Public consultation comments and responses

Steel Criteria

Documents Supporting this document

Information to support applicants and verifiers is available at Steel | Climate Bonds Initiative as follows:

- Steel Criteria document: the complete Criteria requirements.
- Steel Background Paper that details why the criteria were chosen
- Steel Frequently Asked Questions (FAQ's)
- The Climate Bonds Standard: contains the requirements of the overarching CBS
- The 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.

Category / Question	Number	Feedback Received	Response
Scope 1 – Is the scope of activity clear and appropriate? Refer to section 2 of the Criteria document and section 3.2 in the Background document.	1.	We believe it is clear but it is not appropriate as coal mine methane is not considered. Coal mine methane leaks add at least 27% to the global warming of the CO2 emitted from global steelmaking according to IEA data. Methane emissions from coking coal mining are equivalent to 988 million tonnes of CO2 (using the IPCC's 82.5 multiplier for methane's climate impact versus CO2). This is more than all the CO2 emissions of Germany or Canada.	Climate Bonds and the TWG agreed with this which is now reflected in the Criteria. Although Coal Mine Methane (CMM) is not considered within the scope of the criteria (because we are not certifying coal mines, or coal mining), in order to account for CMM emissions (which are in many cases scope 3 for the steel producer), we have added additional criteria for facilities that use coal. See criteria document section 6.3
	2.	While the scope in general is clear, it stays unclear whether single plants, which are not connected to a steel making plant, are included although further processing is not mentioned in the first sentence.	The scope section has been modified to make this clear, also examples have been included (see criteria document)
	3.	Agree	NA
	4.	1-The scope mostly makes sense as drawn but leaving out the methane from metallurgical coal mining which is highly material to the GHG scope of steel production especially with more accurate studies recently conducted. Leaving it out and leaving that source of GHGs unanswered is very risky. Experts to consult include Ember and SEI.	See response 1
	5.	Please clarify whether storage of hydrogen (and the associated equipment) is considered as an asset that is covered by the steel sector. Apart for this point looks the scope clear and comprehensive. The scope of emissions, based on the Fixed boundary approach, seems robust and clear to use; on the condition that this scope is the same as the one considered in the study and used as reference	Storage of hydrogen is not covered by the steel criteria, it will be covered by the Hydrogen criteria. The fixed boundary approach is indeed the same used to define the sector pathway (emissions intensity)

		to define the sector pathway. The same consideration applies for system boundaries. Please clarify.	
	6.	We propose the removal of "Natural Gas or Biogas Production" from the identified boundary criteria (Figure 1). As identified by the Expert Advisory Group (EAG) for the Science Based Targets Initiative, it would be difficult to include upstream emissions from extraction of fuels and energy in the boundary. Any requirements to reduce greenhouse gases tied to the extraction of fuels and energy should be assigned to the energy sector itself instead of the steel sector.	Natural Gas or Biogas Production is not included within the system boundary (dotted line in figure 1 of the criteria). However we have set additional criteria for the procurement of fossil gas (see criteria section 6.2)
	7.	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. What about EAF that intake of a mix of scrap and DRI? 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, Do you mean the below listed Assets or projects are out of the scope of "Climate Bonds Initiative Steel Criteria"?	The scope section has been modified to make the scope of the criteria clearer, also examples have been added, please see criteria document for clarification
	8.	We believe it is clear but it is not appropriate as coal mine methane is not considered. Coal mine methane leaks add at least 27% to the global warming of the CO2 emitted from global steelmaking according to IEA data. Methane emissions from coking coal mining are equivalent to 988 million tonnes of CO2 (using the IPCC's 82.5 multiplier for methane's climate impact versus CO2). This is more than all the CO2 emissions of Germany or Canada.	Climate Bonds and the TWG agreed with this which is now reflected in the Criteria. See response 1
2 – Is the scope of emissions based on the Fixed boundary approach, a robust	9.	Excluding coal mining from the emissions boundary for steel making risks severely undercounting the emissions associated with coal-based steelmaking. GEM recently found that metallurgical coal use in the steel industry results in coal mine methane emissions of	Climate Bonds and the TWG agreed with this which is now reflected in the Criteria. See response 1

and clear methodology to use for emissions accounting? Refer to Box 1 of the Criteria document and section 3.3.1 in the Background document.		nearly 1 Gt CO2e20 emissions annually, which represents a 27% increase to the commonly cited emissions footprint of ~3.6 Gt CO2 for the steel industry. Source: https://globalenergymonitor.org/report/pedal-to-the-metal-2022/	
	10.	Without deep knowledge on the background document and other references in the document, the methodology is unclear, e.g. 1. Box 1 refers to a wide range of plants and processes including ferrous metal processing till coating and including scope 1, 2 and 3 emissions in a wide range. Additionally it refers to standards like ISO 4404, EN 19694-2 and GHG-Protocol. 2. Methodology in Chapter 5 refers IEA NZE and its projection with a smaller scope and balance room. It remains unclear whether all methodologies and standards use the same scope and balance room, especially as the IEA methodology has not yet been standardized (missing rulebook). A standard hopping (choice of the standard that leads to the individual best results) should be avoided. In addition, penalization of producers of highest grades needs to be avoided (see answer to Q13).	The scope of emissions and the pathway used as guideline to set emissions intensity thresholds are in alignment, the pathway uses IEA NZE data but it is adjusted to also include the rest of the scope, this is explained in the criteria document and background paper (see sec 5.3.3 criteria document). Guidelines for emissions accounting have now been modified and give a clear guidance and there is no standard hopping possibility. High alloys are not part of the scope of these criteria
	11.	This is aligned to the intended scope for certification as above in Q1.	Does not require response
	12.	Its clear but to leave out met coal methane of the scope is concerning. There are more mitigation steps than previously and some of which may require financing companywide or mine specific.	Climate Bonds and the TWG agreed with this which is now reflected in the Criteria. See response 1
	13.	Apart for this point looks the scope clear and comprehensive. The scope of emissions, based on the Fixed boundary approach, seems robust and clear to use; on the condition that this scope is the same as the one considered in the study and used as reference	See response 10

