy (ESSA)

Exploitation Plan

Deliverable D6.3

(Final Version 30.06.2023)

Project acronym:	ESSA
Project title:	Blueprint “New Skills Agenda Steel”: Industry-driven sustainable European Steel Skills Agenda and Strategy
Project number:	2018-3059 - 600886-EPP-1-2018-1-DE-EPPKA2-SSA-B
Coordinator:	TU Dortmund University
Funding Scheme:	Erasmus+
Due date of deliverable:	30th of June 2023
Actual submission date:	30th of June 2023
Project duration:	01.01.2019 – 30.06.2023 (54 months)
Work package:	WP 6 - Transfer and Implementation of the Blueprint
Work package leader:	SSSA
Authors:	Antonius Schröder, Mathias Cuypers, Adrian Götting, Karina Maldonado-Mariscal (TUDO), Teresa Branca (SSSA), Jorge Muract (worldsteel), Dean Stroud (Cardiff)
Dissemination level:	Public

Co-funded by the Erasmus+ Programme of the European Union

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Abbreviations

Abbreviation	Meaning
CEDEFOP	European Centre for the Development of Vocational Training
CEO	Chief Executive Officer
CEPIS	Council of European Professional Informatics Society
CFE-CGC	Confédération Française de l'Encadrement CGC
CIELFFA	Comité International d'Étude du Laminage à Froid du Feuillard d'Ácier
CMC	Commercial Metals Company
CoP	Community of Practice
CSP	Clean Steel Partnership
ECoP	European Community of Practice
ECQA	European Certification and Qualification Association
EQAVET	European Quality Assurance for Vocational Education and Training
EQF	European Qualifikation Framework
ESCO	European Skills, Competences, Qualifications and Occupations
ESSA	European Steel Skills Agenda
ESSA ETP	ESSA European Steel Technology and Skills Foresight Panel
ESTEP	European Steel Technology Platform
EU	European Union
EUROFER	European Steel Association
FG People	Focus Group People
H4C	Hubs for Circularity
IMZ	Instytut Metalurgii Żelaza
KPIs	Key Performance indicators
LSP	Large-scale skills partnership
LSP EII	Large-scale skills partnership for energy-intensive industries
NEIA	New European Innovation Agenda
NSZZ	Solidarność
OS KOVO	Odborový Svaz Kovo
RFCS	Research Fund for Coal and Steel
SPIRE-SAIS	Skills Alliance for Industrial Symbiosis
SME	Small and medium-sized enterprises
SSDCS	Sectoral Social Dialogue Committee on Steel
SSSA	Scuola Superiore Sant'Anna di Studi Universitari e di Perfezionamento
UNESID	Unión de Empresas Siderúrgicas
VA	Visionary Analytics
VET	Vocational education and training

2. Framework

The implementation, institutionalisation and use of ESSA has already taken place to a large extent, thanks to the development of the European Steel Skills Alliance and the ESSA agenda as a social innovation process. The following exploitation plan based on the findings and results of the ESSA project and its final Blueprint (Deliverable D5.3) has the objective to guarantee the further implementation, dissemination, running and development of the European Steel Skills Alliance for proactive industry skills adjustment. Right from the beginning of the project, starting with the proposal phase, the sustainable implementation of the European Steel Skills Alliance was a consideration and built into the programme of work. As an activity **of the steel industry for the steel industry** all the relevant stakeholder groups of the project (companies, training providers, research institutions, and associations / social partners) were integrated in the Blueprint developments. A significant partnership of 24 partners and, up to now, 20 associated partners (all willing to participate on their own costs) indicates a strong level of engagement and an urgency of the steel sector for re- and upskilling and attracting, recruiting and retaining talents for the future steel industry. In the ESSA Final Conference, it was stressed that the grounds for a sustainable running and further development of the ESSA skills alliance is given, supported and welcomed by all the stakeholders beyond the project funding period.

The exploitation concept is very much in line with the integration of ESSA activities in existing European-national steel sector governance structures, such as European Steel Technology Platform (ESTEP) Focus Group (FG) People, EUROFER Social Affairs Committee, industriALL Social Dialogue Committee, national steel associations and as much as possible connected with European (funding) programmes (namely Pact for Skills and the Large Scale Partnership Energy Intensive Industries, Clean Steel Partnership, Processes for Planet, Research Fund for Coal and Steel (RFCS), European Centre for the Development of Vocational training (CEDEFOP) Skills Intelligence). The ESSA governance reflects these alignments and ensures the further ESSA activities by a Foresight Observatory, a Technology and Skills Radar, the online training platform steelHub, National-Regional Training Ecosystems and a European Community of Practice (ECoP Steel) connecting them. Started as a social innovation process, ESSA has already reached the state of implementation, institutionalisation and impact, ready for further improvement and institutionalisation (see Figure 1).

The process of developing and further running of the ESSA Blueprint organised as a social innovation process is integrating relevant and intrinsic motivated stakeholders of different areas and provinces right from the beginning in the consortium. Starting with the **challenge** of adjusting skills needs, because of new technological and economic developments, the **idea** of a sectoral Blueprint of the Erasmus+ program was taken up. This led to the ESSA **intervention** and the setting up the European Steel Skills Agenda and Alliance with interested stakeholders from companies, training providers, social partners (steel associations and unions), testing the developed Blueprint during an **implementation** phase, and setting the basis for **institutionalisation** and **impact** right from the beginning. In the planning of the project **iterative and cyclical feedback loops** were planned, ensuring the upgrading of the interventions and implementation of the Blueprint due to new developments and necessities during the period of the project. This approach will also be applied in the ongoing Skills Alliance beyond the project funding period.

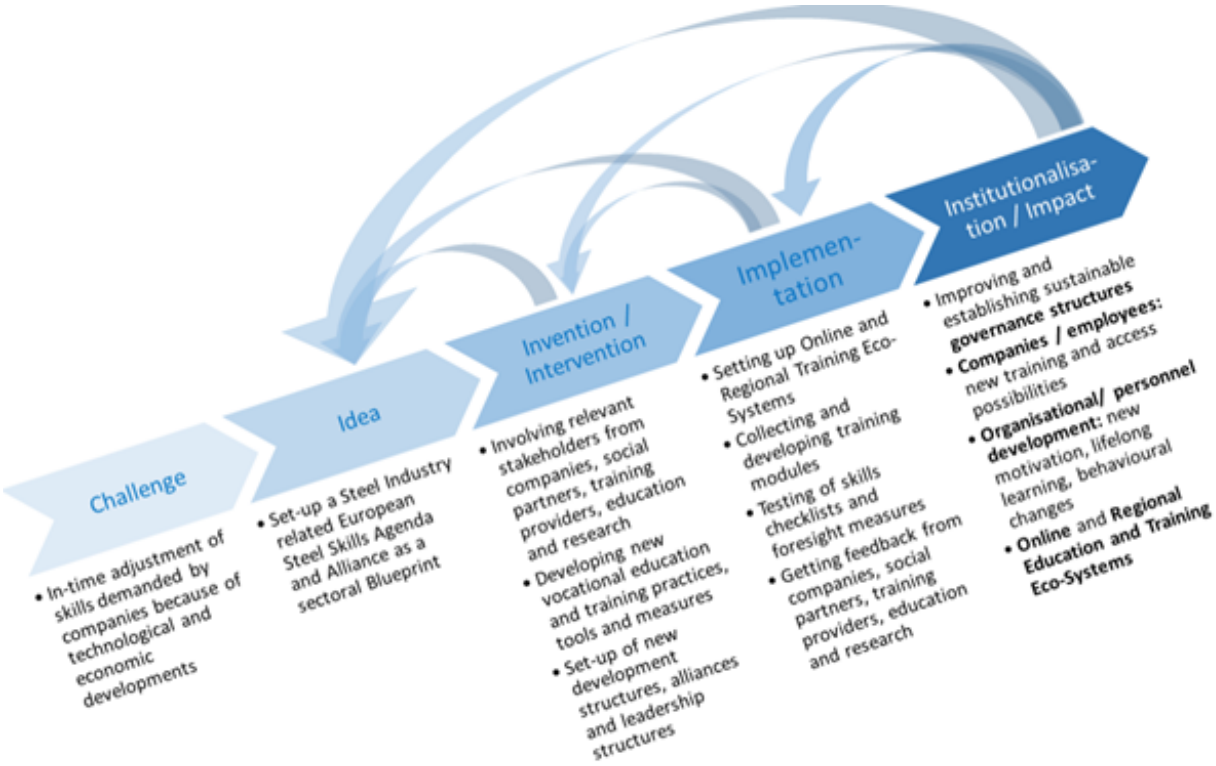


Figure 1: Blueprint development as a social innovation process

ESSA continues following the end of the project's funded period within the European-national-regional governance structures of the Steel Industry. Therefore, the Final Conference of ESSA was much more a "transition conference" from a project to an **established** programme for running the European Steel Skills Agenda and Alliance (ESSA). Its integration in the **Large Scale Partnership Energy Intensive Industries** of the Pact for Skills is a further step for future cooperation and development across sectors and with other industries, raising awareness of the relevant ESSA tools and measures, as well as using them as "blueprints" for other industrial sectors.

