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ECODESIGN FOR STEEL

KEY CONCERNS AND RECOMMENDATIONS

APRIL 2026

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April 2025

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RPM Tribunal de l'entreprise francophone de Bruxelles
Funded by the European Union, Tiina and Antti Herlin Foundation and ClimateWorks Foundation.

Introduction

Following the entry into force of the Ecodesign for Sustainable Products Regulation (ESPR), in April 2025 the European Commission (EC) identified the iron and steel sector as one of the priority intermediate products to receive Ecodesign requirements. According to the EC, iron and steel has *high potential to improve the impacts on climate change, energy consumption, water, air and to boost the EU's resilience, strategic autonomy and technological innovation*[1].

The reasons for prioritising iron and steel are even truer and more urgent today, when fossil fuels dependency is weaponised causing high energy prices, and global overcapacity and tariffs are putting EU steelmaking under pressure; **transforming towards fossil-free and low carbon production routes is therefore the only option that would allow EU steel to remain competitive while improving its environmental and public health impact.**

If well designed, the ESPR requirements will stimulate this transformation by informing the market about the environmental performances of intermediate steel products and providing steel buyers with incentives to purchase true low-carbon steel for their products.

Nevertheless, presently the options on the table do not exploit the full potential of the ESPR framework; the proposed information and performance requirements only target a very limited subset of product aspects, neglecting key ones as energy and materials use and efficiency, as well as the impact on air and water quality. Moreover, the proposed steel label gives a misleading definition of low-carbon steel, potentially leading to a situation where coal-based steel would receive the same ranking as true low-carbon options, cannibalising market quotas originally intended to sustainable alternatives (e.g. under the Industrial Accelerator Act).

This briefing describes the main issues about the scope of the iron and steel Ecodesign requirements, the first label proposal and the Digital Product Passport (DPP). Also, it raises some concerns regarding the methodology approach followed by the EC.

[1] COM (2025) 187 final

1. Steel label

The steel label set by the ESPR is one of the most important issues, because of the mandate within the Industrial Accelerator Act to use this label for preferential treatment in public procurement.

In its draft report "Classes of environmental performance"[2], the JRC proposes classes of performances for 5 intermediate products: Hot Rolled Coils (HRC), Cold Rolled Coils Galvanised (CRCG), Wire Rods (WR), Electrical Steel (ES) and Stainless Steel (SS). This is appreciated, granularity being useful to provide a label adhering to the properties and the peculiarity of each steel product.

For HRC and WR, the JRC decided to include >30% of global production volume in classes A and B, in their words *to ensure policy relevance and avoid unintended impacts on availability, price and potential applicability in Green Public Procurement.* The two products represent ~35% of EU production and cumulative CO2 emissions of ~117 MtCO2/y[3].

CRCG, ES and SS account for emissions of ~75,5 MtCO2/y; their classes of performances have been defined differently, without a defined percentage of products to be in the first two classes.

a. Issues with the proposed label classification system

Ensuring that classes A and B are distinctly better an urgent priority, to ensure that market quotas for low-carbon steel (e.g. in the IAA) are not cannibalised by energy and carbon-intensive products, with categories A and B rewarding only true clean steel. Failing to provide a clear differentiation would send a bad signal to innovators and investors, which would see true low-carbon efforts equated with business-as-usual practices.

The label should not be turned into a greenwashing tool. It should unambiguously promote the best performing steel products in terms of reduced impact on the environment and public health, without putting in the best classes products with vastly different carbon intensities. The benefits of recycled steel should be clearly stated as well, including its reduced consumption of energy and materials.

The classification should take technological development into account and not reflect the status quo; **as it is now, the label (particularly for HRC and WR) does not provide steelmakers with sufficient incentives to produce low-carbon and fossil-free steel, nor steel buyers with clear orientation.**

- **The energy label precedent: leave top classes empty to encourage further innovation**

The Ecodesign and labelling frameworks have successfully contributed to developing markets for sustainable products. In the last 20 years the energy efficiency of household appliances has

[2] JRC (2026): Classes of environmental performance - ESPR five representative iron and steel intermediate products
[3] JRC (2024): Draft Preparatory study on iron and steel – Ecodesign measures under the ESPR

dramatically improved: between 2004 and 2014 the average energy consumption of refrigerators decreased by 25%[4], mainly thanks to the combined action of Ecodesign and Energy Labelling requirements.