		to define the sector pathway. The same consideration applies for system boundaries. Please clarify.	
	14.	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. ISO 4404-1:2012 is Petroleum and related products — Determination of the corrosion resistance of fire-resistant hydraulic fluids. How is this standard relevant for GHG assessment and Scope of emissions? I think the right standard is ISO 14064	There may have been some typo here, we were referring to the ISO 14404 standards. Emissions calculation guidelines are now updated (see box 1 and 2 of the criteria document)
Criteria for New Facilities (Refer to section 3.1 of the Criteria document and section 4.1 in the Background document.) *In general, these criteria are based in the pathway described in section 5.1 of the criteria document, please refer to this section and the background paper section 3.4 for the rationale of the thresholds and percentages set for emissions reduction.* 3 – Is the list of eligible facilities proposed for new plants complete and appropriate? 4 – is the measure: CCUS should capture at least 70% of all process emissions acceptable?	15.	No. These standards over rely on CCUS and provide too much wiggle room for CCUS failure or overreporting that could devastate attempts to reach net zero. CCUS should capture 100% of process emissions (or a high enough level so that the overall process emissions match that of the alternative DRI-EAF steelmaking) in order to be considered green/clean.	Climate Bonds and the TWG agreed that to decarbonize steel, there are multiple potential low emissions intensity solutions that we can certify, there is not going to be only 1 way of producing steel. Implementation of each technology will depend on the resources that each location, producer etc, has. This includes CCS or CCUS, which are also part of every decarbonization pathway used as reference in these criteria (not just the IEA NZE but also those developed by MPP, E3G and PNNL, IDDRI). Regarding 100% capture of emissions, this is just not technically feasible. Currently there is no CCUS operating around the world for steel with capture rates even close to 90%. What has been set in these criteria aims at something that is “doable" (already in place or at a high level of Technical Readiness Level), 100% capture is not. Here is some more clarifications taken from our background paper: The full extent of emissions reduction depends on the ability for large-scale permanent storage or use of captured CO2. High capture rates still have to be proven through demonstration projects. CCUS does not completely eliminate emissions, as very high capture rates (>90%) are difficult to achieve. The application of carbon capture technologies incurs a penalty in energy efficiency that increases with capture rate. Moreover, there are multiple emission points in BF-BOF installations, increasing the technical complexity required for CO2 capture (mostly from the blast furnace, but also from

			basic oxygen furnace and the coking plant[1]. Therefore in order to implement CCS or CCUS technology, the capture rate should be at least of 70% of emissions to be considered for certification. **With 70% capture rate we refer to an average of the emissions captured from all point sources. This aims at promoting investments in 90% capture at the highest emitting point source (e.g. the BF) that should translate in 70% for the overall facility**. As technology advances retrofitting the rest of the facility to capture the remaining emissions shall become feasible.
	16.	We believe this is not acceptable as it considers CO2 emissions at the steel factory but not the major emissions at metallurgical coal mines outlined above.	Climate Bonds and the TWG agreed with this which is now reflected in the Criteria. See response 1
	17.	Table 2 seems to cover known technologies	No response required
	18.	3 - complete and appropriate 4 - Hence, it is unclear how the construction of new BF-BOF facilities with integrated CCUs capturing 70% of emissions will be sufficient to reduce the carbon intensity of steel production to the levels set out in the IEA NZE pathway (shown in Table 6) from 2035 and beyond. The background paper should provide clarity and detail on how the 70% threshold for the capture of process emissions was derived, and how a 70% capture rate aligns with the IEA NZE trajectory As an example, referencing figure 12 in the background document, the CO2 intensity of BF-BOF steel production in India as of 2019 was approx. 3.0t CO2/t crude steel A blanket 70% capture rate will not reduce emissions to align with the decarbonization trajectory going beyond 2025 i.e. Primary intensity of 2.09 by 2025 and 1.81 by 2030. Noting the significant variations in carbon intensity between plants in different countries, our recommendation is for the criteria to be implemented through a dynamic threshold for new facilities to align with the carbon intensity trajectory outlined in the table 5 of	Regarding CCS and CCUS see Response 15 above with clarifications. Climate bonds and the TWG agreed that a dynamic threshold for steel is not an appropriate approach to follow for new facilities, because there are already clean technologies available which are listed in the criteria that can be implemented, so there is no need (in the case of new facilities) to add a dynamic threshold. Installations should already start with emissions intensity levels lower than those set up in the transition pathway (fig. 7 of the criteria) before 2030. The significant variation between plants at this moment is due to the use of technologies that will most likely become stranded assets, these don't match to the requirements that we are requesting in the criteria for new facilities. Also, these criteria reflect the current status of technology and development in transition studies. Thus we have set a 2030 cap for certifications (at measure level and facility) aiming at updating the criteria once new technology is

[1] Witecka, W. K., Dr. Oliver Sartor, Philipp D. Hauser, D. C. O., Dr. Fabian Joas, T. L., Frank Peter,, Fiona Seiler, Clemens Schneider, D. G. H., . . . Yilmaz, Y. (2021). Breakthrough Strategies for Climate-Neutral Industry in Europe. Agora. Retrieved from https://static.agora-energiewende.de/fileadmin/Projekte/2020/2020_10_Clean_Industry_Package/A-EW_208_Strategies-Climate-Neutral-Industry-EU_Study_WEB.pdf

		the criteria document instead of imposing a blanket 70% threshold across the globe.	available and to reflect stricter ambition levels (in principle every 3 years)
	19.	A 90% capture rate by or after 2030 for all BF or fossil gas or syn gas facilities should be the target according to netzerosteel.org study from 2021. An increase performance threshold between 2022 and 2030 and other milestone years would be acceptable so long as it is clear what facilities have to achieve what thresholds by when. The same report as well as E3G's from 2021 clearly points out that no more new Blast Furnaces (BF/BOF) without 90% CCS can be built past 2025 but within those same reports, we need to work with the experts to outline the timetable to retrofit which existing facilities with CCUS or simply not reline and shift production technology entirely.	Indeed we have used netzerosteel.org and E3G's pathways as reference. See response 15 for rationale on the 70% capture rate
	20.	3. complete and appropiate 4. A 70% capture efficiency is not high enough, the Climate Bond should aim for a 90% capture efficiency, based on Beyond 90% capture: Possible, but at what cost? - ScienceDirect All the CCUS activities will be new and operational until 2050. We therefore cannot accept a lock-in of a facility that will have a moderate performance. Also, please clarify the scope of these CO2 emissions: those of all steel production related processes or only of all processes connected to the CCUS system? In addition, we are wondering how will be ensured that the CCUS system achieve this level of carbon capture and who will control this?	See response 15 for rationale on the 70% capture rate. Also in the criteria we have added that with 70% we mean of all emissions of the steel production facility
5 – is the criteria for Scrap based Electric Arc Furnace (EAF) acceptable?	21.	No, there are high alloyed and stainless-steel grades that are not able to meet the 70 % scrap criteria.	high alloyed and stainless-steel grades are not covered by the standard yet
	22.	The criteria should expand upon why 70% is set as the baseline. The total emissions of the EAF-scrap production process can vary significantly from country to country and plant to plant depending on the inputs used, operational energy efficiency, and source of electricity used. For example, research published in 2021 by Columbia University's Centre on Global Energy Policy found that in the US the carbon intensity of the DRI-EAF-Gas process to be 1.40	The approach to scrap in the criteria has been addressed on the background paper section 3.3.4 "Considerations regarding the use of scrap" We aim at promoting the use of scrap and we also know that there is a limit to this, thus we allow supplementing anything that is not possible to meet with scrap, by adding (100%) Hydrogen based DRI.

