Steel Sector Criteria

The Steel Eligibility Criteria of the Climate Bonds Standard & Certification Scheme

Draft Criteria

Version history	Date
Issued as draft for consultation	

Climate Bond Certified

Definitions

Climate Bonds Initiative (Climate Bonds): An investor focused not-for-profit organisation, promoting large-scale investments that will deliver a global low carbon and climate resilient economy. Climate Bonds seeks to develop mechanisms to better align the interests of investors, industry and government to catalyse investments at a speed and scale sufficient to avoid dangerous climate change.

Climate Bond: A climate bond is a bond used to finance – or re-finance - projects or expenditures which address climate change. They range from wind farms and solar and hydropower plants, to rail transport and building sea walls in cities threatened by rising sea levels. Only a small portion of these bonds have been labelled as green or climate bonds by issuers.

Certified Climate Bond: A climate bond that is certified by the Climate Bonds Standard Board as meeting the requirements of the Climate Bonds Standard (see below) as attested through independent verification.

Climate Bonds Standard (CBS): A screening tool for investors and governments that allows them to identify green bonds the proceeds of which are being used to deliver climate change solutions. This may be through climate mitigation impact and/or climate adaptation or resilience. The CBS is made up of two parts: the parent standard (CBS v3) and a suite of sector specific eligibility Criteria. The parent standard covers the certification process and pre- and post-issuance requirements for all certified bonds, regardless of the nature of the capital projects. The Sector Criteria detail specific requirements for assets identified as falling under that specific sector. The latest version of the CBS is published on the Climate Bonds website

Climate Bonds Standard Board (CBSB): A board of independent members that collectively represents $34 trillion of assets under management. The CBSB is responsible for approving i) Revisions to the CBS, including the adoption of additional sector Criteria, ii) Approved verifiers, and iii) Applications for Certification of a bond under the CBS. The CBSB is constituted, appointed, and supported in line with the governance arrangements and processes as published on the Climate Bonds website.

Climate Bond Certification: allows the issuer to use the Climate Bond Certification Mark in relation to that bond. Climate Bond Certification is provided once the independent CBSB is satisfied the bond conforms with the CBS

Green Bond: A green bond is a bond of which the proceeds are allocated to environmental projects or expenditures. The term generally refers to bonds that have been marketed as green. In theory, green bonds proceeds could be used for a wide variety of environmental projects or expenditures, but in practice they have mostly been earmarked for climate change projects.

Technical Working Group (TWG): A group of key experts from academia, international agencies, industry and NGOs convened by Climate Bonds. The TWG develops the Sector Criteria - detailed technical criteria for the eligibility of projects and assets as well as guidance on the tracking of eligibility status during the term of the bond. Their draft recommendations are refined through engagement with finance industry experts in convened Industry Working Groups (see below) and through public consultation. Final approval of Sector Criteria is given by the CBSB.

Industry Working Group (IWG): A group of key organisations that are potential issuers, verifiers and investors convened by Climate Bonds. The IWG provides feedback on the draft sector Criteria developed by the TWG before they are released for public consultation.

Climate Bonds gratefully acknowledges the TWG and IWG members who supported the development of these Criteria. Members are listed in Appendix 1. Special thanks are given to Ali Hasanbeigi, the lead specialist providing technical support in the development of the Criteria.

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1 Introduction

The Climate Bonds Standard

The Climate Bonds Standard and Certification Scheme is an easy-to-use screening tool that provides a clear signal to investors and intermediaries on the climate integrity of Certified Climate Bonds.

A key part of the Standard is a suite of sector-specific eligibility Criteria. Each sector-specific Criteria sets climate change benchmarks for that sector that are used to screen assets and capital projects so that only those that have climate integrity, either through their contribution to climate mitigation, and/or to adaptation and resilience to climate change, will be certified. These sector-specific Criteria are determined through a multi-stakeholder engagement process, including TWG and IWG, convened and managed by Climate Bonds, and are subject to public consultation. Finally, they are reviewed and approved by the CBSB.

The second key part of the Standard is the overarching Climate Bonds Standard. This documents the common management of proceeds and reporting requirements that all Certified Climate Bonds must meet, in addition to meeting the sector specific Criteria.

Rationale behind the criteria selected for the steel sector

The eligibility criteria for the steel industry are underpinned by a long-term transition vision for the sector. A number of pathways[1], developed under rigorous scientific research have shown us what measures can make this possible, and have informed the development of these criteria. Even though pathways provide a vision of the future based on assumptions, they allow a deeper insight into not only what can be done, but also what needs to be done in the industry to limit the global temperature increase to 1.5°C and keep the pledge made at the Paris agreement.

The requirements set out in this document aim at keeping steel production emissions within the IEA NZE pathway. The intent is to achieve this by establishing: assets that are already in alignment, capital investments that will enable steel production to achieve compliance, companies that have credible plans to get in line with the decarbonisation pathway and emissions mitigation in existing facilities without locking out the targeted long run vision.

Sector-specific eligibility criteria for steel

This document details the technical screening criteria for the following within the steel sector:

- Steel production facilities – see Section 3
- Capital investments within facilities producing steel – see Section 4
- Steel production companies – see Section 5

Section 2 provides details of the scope of these Criteria and Section 6 details additional cross-cutting criteria applicable to all investments including Adaptation and Resilience requirements.

Other supporting documents

Further information to support issuers and verifiers using these Criteria is available at https://www.climatebonds.net/standard/Steel as follows:

1. Steel Background Paper: details the rationale behind the Steel Criteria.
2. Steel Brochure[2]: a high-level summary of the criteria requirements.
3. Steel Frequently Asked Questions (FAQs)[1]

More broadly:

- Climate Bonds Standard V3: contains the requirements of the overarching CBS, which all certified bonds need to fulfil.

[1] These criteria are based in the pathway described in section 5.1, please refer to this section and the background paper for the rationale of the thresholds set for emissions reduction. Other pathways used as reference and further discussed in the background paper include those developed by: MPP, E3G and PNNL, IDDRI.
[2] To be published after public consultation.

- Climate Bonds Standard & Certification Scheme Brochure: provides an overview of the Climate Bonds Standard & Certification Scheme, of which these Criteria are a part.

For more information on Climate Bonds and the Climate Bonds Standard and Certification Scheme, see www.climatebonds.net.

