Just Transition Platform Working Groups

Action 15: Strategies for increasing material efficiency and the use of secondary steel

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Regional and Urban Policy

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The **Just Transition Platform (JTP) Working Groups (WGs)**, established in November 2021, bring together all stakeholders from across Europe with a common concern for the people and places affected by the transition to a climate-neutral economy. The WGs for **Steel, Cement and Chemicals** each have a focus on a specific carbon intensive sector that is heavily impacted by the transition, while a fourth WG focuses on **Horizontal Stakeholder Strategy**.

After finalising their Scoping Papers, outlining the focus areas and objectives of their WG, the WG members developed a common Implementation Plan, which sets out their 17 Actions. This plan was finalised and published in April 2023. Throughout the rest of the year, the Action leaders, together other WG members contributing to the Action, have been implementing their respective Action.

This document presents the final output of Action 15.

Introduction

Challenges addressed by Action 15

Issues:

- The EU steelmaking sector is at a turning point; 71.4 % of steel installations will be reaching the end of their lifetime by this decade and will require major investments. This decade will be key to defining the policies that should bring the EU towards a climate-neutral, zero-pollution continent in a socially fair way.
- The present Russian invasion of Ukraine is exposing how dependent the EU is on external suppliers able to menace its own basic interests and standard of living. The steel sector makes no exception, fossil gas making up 32 % of its energy use.

Challenges:

- Greening the production of primary steel via the electrification of processes and use of renewable hydrogen is only one side of the matter.
- Other deployable solutions such as an increased circularity of the sector to make the most of scrap, a better efficiency when it comes to how steel is used to produce a certain output, and the extension of the use of the steel already embedded in products should be implemented at larger scale.
- Such solutions will have an impact on the number, type, and location of current jobs in the steel sector and will require upskilling or reskilling of the current workforce as well as finding solutions for other impacted steel workers to ensure a just transition. Furthermore, it will also require dedicated resources and additional research to increase the quality of scraps.

Objectives of Action 15

The aim of the Action is to show to policy makers and national and regional authorities through a recommendation paper the available options and related needs able to implement circular economy and material efficiency practices to tackle environmental, social and resiliency issues at once.

Stakeholders targeted by Action 15

Action 15 targets:

- regional and local public authorities, to make them aware of the opportunities linked to secondary steel and circular economy;
- chambers of commerce at national and regional level, to support such activities;
- skilling/reskill agencies, to make them aware of the sectors in need of reskilling activities;
- universities/start-up incubators in general, to spark start-ups linked to innovative solutions to tackle certain issues highlighted in the document.

How this Action was implemented

This Action was implemented through:

- data collection;
- consultation of stakeholders including social partners, academia, civil society organisations and regional authorities active in the above-mentioned fields;
- mapping of existing good practices and gathering of information on 'lessons learnt';
- employment mapping of the impact on the number and type of jobs in relation to the proposed approach, including a skills analysis on future skills gaps and upskilling and re-training needs.

Strategies for increasing material efficiency and the use of secondary steel

Introduction: Why focus on material efficiency and secondary steel?

Steel is everywhere. It is in the buildings we inhabit, in the means of transport we use and in many other items that make our life more comfortable, such as household appliances and infrastructures. Moreover, the steel sector provides more than 300 000 direct jobs in the EU.[1]

Despite being so common and present in so many aspects of our daily life, steel is indeed very precious; in fact, the production of primary steel has a big environmental impact in terms of emissions of greenhouse gas (GHG) and pollution, making it responsible for around 5 % of CO_2 emissions in the EU and 7 % globally.[2] Additionally, the mining and processing of iron ore has an important impact on air quality, water quantity and quality, as well as disturbing effects on local fauna and flora.

Here lays the preciousness of steel: its production being so impactful on public health and the environment, we must treat it cautiously, prolonging its life as long as possible once it is produced. Hence, the pivotal importance of secondary steel; improving and increasing its use will allow one to keep the advantages of using such a strong and versatile material while reducing at the same time the environmental and health impacts of its production.

An approach coherent with just transition goals

Increasing material efficiency of steel, prolonging its lifetime, and widening the use of secondary steel to include uses that are usually reserved for primary steel can hit various goals linked to the transition towards a more environmentally friendly, socially just and diversified economy at once.

Firstly, the steel secondary route is easier to decarbonise than the primary route. Being based on Electric Arc Furnaces (EAF), using renewable energy to feed the EAFs would automatically reduce the impact of secondary steel production on the climate and the environment by reducing CO_2 and pollutant emissions.