		tCO2 /ton of Hot Metal (HM), while the DRIEAF- Coal process is more carbon intensive, at 1.95 tCO2/T-HM. Hence, there is a strong case for setting higher requirements on scrap usage from plants that supplement the EAF-Scrap process with the DRI-EAF-Coal process, compared to those that use DRI-EAF-Gas. A secondary consideration is the availability of steel scrap in different regions of the world, and the associated costs with acquiring scrap. According to the Bureau of International Recycling, Turkey used 34.8 million tonnes of steel scrap for steelmaking in 2021 (see Table 2), making it one of the largest users in the world. However, Turkey does not have sufficient domestic supply of steel scrap and is the world's largest importer of scrap. Referencing to Table 3, approx. 25million tonnes, 70% of the steel scrap Turkey uses as inputs are imported. The top 3 sources in which Turkey obtained its steel scrap in 2021 were USA, Netherlands, and the UK, all of which require the use of shipping routes which span thousands of nautical miles to reach Turkey. While scope 3 emissions are out of scope for the IEA NZE pathway, it should be considered towards the practicality of having a 70% baseline to the input of scrap for EAF steel production. Our recommendation is for the criteria to lay out country specific or even plant specific thresholds to align emissions intensity of EAF with the IEA NZE pathway. Lastly, in determining an appropriate threshold for scrap use we should consider the availability of quality steel scrap and constraints regarding scrap mix optimization. For example, certain types of scrap contain high quantities of trace elements, making them unsuitable to produce high-quality steel. Low quality scrap tends to result in lower yields, and higher energy requirements per ton of steel produced. Moreover, most EAF facilities have scrap mix optimization programs that specify optimal scrap mix across produced steel grades. Considering factors such as volume restrictions, quality constraints while avoiding problems with cave-ins, electrode breakage and damage to furnace lining and wall panels during charging. these factors affect the practicality of mandating a minimum amount of scrap use.	- 70% average of yearly inputs was chosen due to being close to the global average use of scrap (used in the IEA G7 report https://www.iea.org/reports/achieving-net-zero-heavy-industry-sectors-in-g7-members as the threshold for scrap to distinguish between primary and secondary steelmaking) but also not so high that it becomes impossible to balance issues like scrap quality and availability. To account for transport and other scope 3 emissions we have set additional criteria in section 6.6. of the criteria document
	23.	We do agree with the acceptance of the combination of scrap + 100% hydrogen DRI.	There is a limit to global availability of scrap that varies and will vary in the future depending on location. We aim at promoting the increase of scrap use (thus we set these criteria) but also taking in consideration the limits and

		Yet, we do not understand that the input of scrap may be as low as 70% of the total input. It should be 100% in our point of view.	challenges see response 22 and section 3.3.4 of background paper for more information.
6 – Is requesting a plan to use either renewable-based captive power generation, and renewable-based power purchase agreement appropriate to address scope two emissions of "new" Electrolysis facilities ? Are there any other instruments available in your region that could also be used and we are missing?	24.	Yes. No other instruments known.	No response required
	25.	the requirements to increase renewable-based captive power generation and/or power purchase agreements does not appear to be concrete or ambitious noting the lack of detail towards how much of an increase would be necessary required to qualify. CBI can consider further research into the total amount of energy used per ton of steel relating to electrolysis of iron ore and devise country specific thresholds for renewable energy use aligned with the IEA NZE trajectory. Steel production is a highly competitive industry with low margins, setting a requirement for the use of renewable energy could make it prohibitively costly for steel producers where renewable energy is costly to access due to limited availability where demand is greater than the supply for renewable energy. Steel production facilities often operate round the clock 24/7, increased reliance on renewable sources of energy that are unable to provide a stable supply of energy throughout the year can present challenges for companies to build up their electricity storage capacities in a costly manner. Other instruments to provide a temporary solution is the use of carbon offsets/ renewable energy certificates (RECs). Transition towards renewable energy may not be realized in the near term and the use of temporary solutions should be explored. In areas where utilization of renewable energy is not feasible, we propose for the use of carbon offsets/ RECs to supplement the overall reduction to carbon emissions.	Climate Bonds does not consider Any type of offsets as credible measures for climate change mitigation, this is a principle that we abide by. Together with the TWG we agreed that, given the variety of challenges globally to increase the use of renewable energies, we keep flexibility in this requirement, by not setting a specific percentage of renewable energy usage for the facility (we can update this as the availability improves in the future). However, to provide credibility, we have added that the plan needs to describe how the use of renewable energy will be increased /introduced in the facility "within the term of the bond", to add a time constrain to the execution of the plan.
	26.	See answer for 7.	No response required
	27.	This criterion should not be restricted to new electrolysis facilities. This criterion should be generalized for the power consumption of all eligible facilities. In addition, this electricity should be generated by new, additional generators. If not, it would lead to a diversion of the renewable electricity only without any increase of the share of renewable energy in the energy mix of the territory. The request for a plan does not suffice either; the eligibility criteria	Climate Bonds and the TWG agreed that, for the steel industry transition, we promote the electrification of the processes, in order to replace the current highly emitting steelmaking processes, this will take care of direct (scope 1) emissions which depend on the steel producer, and this is not the case for the scope 2 emissions of the electricity grid. Then, electrifying the production is already a big step towards decarbonization, therefore the TWG considers new electric