Revisions to these Criteria

These Criteria will be reviewed on a regular basis – at least every three years or earlier if needed – in order to take stock of the latest climate science, updated transition pathways for the sector and developments in improved methodologies and data availability. As a result, the Criteria will be refined and may be tightened over time to maintain decarbonisation pathways aligned with the 1.5°C warming limit. Certification will not be withdrawn retroactively from bonds certified under earlier versions of the Criteria.

2 The scope of these criteria

2.1 Steel supply chain in scope

These Criteria covers assets and activities that produce iron and steel, including integrated steelmaking plants, scrap based Electric Arc Furnace (EAF) facilities, DRI-EAF production line and also DRI facilities.

Figure 1 inside Box 1, shows an overview of processes involved in the production of iron and steel, depending on the applicable type of production line. The way these criteria has been set is to cover the production of iron and steel as a combined series of processes, this means that assets and activities dealing only with the production of coke, iron ore pellets and other raw materials that are not part of an iron or steel production facility are out of the scope, as are assets only dedicated to downstream activities such as rolling, and finishing. In other words, investments in raw material preparation assets and downstream activities can only be certified as a climate bond (subject to meeting the criteria) if these installations are part of a steelmaking or ironmaking plant.

Steel scrap collection and sorting assets and activities are currently out of scope (to be updated in next revision of the criteria).

Iron mining[3], stainless and high alloy steels production and associated activities are out of scope.[4]

2.1 What can be certified

Subject to meeting the eligibility criteria in the following sectors, finance relating to the following can be certified under these criteria:

- Whole production facilities – see Section 3
- Decarbonisation measures in existing production facilities - see Section 4
- Companies operating production facilities – see Section 5.

In the criteria, new facilities are those that become operational in 2022 or later. They can be stand alone and outside battery limits of existing facilities or integrated into existing facilities. Existing facilities are those operational prior to 2022.

Where the bond portfolio includes several separately identifiable projects, expenditures, or groups of assets, these criteria must be met for each separately identified project or asset grouping. Bond issuers should determine these project boundaries, which may be based on geographical and/or supply chain linkages.

2.2 Alignment with other Sector Criteria

In some cases, it may not immediately be clear whether activities, facilities or projects might fall under these criteria or other sector criteria. The possible overlaps, and appropriate sector criteria to be used, are clarified in Table 1.

Table 1: Assets or projects partially or wholly covered by other sector criteria

Potential use-of-proceeds	Sector Criteria
Production of hydrogen	Hydrogen (in development)
Production of Biomass	Agriculture / Forestry (depending on the type of biomass)

[3] Integrated steel plants which are directly connected to a mine are still within scope.

[4] Being outside of the scope of criteria does not indicate that the TWG view these assets and activities as inconsistent with meeting Paris Agreement goals or with a Paris-aligned economy. Rather, at this stage these Criteria do not take a stance on these issues. Future versions of the Steel Criteria may address these and set robust criteria alongside.

Buildings, both commercial and residential, that are not solely dedicated to a steel production facility. For example, office buildings adjacent to a facility	Buildings
Vehicles that cannot be demonstrated to exclusively support compliant steel activities	Transport
Energy generation including Solar, Wind, Marine Renewable, Hydropower and Geothermal energy	Relevant corresponding sector criteria

Box 1. Methodological notes for GHG assessment and Scope of emissions

The scope of emissions that needs to be considered to calculate the emissions intensity of the facility is shown in Figure 1. Issuers must take into account the contributions from all the processes involved in the production of their steel that are shown within the fix boundary (see dashed line in figure 1) irrespective of whether they represent scope 1, 2 or 3 for the reporting company.

The GHG emissions assessment should follow the latest version of one of the following recognized standards: ISO 4404, EN 19694-2:2016 and the GHG Protocol.

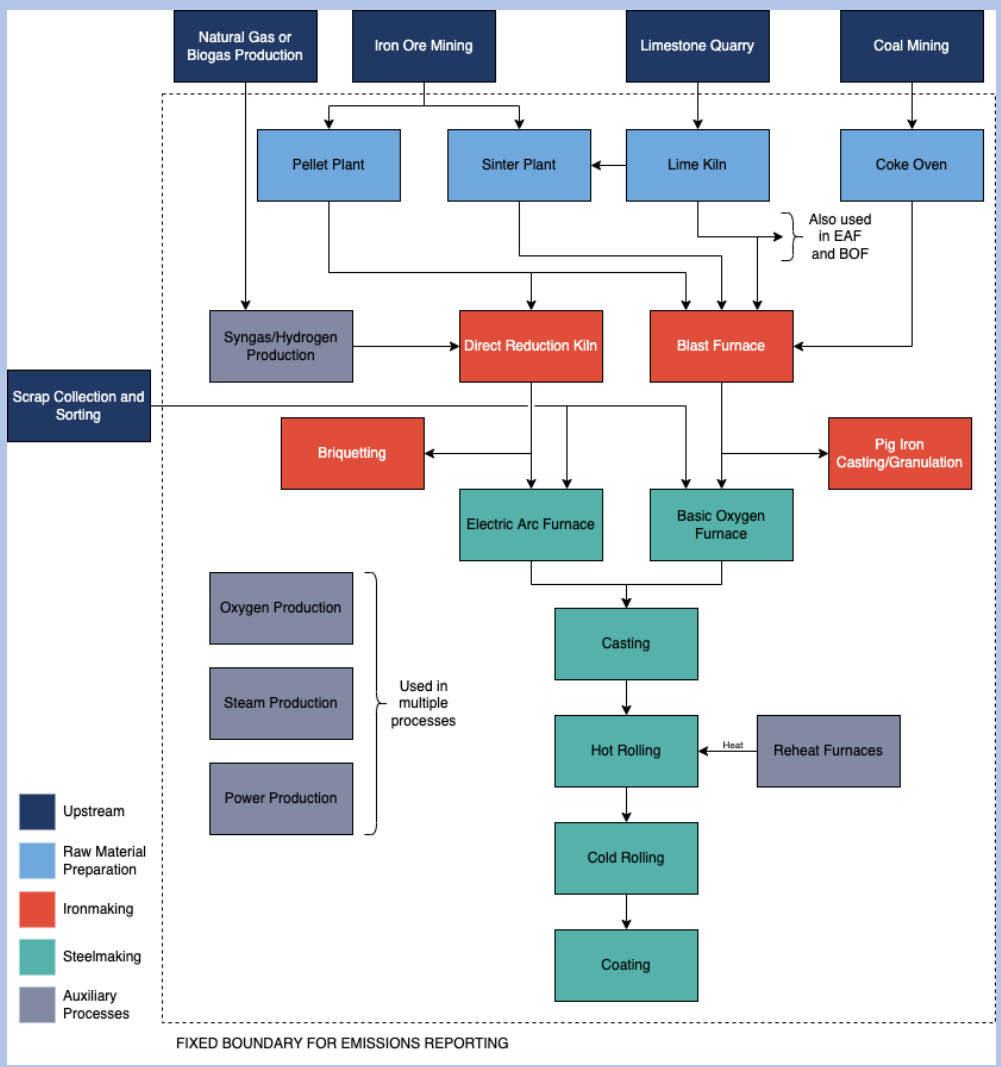

Figure 1. Fixed boundary scope for emissions intensity calculation.