The approach to energy labelling has been often characterised by the practice of leaving the first two classes sparsely populated to incentivise innovation and spur producers to put on the market products able to reduce energy consumption while delivering even better performances.

For instance, when in 2010[5] the energy label for refrigerators was updated, only 1% of the sold products were in the top class and 9% in the second class. From that point onward, the market evolved and in 2014 25% of the products were in the top two classes (see graph below).

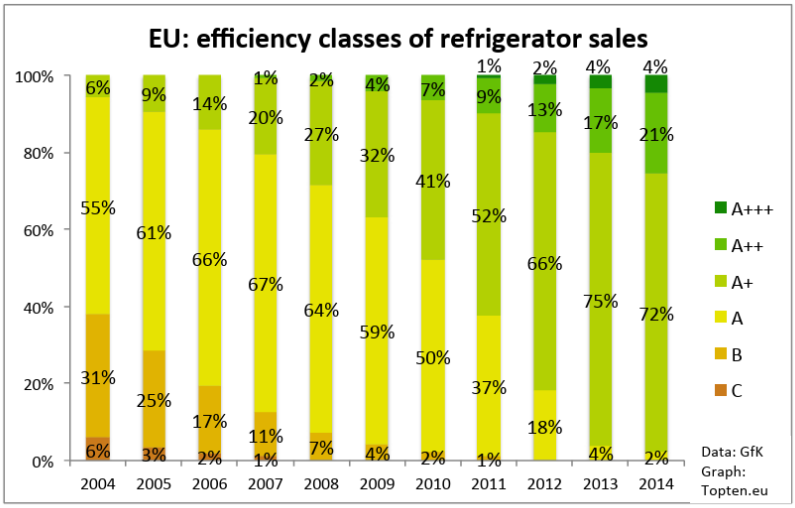


Figure 1: EU: efficiency classes of refrigerator sales

Unfortunately, for the steel label the JRC renounced this effective approach to product policy and opted for a blanket 30% of products in the first two classes (36,1% for HRC and 29,4% WR). The reason behind this approach is not convincing; in the past similar GPP benefits were given to the products in the first two classes of the energy label, without this necessitating a presence of at least 30% of products in the first two classes:

- Firstly, it is not clear why 30% has been picked as the right percentage to ensure that *competition is not unduly restricted*.
- Secondly, such a high percentage of products in classes A and B would undeniably ensure that *a meaningful share of products on the market* achieve the top level, **but at the expense of the effectiveness of the label to make the least polluting products more competitive for the long-term resilience of the EU.**
- **Third, the label would put on equal footing production routes able to dramatically reduce the impact of steelmaking on public health and the environment with fossil-based, pollution and energy-intensive options**. In fact, it leaves in the first two classes steel products with extremely diverse carbon intensities, potentially including even in class A products made with coal-based and carbon-intensive production routes (Blast Furnace-Basic Oxygen Furnaces) compared to the best in class (EAFs and electrolysis

[4] Topten EU (2015): Energy efficiency of white goods in Europe: monitoring the market with sales data
[5] Commission Delegated Regulation (EU) 1060/2010

based H2-DRI). EAFs also have the added benefit of allowing very high scrap inputs, supporting resilience and circularity in addition to a lower carbon intensity.

- **Finally, the label proposed by the JRC would be useless and even counterproductive towards the objective to spark lead markets for low-carbon steel products.** Steel buyers would not be able to understand whether they are actually buying low-carbon or carbon-intensive steel products, and market quotas intended to give a premium to low-carbon steel (e.g. in the Industrial Accelerator Act) would be taken by the cheapest steel products, which are in most cases the most carbon intensive options. **In other words, rather than being a tool helping buyers to purchase sustainable products, the label will become a greenwashing tool.**

- **Even voluntary industry standards are more ambitious than the ESPR label proposal.**

As an example, even the voluntary LESS standard[6], which has been endorsed by most iron ore-based steel producers, is much more ambitious than the proposal included in the JRC study, since any coal-based steel is out of the top two classes. LESS sets the near zero emission level at 400 kgCO2eq/t crude steel and adds for the downstream rolling phase an additional surcharge of 120 kgCO2eq. for rolled quality steel (QST) and 70 kgCO2eq. for rolled steel for structural and reinforcing steel (BST). This results in a cut-off threshold between the first and the second class at 520 kgCO2eq. per rolled quality steel and 470 kgCO2eq for structural and reinforcing steel (table 27 of the IAA Impact Assessment[7]). In comparison, for HRC the ESPR label sets a threshold between the first two classes of 1790 kgCO2eq./t and 2660 kgCO2eq./t between class B and C.