		should fix a term by which the steel plant needs to be supplied with renewable electricity.	facilities as certifiable (while in many cases the grid may not be green yet). Having the plans for PPAs or renewable captive generation is a first step in transitioning the facility to low carbon electricity, without being prohibitive or penalizing countries that still don't have a green grid. Using a threshold on the other hand, is not practical, as some countries have already low carbon grids and some others are still at an early stage and producers in the last one would be penalized even if they are doing the right move by electrifying. We keep flexibility in this requirement, by not setting a specific percentage of renewable energy usage for the facility (we can update this as the availability improves in the future). However, to provide credibility, we have added that the plan needs to describe how the use of renewable energy will be increased /introduced in the facility "within the term of the bond", to add a time constrain to the execution of the plan.
Steel production facilities operational prior to 2022 (Refer to section 3.2 of the Criteria document and section 4.2 in the Background document.) *Also, these criteria are based in the pathway described in section 5.1 of the criteria document, please refer to this section and the background paper section 3.4 for the rationale of the thresholds and percentages set for emissions reduction.* 7 – Is requesting a plan to use either renewable-based captive power generation, and renewable-based power purchase agreement appropriate to address scope two emissions of **EAF facilities**? Are there any other instruments available in your region that could also be used and we are missing?	28.	Yes. No other instruments known.	No response required
	29.	Drawing upon our response to Q.6, the standards and expectations should be more concrete in specifying the proportion of renewable energy use that should be expected in recognition that the use of renewable energy for steel production may be prohibitively costly across different geographies. The use of carbon offsets/ RECs has similar applications to EAF facilities to offset in the near-term.	See response 27 and Climate Bonds does not consider Any type of offsets as credible measures for climate change mitigation, this is a principle that we abide by.
	30.	Distributed Renewable Energy Generation may broaden scope to storage and even incentivize EE as resource which helps local grid to further decarbonize. For EAF's in particular, any incentive to help them use their demand, load, and political power to further decarbonize should be encouraged.	No response required
	31.	Same remark as above.	No response required

BF has been split between those that are operating from 2007 and those that started operation before, this is based on the age of the facility and, in essence is to allow improvements in facilities that still don't need to go for relining and prevent locking in of older facilities that should go for retrofit or decommissioning by 2030 (please see section 3.3.3 and 4.2 of the Background document for more clarification). 8 – For BF that become operational after 2007: is not certifying relining a proper way of preventing locking in these technologies? Are the levels of decarbonization requested by 2030 (15% or 20% depending on the baseline emissions of the facility) acceptable?	32.	For BF that become operational after 2007, the decarbonization request should include a maximum emissions for the facility as well as a required % reduction (so that any facility operating without standard mitigation technology now is forced to adopt them).	Climate Bonds and the TWG agreed with this and it is now reflected in the Criteria. to make the criteria more robust and clearer, we added the following for all BFs: " The emissions intensity of the facility should be below 1.8 tCO_2/t steel by 2030"
	33.	The levels are not acceptable as they do not consider coal mine methane, which might double some BF steel's GHG profiles. "Some coal leaks much more methane than others during the mining process. This is typically correlated with the depth at which the coal is extracted. Less methane intensive (or "gassy") coal is typically used for electricity generation, whereas metallurgical coal is typically gassier, with significant differences even between neighbouring sections of metallurgical mines. The gassiest coal can more than double steel's climate damage, emitting as much as 1,500 kilogrammes of CO2 equivalent per tonne of coal equivalent." https://iea.blob.core.windows.net/assets/98909c1b-aabc-4797-9926-35307b418cdb/WEO2019-free.pdf	Climate Bonds and the TWG agreed with this and it is now reflected in the Criteria. See response 1
	34.	To improve this further, CBI should require that all BF facilities issuing climate bonds cannot choose to undergo relining through other sources of financing. Not specifying this could result in BF operators seeking traditional loans or bonds for relining, which goes against the intention of not allowing climate bond proceeds to be used for relining. However, given the long useful lives of steel manufacturing facilities, perhaps additional requirement should be added to mandate further emissions intensity reduction in the years beyond 2030. For example, a BF facility that became operational in 2015 is likely to be able to last till 2045 even without relining, and hence it is important that the facility's decarbonization efforts do not stop at 2030 and should face further carbon intensity reduction targets.	Climate Bonds and the TWG agree with this. It is important to clarify, however, that this specific part of the criteria is applicable for certification of the whole facility. This means, that a facility that is going to implement relining cannot apply for certification, because this is a requirement (no relining) set at facility level
	35.	8-these two options seem low to me for progress for any facility by 2030 but I would want to see some facility segmentation based on the 2007 split and projected emissions from those 2 groups and what percent of the sector emissions each of those 2 groups account for. Showing the math for this would provide non-technical. experts with more accessible transparency. Overall,	The criteria for BFs is based on research and the discussions with the technical working group (and of course comments from Industry working group). All the rationale, including benchmarking of emissions intensity per route and country, is included in the background paper. Particularly section 4.3 of the background documents gives an explanation of this.

		showing the sector wide calculations that underlie these thresholds would make it much more accessible, transparent, credible.	Basically, the idea for older BFs is that only investments in facilities that will significantly decarbonize (>50%) are allowed, because in line with what a number of decarbonization roadmaps state, BFs that don't retrofit to significantly mitigate carbon emissions with e.g. CCS by 2030, will most likely become stranded assets. With younger facilities we really mean that the facility still has not reach relining age (~20 years in operation), accordingly, a credible mitigation investment will be aimed at implementing measures to decrease the facility's carbon emissions (cap year 2030) without extending the life of the plant (i.e. we know this facilities will keep running, so if efforts to mitigate emissions during the remaining lifetime are taken then we can consider this certifiable, but not the extension of the facilities' lifetime. Please see more info in section 4.3 background paper.
	36.	It is better to set absolute emission thresholds (x ton CO2/ton steel) rather than relative emission reductions. We recommend to copy the thresholds defined in the EU Taxonomy, regardless of the age of the installation. Without having a strong opinion on the exclusion of relining for BFs, operational after 2007, we are wonder whether the requested carbon emission reduction can be achieved with incremental measures only.	Climate Bonds and the TWG agreed with this and it is now reflected in the Criteria. to make the criteria more robust and clearer, we added the following for all BFs: " The emissions intensity of the facility should be below 1.8 tCO2/t steel by 2030"
9 – For BF that became operational before 2007: is requesting emissions intensity (tCO2/t steel) reduction between 2022 and 2030 by 50% acceptable?	37.	No – again there should be a maximum emissions level that they must meet, even if that requires more than a 50% reduction. Baseline is different for each plants	Climate Bonds and the TWG agreed with this and it is now reflected in the Criteria. to make the criteria more robust and clearer, we added the following for all BFs: " The emissions intensity of the facility should be below 1.8 tCO2/t steel by 2030"
	38.	same as above	No response needed
	39.	Might it be useful to combine the request for emission intensity reduction by 50 % with a limit value similar to the limit for BF that became operational in 2007 or later (e.g. request more than 50 % reduction if intensity exceeds 3.6 tCO2/t steel)?	Climate Bonds and the TWG agreed with this and it is now reflected in the Criteria. to make the criteria more robust and clearer, we added the following for all BFs: " The emissions intensity of the facility should be below 1.8 tCO2/t steel by 2030"