3 Criteria for steel production facilities

3.1 New steel production facilities (becoming operational in 2022 or thereafter)

Table 2 lists investments in new assets eligible for certification due to their low emissions potential, and any associated eligibility criteria specific to those investments.

The type of facilities listed are (near)zero emissions technology that are in alignment with the deep decarbonization[5] of the sector. Additional cross cutting criteria have been set to account for emissions or other potential issues resulting from the technologies, energy sources or feedstocks used.

Table 2. Eligible new iron and steel production facilities and applicable certification criteria for each type of facility

<table>
<tr><th>Eligible Facility</th><th>Facility specific mitigation criteria</th><th>Cross cutting mitigation criteria</th><th>Adaptation & Resilience Criteria</th></tr>
<tr><td>BF-BOF production line with integrated CCUS</td><td rowspan="4">CCUS should capture at least 70% of all emissions.
CCUS complies with criteria in Section 6.3</td><td rowspan="5">If the facility uses hydrogen as a reductive agent – complies with the criteria in section 6.1

If the facility uses biomass as a reductive agent – complies with the criteria in section 6.2

If the facility uses fossil gas as a reductive agent – complies with the criteria in section 6.4</td><td rowspan="8">Facility complies with criteria in Section 6.5</td></tr>
<tr><td>Smelting reduction production line with integrated CCUS</td></tr>
<tr><td>Fossil gas-based DRI-EAF production line with integrated CCUS</td></tr>
<tr><td>Fossil gas based DRI with integrated CCUS</td></tr>
<tr><td>Scrap based Electric Arc Furnace (EAF)</td><td>The facility:
• Needs to use 70% of scrap as total annual inputs; OR
• The combined scrap and (100%) Hydrogen based DRI should add to at least 70% of the EAF total annual inputs</td></tr>
<tr><td>(100%) Hydrogen-based DRI</td><td colspan="2" rowspan="2">Hydrogen meets the criteria in Section 6.1</td></tr>
<tr><td>(100%) Hydrogen-based DRI-EAF production line</td></tr>
<tr><td>Electrolysis of iron ore</td><td colspan="2">A plan to address scope 2 emissions through different</td></tr>
</table>

[5] These criteria are based in the pathway described in section 5.1, please refer to this section and the background paper for the rationale of the thresholds set for emissions reduction. Other pathways used as reference and further discussed in the background paper include those developed by: MPP, E3G and PNNL, IDDRI.

steelmaking production line	strategies such as: a) Increasing renewable-based[6] captive power generation b) Increasing renewable-based power purchase agreement A plan shall be provided with evidence of the strategies that will be implemented. Progress of the implementation plan to be assessed every 36 months.	

3.2 Steel production facilities operational prior to 2022

These mitigation criteria have been set in order to allow improvements in the emissions mitigation of existing steel production capacity, without locking in technologies that will impede achieving the decarbonization targets of the sector[7] after 2030. On the other hand, small incremental measures will not suffice to achieve the 2030 reduction targets, particularly for primary steel production, thus capital investments should be focused on the implementation of a bundle of measures (see examples of applicable measures in Table 4) that will mitigate emissions by a significative rate shown in Table 3. Additional cross cutting criteria have been set to account for emissions or other potential issues resulting from the technologies, energy sources or feedstocks used.

For proceeds that are financing a whole ironmaking or steel production facility the criteria in table 3 applies.

All emissions intensity referred to in Table 3, shall be calculated using the methodology from a recognized standard and cover the scope as described in Box 1.

Table 3. Criteria for proceeds that are financing a whole existing production facility

Facility	Mitigation criteria specific to that plant	Cross cutting mitigation criteria	Adaptation & Resilience Criteria
Electric Arc Furnace	A plan to address scope 2 emissions through different strategies such as: c) Increasing renewable-based[8] captive power generation d) Increasing renewable-based power purchase agreement A plan shall be provided with evidence of the strategies that will be implemented. Progress of the implementation plan to be assessed every 36 months.		Facility complies with criteria in Section 6.5

[6] Energy produced from renewable sources such as wind, solar, and small hydropower generation.
[7] These criteria are based in the pathway described in section 5.1, please refer to this section and the background paper for the rationale of the thresholds set for emissions reduction. Other pathways used as reference and further discussed in the background paper include those developed by: MPP, E3G and PNNL, IDDRI.
[8] Energy produced from renewable sources such as wind, solar, and small hydropower generation.

Production line with a blast furnace (BF) that became operational in 2007 or later	The investment shall not be for relining; AND A bundle of decarbonisation measures has been/ will be implemented at the facility that has/ will reduce the facility's emissions intensity (tCO_2/t steel) between 2022 and 2030 by: - 20% if the pre-decarbonisation baseline emissions intensity is greater than or equal to 2 tCO_2/t steel - 15% if the pre-decarbonisation baseline emissions intensity is less than 2 tCO_2/t steel A plan shall be provided with evidence of the decarbonisation measures that will be implemented. Progress against these decarbonisation targets to be assessed every 36 months.	If the facility uses hydrogen as a reducing agent – complies with the criteria in section 6.1 If the facility uses biomass as a reductive agent – complies with the criteria in section 6.2 If the facility has CCS or CCUS – complies with the criteria in section 6.3 If the facility uses fossil gas as a reductive agent – complies with the criteria in section 6.4	
Production line with a blast furnace (BF) that became operational prior to 2007	A bundle of decarbonisation measures has been/ will be implemented at the facility that have/ will reduce the facility's emissions intensity (tCO_2/t steel) between 2022 and 2030 by 50% A plan shall be provided with evidence of the decarbonisation measures that will be implemented. Progress against these decarbonisation targets to be assessed every 36 months.		
Production line with a DRI	Either: a) if plant is fossil gas based: A bundle of decarbonisation measures has been/ will be implemented at the facility that have/ will reduce the facility's emissions intensity (tCO_2/t steel) between 2022 and 2030 by 20% A plan shall be provided with evidence of the decarbonisation measures that will be implemented. Progress against	If the facility uses hydrogen as a reducing agent – complies with the criteria in section 6.1 If the facility uses biomass as a reductive agent – complies with the criteria in section 6.2 If the facility has CCUS – complies with the criteria in section 6.3 If the facility uses fossil gas as a reductive agent – complies with	