3. Exploitation Concept

The exploitation of ESSA will focus on the described framework for guaranteeing the sustainable running and rolling out of the blueprint on the European level, in partner countries and beyond. The exploitation strategy has a double aim: (1) transferring the Blueprint to national and regional decision makers; (2) convincing and integrating end-users in the further social innovation development process (esp. companies, education and training providers and workers/learners) to implement new strategy measures.

The exploitation strategy concentrates on the following two stages and its main elements:

1. Exploitation **during the project life span** via the rollout activities: This was done by focusing on countries represented by the project team. Each type of partner (e.g. companies, education

and training providers, social partners) performed their specific exploitation activities (due to their main roles in the project; see next chapter). Key activities were:

- Testing (piloting) of the Blueprint
- Integrating the selected job roles into the skills training programs
- Testing and including the training materials into existing training portals
- Informing trainers and training bodies
- Developing own training offers and offering training on the market (online via steelHub, onsite via the National-Regional Training Ecosystems)
- Dialogue with policy makers to facilitate rollout of the blueprint.

2. Exploitation **after the project** to other countries and sectors: Focus is on integrating further steel regions and steel producing and processing member states (beyond those represented by the project and in the rollout activities so far) as well as cooperating with other sectors and networks. Key activities will be:

   - Further implementing and adjusting the sustainability structures
   - Further extending the steelHub: new contents, skills and trainings, providers and end-users
   - Lobbying for additional financial support from other supporters or donors
   - Exploiting and connecting further with existing networks (esp. Large Scale Partnership Energy Intensive Industries under the Pact for Skills)
   - Multiply the results based on good practice examples collected during and after the project
   - Continuing dialogue with policy makers to facilitate a continuous rollout of the blueprint.

To monitor the exploitation, related indicators are covered already via the yearly evaluation reports (Deliverables D8.2 and D8.3). They will be used for further assessing the success of the ESSA activities:

- Main steel occupation job roles identified and described (Database)
- Main occupation job roles identified with appropriate skill-sets and certification
- Associated VET (and appropriate degree level) programmes (to jobs roles) identified and updated according to skills needs
- Number of regular events of the steel associations where ESSA Blueprint is integrated
- Number of partner countries where the Blueprint Strategy has been rolled out (during the project)
- Number of other main steel producing EU member states where the Blueprint Strategy has been rolled out (after the project)
- Number of organisations that pledge to adopt the blueprint in their work
- Share of consortium partners that are going to actively work on the blueprint after the project
- Share of respondents that endorse/validate project results
- Share of partners that report significant progress in their particular activities.

However, the ongoing exploitation of ESSA after the end of the project is in the hands of the ESTEP FG People, which does not have to develop a new exploitation concept. Instead, ongoing exploitation takes the form of a "take over" from a funded project to day-to-day management and activity integration in the European Steel Sector structures and procedures. This is done by an incorporation of the exploitation in the ESSA governance within existing steel sector structures (ESTEP FG People, EUROFER Social Affairs Committee, industriALL Sectoral Social Dialogue Committee on Steel) and in steel related European programs (Clean Steel Partnership, Pact for Skills and the Large Scale Partnership Energy Intensive Industries, Processes for Planet, Research Fund for Coal and Steel). This approach includes also an engagement in new European innovation activities, namely New Skills Agenda, Industry 5.0, and the New European Innovation Agenda (NEIA).

Background for the exploitation and sustainability of ESSA is the already existing involvement of the European steel community and the related huge **partnership** as well as the ongoing activities within the established ESSA **governance:**

- Foresight Observatory, and its Technology and Skills Foresight Radar
- Online training platform steelHub
- National-Regional Training Ecosystems and the related European Community of Practice (ECoP Steel).

4. ESSA Partnership as the Ground for a European Steel Community Involvement

Central for the exploitation is the already established steel community partnership comprising 44 partners now, out of them 24 project consortium partners:

- **Steel companies:**
  thyssenkrupp Steel Europe (also training provider), ArcelorMittal Poland, ArcelorMittal Spain, Salzgitter AG, Sidenor, Celsa Group/Barna Steel, Tata Steel
- **Education and training providers:**
  Steel Institute VDEh, IMZ, Scuola Superiore Sant'Anna, Worldsteel Steeluniversity, DEUSTO, Cardiff University (also research institution), ThyssenKruppSteel Europe Training Centre (part of the steel company), ArcelorMittal Spain Training Centre
- **Steel associations and social partners:**
  EUROFER umbrella organization of the steel industry employers, Worldsteel Association (also training provider), UNESID Spanish Steel Association, Belgium Steel Platform, Wirtschaftsvereinigung Stahl German Steel Federation, Federacciai - Italian Steel Federation, European Cold Rolled Steel Association CIELFFA, Association of Finish Steel and Metal Producers, OS KOVO (trade union)
- **Research institutions:**
  TU Dortmund University, Cardiff University, RINA/CSM, Visionary Analytics VA

completed by 20 **associated partners**:

ESTEP European Steel Technology Platform, industriALL (European Industry Union), EIT RawMaterials, Industriarbetsgivarna (Swedish Industry Federation), Polish Steel Technology Platform, Enrico Gibellieri (European Steel expert), Unite and Community (UK unions), CEPIS Council of European Professional Informatics Society, University of the Basque Country, Warwick University, ArcelorMittal Italy, Fédération Métallurgie CFE-CGC, Metalowców NSZZ „Solidarność", UK Steel, SAAT Consulting, Greensteel Academy / Liberty Steel, Commercial Metals Company (CMC), Swansea University, and ArcelorMittal Germany.

Affiliated organisations to the above are also included, which provide access to their respective members. The partnership is directly involving **13 EU countries**: Belgium, Czech Republic, Finland, Germany, Italy, Lithuania, Netherlands, Poland, Spain and UK[1], completed by France, Romania and Sweden (associated partners). Nevertheless, via EUROFER, industriALL, CIELFFA, and steel company subsidiaries in other countries ESSA is **covering the whole steel industry member states** in Europe, including steel processing and the Small- and Medium-sized Enterprises (SME) perspective.

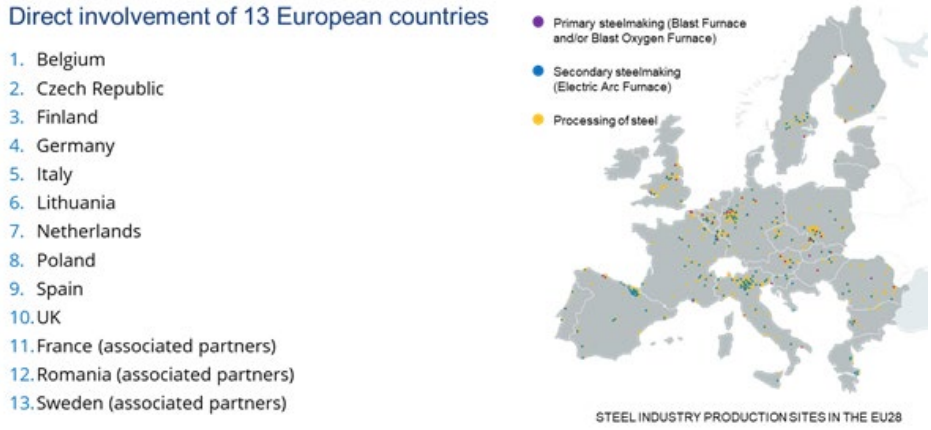


Figure 2: European Steel Industry integration

To broaden the perspective beyond the Steel Industry, ESSA integrated institutions in the partnership not focusing (only) on the sector, e.g. EIT RawMaterials and the Council of European Professional Informatics Society (CEPIS) completed by several European networks (such as Pact for Skills, CEDEFOP Skills Intelligence, ECoP Hubs for Circularity, CoP Industry 5.0, and other steel related Blueprints, namely DRIVES, Skillman, SPIRE-SAIS).