As a purely representative example, using the distribution table of the JRC for HRC (figure 9 in its labelling proposal[8]) and calculating the thresholds according to LESS (at 14% scrap[9]) without using a sliding scale gives a distribution among classes more in line with the Ecodesign approach aimed at stimulating innovation, clearly differentiating between real low-carbon and carbon intensive production routes.

Even the IAA Impact Assessment provides performance levels below 600 kgCO2eq./t (table 36)[10]. All EAF 100% scrap input-based processes perform below 256 kg within that table.

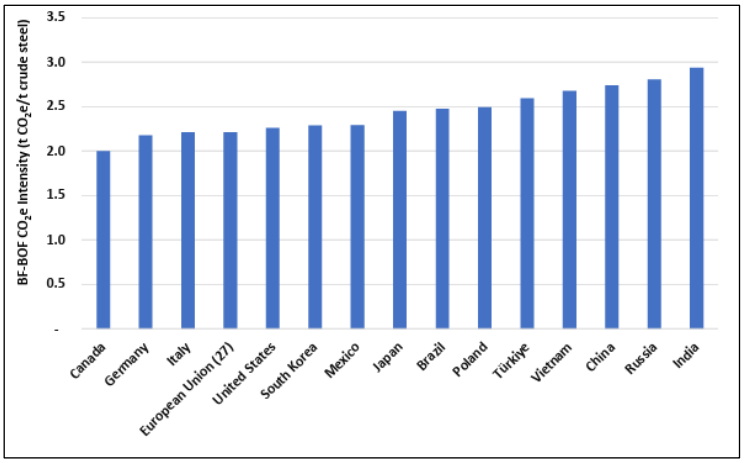
- **The use of CBAM default values skews the distribution of carbon footprint data.**

The use of CBAM default values to define the carbon intensities of non-EU steel overrepresents the emissions of non-EU countries, consequently unbalancing the whole distribution of installations into the classes. The CBAM default values were set with a different purpose than the ESPR label and are intended to be particularly penalising, to encourage exporters to the EU to report actual emission

[6] https://lowemissionsteelstandard.org/
[7] Commission Staff Working Document SWD(2026) 71 final
[8] JRC (2026): Classes of environmental performance - ESPR five representative iron and steel intermediate products
[9] As in the JRC Reference Scenarios
[10] 542 kg for DRI Natural Gas EU MIX with CCS, 247 kg DRI RES H2 RES ELEC and 170 kg for H2 DRI RES with 50% scrap input

values from specific installations. They therefore do not serve as an accurate representation of the real CO2 emissions of non-EU installations.

According to Global Efficiency Intelligence[11], the actual GHG intensities of non-EU steel are much lower than the CBAM default values, as shown in the table below. No value is higher than 3 tCO2eq./t crude steel (in the JRC distribution of classes there are carbon intensities well above 3).



Moreover, **it is probable that the actual GHG intensity of steel exported to the EU would be lower than the average shown in the graph** because CBAM will encourage exporters to the EU to sell their best performing steel products in terms of CO2 emissions.

- **The label should reflect the reality of the EU steel market.**

The dataset used by the Commission misrepresents the actual trade patterns related to steel, putting on equal footing countries that do not trade (or trade very little) steel with the EU with the bigger exporters.

According to Eurofer[12], the EU imported 27.4 Mt of finished steel products in 2024 (21.7 Mt flat products, 5.7 Mt long products). The main exporters of flat products are South Korea, India, Turkey, Taiwan, Vietnam and China (accounting for 68.3% of the exports combined), while the main exporters for long products are Turkey, China, Vietnam, Egypt, Switzerland and Ukraine (accounting for 62% of exports combined).

Table 46 of the Preparatory Study shows that 26% of HRC, 13% of WR, 27% of GCRC, 35% of ES and 40% of SS are imported, with a 2035 scenario in table 47 projecting even lower numbers.