	these decarbonisation targets to be assessed every 36 months; OR b) if plant is coal based: A bundle of decarbonisation measures has been/ will be implemented at the facility that have/ will reduce the facility's emissions intensity (tCO_2/t steel) between 2022 and 2030 by 40% A plan shall be provided with evidence of the decarbonisation measures that will be implemented. Progress against these decarbonisation targets to be assessed every 36 months; OR c)The plant uses 100% Hydrogen or has a CCUS facility that captures at least 70% of all process emissions	the criteria in section 6.4	

4 Criteria for decarbonization measures within steel production facilities

These criteria cover capital investments (decarbonisation measures) within existing facilities, this differs from an investment that would finance the whole facility in that it involves investments that are focused on the measures or specific areas of improvement within an asset.

The requirements set in this section take into account that implementing small incremental measures in the production of iron and steel (particularly for primary steel) will not suffice to achieve the 2030 reduction targets, thus capital investments should be focused on the implementation of a bundle of measures that will mitigate emissions by a significative rate. This reflects the same principles used to set the criteria for facilities shown in section 3.

Examples of this measures or capital investments are shown in Table 4, these are eligible for certification due to their climate mitigation potential, nonetheless, **in order for the capital investments to be certified these must relate to a production facility where:**

- The Mitigation criteria specific to that plant shown in table 3 (Section 3 of this document) are met.
- The cross-cutting mitigation criteria in section 6 are met.
- Adaptation and resilience criteria that apply to all facilities are met (see Section 6.5)

Table 4. Primary steel production Capital Investments eligible for certification due to their CO_2 emissions mitigation potential.

Asset and activity types	Example use of proceeds (Capital investments)
Heat recovery	Installation, upgrade, and operation of heat recovery systems
Optimization of Blast Furnace	Pulverize Coke Injection, Top Gas Recycling, Stove waste gas heat recovery
Optimization of Basic Oxygen Furnace	Recovery of BOF gas and sensible heat
Optimization of Coke Plant	Coke Dry Quenching
Optimization of Sinter Plants	Sinter Plant Heat Recovery
Optimization of EAF	Oxyfuel burners, EAF scrap preheating, CHP from waste heat
Optimization of rolling and finishing and reheat furnace	High Efficiency Burner, Flue-gas monitoring, combustion optimization, exhaust gas heat recovery

Asset and activity types	Example use of proceeds (Capital investments)
Optimization of casting	Near net-shape casting
Optimization of monitoring and control systems	Installation, upgrade, and operation of advanced sensors and digitized control equipment and systems
Carbon Capture Utilization and Storage	Installation, upgrade, and operation of infrastructure and equipment related to CO_2 capture of emissions from steel production.
Fuel switching	Infrastructure, revamps or modifications of equipment needed for the production of steel using hydrogen or biomass as reducing agent
Electrification of heat	Electrification of reheating furnacing

5 Criteria for companies

- - - These criteria are currently still under discussion. However, feedback is sought on the working proposal outlined below - - -

WORKING PROPOSAL

For investments aimed at financing the transition of an entire company or entity, there are two potential levels of certification. The first level "Tier 1" is for steel companies that at the time of issuance meet the thresholds in the pathway shown in figure 2 and are looking to finance their further transition in order to keep meeting the pathway and reach net zero by 2050. The second level "Tier 2" is for steel companies that need some time to reach the pathway in figure 2, thus financing needs to be aimed at meeting the 2030 thresholds and also having credible plans to reach net-zero by 2050.

The criteria that need to be met in order to get certification for each performance level is described below:

Tier 1 performance level criteria:

Companies can be certified as Tier 1 Performance level if they meet the following requirements:

a) Emissions intensity performance:
- The weighted average emissions intensity across all of the company's production facilities meet the threshold values as per figure 2 **at the time of certification**
- Transition plans detail what further action will be taken to ensure the weighted average emissions intensity across all of the company's production facilities will continue to meet the threshold values per figure 2 over the full timeframe from certification to 2050
- The enabling environment (governance etc) that will enable those plans to be carried out is in place

b) Adaptation and Resilience:

- At the time of certification, all of the company's facilities meet the adaptation and resilience criteria described in Section 6.5.

c) Cross-cutting criteria:

- At the time of certification, all of the company's facilities:
  - Using hydrogen, biomass or fossil gas as a reducing agent meet the cross-cutting criteria in section 6.
  - With CCUS meet the criteria in Section 6.3

e) Additional considerations for plants becoming operational in 2022 or thereafter
- The company commits that any future plant will meet the criteria described in section 3.1. Details of this to be provided in the company's transition plan.

Tier 2 performance level criteria:

Companies can be certified as Tier 2 Performance level if they meet the following requirements:

a) Emissions intensity performance
- The weighted average emissions intensity across all of the company's production facilities will meet the threshold values for 2030 per figure 2 **by 2030**
- Transition plans detail what action will be taken to ensure that this 2030 target will be met, and the further actions that will be taken post 2030 to ensure the weighted average emissions intensity across all of the company's production facilities will continue to meet the threshold values per figure 2 over the full timeframe from 2030 to 2050
- The enabling environment (governance etc) that will enable those plans to be carried out is in place

b) Adaptation and Resilience
   - At the time of certification, all of the company's facilities meet the adaptation and resilience criteria described in Section 6.5.

c) Cross-cutting criteria:
   - At the time of certification, all of the company's facilities:
     - Using hydrogen, biomass or fossil gas as a reducing agent meet the cross-cutting criteria in section 6.
     - With CCUS meet the criteria in Section 6.3

d) Additional considerations for plants becoming operational in 2022 or thereafter
   - The company commits that any future plant becoming operational in 2022 or thereafter will meet the criteria described in section 3.1. from the day 1 of starting operation. Details of this to be provided in the company's transition plan.