The dedicated main roles of the stakeholders engaged in ESSA for the exploitation are more or less the same as during the project phase:

[1] Although UK became no longer a member of the EU, there was a strong commitment and important activities within the South-Wales industry cluster within ESSA.

- **Steel companies:** defining new skills needs, developing and integrating training tools, good practice exchange, adjusting the blueprint, testing of tools and programmes, involving company related training organisations, roll-out to other company sites.
- **Training providers:** defining new skills demands and answers to it, developing related training tools and strategies for the blueprint, leadership and train the trainer programs, developing new methods and learning arrangements.
- **Steel associations / social partners:** supporting and rollout of the Skills Alliance; feedback, assessment of Blueprint strategies and tools, dissemination, involving national VET organisations, rollout of the Blueprint on the European and national level.
- **Research institutions:** management activities; research on technological, economic, skills development; VET system connection and integration, further strategy development for the Blueprint.
- **External experts:** integration of technological and skills expertise.

This huge partnership is, and will be, engaged in the ESSA Skills Alliance in supporting measures for the transfer, implementation, monitoring, cooperation and dissemination (EU and Member State Level) as well as for national-regional roll-out activities (National-Regional Training Ecosystems):

- Steel companies and social partners (associations and unions) are central and are engaged with ESSA aims and objectives for skills needs identification and analysis, and the upskilling of the workforce for the overall contribution to competitiveness, through database and foresight tools as well as training module development.
- Education and training providers contribute to the creation and development of the network and the online training platform steelHub by assisting in conducting analysis of existing training and qualifications frameworks and development of new programmes and curricula as well as supporting training modules development.
- The research institutes provide the social and technical basis of the skill needs analysis and contribute to skill requirements and foresight in respect of Work 4.0, as well as contributions to analysis of national VET requirements, regulations and systems and Blueprint development, including training and train the trainer modules and the interrelation to existing EU tools like ESCO, EQF, EQAVET, etc.). A contribution to policy recommendations (including collaboration with EU and Member State Stakeholders, national funding institutions) was also done by the research institutes.
- The contribution of sector experts is for integrating their knowledge of areas covered by the project to get sound feedback on Blueprint processes and progress, as well as key contributions to policy recommendations and transfer, implementation and monitoring processes.

The participating organisations and stakeholders have been selected because each of them is – in different ways – strategically committed to the European steel industry. Key stakeholders, including those directly involved in the project and those to which the project relates, have been integrated and will drive the identification and analysis of the skills intelligence related to the execution of the Blueprint and for the design and development of the network beyond the funding period of the project.

5. Governance

Based on, and fostered by, the huge partnership, the European governance of ESSA was initialised and tested, and finally accepted as part of already existing European steel industry support structures (see Figure 3):

1. The European Steel Technology and Skills **Foresight Observatory** as the main European coordination unit, conducting a regular **E**uropean Steel **T**echnology and Skills Foresight **P**anel (ESSA ETP)
2. The Online Training Ecosystem **"steelHub"**
3. The **European Community of Practice of Steel Regions** (ECoP Steel), connecting and supporting steel related member states and the main European steel regions with a European platform for the different **National-Regional Training Ecosystems**: mutual learning by exchanging, initiating, developing, and implementing good practice for skills and training.

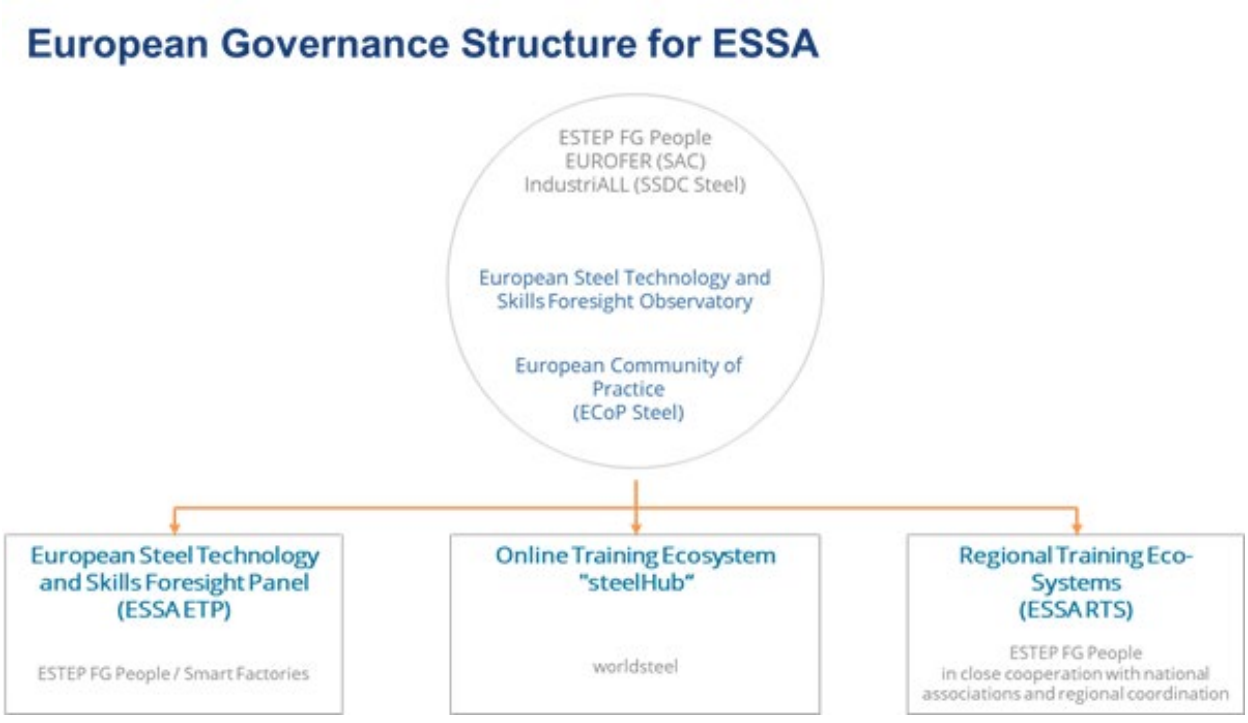


Figure 3: European Governance of ESSA

The European Steel Technology and Skills Foresight Observatory will take over the leadership of the ESSA Alliance cooperating closely with existing and supporting associations and platforms, mainly ESTEP, EUROFER, SSDC, industriALL, and national associations (namely UNESID, the German Steel Federation, IMZ, SSSA, and others). Under the head of ESTEP FG People, the Observatory will coordinate its activities closely and in collaboration with the European steel stakeholders related to:

- Strategies for gaining political support, mobilizing human resources and engaging stakeholders for the Blueprint and Skills Alliance
- Further Blueprint development, implementation, operation and monitoring on the European Level
- Communication and involvement strategy for skills adjustments (e.g. new skills demand and development and upload of training measures in the steelHub)
- Rollout of new information, tools, measures to the steel regions
- Implementation and transfer plans elaborated with the national steel associations
- Setting-up of ad-hoc or regular sub-committees for hot topics – mainly incorporated in existing committees
- Coordination of national/regional rollout activities and National-Regional Training Ecosystems (ECoP Steel)
- Organising joint processes of associations, companies, training providers to optimise skills adjustment strategies and VET strategies, tools, curricula by linking European and national, regional VET cooperation, joint training programmes, exchanging best practices, advertising the steelHub, and others.