	40.	The requirement for emissions intensity reduction by 50% seems to be an ambitious target but may be excessively harsh. Perhaps the requirements for BF facilities operational before and after 2007 can be combined, but with the required extent of decarbonization for each individual facility be tied to the IEA NZE trajectory's carbon intensity reduction targets of 1.81 tCO2/t steel by 2030 and 1.35 tCO2/t steel by 2035. We also noted that the criteria specifies that climate bond issuances cannot but used for relining for BF facilities operational in 2007 in later but does not specify this for BF facilities operational prior to 2007. We hope that CBI could clarify its stance regarding this, and we feel that climate bond proceeds should not be used for relining, as conventional BF facilities need to be rapidly phased out over the next 2 decades for the IEA NZE trajectory targets to be met.	Climate Bonds and the TWG agreed with the point about relining and it is now reflected in the Criteria. Also, regarding the 50%, we mention in the Background paper (Section 4.3): the 50% used as requirement for older facilities assumes that the only transition investment possible for an old BF-BOF, other than decommissioning, needs to involve a total refurbishment of the facility, such that it will lower the emissions enough to reach a threshold lower than that of 2030. Currently, lowering emissions in existing BF-BOF by 50% can only be achieve by implementing CCS or CCUS. The rationale behind setting this requirement, agreed by the TWG, assumes that finance may be needed to test transition technologies to refurbish existing BFs and further lower emissions, thus 50% lower emissions was considered significant enough (if also cross cutting criteria is met).
	41.	Further investment in fuel switching to biomass should be heavily scrutinized to thoroughly determine the full health, air, human rights, and ecosystem impacts . IEA, Responsible Steel, and other experts or standards are increasingly skeptical of the using biomass for steel too much further beyond its current levels of demand and as biomass resources become scarcer in key regions like Brazil, the marginal impact of the demand for biomass in steel making will increase rapidly.	Climate Bonds and the TWG agreed with this, consequently we have include additional criteria for the use of biomass.
	42.	Same remarks as above.	No response needed
10 – **For DRI:** is it requesting 20% reductions in emissions by 2030 to fossil gas based plants acceptable? is it requesting 40% reductions in emissions by 2030 to coal-based plants acceptable?	43.	Should there also be a limit in both cases to not penalize frontrunners already operating at an optimum?	These criteria is only to be implemented by 2030, to promote mitigation measures and refurbishments implemented in this facilities (e.g. fuel switching). At the moment, even if it is not as emissions intense as other technologies, DRI facilities have room for improvement, which is what is covered by the percentages set. This is based in benchmarking available, where we see that facilities with coal need to significantly (i.e. 40%) decarbonize by 2030 (e.g. with fuel switching) and those with fossil gas are less emissions intense thus need to reduce emissions by 20%, (unabated) fossil gas based or coal based facilities are not considered to be operating at an optimum, these still need to abate emissions

	44.	The criteria are acceptable for fossil gas-based plants while there should be more ambitious targets set to phase out coal-based plants. According to a study done on the comparative life cycle assessment of natural gas versus coal-based DRI production, coal based DRI has approx. 33–41% higher CO2 emissions than natural gas based DRI. A 40% reduction in emission by 2030 to coal-based plants does seem acceptable considering that this doubles the requirements of fossil gas-based plants. However, more ambitious targets should be set in relation to coal-based plants as we consider that coal based DRI production has been trending upwards in the past 20 years. The stark increase can be seen as the coal-based processes which accounted for 13% in 2000 has since almost doubled to 24.4% as of 2020 (refer to table 3). Based on the 2020 World Direct reduction Statistics, production of coal based DRI has risen between 2018 to 2020 (an increase from 20.2% to 24.4% referencing Table 3) and gas-based DRI production has declined across these 3 years. Based on our estimations, coal based DRI production was accountable for approximately 31% of overall carbon emissions relating to DRI production in 2020. Hence, our recommendation is to stretch targeted decarbonization beyond 40% by 2030 and promote the phase out of coal-based DRI beyond 2030	Climate Bonds and the TWG agreed with having more strict measures for CMM and this is now reflected in the Criteria (see response 1) Also we only cover coal based DRI facilities, if this will significantly decarbonize by 2030, new coal based DRI facilities are not certifiable and we will revise the criteria before 2030, to update this requirement (i.e. facilities should stop using coal before 2030)
	45.	Same remarks as above. In addition: the conditions for DRI: "The plant uses 100% Hydrogen or has a CCUS facility that captures at least 70% of all process emissions." We find it unfair to put two technologies that lead to different emissions reduction levels at the same level (assuming H2 will bring reductions higher than 70%).	We agree, we remove this write up from the criteria because it was confusing.
11 – Is there any additional criteria that existing facilities should meet?	46.	In general, these emissions reductions standards should be set as two part: a maximum allowed emissions intensity and a % reduction. The facility has to meet whichever one requires greater emissions reductions.	Climate bonds and the TWG agreed with this for the case of the BF and the criteria was updated accordingly. This is because this type of facility causes the main emissions in this sector and these need to be kept according the decarbonization pathway (fig. 7 of the criteria) before 2030 in order to not blow the carbon budget. Other technologies are already less emitting than the BF, thus any of those other facilities that is investing in decarbonization, according to the percentages set up in the