N.B. For both Tier 1 and Tier 2 performance levels:

- The specific requirements for transition plans and supporting governance will be detailed separately and consulted on separately – as these requirements will be generic across all sectors open to certification, but they will be consistent with the framework of the '5 Hallmarks for a Credible Transition' described in the paper "Transition finance for transforming companies".
- Verification of actual emissions intensity is required at the time of certification and every 3 years thereafter. Where targeted performance per the Transition Plan is not being met, certification can be revoked.

5.1 Methodological notes:

The pathway:

The pathway chosen as target for the companies decarbonization is the IEA NZE (shown in Figure 2), because this is consistent with around a 50% chance of limiting long-term average global temperature rise to 1.5°C without a temperature overshoot, which is one of the principles of setting criteria within the Climate Bonds. The scope of the IEA NZE trajectory was adjusted to be consistent with the scope of the fixed system boundary described in Box 1.

The carbon budget reflected in the trajectory depicted in Figure 2, has been split in primary and secondary steel production, the methodology and approach are further explained in the Background paper.

Primary steel: refers to the production of steel using iron products that have been obtained from the reduction of iron ore. This includes pig iron, hot briquetted iron (HBI) and direct reduced iron (DRI).

Secondary steel: refers to the proportion of steel produced using steel scrap.

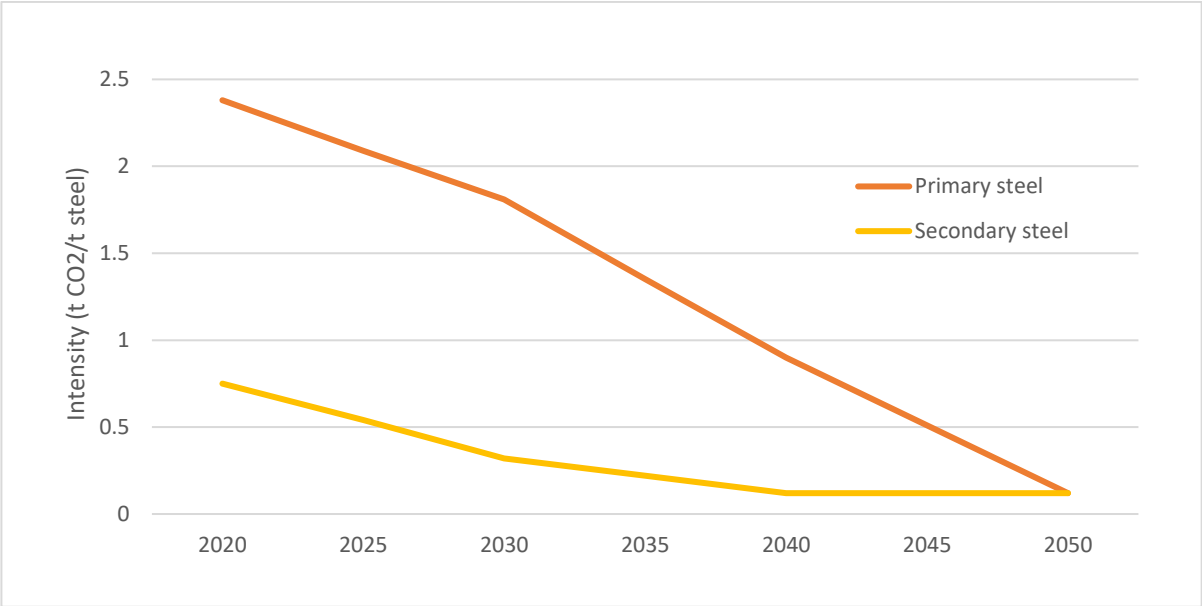

Figure 2. Decarbonization trajectories (IEA NZE) for primary and secondary steel production based on the IEA projections and the approach from the CAF initiative[9]

Table 5. Emissions intensity values for each trajectory shown in figure 3 (Source: RMI)

	IEA NZE Trajectory	
Year	**Primary Intensity** (t CO2/t steel)	**Secondary Intensity.** (t CO2/t steel)
2020	2.38	0.75
2025	2.09	0.54
2030	1.81	0.32
2035	1.35	0.22
2040	0.90	0.12
2045	0.51	0.12
2050	0.12	0.12

Calculating the company's alignment:

The pathways are used to determine the alignment of a company based on its emissions and use of external scrap. To show compliance with the pathway the steelmaker must determine the IEA NZE thresholds they need to meet each year as the weighted sum of the primary and secondary trajectories (determined from the IEA NZE), with the weights being the share of external scrap by weight (for secondary production) and other metallic inputs (for primary production) (see

Table 6).

[9] RMI, Steel Sector Decarbonization Pathway: An Alignment Zone Approach, Center for Climate Aligned Finance, January 2022

To determine their alignment the company needs to follow the steps below (see example in Table 6):

1. Steelmaker obtains annual data on its (i) use of external scrap by weight as a share of total metallic inputs, and (ii) CO2 emissions on a comparable basis per ton of crude steel.
2. Generate a trajectory target for the steelmaker for each year as the weighted sum of the primary and secondary thresholds (determined from the IEA NZE), with the weights being the share of external scrap by weight (for secondary production) and other metallic inputs (for primary production).
3. Check if the company's total emissions are above or below the target.

If the company's emissions are below the target, this means they are aligned with 1.5°C, consequently they can apply to a Tier 1 certification. On the contrary if the company's emissions are above the target, it is not aligned with 1.5C yet, thus it can apply to a tier 2 certification.

		Steelmaker A		Steelmaker B	
	Parameter	Primary	Secondary	Primary	Secondary
Reported by the company	Production 2022 (t)	9000000	1000000	1000000	9000000
	Production mix 2022	0.9	0.1	0.1	0.9
	Combined emissions intensity 2022 (tCO_2/t steel)	2.4		0.5	
Calculated	IEA NZE intensity thresholds by type of input 2022 (tCO2/t steel)	2.3	0.7	2.3	0.7
	Steel company IEA NZE combined intensity target (tCO2/t Steel)	2.1		0.8	
	Emissions intensity Δ (Combined emissions intensity 2022 - IEA NZE target) (tCO2/t Steel)	0.3		-0.3	
		Steelmaker A emissions are above the 2022 target and it is still not aligned with 1.5°C. To get certified the company needs to apply to a Tier 2 performance certifications and meet the requirements.		Steelmaker B emissions are below the 2022 target and is aligned to the 1.5°C trajectory. The company can apply to a Tier 1 performance certification.	