The dataset on which the label is built should better weigh non-EU countries' steel production according to their actual exports to the EU and better reflect actual imports. **The label should consider the steel that is actually traded in the EU to carefully reflect the reality of the market**; this would allow to devise a more realistic label able to reward ambition through more realistic thresholds among classes.

[11] Global Efficiency Intelligence (2025): Steel Climate Impact 2025
[12] Eurofer (2025): European steel in figures

b. Recommendations

- **The label should support fossil-free, renewables-based production routes and set a clear cut-off point between the first two classes of 400 kgCO2eq./t of crude steel**, based on the widely accepted IEA definition of near-zero emissions steel. Any coal-based production route must be excluded from the first two classes, including with the use of carbon capture. Similarly, any natural gas-based DRI production route must be excluded from the first two classes.
- **It is essential to use actual CO2 emissions values for non-EU installations to better reflect the reality of global carbon intensities**. To do so, all carbon intensities beyond 3 tCO2eq./t steel should be put in the last class; the remaining carbon intensities should be redistributed among the other classes, ensuring that classes A and B are sparsely populated and do not host fossil-based installations.
- **It is equally important that the label reflects what is actually sold in the EU market**. Carbon intensities for non-EU installations should be weighted according to the real amount of steel imported in the EU, considering also which are the actual non-EU countries exporting steel to the EU.

2. Selection of product aspects

While all 16 ESPR product aspects are in some way related to the production of steel, according to a preliminary assessment by the JRC only 7 product aspects out of 16 are applicable to steel as an intermediate product:

- Presence of Substances of Concern (SoC)
- Energy use and energy efficiency
- Water use and water efficiency
- Resource use and resource efficiency
- Recycled content
- Environmental impacts, including carbon footprint and environmental footprint
- Generation of waste

Such a list would represent a bare minimum to define a comprehensive set of Ecodesign requirements, since it neglects important aspects as durability and possibility of recovery of materials. Nevertheless, the Commission is considering, *in the light of the current policy context and stakeholder discussions surrounding the steel sector*, to shrink the list even further, focusing only on 3 product aspects:

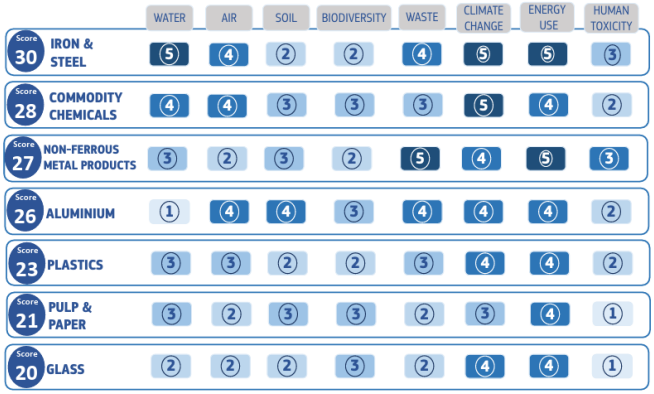
- Recycled content
- SoCs
- Carbon footprint, including the development of classes of performance.

a. Issues with the selection of product aspects

Firstly, it is not clear to which kind of *discussions and policy context* the Commission is referring to justify the consideration of only 3 product aspects. On the contrary, the current context characterised by the weaponisation of energy and raw material dependencies should tell the Commission to include aspects able to reduce energy, water and resource use, as well as increase efficiency.

Secondly, the proposal is incoherent with the reasons why iron and steel products were prioritised for Ecodesign requirements in the 2025-2030 Work Plan. According to the study on new product priorities by the JRC, iron and steel received the highest score in terms of environmental assessment. It *scored maximum points in three out of the eight categories investigated, due to high impacts and high improvement potential in water effects, climate change, and life cycle energy consumption. In waste generation and air effects, iron and steel scored high only in terms of impacts, whereas its improvement potential was estimated as medium*.

Table 10. Environmental assessment of the 7 intermediate products shortlisted.



Source: JRC own elaboration

Iron and steel scores high also in the Open Strategic Autonomy table, particularly regarding the content of critical raw materials (linked to resource use) and energy consumption (linked to energy use).

Using less energy, water and resources should be at the heart of any attempt to make the sector more resilient and competitive, as well as compatible with the environment. The inclusion of such indicators would stimulate the industry to use them better, leading to a more resilient and sustainable production.