The ESSA governance structure based in the ESSA Foresight Observatory is integrating stakeholder representatives of all steel relevant areas (as described above), ensuring a quadruple helix perspective (industry, policy, education and science, and as much as possible civil society (mainly at the regional level, where people live and work)) and a continuous social innovation process to establish and improve new social practices in skills adjustments. The exploitation of results into practice includes a new coordination and **distribution or division of responsibilities and leadership**. Responsibilities but also duties and interaction for continuous learning have to be *newly balanced and interrelated* between industry, VET systems, and the individual learner, supported by new policy frameworks, for instance:

- Steel industry focusing on company specific short-termed adjustment of skills needs, recognising the T-shaped skills approach by paying attention not only on specific technical but also transversal and soft skills (digital, green, individual/personal, methodological, and social)
- VET systems on basic and transversal competences and skills relevant across sectors
- Individuals by improving self-learning capabilities and a lifelong learning attitude, empowering individual lifelong learning capabilities
- Policy by developing new innovative frameworks supporting lifelong learning (e.g. through individual learning accounts, micro credentials).

4.1 Foresight Observatory

A central part of the ESSA Foresight Observatory will be a regular **European Steel Technology and Skills Foresight Panel** (**ESSA ETP**). The existing questionnaire will be developed further based on the results and methodology assessment of the two surveys conducted during the implementation and testing phase of ESSA (see Deliverable D3.2) into a new annual monitoring and assessment instrument. It is planned to shorten the existing questionnaire to the key questions (not to overload the participants with too much time for responding). The results are summarised in a **Steel Technology and Skills Foresight Index**, developed in close cooperation with the ESTEP FGs People and Smart Factories. The quantitative results will be extensively discussed not

only on the basis of statistics, but in an annual workshop of selected experts focusing on the necessary implications for the steel industry in relation to the main results of the survey.

Based on the regularly updated results of the ESSA Technology Foresight Panel (ESSA ETP) the ESSA Foresight Observatory will coordinate the continuous refinement of all the other relevant measures and activities planned on the European level:

- Training Offers and Learning Arrangements: Online with the steelHub and national-regional within the Training Eco-systems of the ECoP Steel, including also train the trainer programs
- Pilot Measures and Tests: The Observatory will initiate and coordinate **pilot measures and tests** - supported, funded or framed by EU Programmes (such as Erasmus+, Horizon Europe, Pact for Skills) and steel sector specific programmes (such as Clean Steel Partnership, RFCS) or platform activities (such as ESTEP, SSDCS with support of the social partners EUROFER and industriALL).
- Incentives: Awards, Online Fora, or others
- Division of Responsibilities / Leadership
- Image, Recruitment, Talent Management campaigns and recommendations
- Policy recommendations.

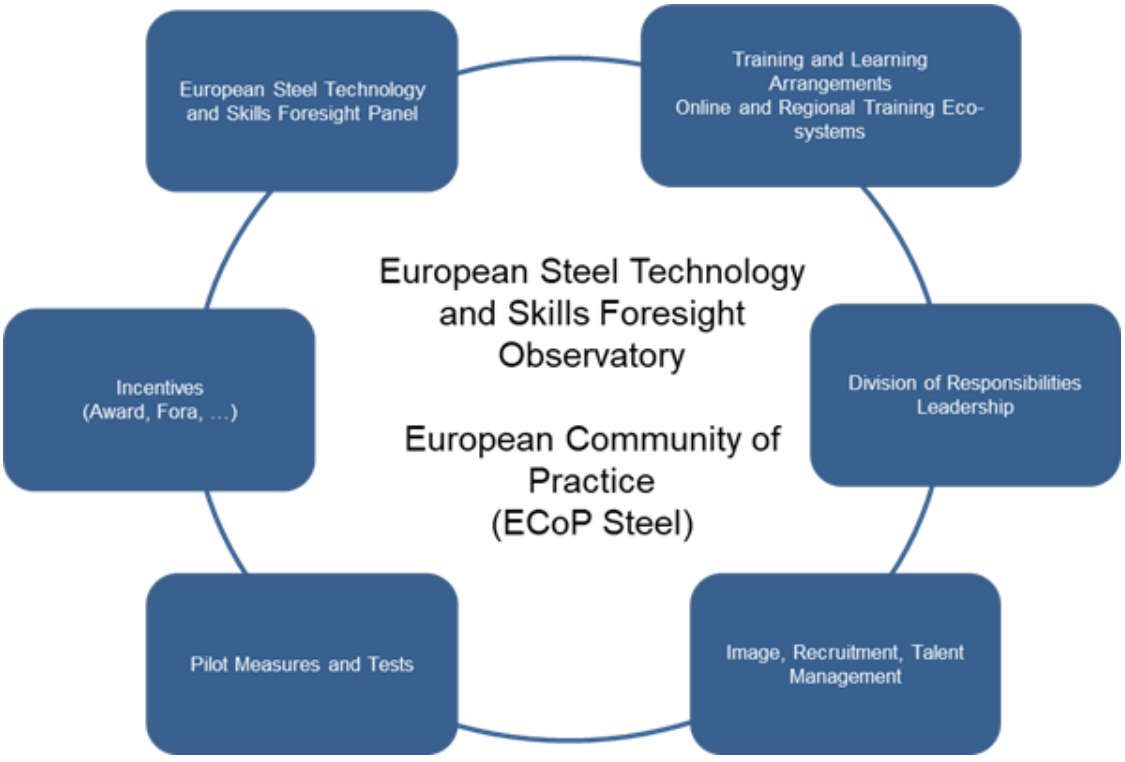
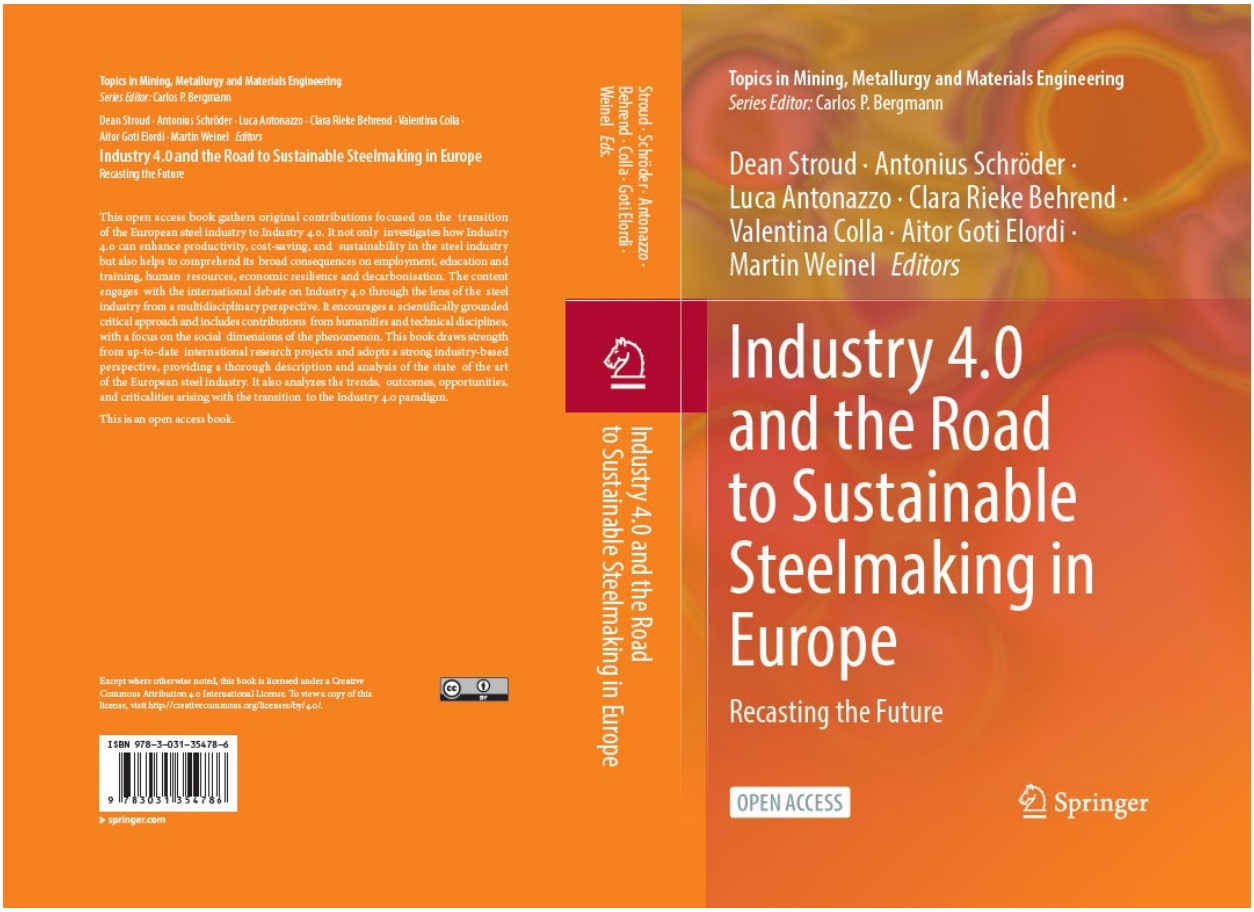