			criteria is doing a significant effort to decarbonize and can be certified and will be within the pathway. Also, these criteria reflects the current status of technology and development in transition studies. Thus we have set a 2030 cap for certifications (at measure and facility level) aiming at updating the criteria once new technology is available and to reflect stricter ambition levels (in principle every 3 years)
	47.	Acceptable	No response required
	48.	None	No response required
Criteria for decarbonization measures within steel production facilities (Refer to section 4 of the Criteria document and section 4.3 in the Background document.) 12 – Is requesting for the production facility to meet the criteria specific for that plant in order for the capital investments (individual measures implemented in a plant) to be certified, acceptable?	49.	Acceptable A secondary consideration would be to establish the criteria that would facilitate transition beyond 2030. The criteria require borrowers to have a plan evidencing the implementation of decarbonisation measures and assess their progress against decarbonization targets every 36 months up to 2030. However, there are no set targets that extend beyond 2030 to provide guidance on alignment with the IEA NZE pathway. Establishing these criteria allows for bond investors to have insight towards the long-term outlook of these capital investments while prompting borrowers to look beyond short-term reductions solely from an improvement in energy efficiency.	At company level, we have indeed established the targets beyond 2030 using the (adapted) IEA NZE pathway. On the other hand, at facility and measures level we are relying on the percentage reduction of emissions intensity. This is because the IEA NZE emissions intensity thresholds before 2030 are "too high" compared to the global benchmarks (Hasanbeigi, A. 2022. https://www.globalefficiencyintel.com/steel-climate-impact-international-benchmarking-energy-co2-intensities), thus we did not include ceiling intensity numbers because the benchmarks give us a starting point and show us how much redction is needed. Also if we look at dynamic thresholds, these may be too high for some countries, or too low for others (depending on many factors like grid intensity), the % is a more fair approach However, to make the criteria more robust and clearer, we added ceiling emissions for the BFs by 2030 For more information see section 4 of the background paper, particularly 4.3
	50.	The framing of this question is not clear to me so instead of breaking the thresholds are target by technology, what if GHG intensity thresholds derived from a 1.5C degree study were used to measure against. So if you use netzerosteel.org study, the intensity thresholds for 2030 primary steel emissions intensity falls from around 2 tonnes CO2/tonne of steel produced in 2020 (given	See response 49 and section 4 of the background paper, particularly 4.3

		modelled boundary) to 1.42 - 1.46 tonnes CO2e/tonne of steel produced in 2030 (reduction of 27-29% vs 2020). Secondary steel falls from 0.15 tonnes CO2e/tonne of steel produced in 2020 to 0.14 tonnes CO2e/tonne of steel produced in 2030 (reduction of 4%)	
	51.	In case of electrification of heat should the electricity come from additional renewable capacity.	The criteria for measures are based at a minimum percentage decrease in emissions intensity that needs to be achieved we have not set specific requirements per type of measure for these sector
Criteria for companies (Refer to section 5 of the Criteria document and section 4.4 and 3.4 in the Background document.) 13 – Is it setting to performance levels (tier 1 and tier 2) for companies to get certification appropriate?	52.	As far as we understand, the methodology does not differ between steel grades and product. Without a clear definition of a reference grade and correction rules to keep comparability, producers of steel grades that require more treatment, heat, … might be penalized in comparison to producers of simpler grades.	Currently the criteria does not cover high alloy steels
	53.	Optically, we would suggest for the CBI to make a similar differentiation in the certification under the climate bonds standard for both tier 1 and tier 2 companies. For example, the independent verifier should refer to the tiering under the suggested certification standards and categorize the issuer/borrower as either tier 1 or tier 2 within the verifier's report. Additionally, CBI has a database that lists all certified bonds and loans that have been issued. As part of the label, tier 1 and tier 2 companies can be categorized under specific data fields within this database. Omitting the use of carbon offsets should also be an additional consideration towards defining the criteria for tier 1 and tier 2 companies. Within the criteria, it is assumed that the calculation against the weight emission intensity for the company's production facilities would not include the use of carbon offsets. This should be made explicit for the avoidance of any doubt to the criteria.	The suggestions for the market intelligence data base have been brought for consideration. Also, regarding offsets, climate bonds explicitly does not accept offsets as credible climate mitigation measures, this i s a principle we abide by.
	54.	(relevant for questions 7-13 too though)-The idea of a level for "striving" vs "high performing" as one could characterize the 2 tiers as explained in the criteria makes some sense but then down the line as the breakthrough technology becomes commercialized at	Climate Bonds acknowledges that there are challenges for decarbonization depending on the region. In principle, the goal of the criteria is to serve as a guidance of what is a credible transition investment in the sector, and we aim to be

		scale, it could have an unintended effect of only financing the high achievers and not getting enough financing to those projects or companies or regions that may need it most. Some issue of equity in how CBI approves bonds and whether there is some level of parity between global North and South and more or less resourced companies that may have less gov't funds, more debt, or other barriers should be taken into account.	able to be globally applicable, thus the idea of the tiers is to also cover those producers that need time to get there. Having regional specific pathways is also tricky, it does not guarantee that they meet the necessary ambition needed to meet 1.5°C in the sector. Secondly, some regions do not have their own pathways which makes a global pathway a necessity. Ultimately, the entity level criteria reflect regional contexts to an extent: companies that are not yet on the pathway can meet Tier 2 requirements through meeting the pathway by 2030 and having a transition plan that demonstrates how they will get there. This would give ample time to overcome various regional barriers currently faced. It is also important to note that the criteria set an emissions pathway rather than prescribing specific milestones. This allows producers to reach the necessary emissions levels that best suits their context.
	55.	Yet, we find it fundamental to set performance levels for companies. Reaching targets in 2030 and 2050 is not the only thing that matters; it is equally important that the companies follow a specific emission reduction pathway from now until these years. In addition, Figure 2 values are related to a certain amount of steel produced globally, how it is ensured that the real amount is aligned with the IEA NZE study?	The companies need to follow this emissions reduction pathway, the only caveat is that some companies will need time to get alignment with the pathway, consequently, tier 2 was added in order to account for this. Regarding the IEA NZE: The NZE models the transition needed for the global energy sector to achieve net-zero CO2 emissions by 2050 in a way that is consistent with a 50% probability of limiting global temperature rise to 1.5°C, without overshoot[2].The model delivers the optimal share of technology choices by country and region over time by optimizing emissions reductions and minimizing costs, while satisfying demand for steel. To do so, the model includes specific carbon pricing mechanisms where relevant (e.g., the European Union's Emissions Trading System). The NZE discloses the inclusion of the following technologies and practices: BF-BOF, blast furnace retrofits, scrap-based EAF, hydrogen-based DRI-EAF and natural gas-based DRI-EAF, iron ore electrolysis, CCUS-based primary, smelting reduction, and technologies using bioenergy. In addition, the NZE models material and energy efficiency measures, assuming global demand for steel is 12% higher in 2050, compared to 2020. Additionally, the model includes carbon pricing assumptions