Secondly, prolonging the life of the steel that is already in use involves many kinds of expertise able to protect employment rates, diversify local economies and make them more resilient to external shocks. For instance, prolonging the life of the built environment through deep renovations will require a skilled workforce in building technical systems, residential renewable energy generation and insulation, demand-side management experts, etc.

[1] Eurofer, European Steel in Figures 2022
[2] International Energy Agency, Iron and Steel Technology Roadmap

Thirdly, increasing the quality of scrap to deliver high-grade secondary steel will not only allow the preservation of the economic value of end-of-life steel (after one use cycle, EUR 19 billion worth of steel are lost due to quality degradation[3]), but also encourage a further diversification of local economies through the creation, for instance, of businesses able to: improve collection of scrap and disassembly of products; improve the design of products to ease the recycling of materials; research innovative ways to reduce steel contamination from other materials, such as copper; and digitalise the scrap market to ease steel reuse.

Finally, the implementation of such an approach will hit many objectives linked to just transition and would result in easier access to the available funds: for instance, it would spark investments in small and medium-sized enterprises and start-ups, research and innovation activities, investments in renewable energy and digitalisation, investments in circular economy, including through waste prevention, reduction, resource efficiency, reuse, repair and recycling.[4]

Ramping up the use of secondary steel

Improving availability, collection and sorting of scrap

In 2021, exports of ferrous metals waste amounted to 19.5 million tonnes, accounting for 59 % of all waste exports from the EU.[5] According to Eurofer, for every tonne of steel scrap recycled, a saving of 1.5 million tonnes of CO_2 is achieved, meaning that more than 29 million tonnes of CO_2 per year could be saved if we were able to not export end-of-life steel. In this sense, the review of the Waste Shipment Regulation could provide a favourable legislative framework to reduce the export of ferrous waste and keep it in the EU.

Despite this, currently an average of 85 % of end-of-life steel in the EU is collected for use in the production of new steel.[6] Nevertheless, getting 100 % is increasingly difficult because of the widespread use steel; important sources of losses include steel structures that are abandoned or left in place, or losses through corrosion. A small share of scrap is landfilled due to incomplete separation (e.g. in construction waste), whereas there is a small share of scrap from manufacturing that goes uncollected. Finally, some steel is collected but incorrectly sorted (e.g. scrap in fillers for construction).

The potential lying in the improvement of collection and sorting of scrap includes:

1. **Expand the capacity and the accuracy of scrap collection** through a more granular identification of scrap sources and the development of businesses and other initiatives able to inform and encourage scrap collection and recycling. For instance, the construction sector could play a bigger role by systematically separating steel of the structures of demolished buildings and heading them towards recycling or even direct reuse. Public authorities can play a significant role in mapping abandoned steel structures and encourage their reuse or recycling.
2. **Improve the sorting of scrap to identify and separate different steel grades**. This area offers opportunities in terms of research to find innovative

[3] Material Economics, Preserving the value in EU industrial materials
[4] Regulation (EU) 2021/1056, art. 8.2
[5] Eurostat, What are the main destinations of EU export of waste?
[6] Material Economics, Preserving the value in EU industrial materials

technologies for: an increasingly granular identification of different steel grades; the creation of consultancies able to help companies to keep different grades of steel separated at the source; and the change of processes and logistics along the steel value chain to keep separated the different streams of steel grades. For example, recycling the steel used to manufacture a car would not only require a granular dismantling of cars to avoid contamination and reduction of the steel grade, but also a better design of the car to ease the recycling and reuse of materials.

3. **Improve the sorting of scraps to identify and separate different alloys.** The key is to analyse scraps to determine their composition and mix them to obtain a certain alloy; the development of these technologies would allow the creation of new markets where alloys coming from secondary steel could be placed, so steelmakers can obtain the specific type of alloy to produce high-grade products. A good example of a 'circular loop' able to keep the value of alloyed steel is represented by stainless steel, where nickel and chromium constitute only 25 % of the volume but 70 % or more of the material value. Nevertheless, 20 % of the alloy value is lost also for stainless steel; a study from Japan found that with a high level of scrap sorting, the amount of chromium and nickel in steel scrap that can be recycled and used in new steel products would be 250 % higher than in a system with poor sorting.[7]

The problem with copper contamination

Higher uses of secondary steel are heavily hampered by copper contamination. Copper lowers the strength and quality of steel even in very low concentrations, and it is extremely hard to separate from steel once it is mixed with it. At the moment, the common practice to use steel contaminated with copper is to dilute it with primary steel to reduce copper concentration: such a practice does not help to develop a true circular steel loop, being reliant on virgin material.
By solving the copper issue, the EU could base its steel demand almost entirely on secondary steel. It can be fixed by implementing a series of measures able to spark new businesses and research, such as:

- improve end-of-life separation of materials, particularly in cars;
- design products to ease disassembly between copper and steel;
- replace copper with other materials (e.g. copper cables with fibre optics);
- conceive more efficient methods to separate copper from steel and improve sorting;
- make it obligatory to label high copper contents in steel in certain uses (e.g. car manufacturing).