Figure 4: Elements of the Foresight Observatory

The Observatory will be based on **collaboration** of (steel and VET) **stakeholders** at the EU level (ESTEP, EUROFER, industriALL, SSDCS, RFCS, SPIRE, Cedefop, ESCO and others). National steel associations or unions are foreseen as communication and coordination nodes between the European, national, and regional level. Nevertheless, the Observatory will also be related and

interconnected to existing (or forthcoming) European **platforms**, namely the Large Scale Partnership Energy Intensive Industries under the Pact for Skills (see chapter 5).

ESSA is exploited also by a huge number of **dissemination** activities: more than 80 presentations at European and international conferences and events, 44 presentations of ESSA in events of the steel associations and social partner, and 32 articles in journals and books. Additionally, a Springer Book "Industry 4.0 and the Road to Sustainable Steelmaking in Europe" with several articles based on ESSA results and beyond will be published in autumn 2023 with open access. The Observatory will take up these activities and proceed with the dissemination continuously.



4.2 steelHub

As a central element of the strategic blueprint, ESSA developed steelHub, a centralized digital platform to facilitate communication, collaboration, and coordination. steelHub sets the infrastructure for a worldwide exchange of content to create a Learning Solution Directory for the steel sector. This directory is a collection of learning solutions delivered by diverse Publishers into the framework of a marketplace business model (see in detail Deliverable D6.2). The business model is the blueprint for agreements with the publishers regulating intellectual property rights, fees, and other contractual issues.

One important component of this platform is the Skill Directory, which represents the current and future training needs of the steel sector. This Directory is used to curate the learning solutions. Using a standard terminology and big data infrastructure, steelHub is able to identify skill gaps and the most demanded skills for the steel sector to guide the training solutions development as well as to analyze trends that can support governments to define new regulation and funding tools to support the transformation of the steel sector. This information will be used for the ESSA Foresight Observatory to create updates in the skill directory and develop recommendations.

The integrated design of the platform offered by steelHub enables the possibility to develop new and innovative solutions into the context of the Capability Assessor using a variety of methods to evaluate an individual's capabilities, including self-assessment, interviews, tests, and job simulations. The goal of the assessment is to determine whether an individual learner has the necessary skills and experience to perform effectively in each role, task or skill and design a custom development plan for each organization or individual.

The flexible integration of this platform offers organizations the ability to easily connect and integrate learning solutions with their own systems, which can improve productivity, reduce costs, and enhance overall efficiency. Besides, regional industrial and professional associations are able to integrate these solutions to provide learning solutions to their members.

Figure 4: Modules of the Digital Platform steelHub

steelHub has been successfully integrated in 28 Industries (companies), 8 Associations, 2 Equipment Provider, 1 Education and Training Provider and 10 R&D Institutes and Universities. A total of 13,406 activate learners used learning solutions available in steelHub.

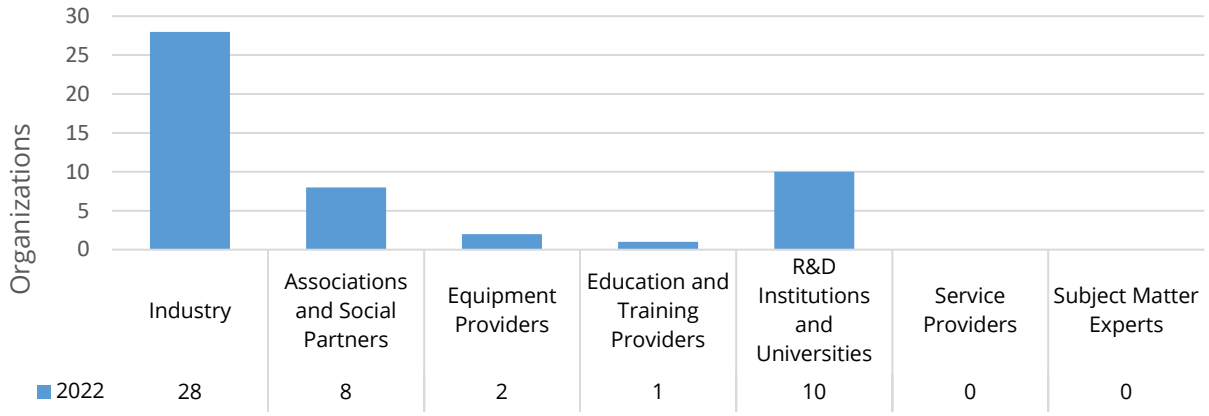
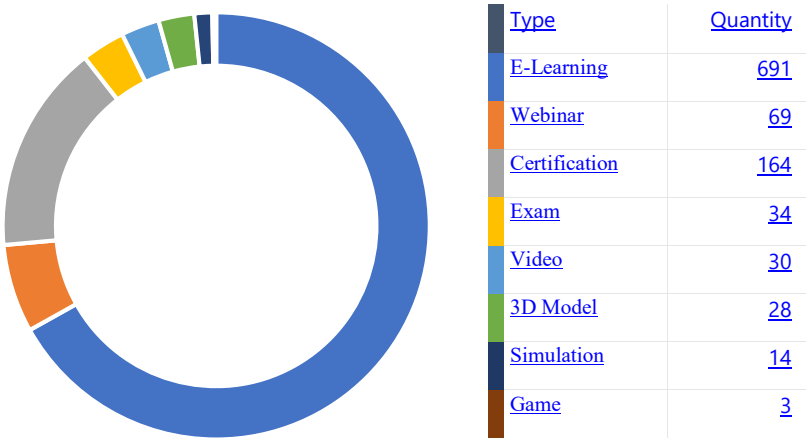


Figure 5: Organizations using steelHub

Besides, steelHub offers an additional distribution channel for stakeholders of the training ecosystem that develop and deliver learning solutions (Publishers). There are 7 Industries, 5 Associations and Social Partners, 1 Equipment Provider, 3 Education and Training Providers, 5 R&D institutions and Universities, 6 Service Providers and 4 Subject Matter Experts. These publishers contribute to a directory of 1,896 solutions.

Figure 6: Publishers integrated and in progress

The community of publisher collaborate to create a Learning Solution Directory of 1,896 innovative digital learning modules in different languages. The following Figure 7 represents the distribution of those learning solutions by the related learning method used. An important challenge for the future development of this solution is to perform the translation of the solutions and information available to improve the dissemination at regional level, like in Poland, Italy and Romania.



Type	Quantity
E-Learning	691
Webinar	69
Certification	164
Exam	34
Video	30
3D Model	28
Simulation	14
Game	3

Figure 7: Learning Method used in steelHub

The most used learning solutions correspond to the knowledge area of "Manufacturing" with 10,413 active learners and "Occupational Safety and Health" with 4,461 learners (see details in Figure 8). This is because the main solutions available at this time are focusing on these two main topics. There are several requirements to include solution about "Sustainability" and "Process Safety", which is the priority of the platform for the following months.