[2] International Energy Agency, Net Zero by 2050, IEA, 2021

			starting in 2025 in advanced economies, emerging markets, and developing economies, which ramps up to 2025. For more information please see section 3.4 of the background paper
14 – Is there any additional criteria that companies should meet?	56.	Companies should meet criteria of buying less methane-emitting metallurgical coal. This requires a) coal mine methane monitoring, reporting and verification standards (such as being proposed by the EU energy sector methane proposal) b) performance standards such as in the Oil and Gas Methane Partnership (OGMP)	Climate Bonds and the TWG agreed with this which is now reflected in the Criteria. See response 1
	57.	None that we can think off.	No response needed
	58.	same as 12	No response needed
	59.	Broader ESG considerations should be incorporated more closely aligned with Responsible Steel 12 part standard including labor, human rights, ecosystem and air and water pollution impacts. Bad actors on those fronts increase risk for the company as a whole. In addition, companies that conduct themselves with more climate urgency in the global North vs the global South when the global South is more at risk for climate destruction and damage allows a dangerous precedent and should be discouraged with any and all climate finance mechanisms.	Climate Bonds sector criteria are intended to directly address climate impacts of investments. As such, non-climate environmental objectives such as water and other SDGs are normally not included. However, we do include criteria for adaptation and resilience that addresses environmental aspects. Our criteria does not attempt to replace other standards such as Responsible Steel, which covers the broad spectrum of ESG issues, we also accept RS certification as proxy for some aspects of our criteria
15 – Is the pathway chosen as target for the companies decarbonization appropriate? (Pathway is in section 5.1 of the criteria document and section 3.4 of the background paper)	60.	There is a danger of penalization of producers of highest grades (see answer to Q 13)	highest grades are not included in the standard
	61.	As a caveat, we would like to see further clarity on the breakdown for how the IEA NZE trajectory figures in table 5 of the CBI paper was derived. Based on our own calculations using the provided emissions intensity value from table 5 of the CBI paper and using the projected share of scrap referenced from IEA's NZE seems to fall short fall short from aligning with the IEA's NZE forecasted carbon intensity between 2030 to 2050.	A thorough explanation of how this pathway was derived is in the background paper section 3.4 on how the pathway was adapted and answer 55 above for a glimpse of this information.

	62.	Primary Intensity (t CO2/t steel) Secondary Intensity. (t CO2/t steel) What is the definition of Primary Intensity and Secondary Intensity? Do you mean scope 1 & 2? Or is it related to primary and secondary production? with the weights being the share of external scrap by weight (for secondary production) and other metallic inputs (for primary production) Please clarify primary and secondary production. Do you for primary the DRI plant and for secondary SMP and RM plants?	Primary production is steel produced from iron ore via the BF-BOF or DRI process and secondary is steel produced using scrap. The criteria documents have now been adjusted to include more clarity regarding these terms.
	63.	We are wondering to what extent the scenario modelled by the IEA for the steel sector, aiming at reaching net zero by 2050, is compatible with a 1.5°C global warming scenario. The background document specifies: "On an individual country basis, production is concentrated in China (53%), India (6%), Japan (5%), the United States (5%) and Russia (4%). Production in China is predicted to peak in 2025 and decline towards the national goal of net-zero by 2060" If China accounts for more than half of the global steel production and the Chinese target year to net zero is 2060, how sure can we be about the compatibility of IEA NZE trajectory with 1.5°C temperature increase?	The IEA NZE is a scenario of decarbonization based on assumptions of what could happened to limit global warming to 1.5C (please see the background paper section 3.4 on how the pathway was adapted and answer 55 above) The fact that China at the moment has a net zero goal by 2060, just means that China is not aligned with a 1.5 pathway (as is the case for many other countries). What we attempt to do by following the IEA NZE is to show investors and other stakeholders what does 1.5C aligned decarbonization looks like in this sector, as opposed to following the business as usual or current practices that are in many cases not ambitious from a climate change abatement point of view.
	64.	We disagree with the approach of separating decarbonization trajectories by the type of steel making (primary and secondary). The approach should be tied to steel products manufactured, as opposed to the different technologies utilized to make the same products. For example, using a subsector approach for both long and flat products is more sensible and fairer. A steel product approach would remove technology bias and more appropriately reflect the identified key principle of "technology neutral" from Table 2 of the Background Document. By separating trajectories based on steel making technology the criteria is technology biased and does not meet this key principle. As mentioned previously, the primary and secondary intensity trajectories give an advantage to primary steel making and allow them to certify while emitting higher greenhouse gas emissions. For example, if a secondary steel maker is unable to reduce CO2	A separate decarbonization scenario for primary and secondary steel production ensures that efforts focus on transforming primary production. Utilizing a single global steel carbon budget to measure the sector's emissions could incentivize steel producers to increase the utilization of scrap as a decarbonization strategy. However, since global scrap availability is limited (see section 3.3.4 of background paper), this strategy could result in the reshuffling, rather than reduction in the sector's overall emissions. Instead, we have adopted the approach from the Sustainable STEEL Principles, to separate the sector carbon budget into decarbonization scenarios for primary and secondary steel. This shifts the focus to transitioning primary steel production, leading to the

		emissions by almost 60% by 2030 they will not be able to certify while a primary steel maker might be able to certify to their less aggressive criteria and appear to be greener despite having a higher CO2 emission rate during the same time frame.	adoption of clean end-state technologies for steelmaking.[3] This is basically acknowledging that primary production needs to fundamentally change the way they are producing steel, so it is not just about using more scrap, they also need to emit less in their production process. This is an approach that is aligned with what other initiatives are doing, that can be used now to push for the sector transition. A more detailed, product base approach would need to be studied and require more time and resources to develop. At this stage, this is the best option out there to compare producers, and acknowledge the higher emitters, those who are already low emissions and secondary producers that also have a chance to improve their practices. Also, at a facility level, the criteria the criteria is quite flexible with secondary production, in comparison with primary production, this is also acknowledging the stark difference between the CO_2 emissions of different production routes. Also, to derive this pathway the following assumptions were made (Taken from https://climatealignment.org/wp-content/uploads/2022/06/alignment_zone_briefing.pdf): the primary and secondary decarbonization trajectories are derived by splitting the carbon budget using the 80th percentile of emissions intensity of 100% scrap-based EAF producers in 2020. This results in a more lenient decarbonization trajectory for secondary steel production, because 80% of EAF producers would align with the trajectory, meaning a larger share of the sector's total carbon budget is allotted to secondary steelmaking. This results in a stricter trajectory for primary steelmakers, because a smaller share of the sector's total carbon budget is allotted to primary steelmaking. See original document from the STEEL priniples for more information
Cross-cutting criteria	65.	16-Broader ESG scope to incorporate local community and ecosystem impacts from hydrogen production facilities is prudent, to ensure there are no unintended negative effects from technology shifts.	This has been adjusted, Climate Bonds has published hydrogen production criteria and this is now the standard to be used https://www.climatebonds.net/standard/hydrogen-production