Modernise the scrap market to ease the direct reuse of steel components

To make the most effective use of steel scrap, its market should be modernised to track the different steel grades, know the state of scrap supplies and link the scrap demand side with the available supply.

In this sense, the digitalisation of the scrap market offers the potential to make available real-time data concerning the above-mentioned items; this will be particularly important, for instance, to match the availability of certain alloys with the demand and widen the use

[7] Nakamura, S., Kondo, Y., Nakajima, K., Ohno, H. and Pauliuk, S. (2017). Quantifying Recycling and Losses of Cr and Ni in Steel Throughout Multiple Use cycles Using MaTrace-Alloy. Environmental Science & Technology, 51(17). 9469–76. DOI:10.1021/acs.est.7b01683.

of secondary steel for higher-grade products and to improve the possibilities for direct reuse of certain steel products at the local level.

Digitalising the scrap market would also be key to provide the scrap market with information regarding the safety of specific products with, for instance, labels able to communicate to possible buyers the technical characteristics of a certain product, such as the grade of contamination, its strength and so on.

The scrap market still being far from this level of digitalisation and detail, the opportunities for start-ups to launch dedicated software are great, with potential to diversify the local economy with quality jobs in the tertiary sector.

Design for circularity: easing the disassembly of products

Other opportunities are offered by new concepts of product development aimed at easing their end-of-life disassembly. This is not only relevant for steel scrap but also for many other materials such as plastics, cement, glass, etc. Also, a better product design would reduce steel contamination and improve possibilities for direct reuse, recycling for higher-grade products and, by doing so, reduce reliance on primary steel.

Design for circularity is a label that can be used for many activities, such as research for material substitution (e.g. substitute the use of copper cables with fibre optics or other equivalents), improved dismantling protocols for vehicles, or new automation technologies to make the dismantling of vehicles and buildings more sophisticated and economically viable.

In general, poor product design is a major barrier to improving the availability of steel scrap, particularly for vehicles and buildings. The automotive sector being increasingly interested in making the most of old vehicles to improve its environmental and economic performance and circularity being at the top of the legislative agenda (e.g. the End-of-Life Vehicles Directive is currently under review), innovative design and product development approaches taking end-of-life into account have the potential to offer long-term job opportunities.

Using the Green Public Procurement (GPP) handle to spark the market of secondary steel products

Public authorities can use their purchase power to incentivise the use of secondary steel products when drafting calls for competitive bids. Despite being only a voluntary instrument at the EU level, the inclusion of clear environmental criteria for products and services bought by the public sector has the potential to stimulate demand for such products and increase the opportunities linked to circular economy in just transition areas.

The European Commission and many Member States already stimulate the uptake of green criteria and have developed guidance documents that can be used by public authorities to draft their calls for bids. The EU GPP Helpdesk[8] offers guidance and good practice examples, as well as procurement criteria for many products and services that can be

[8] https://green-business.ec.europa.eu/green-public-procurement_en

promptly used and that balance the need for good environmental performances with cost considerations, market availability and verification needs.

Increasing material efficiency

What is material efficiency?

Material efficiency means obtaining the same output, either a service or a product, with the same or a lower amount of material. While historically economic growth counted on an increase in demand of materials (e.g. steel, cement), today the need to decouple these two trends is imperative to accomplish the goal of climate neutrality while preserving quality jobs and a healthy industrial sector. The potential for material efficiency lies throughout whole value chains: better design of products, lightweighting of vehicles, lifetime extension of products, increased reuse and recycling of materials after the end of life of a certain product.

According to the Clean Technology Scenario of the International Energy Agency, which is aligned with the goals of the Paris Agreement, demand can be reduced by 24 % for steel, by 15 % for cement and by 17 % for aluminium in 2060, contributing to 30 % of the combined emissions reduction for these three materials in 2060.