Table 6. Example calculation to determine the company's emissions intensity alignment to the IEA NZE pathway[10]

[10] Adapted from: RMI, Steel Sector Decarbonization Pathway: An Alignment Zone Approach, Center for Climate Aligned Finance, January 2022.

6 Cross-cutting criteria

6.1 Additional criteria when using hydrogen as a reducing agent

Facilities using hydrogen are eligible only if the hydrogen used meets the thresholds in Table 4:

Table 7 Carbon intensity thresholds for the life cycle emissions of hydrogen used as a reducing agent

2022	2030	2040	2050
3 t CO_2e/t H_2	1.90 t CO_2e/t H_2	1.0 t CO_2e/t H_2	0.6 t CO_2e/t H_2

Life Cycle GHG Assessment for hydrogen: Cradle-to-site boundary includes cradle-to-gate emissions plus any transportation emissions to the site where a product is used. In this case, the life cycle assessment should follow ISO standards (ISO 14040 and ISO 14044). The Recommendation 2013/179/EU will be acceptable for assets located in the EU. Results should be verified by an independent third party.

---The Climate Bonds Initiative is currently developing criteria for hydrogen. Once the hydrogen criteria is published, it shall supersede the requirements set in this section---

6.2 Additional criteria for the use of biomass as a reducing agent

The direct scope 1 emissions generated by the use of charcoal or biomass in the production of iron or steel you be fully counted, as it is the case for all direct emissions.

The biomass used needs to comply with the following sections of the criteria applicable for biomass sourcing set out in the CBI Bioenergy criteria: Section 3.3.2 – "Requirement 2: Feedstocks certified under approved best practice standards".

6.3 Additional criteria for CCS and CCUS

--The Climate Bonds Initiative is developing criteria for CCUS. Once the CCUS criteria is published, it shall supersede the requirements set in this section--

Utilisation of direct CO_2 emissions from steel production is only eligible when the CO_2 is used for the manufacture of durable products (e.g. construction materials stored in buildings, or recyclable products e.g. PET). CO_2 should not be used for enhanced oil recovery, and the production of other forms of fossil energy sources.

Carbon capture and storage. Carbon Capture equipment, both as an individual measure and as part of a whole facility being evaluated, is eligible so long as there is evidence[11] that demonstrates the CO_2 will be suitably transported and stored in line with the criteria below:

Transport

1. The CO_2 transported from the installation where it is captured to the injection point does not lead to CO_2 leakages above 0.5 % of the mass of CO_2 transported.

2. Appropriate leak detection systems are applied, and a monitoring plan is in place, with the report verified by an independent third party.

Storage

[11] Either directly from the issuer or through contracts or agreements with a third party

1. Characterisation and assessment of the potential storage complex and surrounding area, or exploration[12] is carried out in order to establish whether the geological formation is suitable for use as a CO_2 storage site.

2. For operation of underground geological CO_2 storage sites, including closure and postclosure obligations:

a. appropriate leakage detection systems are implemented to prevent release during operation;

b. a monitoring plan of the injection facilities, the storage complex, and, where appropriate, the surrounding environment is in place, with the regular reports checked by the competent national authority.

3. For the exploration and operation of storage sites, the activity complies with ISO 27914:2017225[13] for geological storage of CO_2.

Furthermore, the use of any certification scheme would be encouraged. Examples of certification schemes include the U.S. EPA Class VI well certification, which includes reservoir characterization[14]. Another example includes the DNV GL certification framework to verify compliance with the ISO 27914:2017 Carbon dioxide capture, transportation and geological storage – Geological storage[15].

6.4 Fossil gas

Only eligible for existing facilities prior to 2030. To qualify after 2030 facilities would have to use fossil gas combined with CCUS measures that meet the criteria in section 6.3. Any venting or burning shall be reported and accounted in the GHG assessment. Projects using fossil gas (even if) combined with CCUS should demonstrate MRV (monitoring, reporting and verification), and mitigation measures for methane leaks as per the best practice recommended.[16]

6.5 Adaptation & resilience

To meet the requirements for Climate Bonds Certification, physical climate risks associated with the investment over the operational lifetime must be addressed. This includes taking appropriate measures to identify and mitigate those risks in the face of the uncertain impact of climate change and undertaking an assessment of the resilience benefits that the investment can provide to the wider system. The assessment should demonstrate that the investment will do no significant harm to the climate resilience of the wider system itself. To demonstrate compliance, all assets and projects applying for certification must satisfy the requirements of the checklist detailed in **Error! Reference source not found.** 8.

The checklist (table 8) is a tool to verify that the issuer has implemented sufficient processes and plans in the design, planning and decommissioning phases of a project to ensure that the operation and construction of the asset minimises environmental harm and the asset is appropriately adaptive and resilient to climate change and supports the adaptation and resilience of other stakeholders.

12 'exploration' means the assessment of potential storage complexes for the purposes of geologically storing CO2 by means of activities intruding into the subsurface such as drilling to obtain geological information about strata in the potential storage complex and, as appropriate, carrying out injection tests in order to characterise the storage site

13 ISO Standard 27914:2017, Carbon dioxide capture, transportation and geological storage — Geological storage (version of [adoption date]: https://www.iso.org/standard/64148.html).

14 https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-co2

15 https://www.dnv.com/news/dnv-gl-launches-certification-framework-and-recommended-practice-for-carbon-capture-and-storage-ccs--108096

16 Best practice can be found in the report: Best Practice Guidance for Effective Methane Management in the Oil and Gas Sector. Monitoring, Reporting and Verification (MRV) and Mitigation. United Nations Economic Commission for Europe. 2019 https://unece.org/fileadmin/DAM/energy/images/CMM/CMM_CE/Best_Practice_Guidance_for_Effective_Methane_Management_in_the_Oil_and_Gas_Sector_Monitoring_Reporting_and_Verification_MRV_and_Mitigation-_FINAL_with_covers_.pdf

All elements of this checklist must be addressed, and appropriate evidence provided that these requirements are being met or are not applicable in respect of the specific assets and projects linked to the bond. It is expected that their evidence will encompass a range of assessment and impact reports and associated data, including but not limited to those reports required to meet national and local licensing and approval processes. This might include Development Consent Orders, planning regulations adhered to, Environmental Impact Assessments, Vulnerability Assessments and associated Adaptation Plans.