When it comes to water, the reporting of water consumption for iron and steel production is mandatory pursuant to the Industrial Emissions Directive and the Regulation establishing the Industrial Emissions Portal; also, it is a key performance indicator for Environmental Management Systems such as ISO 14001 or EMAS. Hence, data should hence be readily available.

When it comes to energy and resource consumption, production routes able to decrease the emissions of GHGs can be energy and resource/feedstock-intensive (e.g. production of H2 and related use of energy, use of CCS), as well as being based on fossil fuels.

Production route	Energy requirement (GJ/t of crude steel)	CO2 emissions abatement potential vs BF-BOF
Scrap-EAF	2,8	100%
H2-DRI-EAF	10,8	100%
H2-DRI-SMELT-BOF	10,9	98%
NG-DRI-SMELT-BOF	11,9	68%
NG-DRI-EAF	12	70%
NG-DRI-EAF (with CCS)	12,2	89%
AEL-EAF	13,7	100%
MOE	14,8	100%
Hisarna-BOF (with CCS)	15	93%
BF-BOF (with 73% CCS)	22,8	73%

The table above[13] shows that production routes able to completely abate CO2 emissions can have very different energy requirements. By not including energy use in the list of product aspects there will be no requirement pushing steelmakers to choose low-energy production routes, particularly the scrap-EAF, which can reduce energy consumption by ~75% and supports the move towards circular inputs and resilience.

Thirdly, the proposal does not address the impact of steelmaking on public health, not considering the requirements of the ESPR. According to CREA, deaths linked to iron and steel production can be quantified at about 2.500 per year, while negative externalities amount to about 7 billion € per year[14].

The ESPR clearly states that such aspects must be taken into consideration: article 5.11(b) mentions that Ecodesign requirements shall not have *adverse effect on the health and safety of persons*, while article 6.3 states that *the setting of performance requirements shall also, where appropriate, reduce significant risks to human health or the environment*.

Moreover, even voluntary certification initiatives such as Responsible Steel, supported by a large part of the industry[15], includes in its standard aspects like prevention of pollution, water management and protection of biodiversity.

Finally, the general statement that *recyclability [is] not applicable to intermediate products* is not supported. Decisions made at the intermediate product stage can have a significant influence on recyclability and reusability. For iron and steel this might be less impactful but should not be used as a blueprint for other intermediate products (e.g. plastics).

b. Recommendations

We recommend including in the list of product aspects receiving Ecodesign performance and information requirements all the 7 product aspects applicable to intermediate products to ensure coherence with the scope of the ESPR and address the impact of iron and steel production on public health, as well as on the overall resilience and strategic autonomy of the EU. **This should as a priority include water and energy consumption and air quality**.

Even though some impact categories may be adequately reflected by climate change results (i.e. leading to similar conclusions), these are not included in the present LCA. Nevertheless, a broader set of impact categories should be assessed to identify where impact hotspots align and where they diverge.

[13] Agora Industry, Wuppertal Institute and Lund University (2024): Low-carbon technologies for the global steel transformation. A guide to the most effective ways to cut emissions in steelmaking.
[14] CREA (2023)
[15] https://www.responsiblesteel.org/members-and-associates

3. Digital Product Passport

Generally, the study on DPP content for iron and steel products under the ESPR provides a good starting point, but the following parameters are missing within the 7.1.4 section (product environmental and circularity information):

a. Water consumption information

This is an essential element of the environmental performance indicator and has been awarded the maximum relevance ranking (5) in the study identifying the first ESPR priority products.

The reporting of water consumption for iron and steel production is mandatory pursuant to relevant EU environmental protection acquis such as the Industrial Emissions Directive (IED) and the Regulation establishing the Industrial Emissions Portal (IEP); it is also a key performance indicator for Environmental Management Systems such as ISO 14001 or EMAS. Therefore, data should be readily available.

The water use (irrespective of type) can be averaged per tonne of steel produced. For increased granularity, a differentiation could be made by type of water (e.g. total amount of abstracted water: rainwater, surface water, groundwater). The water re-use efficiency (recirculation rates) should also be reported, being it indicative of lower wastewater generation volumes and improved water use footprint. BAT associated performance benchmarks for water consumption are also set for downstream processes, such as in the Ferrous Metal Processing BREF (2022)[16].

b. Air quality information

Wider public health impacts linked to air pollution emissions can be quantified; data is available, being steelmakers obliged to report emission data under the IED framework. The current EU rules set in the Iron and Steel BREF allow for wide margin of emission performances; hence there is a considerable improvement potential.