The uptake of material efficiency strategies carries with it a change of the structure of the economy, likely boosting economic activities related, for instance, to extending the lifetimes of products (building renovations, product repairing and reconditioning, recycling), new business models and services, while negatively affecting material-intensive sectors. This aspect will be discussed in more detail in the next chapter about skills.

The construction sector: deep renovations to prolong building life

According to the Building Performance Institute Europe (BPIE),[9] deep renovation of buildings is a process of capturing in one or a few steps the full potential of a building to reduce its energy demand. Deep renovations achieve the highest possible energy savings and leads to a very high energy performance, with the remaining minimal energy needs fully covered by renewable energy. Deep renovation also delivers an optimal level of indoor environmental quality to the building occupants.

Deep renovations have multiple positive impacts on our society: they substantially contribute to reducing CO_2 and pollution emissions through buildings' higher energy efficiency and lower use of materials such as steel and cement; improve the quality of life of buildings users; lead to lower energy bills for consumers, thereby reducing their vulnerability to the volatility of energy prices; boost the whole construction value chain; and increase the number of jobs. In fact, for every EUR 1 M invested in building renovation, 18 jobs are created on average across the EU.[10]

[9] BPIE (Buildings Performance Institute Europe) (2021). Deep Renovation: Shifting from exception to standard practice in EU Policy

[10] Renovate Europe (2020). Building Renovation: A kick-starter for the EU recovery.

Given that the investment gap to bring the EU building stock in line with the 2050 climate neutrality target is around EUR 200 billion, the potential amount of available jobs linked to deep renovations is around 3.6 million. Deep renovations imply a need for competence and technical knowledge of high efficiency solutions and processes. Increasing the rate of deep renovation is an opportunity to develop industrialised solutions to renovation and to create high-quality jobs and boost the green economy.

The automotive sector: use of secondary steel and a different concept of moving

The production of vehicles requires the use of steel. Even though substitute materials (such as aluminium, magnesium, titanium, composites, etc.) are increasingly available for certain parts to reduce weight and save energy or fuel, steel remains a key material even for the most recent vehicles given its low cost, high performance and recyclability.

Automotive players are increasingly using secondary steel to produce new vehicles: BMW is planning to increase its percentage of secondary steel in its production lines to reach up to 50 % by 2030,[11] while Volvo is aiming at reaching 25 % by 2025 and become fully circular by 2040.[12] To make this happen, not only are circular design needed but advanced scrap collection solutions also are.

Increased investments in public transport also have the potential to differentiate local economies.[13] It has been recognised that the quality of public transport has effects on private cars ownership; improving the public transport network will not only create job opportunities in the sector (e.g. building of infrastructures, technical services, drivers, etc.) but also reduce the need of private cars, so reducing the amount of materials, including steel, used for their production. In general, this would also lead to cheaper transport for people (private mobility options are more expensive than public ones), resulting in higher budget availability for families that could be spent for other services or needs, as well as increasing the quality of life in our crowded cities.

Household products: right to repair to extend their life

Sparking the 'repair economy' for household products (white goods such as washing machines, refrigerators, etc.) would extend the lifetime of such products and allow one to make the most of the steel that has been used to produce them. Discarded products are often repairable goods but are often tossed prematurely, resulting in 35 million tonnes of waste, 30 million tonnes of resources and 261 million tonnes of greenhouse gas emissions in the EU every year. Furthermore, the loss for consumers opting for replacement instead of repair is estimated at almost 12 billion per year. The European Commission has launched a proposal to introduce common rules to promote the repair of goods, which is estimated to bring EUR 4.8 billion in growth and investment in the EU.[14]

[11] https://www.press.bmwgroup.com/global/article/detail/T0366153EN/bmw-group-significantly-increases-use-of-low-carbon-steel-in-series-production-at-european-plants?language=en
[12] https://www.volvocars.com/intl/v/sustainability/circular-economy
[13] Johan Holmgren, The effect of public transport quality on car ownership – A source of wider benefits?, Research in Transportation Economics, Volume 83, 2020, 100957, ISSN 0739-8859, https://doi.org/10.1016/j.retrec.2020.100957.
[14] https://ec.europa.eu/commission/presscorner/detail/en/ip_23_1794

Such investments will benefit various parts of society and will contribute to diversifying local economies. Independent repairers, including small and medium-sized enterprises are well placed to benefit from the 'repair economy'. When repair is not the optimal option, replacing a defective product with a refurbished one should be considered. Refurbishment is an increasing business model that presents many advantages in terms of sustainability and diversification of the economy.