Table 8: Checklist for evaluating the issuer's Adaptation & Resilience performance in respect of a Steel Production facility

	Item	**Proof given**	**Overall assessment**
		For verifier to complete	
1. Clear boundaries and critical interdependencies between the infrastructure and the system it operates within are identified.			
1.1	Boundaries of the infrastructure are defined using (1) a listing of all infrastructure and assets and activities associated with the investment, (2) a map of their location, and (3) identification of the expected operational life of the activity, asset or project.		
1.2	Critical interdependencies between the infrastructure and the system within which it operates are identified. Identification of these interdependencies should consider the potential for adverse impacts arising from, but not limited to: (1) the effects of supply disruption or interruption on dependent electricity users or populations; (2) relationships of the asset/activity to surrounding water bodies and water courses; (3) relationships of the asset/project to nearby flood zones; (4) reduction in pollinating insects and birds; (5) reduction in biodiversity or High Conservation Value[17] habitat; (6) damage or reduction in value of neighbouring property due to boundary structures at risk of falling during storm events; and also reduction in value of neighbourhood property due to pollution caused by the facilities, due to extreme weather events (e.g., release of toxic material due to failure in safety systems in case of extreme weather events); (7) fire, dust release and other practices that affect air quality; (8) appropriation of land or economic assets from nearby vulnerable groups; (9) exacerbation of wildfires;		
1.3	Force measures implemented locally to mitigate some potential risks are identified		
1.4	Potential co-occurrence of risks are identified		
2. An assessment has been undertaken to identify the key physical climate hazards to which the infrastructure will be exposed and vulnerable to over its operating life.			

[17] High Conservation Value (HCV) habitat criteria in accordance with https://www.hcvnetwork.org.

2.1	• Is there a good understanding of the risks facing the facility today? In five years? In ten years? • Are risks defined and detailed? • Are locally implemented measures to mitigate potential risks identified? • Key physical climate risks and indicators of these risks are identified in line with the following guidelines. Risks are identified based on (a) a range of climate hazards, and (b) information about risks in the current local context, including reference to any previously identified relevant hazard zones, e.g., flood zones. In order to be confident that assets and activities are robust and flexible in the face of climate change uncertainties, it is essential that the climate risks being assessed and addressed cover those that are of greatest relevance to the production of steel. • Risk should be identified for each of the following categories[18]: a. Capital Assets b. Operations c. Logistics and Supply d. Labour • Time horizon is set according to the severity of the risks. Higher risk locations: shorter time (every 5 years). Lower risk locations: Longer time (every 10 years).[19] See section 4.4 for tools and reference guidelines to assess degree of risks. • Where accurate assessments of climate variability for specific locations are not possible, use worst-case scenarios. The potential impacts that must be considered in the risk assessment include[20]: ○ Temperature rise and heat waves: • Potential increase in temperature may result in expansion and stress of plant, pipework and fittings. • There could be an increase in dust emissions from the site. • There could be an increase in odour from the site. • Increase in fugitive or diffuse emissions from the site. • Increase in pollution • Increase in water consumed for cooling purposes. • Increase in energy consumption due to added pumping of cooling water around site. • Limited cooling, which implies that throughputs could need to be reduced or processes shut down ○ Extreme cold weather • Freezing of cooling water, resulting in blockages – particularly on long pipelines and storage in exposed areas • Frozen onsite roadways may restrict access for staff and emergency vehicles. • Lack of water for fire suppression • Damage to site infrastructure from snow-loading over extended periods. ○ Daily extreme rainfall • Flooding could lead to increased site surface water and flash flooding • The site may experience reduced access or egress due to site flooding. • Stored substances can react with water or be contaminated		

[18]Marshall, 2018. In the Path of Destruction: Preparing for Climate Change in the Chemical Industry. Lux Research

[19] High/low risk areas are not generally provided by any source. It is recommended to look at potential climate hazards and identify which assets are likely to be exposed to those hazards, the likelihood and consequences of the exposure, and then identify how risky those assets are to climate change.

[20]Chemical Industries Association, 2021. Safeguarding chemical businesses in a changing climate. How to prepare a Climate Change Adaptation Plan

	• Equipment running hot materials can be affected by thermal stress ○ Season rainfall increase • Overland flow or groundwater flooding. • Flooding and associated impacts, as previously identified. ○ Sea level rise, If located near the coast a site could experience increased: • Risk of flooding and associated impacts, as previously identified • Corrosion due to increase in saltwater spray • Reduction of useful life of assets due to frequent exposure to salty water ○ Drier seasons • Drought may alter or reduce availability of water with temperature increase. • Potential for increase in dust emissions from the site. ○ Decreased river flow • Supply chain disruption ○ Wildfires • Severe damage on buildings, equipment and industrial infrastructure • Release of toxic pollutants • Explosions • Pipelines for transporting oil and gas, fuel storage facilities, external floating roof tanks for combustible liquids can spread the fire • Supply chain disruption Guidance for carrying out risk assessments: • Users should apply climate scenarios based on representative concentration pathway (RCP) 4.5 and 8.5 or similar / equivalent to ensure consideration for worst case scenario. • Risk assessments should use both top-down methods and bottom-up methods that look at inherent system vulnerabilities in local context. • A broad range of models can be used to generate climate scenarios • Where accurate assessments of climate variability for specific locations are not possible, use worst-case scenarios. • Risks can be characterized by the associated annual probability of failure or annual costs of loss or damage. • For risk assessment, the TCFD The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities is recommended.		
3. The measures that have or will be taken to address those risks, mitigate them to a level such that the infrastructure is suitable to climate change conditions over its operational life.			
3.1	Address the following questions[21]: • What information, awareness or skills would improve your resilience to your priority risks? • What operational changes could you make to manage your priority risks? • What physical changes or technology could you invest in to manage your priority risks? Due to the nature or size of the risk or opportunity are there any strategic responses that should be considered, such as by relocating, developing a new product, exploiting		

[21] Chemical Industries Association, 2021

a new market or creating a strategic partnership to manage shared risks?

The issuer must annually verify this ongoing monitoring and evaluation of climate resilience performance. This reporting will only be required for the lifespan of the Certified Climate Bond.