It is proposed to at least focus on a subset of key air pollutants (NOx, SO2, dust, PCCD/F) and heavy metals. The metric could be presented in yearly averaged concentrations as in the EU BREF format (mass per cubic metre - Nm^3) and/or in averaged mass pollutant per tonne steel produced.

EPDs developed already set out environmental impact indicators such as ozone depleting, acidification, eutrophication, photochemical ozone potentials and have resource depletion indicators. Hence this data is readily available.

c. Energy consumption / Share of renewable energy

The total energy consumption per tonne of steel produced can be reported, as well as the share of renewable energy in a separated field. This piece of information is a standard requirement under EPDs (total primary energy consumption, renewable and non-renewable energy use). For EAFs, one way to

[16] https://bureau-industrial-transformation.jrc.ec.europa.eu/reference/ferrous-metals-processing-industry

decrease indirect emissions (air pollutants and GHG) from steelmaking is the use of renewable electricity.

Energy efficiency performance of the processes is also readily available information. The main improvement parameters relate to heat recovery, energy consumption can be expressed in GJ/t.

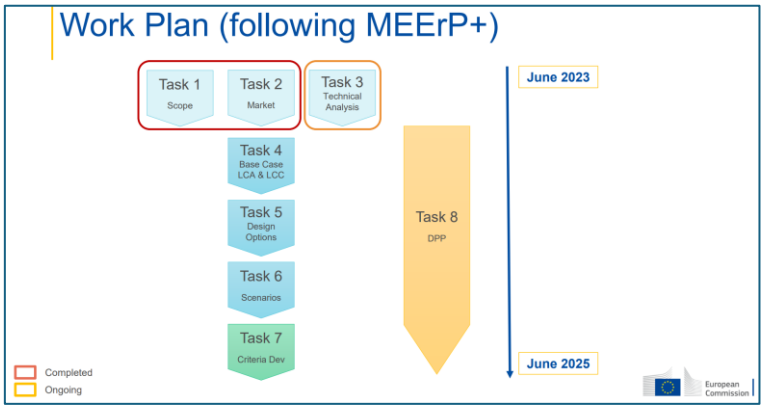
d. Voluntary inputs

Other information that could influence sustainable product choices could be:

- Whether the producer is accredited to an Environmental Management System (EMS), which could be ISO 14001 or EMAS. This information could also be added to the fields for the producer identification (Table 9). In this case the registration number to EMAS / ISO 14001 is to be provided.
- Information on whether the producer benefits from a derogation to comply with relevant state of the art production standards (IED Article 15.4) should be added under the Table 12 'other Union law data'. This could also make a mandatory URL to the latest annual compliance report as per the IED Article 14.1 (d).

4. Methodological concerns

During the first stakeholder meeting (25.6.2024) the approach for the Preparatory Study for steel was presented: it was characterised by 8 tasks, all of them set out to develop the definition of Ecodesign requirements and labelling proposals for intermediate steel products.



To date, some of the tasks have not been completed or have been changed; for instance, task 5 does not lay *design options* but *product aspects to be covered*. Moreover, it is not clear whether the JRC considers task 5 as final, nor what is the status of tasks 6 and 7. Also, some of the documents conclude with recommendations for further development. However, it remains unclear, whether, when, and in what form these developments are expected to materialise.

It is very concerning to see that not only has the JRC advanced a labelling proposal without completing all the tasks outlined for the Preparatory Study, but it also failed to present different options to be then discussed by the Ecodesign Forum.

Beyond this important limitation, other questions remain:

- While recognising that a standardised set of rules for Life Cycle Assessments and recycled content is needed, it is not clear to which extent this is reflected in the definition of classes of performance. This is especially important in the context of the upcoming Circular Economy Act, to not inadvertently provide obstacles for this important other initiative.
- The study on substances of concern addresses lead as a SoC but does not provide a strategy to reduce its use. It is mentioned that lead has positive properties for certain steel applications, but it is unclear why no assessment was done regarding alternatives to aim at a restricted use only in those applications where substitution is not possible.