The skills issue

Circular economy and employment

Circular economy is one of the keys to reaching our environmental, climate and strategic autonomy targets. Moreover, as described above, it has the potential to spark new economic sectors, as well as making our economic and social fabric more diversified and less vulnerable to external shocks. Circular economy must also be fair and take into consideration the needs of workers in terms of quality of life, high safety standards and involvement in the transition from linear to circular practices, by providing opportunities to improve their skills and acquire new ones.

It is generally recognised that circular economy practices will increase jobs. In particular:[15]

- The waste management sector will create 45 million jobs by 2030, according to the International Labour Organisation (ILO). The sector is strongly linked to the use of secondary steel, including all the operations ranging from collection, sorting, treatment and disposal of scraps.
- ILO estimates 50 million additional jobs by 2030 in the repair sector. For steel, this means jobs connected to prolonging lifetimes of goods, such as cars and household appliances.
- Reprocessing of secondary steel and wood will create, according to ILO, more than 30 million jobs worldwide by 2030.
- The construction sector will likely benefit from the increasing focus given to deep renovations and energy efficiency of buildings, particularly when it comes to insulation materials, energy efficiency and renewable energy solutions, demand-side management and domotics. As said in the previous chapter, a strong uptake of deep renovations would see the involvement of up to 3.6 million workers in the EU.

Nevertheless, other sectors will see a decline of jobs, such as raw materials manufacturing and mining. Even though, in general terms, the absolute numbers are limited, the high geographical concentration of unemployment raises social concerns that must be addressed. In this sense, legal frameworks such as the Just Transition Mechanism are particularly important to provide adequate resources to allow companies and public authorities to ensure that the transition towards circular and material efficiency practices are pursued by reducing social impacts as much as possible.

[15] Trinomics "European Social Partners' Project on Circular Economy - Final Report", 2021

Upskilling and reskilling for circularity

The opportunities linked to the shift towards circularity can be grasped only if workers are timely provided with the right skills. In fact, the qualification levels and skills of the jobs being created do not match one-to-one with those of the jobs being lost, so that support to the transition of workers and businesses to circular economy will be a priority.

In the waste management sector, in general the level of qualification is likely to increase in the context of a transition to circular economy, because the least qualified jobs (landfilling) will tend to disappear, whereas those requiring more qualifications (repair, re-manufacturing, recycling) should increase. Higher skilled workers will also be needed in waste management to operate the emerging automated sorting machines.

In the automotive industry mechanical skills will likely be less needed, while IT skills and soft skills (such as teamwork, self-organisation and problem-solving capacity) become more important. The cars will have longer lifetimes and therefore more repair and maintenance work will be needed, with higher qualifications.

Prolonging the lifetime of buildings will likely have the same effects, with less workforce and fewer raw materials (e.g. steel, cement) needed to build new buildings, but more skilled workers required to project and implement deep renovations, install renewable energy systems and heat pumps, design and install demand-side management systems in apartments.

The repair industry requires entirely new skills compared to the retail one. Prolonging the life of household appliances, for instance, will require workers operating in retail services to upskill themselves through, for instance, 'repair programmes' initiated by companies or associations.

The European Steel Skills Agenda (ESSA)

The European steel sector recognises the concurrent challenges posed by a deep industrial transition, running parallel to the ongoing energy transition. To thrive in the future, steelworkers must not only adapt but also continually update their skills to meet evolving demands.

The sector is undergoing a significant transformation driven by global digitalisation, extending beyond plant-level operations to encompass supply chain integration, sustainability, the circular economy, decarbonisation and energy efficiency. This evolution is reshaping both the 'hard' technical skills and the 'soft' interpersonal skills within the industry. Additionally, it is essential to ensure a just transition that safeguards the well-being of our workers, leaving no one behind.

At the heart of this transformation is the ESSA, a social research project initiated in 2018. Led by the European Steel Technology Platform (ESTEP), ESSA boasts extensive participation from 24 partners across 10 European countries, representing more than 70 % of EU steel production. These partners encompass a diverse array of stakeholders, including steel producers, industry associations, universities, research centres, and experts with expertise in various fields, including trade unions.

ESSA's research reveals a shifting landscape of skills. There is a clear emergence of three key categories: social and emotional skills, technological skills, and green skills. In contrast, physical and manual skills, along with basic cognitive abilities, are on the decline.