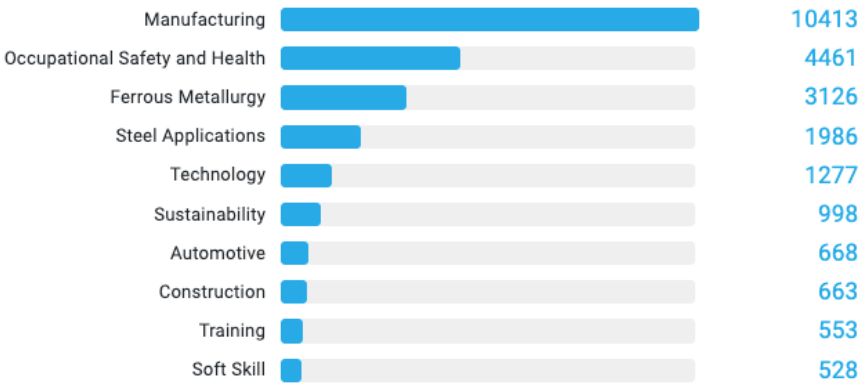


Figure 8: Active learners per knowledge area

The successful implementation of the steelHub infrastructure trigger the idea to expand this model and infrastructure to other sectors and sector Blueprints with the objective to continue the co-development of the platform. Therefore, ESSA develop **HUB5.0**.

HUB5.0 is a Service as a Software (SaaS) developed in the framework of the European Steel Skill Agenda (ESSA) with the objective to provide an omnichannel dissemination infrastructure for the Skills, Learning Solutions and Qualification directories developed in the project. The platform offers a solution for sustainable and exponential impact of the *Blueprint alliances*.

HUB5.0 follow the vision of **Industry 5.0**[2] and places the wellbeing of the workers at the centre of the production process, empowering and helping them to take control of their upskilling and reskilling journey to support the transformation of the industry to provide prosperity beyond jobs and growth while respecting the production boundaries of the planet.

The **HUB5.0** is a platform developed with the approach of Continue Deployment, which allows frequently delivering through automated deployments of new functionalities and updates. Besides, this infrastructure allows the deployment in several and independent instances, like steelHub and SKILLS4Planet (the training online platform which is under development in the SPIRE-SAIS Blueprint). First contacts were also made with the automotive Blueprint DRIVES (autoHub). Every instance uses a dedicated Amazon Web Services in Europe, with their own Data Base, Dashboards and user access.

The following diagram shows the HUB5.0 replicated in different instances deployed as an example of this flexible infrastructure. steelHub is shown as one of the instances that have been used for the last 3 years by several **publishers** (organizations and individual that upload learning solutions to the platform), and **users** (industry, universities, high schools, among others).

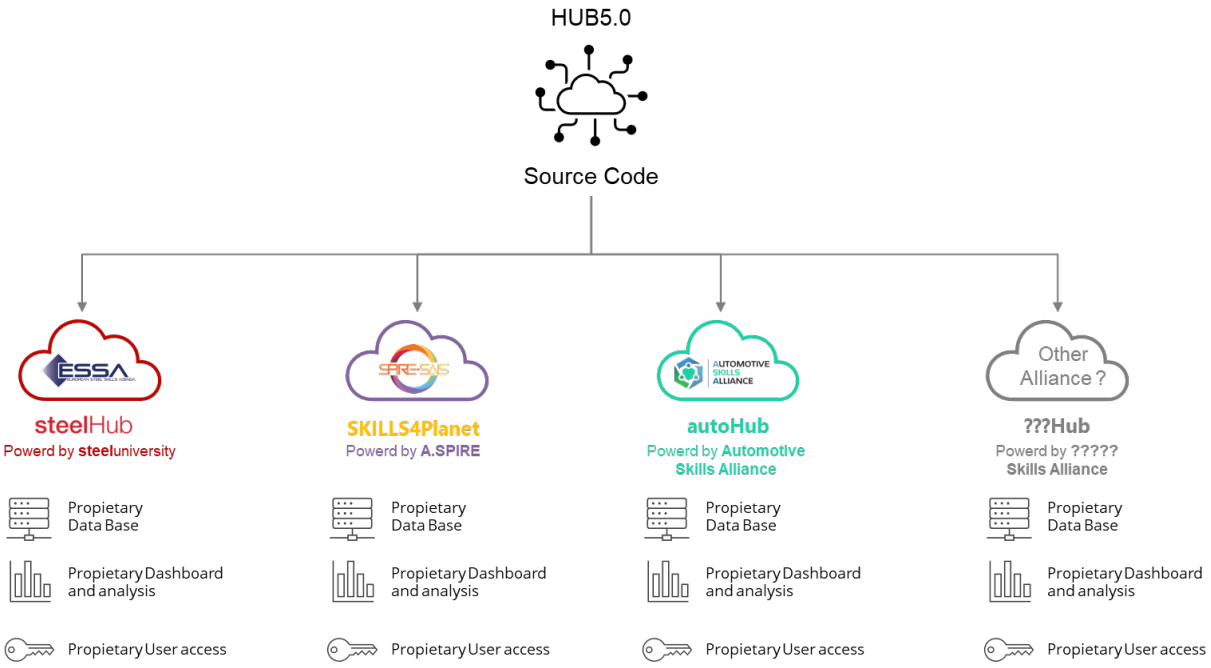


Figure 9: HUB5.0 as a collective platform for different sectors or Blueprints

[2] Industry 5.0 - Publications Office of the EU (europa.eu)

4.3 European Community of Practice (ECoP Steel): Exploitation, Rollout and Implementation of the Blueprint in Steel Regions and Countries

During the test and implementation phase of ESSA we set up skills and training related pilot ecosystems in nine countries or regions. Although the rollout was conducted according to a common framework, different processes appeared in all the regions/countries depending on the national-regional priorities and the involved actors. However, some common topics (such as image and recruiting, poor relationship with public authorities, disconnection between formal training and companies' requirements) could be reported. But in the end, all the ecosystem development *processes* were different, depending on the composition of the actors, the defined priorities and processes, and the specific regional demands.[3] All in all, with these rollout activities we integrated more than 100 additional stakeholders in our Skills Alliance: companies, public authorities, associations, unions, research institutions, universities, vocational schools, training providers and others. Because of successful national-regional processes (some regions are conducted already up to four workshops, setting the ground for a yearly event/workshop within the ecosystem), ESSA is setting up a **European-National-Regional Community of Practice (ECoP Steel)** for supporting the existing and establish new National-Regional Training Ecosystems, exchanging good practice and mutually learning from each other. Within this EU-wide network, national-regional ecosystems will share knowledge, tools, strategies and good practice, learn from each other, support each other, and conduct common research and development to improve the steel regions. In order to avoid fragmentation and not to reinvent the wheel several times over again, the ESSA ECoP Steel will catalyse regional collaboration on the European level (within the Foresight Observatory) to develop the training solutions within the local context by connecting the steel regions and its regional stakeholders, using synergies to accelerate the progress.

This kind of exploitation will be coordinated, supported and implemented by the ESSA Foresight Observatory in collaboration with the European steel associations and platforms as described above. Especially the national steel associations and unions will be involved in the national-regional ecosystem activities. Within the member states a focus on steel regions (steel industry clusters) is key. These clusters are the basis for different specific (depending on the main regional employment, education and training, and social demands) Regional Skills Eco-systems also connected with the steelHub (Online Training Eco-system).

Within these main steel regions in Europe the ESSA Blueprint will support and be combined with national/regional skills approaches. A key element is the integration of companies, VET institutions, science, policy and social partners (esp. unions), and civil society activities at the regional level within the eco-system structure and governance. **Regional Dialogues** are part of the Regional Training Eco-systems related to already existing regional structures (for innovation and education and training) and we are checking what kind of support is needed from the national level (steel associations, training providers, VET institutions, policy, funding) and the EU level.

[3] A detailed summary of all the different ecosystems could be found in Deliverable D6.2 (final version).

Systematic mutual exchange between the Foresight Observatory and the Steel Regional Training Ecosystems bundled in the **Community of Practice (ESSA ECoP)** within the Foresight Observatory ensures mutual synergies, support, exchange and learning. This ECoP will inform the work of the European Foresight Observatory as a junction for improving skills adjustments proactively together, learning from each other, and pushing both technological innovation and qualification of the workforce forward in a common manner, to the benefit of each other.

