Comments to BREF Workprogramme 19th IED-Forum

26/04/2024

Prioritisation of Iron and Steel BREF review

The EEB **supports the prioritisation of the review of the Iron and Steel BREF (I&S BREF) - reactivation in Q2 2024.**

1. Environmental relevance

The production of iron and steel is highly materials, energy and hence pollution intensive. The steel industry is responsible for about 9% of anthropogenic CO2 emissions (3Gt CO2/yr). Blast Furnace / basic oxygen (BF-BO) route is highly CO2 intensive, the EU steel production and processing facilities rank in the European Emissions Portal at rank#3 (7,4%) of all IED GHG emissions – the energy sector is expected to reduce significantly due to enacted EU coal phase outs. The processes are air pollution intensive, mainly in regard Mercury and dust (rank#2: respectively 13 % and 18%) but also NOx (rank#3: 7%) and SOx (6%).

2. Improvement potential

EU steel industry players are committed to achieve climate neutrality by latest 2050, some key players are committed to deliver earlier (by 2030) on GHG emissions reduction within Europe[1]:

- Liberty Steel aims for carbon neutrality by 2030 at 2 Saarstahl Ascoval Saint-Saulve, Dunkirk (FR) and GFG Liberty Galati – iron- plant (RO)
- Salzgitter aims 50% reduction at Salzgitter and Wilhemshaven (DE)
- ArcelorMittal: 35% reduction at various sites (BE, DE, FR, NL, ES, NO)
- Thyssen Krupp aims at 30% reduction at Duisburg (DE) and Rotterdam site (NL)
- Voestalpine aims at 30% reduction at Donawitz and Linz site (AT)
- SSAB aims at 26% reduction at 5 sites in SWE and FIN and to be fossil free by 2045
- Tata Steel aims a 30% reduction at the Ijmuiden site.

Climate protection is the main driver of industrial transformation within the sector, leading to important air pollution prevention co-benefits. The most effective techniques option is to phase out blast furnaces and other process techniques relying on fossil inputs. The conversion process is underway. Considering that the EU BREFs also serve as a reference for setting permit conditions / legislation beyond the EU, we expect the improvement potential impact to be higher.

a) Alternative techniques for Iron ore reduction (GHG, air pollutants)

Significant improvements are expected from the substitution of using coke/coal as reducing agents and alternative iron ore reduction process (DRI). A process shift will mean that downstream pollution (mainly air emissions) from other pollution intensive processes such as sintering and coke ovens will be avoided, provided an ambitious decommission plan is established within the

[1] Source https://www.industrytransition.org/content/uploads/2023/11/20231123-green-steel-tracker.xlsx + https://www.industrytransition.org/content/uploads/2023/11/20231123-green-steel-tracker.xlsx

revised BAT conclusions. The current EU ETS Benchmark data do not provide GHG performance data on the new (renewable)H2-DRI-EAF iron ore route, potential cross media effects expected would be water consumption, NOx emissions and energy consumption (H2 production).

b) Improvement potentials for scrap EAF route (GHG, hg air emissions, dust slag treatment and input controls)

The current BREF states that the specific energy consumption is in average about 1.8GJ/t liquid steel, with an average fossil fuel input indicated at 0.5GJ/t. We regard these figures as no longer corresponding to BAT, considering that the *use of electricity from fossil free energy sources* is established BAT for related sectors. The EU ETS benchmarks suggest the current GHG intensity to be at 0,215 / 0,266t CO2eq/t (carbon/high alloy steel). We expect further GHG performance improvement potential by a considerable increase of the share of renewable electricity, as well as other air pollutants benefits if this electricity is generated by non-combustion type of renewables.

Further improvements are also expected from the switching to renewables based reducing agents within both the DRI-EAF (iron ore) and scrap based EAF route. According to Soler-group, the use of biocarbon combined with biogas could reduce residual GHG emissions to DRI route: 0.38 tCO2eq/finished steel product, to 70kg CO2eq/finished steel in case of use of renewable electricity+ biocarbon+biogas. Scrap EAF route would result in 80kg/CO2eq.

Mercury and dust emissions but air emissions of inorganic and organic compounds still remain relevant pollutants with further mitigation potential. The main focus is on input controls for scrap quality and dedicated mercury controls. The level of <5mg/Nm³ (daily average) for primary and secondary dedusting (BAT 88) is regarded as BAT and we suggest to maintain that level, however the level of <10-20mg/Nm³ for on-site slag processing (BAT 90) shall be reconsidered since more effective techniques are available. The 50µg/Nm³ for mercury (BAT 88) should be reconsidered considering available hg specific abatement techniques.

c) Fossil based decommissioning BAT and interim BAT-AE(P)Ls

Due to the conversion of process in regard to DRI, many fossil based and otherwise pollution intensive downstream processes will become obsolete and hence should be subject to "negative BAT". An agreed decommissioning / phase out plan shall detail the minimal performance expectations during the decommissioning phase. Examples are the following:

Sinter process: The implementation of bag filter, such as in the ThyssenKrupp Duisburg plant, demonstrates that dust emissions can be below 5mg/Nm³.

BF-BOF: the Chinese standards suggest that SCR is a widely applicable secondary DeNOx technique.

3. Suggested way forward

1. To kick start the review of the I&S BREF without further delay. The issues identified in point b+c would be processed in parallel to developing a new section on the novel H2-DRI-EAF iron ore process technique route;

2. Real monitoring data on H2-DRI-EAF should be readily available as from 2026, and thus could be integrated in a later phase and prior to the Final meeting (assuming that a typical BREF reactivation to first BREF draft takes typically 2 years = October 2026).;
3. The TWG to decide in a later stage whether the H2-DRI-EAF process is to be labelled as “deep transformation”, meaning that – at the very best-case scenario- the implementation deadline for the sector will not be prior to October 2026+8 years = October 2034.