The following are examples of risk management activities[22] that bond issuers might consider, or that might be adopted as part of regulations (e.g. codes and standards). This list is not exhaustive and bond issuers should fully assess the mitigation measures that are relevant to the climate risks and impacts identified in the risk assessment.

- Temperature rise and heat waves
  - Regular inspection and preventative maintenance of plant and equipment.
  - Design standards that maintain equipment rating over its lifetime performance in the face of all potential ranges of temperature rise.
  - Resilience measures that ensure employees can continue to work at more extreme temperatures (e.g., air conditioning).
  - Water can be cleaned and recirculated for reuse on site
  - Alternative cooling systems.
  - Assess how efficient the current cooling system is, and to propose upgrades or modifications where necessary.
- Extreme cold weather
  - Regularly inspect and maintain insulation, particularly on pipework and equipment in exposed areas of the site.
  - Consider added insulation on pipework containing water review operating procedures to make sure pipework is not left full of static water when not in use identify any potential dead-legs where static water may be held up
  - Regularly inspect and maintain roadways during winter and remove any standing water
  - Make sure grit is available to treat road surfaces
  - Review the design of structures to withstand increased loadings.
- Daily extreme rainfall
  - Suitable measures are in place for the management of expected surface water and flood waters
  - Drainage systems are inspected and maintained
  - External areas where wastes are handled or stored are provided with contained drainage
  - Make sure there are suitable alternative transport routes to and from the site.
- Season rainfall increase
  - Make sure suitable measures are in place for the management of anticipated overland flow or groundwater flooding.
  - Prepare flood plan including:
    - Risk assessment of equipment and services at greatest risk from flooding
    - Provision of emergency pumps to remove floodwater and identification of lowest risk location for discharge of floodwaters
    - Protection of control and electrical systems
  - Reduced reliance on imported energy and storage infrastructure.
- Sea level rise
  - Prepare flood plan including:
    - Risk assessment of equipment and services at greatest risk from flooding

[22] Chemical Industries Association, 2021

	○ Provision of emergency pumps to remove floodwater and identification of lowest risk location for discharge of floodwaters ○ Protection of control and electrical systems • Prevent corrosion. Measures could include making sure that plant or equipment prone to corrosion are: ○ Protected, such as by being painted with resistant coating ○ Regularly inspected and maintained ○ Drier seasons • Measures are in place to review and minimise water use and to maximise collection and use of rainfall • Mains water capacity is adequate, taking into account reduced availability of rainwater for activities such as dust suppression and cleaning ○ Decreased river flow • Check existing environmental risk assessment to make sure low river flow used in assessment remains valid – if not, discuss with Environment Agency (local site inspector and water quality team) and carry out an updated environmental risk assessment ○ Wildfires • Implement active fire prevention measures such as fire detector, gas detector, design of sprinkler systems, use of line detectors, design of deluge systems, design of gaseous extinguishing systems[23] • Implement passive fire protection measures, like permanent inertization of warehouses, support for pipe racks, fireproofing cabling, use of fire resistance cable coating, protection of tank farms • Storage protection measures such as distancing to avoid fires from spreading within an industrial complex • Wildland and vegetation management		
3.2	Risk reduction measures must be tolerant to a range of climate hazards and not lock-in conditions that could result in maladaptation.		
4. The infrastructure enhances the climate resilience of the defined system it operates within, as indicated by the boundaries of and critical interdependencies with that system as identified in item 1 in this checklist.			
4.1	The infrastructure itself does not pose significant risk of harm to the system it is located within or others' natural, social, or financial assets according to the principle of best available evidence during the investment period, taking into account the boundaries and critical interdependencies as defined in item 1 in this checklist. Harm is defined as an adverse effect on any of the following items: (1) adverse effects on local water bodies and water courses; (2) air pollution from dust and other pollutants; (3) relationships of the asset/project to nearby flood zones; (4) reduction in pollinating insects and birds; (5) reduction in biodiversity or High Conservation Value habitat; (6) appropriation of land or economic assets from nearby vulnerable groups ;		

[23] Wehmeier & Mitropetros (2016). Fire Protection in the Chemical Industry

5. The issuance is required to demonstrate that there will be ongoing monitoring and evaluation of the relevance of the risks and resilience measures and related adjustments to those measures will be taken as needed.			
5.1	Indicators for risks identified under item 2 in this checklist are provided. Risk thresholds/trigger levels, for which new adaptation actions are set[24] ,are monitored		
5.2	Indicators for risk mitigation measures identified under item 3 in this checklist are provided. Determine whether planned outputs and outcomes from adaptation actions have been achieved.[25]		
5.3	Indicators for "fit for purpose" resilience benefit measures identified under item 4 in this checklist are provided.		
5.4	Issuers have a viable plan to annually monitor and evaluate (a) climate risks thresholds/triggers, (b) climate resilience performance, (c) appropriateness of climate resilience measure(s) and to adjust as necessary to address evolving climate risks.		

[24] The adaptation process Coastal Climate Adaptation Decision Support (C-CADS), 2018.

[25] National Climate Change Adaptation Research Facility. NCCARF, 2018.

Appendix 1: TWG and IWG members

CBI Technical Consultant:

Global Efficiency Intelligence, US – Ali Hasanbeigi

Technical Working Group (TWG) Members

Lund University, Sweden - Max Åhman

CDP, UK - Brenda Chan

The Institutional Investors Group on Climate Change (IIGCC) - Dan Gardiner and Jose Lazuen

Berkeley Lab, US - Hongyou Lu

Rocky Mountain Institute, US - Lucy Kessler and Lachlan Wright

European Bank for Reconstruction and Development (EBRD), UK - Robert Adamczyk

Kobolde & Partners AB, Sweden - Rutger Gyllenram

Pacific Northwest National Laboratory (PNNL), US - Sha Yu

WMG The University of Warwick, UK - Zushu Li

Transition Pathway Initiative (TPI), UK - Antonina Scheer

Industry Working Group (IWG)

Members of the following organizations have participated in IWG meetings through the development of these criteria:

- Affirmativ IM
- Alacero
- Arcelor Mittal
- Baosteel
- Bayern nlb
- Bluescope
- Citi
- Danske Bank
- Deloitte
- ERM CVS
- Gerdau
- ING
- ISS ESG
- JCRA
- JSW
- NAB
- NNIP
- Nomura
- Severstal
- SGCIB
- Sustain Advisory
- Sustainalytics
- Tata Steel
- TERNIUM BR
- Unicredit
- Voestalpine
- Worldsteel