The project goes beyond merely identifying these evolving skill sets; it actively shapes the future by crafting job profiles that align with the skill requirements. These profiles cover initially around 50 different working roles. What sets ESSA apart is its commitment to a 'just transition'. The material developed within the project empowers current steelworkers to self-assess their skills and facilitates skill enhancement. This, in turn, opens doors for internal job transitions or lateral moves within steelmaking companies to new areas.

To support these skill improvements, ESSA has integrated knowledge-sharing within a specialised Learning Management System (LMS) known as the steelHub. This LMS can be customised to accommodate the specific needs of project participants and the wider steel industry.

ESSA, under the guidance of ESTEP and its diverse partners, stands as a comprehensive response to the challenges of the steel sector. By continually updating skills and focusing on just transition, the European steel industry is poised to adapt, innovate, and evolve in an ever-changing global landscape.

Practical reskilling examples

Example 1: APPLiA is the association representing the home appliance industry in Europe. Following the push provided by EU Ecodesign legislation in terms of extended efficiency, repairability and durability of household appliances, APPLiA's members are investing in educational programmes training younger generations in professional home appliance repair. Particularly, APPLiA Hungary runs repair courses in partnership with local schools.[16] Similar initiatives were also undertaken by other organisations within APPLiA's network including in Slovakia, Czechia and Poland,[17] which launched their own repair programmes at the national level.

Example 2: The massive deployment of heat pumps in the EU (at least 10 million in five years, according to the REPower EU programme) is expected to impact positively on employment. According to the European Heating Industry association (EHI),[18] an additional 0.75 million heat pumps installers will be needed in 2030, that is around 50 % more than today. In addition, at least 50 % of the existing installers will have to be reskilled to be able to work with heat pump technologies. In France, it is estimated that 20 000 additional installers will be needed, whereas in Germany the number is 38 000.

In this framework, reskilling installers from old, inefficient heating systems to heat pumps is key. In most of the EU countries manufacturers take care of reskilling their workforce, sometimes, as in Germany, offering training not focused solely on their own products but more largely to specific conditions for heat pumps. Many projects funded in part by EU resources in Greece, Belgium and other EU countries have contributed to addressing this issue. Nevertheless, more investments in reskilling are needed to cover the need for upskilled workers able to install and maintain the number of heat pumps that are going to be deployed.

[16] http://repair-it-right.eu/
[17] https://zostantechnikiemagd.pl/
[18] European Heating Industry association, 2022, Heating systems installers: Expanding and upskilling the workforce to deliver the energy transition

Addressing the gender gap

There is a clear gender gap in almost all industrial sectors, and, unfortunately, the steel sector is not an exception. The gap is even wider when referring to STEM (science, technology, engineering and mathematics) profiles. These profiles are largely required within large industries. In order to meet the future skills demand, the steel industry must have access to 100 % of the talent pool regardless of whatever bias, and gender is the main one.

The possible reasons are multiple. Some of them are gender based and many of them come from previous education/cultural biases:

- The so-called 'heavy industry' is linked to male attitudes. Nonetheless, nowadays almost no one needs physical strength within most heavy industry activities.
- Energy-intensive industries are not viewed as attractive for youths, many of whom consider them 'old-fashioned'.
- Industry in general, and STEM in particular, is strongly linked to male stereotypes, even more evident in western countries. A lack of visible female role models in industry and steelmaking is a key issue. Despite that, there are many women working in steel companies, ranging from production workers to crane operators, engineers, lawyers, psychologists, doctors and firefighters.

To correct this last point, UNESID launched the campaign #WomenOfSteel in 2014. The campaign intends to visualise women's talent in steelmaking with their knowledge, capabilities and actions, trying to break through gender prejudices. The campaign has been receiving a good echo from many companies and countries. UNESID changes the approach and theme of their campaign every year. From testimonies from women who work in the process itself, to streamed round tables about the many faces of challenge of the decarbonisation of the steelmaking sector (energy, sustainability, marketing, innovation, etc.). Every year a panel of actual #WomenofSteel decides the coming year's campaign.

Main sources

- Material Economics (2020). Preserving value in EU industrial materials – a value perspective on the use of steel, plastics, and aluminium.
- International Energy Agency (2019). Material efficiency in clean energy transition.
- Organisation for Economic Co-operation and Development (2020). Labour market consequences of a transition to a circular economy.
- Trinomics (2021). European Social Partners' Project on Circular Economy - Final Report.
- Buildings Performance Institute Europe (2021). Deep Renovation: Shifting from exception to standard practice in EU policy.