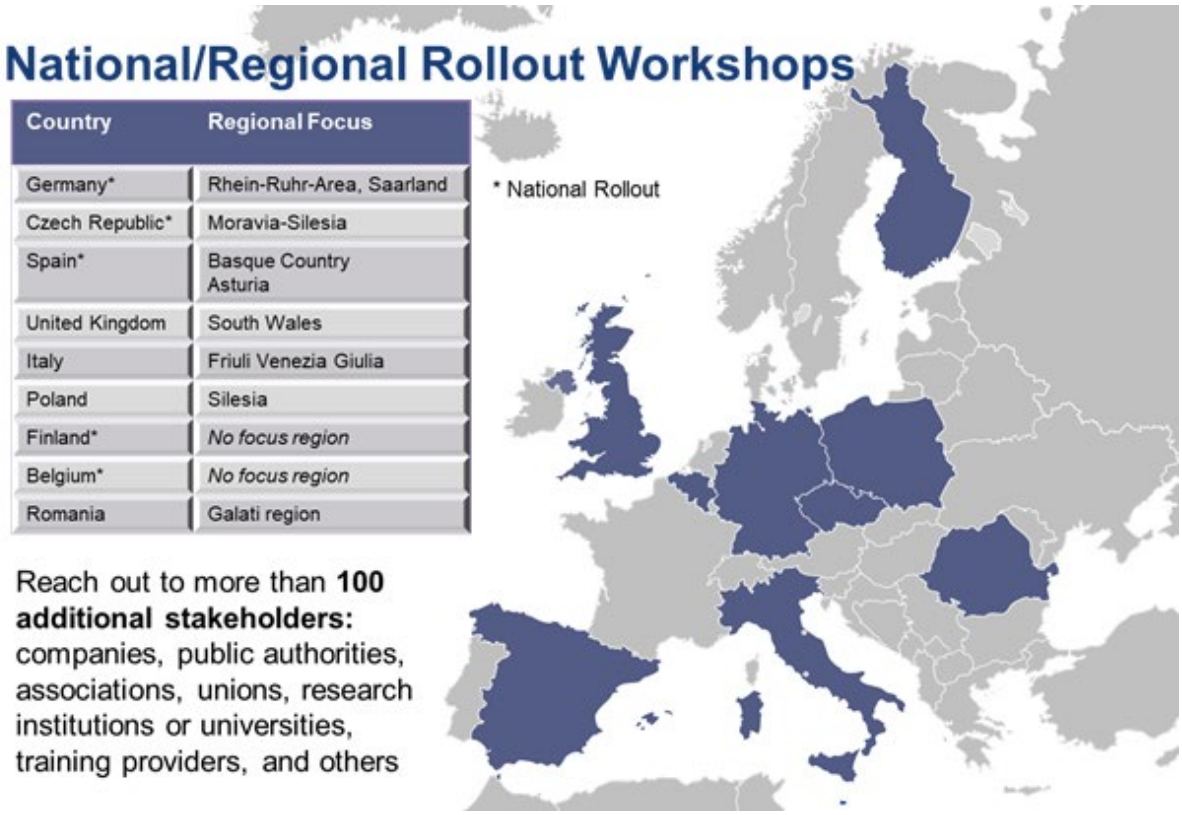


Figure 10: National-Regional Exploitation so far

Starting from results of ESSA Final General Assembly and the Final Conference, further developments of the ECoP are outlined as follows. In particular, the structure, content and possibilities of such Community of Practice have been discussed, including possible governance of the Community of Practice within ESTEP FG People and the steelHub online platform. The main objective of ECoP is to set up a **platform** for sharing best practice as well as common goals and information, connecting and coordinating the rollout of nations-regions in order to aligning and sharing their experience. The platform content will include **strategies for skills development** and **strategies for networking**, with clear objectives, agreeing on goals and purpose and explaining the added value. In addition, it is crucial to define the end-users of the contents clearly and be in continuous communication with them. In particular, it will include:

- Establishment and integration of new national-regional skills and training ecosystems: esp. of missing important steel producing and processing countries such as **France, Sweden, Austria** (see landscape of Figure 5)
- Web platform (e.g. to share best practices and content, such as recent projects, etc.) as part of the ESSA homepage or within the steelHub

- Information exchange by collecting information from different countries to be aligned and share experience
- Connect and coordinate the exploitation to regions and member states via moderating processes
- Strategies for skills development and for networking
- Maintain contact with all stakeholders: generate networking to share common problems and solutions;
- Continuous updating about project results as well as related projects: Catalogue of practices, present expert content, help each other – answer questions, collaborate on common and emerging themes

The **ECoP activities** will include different topics based on good practices exchange, presenting the following characteristics:

- Structured online/as an online platform: steelHub as platform to stay in contact
- Hybrid fashion: online platform alongside regular annual meetings
- Open forum
- ESTEP FG People: Regional stakeholder meetings: regional stakeholder sub-groups with meetings face to face
- Create an award program every year to share and recognise best practice (of training and skills adjustment
- Image, Recruitment, Talent Management campaigns
- Create KPIs for talent development for monitoring the processes, benchmarking and align objective of the eco-system
- Topics to be included are:
  - Good practices exchange
  - Hot topics
  - *For specific interest groups - sub-themes and issues → each of the interest groups should have an owner or community manager*
- Create awareness and visibility of ESSA and its results.

The combination of the regional and national level with the European Steel Skills Alliance and Agenda will lead to plan a cooperation within the ECoP of Steel Regions, by extending complementary, subsidiary or supporting cooperation with setting up a structural framework for the practical implementation. In this regard, during the **ESSA** project, it has been discussed **how to connect the ECoP with the rollout regions**. Concerning the ECoP approach, one important point is the connection nodes, in particular, to connect the national-regional developments with the European ones. First, decisions have to be made on the shape and form of connections before developing things further. In particular, it is crucial to discuss the acceptance to move on beyond the project duration; e.g. deciding who runs the online platform and on which conditions and who will coordinate the ECoP on behalf of the FG People. To sum up the following activities are planned:

- Establishing reliable connection nodes (e.g. through influential institutions);
- Nominate a central co-ordinator with resources (particularly time) and influence within the sector;
- Identifying representatives (e.g. for each country) as connectors;

- Creating region-based groups (for even more intense regional cooperation);
- Generating a clear message on benefits as well as on tangible outcomes of value to industry; across National Associations and steel companies in each region;
- Set up a common online platform with news, updated information.

Finally, in order to manage the ECoP in a sustainable way the following suggestions of the ESSA partnership will be considered:

- Integration in the ESSA governance and existing institutions: **ESTEP FG People and steelHub**
- Looking for funding to set up the online platform and specific themes (e.g. through membership fee) to ensure economical sustainability
- Identifying key stakeholders to co-ordinate at ECOP and regional level, ECoP should be run by the same people that run the National-Regional Ecosystems
- Creating regular tasks/communication to maintain activity and interest;
- Organising common events (language might be a problem)
- Sustainability also by new EU funded projects / dedicated EU funding
- Set a clear strategy (who is responsible for what in the level of management)
- Organising online and onsite workshops
- Webinars about content of interest for all communities
- Hybrid meetings to enable labour conciliation of family and working life;
- Periodic meetings to share the results.

6. ESSA Integration in European Activities

Beside the integration of ESSA in the activities of the engaged huge partnership, ESSA is already integrated in the main European and national steel industry activities related to skills. About 80 presentations of ESSA at important events of the steel industry (and beyond, esp. other energy intensive industry events) and more than 40 inputs of ESSA results in regular events, meetings, and other activities of steel associations and social partners show that ESSA was not aiming just at disseminating but integrating the skills debate in the regular activities of the European Steel Industry. Needless to say, that these activities will be proceeded after the project funding time.

Also 32 scientific articles spread the ESSA results to the scientific world, most of them in a ESSA based Springer Book: D. Stroud, A. Schröder, L. Antonazzo, C. Behrend, V. Colla, A. Goti, & M. Weinel (Eds.), Recasting the Future: Industry 4.0 and the Road to Sustainable Steelmaking in Europe, to be published in autumn 2023.

Additionally, cooperating and informing European programs and concepts took and will take place further, especially related to the Pact for Skills and the European Year of Skills, skills for Industry 5.0, Skills Intelligence, ESCO, Processes for Planet, Clean Steel Partnership and RFCS. Cooperation with projects with workforce and skills development is key to be updated. Namely BRIDGES 5.0, PURESCRAP, P4Planet projects have taken up the skills perspective, ECoP Europe and H4C, CORALIS, and others.

The ESSA Blueprint was also developed under the perspective of being a possible blueprint for other industry sector. Discussions took and will take place for instance with DRIVES, SPIRE-SAIS, the new chemical Blueprint run by ECEG, ECoP Europe and H4C, Construction, Skillman.

ESSA already contributed to the launch of the European Year of Skills (via a common video of ESSA and SPIRE-SAIS, and the ESSA Final Conference). Steel actors are the main founders of the Large Scale Partnership Energy Intensive Industries (LSP EII) under the Pact for Skills.

This **Large Scale Partnership Energy Intensive Industries (LSP EII)** is a central element of the further exploitation of ESSA. Within this already launched partnership we are aiming at integrating both the European Steel Skills Alliance and Agenda ESSA and the Skills Alliance for Industrial Symbiosis SPIRE-SAIS. Based on a Memorandum of Understanding the two Blueprints will merge under a common umbrella with two specific foci for a start:

- SAIS = cross-sectoral and **industrial symbiosis skills** specific Blueprint
- ESSA = example of a **specific sector (steel)** related Blueprint including an incremental upskilling of representative job profiles (t-shaped skills: technical and transversal skills (green, digital, social, individual, and methodological)).

From this starting point there is the possibility to use ESSA as a Blueprint for other SPIRE-SAIS sectors, and to complement the ESSA Blueprint with skills for Industrial Symbiosis and Energy Efficiency.

Within the LSP EII, ESSA will engage with other European tools, such as ECQA (European Certification and Qualification Association), the Skills Intelligence Platform of CEDEFOP (to exchange ESSA results with the broader VET and industry community), and Europass (to collect learning outcomes for the individual learner). A roadmap for the LSP EII is under construction, focusing on examine still existing gaps and further development needs of ESSA (e.g. SME focus, new job profiles, integration of further regions).

This cross-sectoral Skills Alliance will address the challenges of European digital and green twin transition and complement it by the social transition of the SPIRE-SAIS and ESSA industry driven Skills Agenda and Strategy for an ongoing and short-termed implementation of new skills demands in the sectors. Economic, digital and technological developments, as well as increasing energy and resources efficiency and environmental demands (e.g. decarbonization, emission and waste reduction), present the European (and global) process industries with many challenges, not least to continuously update training and qualification, knowledge and skill profiles of the workforce. To address multi-faced, cumulative and constantly changing economic challenges and technological development, human resources policy could only be successful by integrating all the concerned and relevant actors and stakeholders. The LSP EII is built on a Blueprint strategy for human capital and skill development through a **Cross-Sector Skills Alliance of Process Industries,** already developed within a (social) innovation process of ESSA and SPIRE-SAIS, involving a broad range of key stakeholders from the included sectors: companies, associations and social partners, education and research institutions, policy and civil society organizations. Based on this we will develop both strands further under a common umbrella, by integrating new (non-Blueprint) members and addressing further skills demands and related training solutions.

Three principal objectives are supported by an underpinning strategy framework:

1. Identify existing skill gaps and demand for the ongoing transition
2. Build appropriate training and curricula, including new vocational education content and pedagogies across the sectors (thus enabling mutual recognition of skills and training), within companies as well as education and training institutions;
3. Identify, develop and promote successful sectoral recruitment and upskilling schemes, including first (framework) training tools for: i) the efficient management of knowledge towards high skilled workers, and ii) tackling recruitment difficulties (e.g. industry attractiveness) for widening the talent pool and establishing a more diverse workforce.

Our vision is to ensure a smart ongoing and dynamically developing cross-sectoral alliance and cooperation integrating the skills perspective in common programs (as of today already done in the P4Planet Strategic Research and Innovation Agenda 2050 and the Clean Steel Partnership). Via the Focus Group People of the European Steel Technology Platform ESTEP, the Permanent Working Group Societal Innovation of Processes for Planet and its Advisory and Programming Group, as well as with the Sector Representatives Committee of SPIRE-SAIS we will support the future activities of the Large Scale Partnership and Process Industry Ecosystem under the Pact for Skills.

Via the Open Coordination Method task and actions of the Process Industries Pact for Skills based on the ESSA and SPIRE-SAIS structures we aim with our action and deliverables to address three central pillars in priority:

- Technology and Skills Foresight for all Process Industry sectors
- Skills Intelligence Hubs (including online training platforms SKILLS4Planet, steelHub)
- European collaboration of the sectors, member states and regions.

We aim to update the relevant skills demand and training framework continuously via the foresight (Skills Intelligence). The ESSA and SPIRE-SAIS Blueprint tools (e.g., skills assessment survey, training framework, training modules, train the trainer measures) are planned to be offered on a European level with the possibility to adapt them to sectoral-national-regional specific needs. Recruitment and image campaigns are considered to attract specific target groups (young people, women, etc.). Bundling and exchanging best practice will be done by addressing and integrating members of existing sector associations and structures. With a cross-sectoral exchange strategy and alliance the aim is to dynamically detect and adjust future skills demands, in line with the ambitions of the Process Industries European Strategies (e.g., P4Planet's Strategic Research and Innovation Agenda, ESTEP Strategic Research Agenda and Clean Steel Partnership CSP).

Alignment with other European programs and activities will ensure the integration of the EIIs skills perspective (esp. Erasmus+, Horizon Europe, P4Planet, CSP calls and projects). Possible complementarities with the Raw Materials Academy managed by the EIT Raw Materials will be explored to identify new areas for skills-focused actions. Rollout to the different sectors, member states, selected regions (esp. Hubs4Circularity, sector related clusters) is planned to be done by the members of the Pact for Skills through different means (e.g., platforms, events, workshops). This can be done in collaboration with European Community of Practices, the Pacts for Skills Support or other. Beside the existing skills approaches (ESSA: t-shape skills combining technical with transversal skills, SPIRE-SAIS: skills for industrial symbiosis and energy efficiency) and depending on the existing resources and funding possibilities the integration of further cross-sectoral skills demands for other and new challenges (e.g., decarbonization, hydrogen usage) are under consideration.

7. Further Exploitation Steps

Based on what has been outlined so far, we will start with the following activities of the main ESSA coordination units, completed by the starting activities of the LSP Energy Intensive Industries, and monitored by the ESTEP FG People and regular quarterly meetings of the **ESSA Executive Team** (consisting of members of the former Project Executive Team).

Foresight Observatory:

- Technological Foresight and Skills Requirement survey
- New emerging job profiles
- SME perspective and CEO awareness for skills adjustment
- Proposal for closing existing gaps and new skills needs
- Awareness campaign for Industrial Symbiosis
- Image, Recruitment, Talent Management for the steel industry
- Regular (monthly) ESSA meetings
- Year of Skills participation
- Canvas Business Plan

steelHub:

- new training content, providers and users
- ECoP online platform (regional platforms)
- skills assessment tool

ECoP Steel (National-Regional Ecosystems):

- Further steel regions from France, Austria, Sweden, and others
- Governance (responsible people for the European and national-regional coordination)
- Roadmap for further activities: ongoing activities of the already established ecosystems, integration of new regions

LSP Energy Intensive Industries:

- Integration of the two Blueprints: communalities and sector specific needs
- Awareness campaign for Industrial Symbiosis
- Cross-sectoral Image, Recruitment, Talent Management
- Extending membership (missing sectors, sector associations)
- Regular meetings of the LSP with specific topics, Kick-of Meeting in September / October 2023
- Governance structure
- steelHub and SKILLS4Planet online platform integration
- EU programming P4Planet, CSP, Industry 5.0 (Strategic Research and Innovation Agenda update)
- Rollout of the ESSA Blueprint to other SPIRE-SAIS sectors
- Complement the European Steel Skills Agenda with skills for Industrial Symbiosis and Energy Efficiency
- Cooperation with other LSPs, Blueprints (Automotive, Hydrogen, …), networks (e.g. EUWIN), and projects (e.g. BRIDGES 5.0)
- Supporting EU programming P4Planet, CSP, Industry 5.0 (Strategic Research and Innovation Agenda update)
- Development of a Process Industry 5.0, operationalisation concerning skills
- Application of a proposal for funding further steps of the Blueprint implementation and development, integration of new job profiles, SME focus, sector specific skills needs, Process Industry 5.0 and human-centricity / skills, and other topics not covered by the two Blueprints ESSA and SPIRE-SAIS