[3] Taken from the Split Trajectory Briefing from the Sustainable STEEL Principles, available at: https://steelprinciples.org/

(Refer to section 6 of the Criteria document and section 4.5 in the Background document.) 16 – Is the additional criteria for the use of hydrogen acceptable?	66.	There is an insufficient and too slow reduction of the carbon intensity of hydrogen. The evolution of threshold values for H2 carbon intensity should be aligned with forecast progresses in carbon footprint reduction of renewable energy technologies (and efficiency improvements in hydrogen production). If not, we risk to create lock-ins of hydrogen technologies that still will be there at 2050 and that would hamper reaching the objectives of the Paris Agreement.	This has been adjusted, Climate Bonds has published hydrogen production criteria and this is now the standard to be used https://www.climatebonds.net/standard/hydrogen-production
17 – Is the additional criteria for the use of biomass as a reducing agent acceptable?	67.	Acceptable 17-See answer for #11, there are increasing concerns about fuel switching to biomass overall and systems wide effects. Yes, the additional criteria seem acceptable.	No response needed
18 – Is the additional criteria for the use of CCS and CCUS acceptable?	68.	No, as these technologies might mitigate emissions at the steel factory but not at the coal mines that exist to supply the steel industry which are emitting at least 11.975 MT of pure methane according to the latest IEA Methane Tracker. Steel production is expected to continue to use coal for at least half of its energy needs in 2050, even under the IEA's most optimistic decarbonisation scenario.	Climate Bonds and the TWG agreed with this which is now reflected in the Criteria. See response 1
	69.	CO2 should not be used for enhanced oil recovery, and the production of other forms of fossil energy sources. Which means the only way to comply is by introducing the following: 1. hydrogen (technologically and financially challenging as of now) 2. Renewable energy (not nuclear) 3. Scrap (here they mentioned 70% scrap, but us as XX will not be able to accommodate this in our existing SMPs, only the new SMP4 can and SMP2 if it's upgrade will get approved. Not forgetting that sourcing of about 3mt of scrap will be difficult) Carbon capture units to enhance oil recovery shall be considered.	Carbon capture units with enhance oil recovery are not aligned with a 1.5C decarbonization pathway, keeping the 1.5C limit is a principle we abide by
	70.	However, one point we would like to highlight is that there are no criteria relating to CCS's project related emissions. Given that there will be energy usage, and hence associated carbon emissions, required for the capture, transport, storage and direct land use	Since our system boundary is the steel production facility then the CCS project emissions are already covered by the

<table>
<tr><td rowspan="2"></td><td></td><td>change operations, efforts should be taken to quantify CCS's operational emissions and ensure that the project achieves a minimum GHG reduction, which is the net of CO2 injected into the geological storage and GHG emissions of the CCS project. CBI can take reference from the California Air Resources Board's CCS Protocol Under the Low Carbon Fuel Standard. The Standard delineated a system boundary that covers all CO2 source, sinks and reservoirs from a CCS project, including CO2 leakage. The GHG reduction for the CCS project is then calculated factoring all the processes and components within the system boundary. The formula for net GHG reduction and total GHG emissions for the CCS project are included below in Figure 4.
Figure 4: Methodology for GHG accounting for CCS (Source: California Air Board's CCS Protocol)</td><td>threshold. The emissions intensity calculations shall consider all direct emissions and these are direct emissions</td></tr>
<tr><td>71.</td><td>We welcome the additional criteria on CCUS, especially the ban on using the captured CO2 for oil recovery and for the production of fuels.</td><td>No response needed</td></tr>
<tr><td>19 – Is the additional criteria for the use of fossil gas acceptable? Is there any additional criteria that we may need to consider?</td><td>72.</td><td><u>Table 5: Various Scenarios within the Steel Criteria Paper</u>
<table><tr><th>Scenario No.</th><th>New or Existing facility operational prior to 2022</th><th>With / without CCUS measures or implementing CCUS measures</th><th>Eligible for CBI certification prior to 2030 (subject to alignment with other criteria)</th><th>Eligible for CBI certification in 2030 and after (subject to alignment with other criteria)</th></tr><tr><td>1</td><td>New</td><td>With</td><td>Yes</td><td>Yes</td></tr><tr><td>2</td><td>New</td><td>Without</td><td>No</td><td>No</td></tr><tr><td>3</td><td>Existing</td><td>Without</td><td>Yes</td><td>Unclear as per Section 6.4. Our view is this should be a no.</td></tr><tr><td>4</td><td>Existing</td><td>Implementing</td><td>Yes</td><td>Yes</td></tr></table>Table 5: Various Scenarios within the Steel Criteria Paper
Agree with the additional criteria to demonstrate MRV and mitigation measures for methane leaks given that majority of the GHG emission happens upstream (fossil gas extraction, processing and transportation). Below table compiles the scenarios for steel</td><td>Climate Bonds and the TWG agreed with this, and the attempt has always been that the certification of existing primary (i.e. DRI and BF) facilities have a cap until 2030. Thus scenario 3 was already covered by the criteria but not well clarified, now the write up is clearer. We attempt to revise the criteria before 2030 to update according to technological developments and levels of ambition in the sector.</td></tr>
</table>

		production facility which uses fossil gas as a reductive agent. Under Section 6.4 Fossil gas, it is stated that CBI certification is "only eligible for existing facilities prior to 2030. To qualify after 2030, facilities would have to use fossil gas combined with CCUS measures." We find this criterion to be unclear when applied to scenario 3 – whether an existing facility operational prior to 2022 and without CCUS measures is eligible for CIB certification in 2030 and after. It would be good if CBI provides more clarity on this. We acknowledge that using fossil gas as a reductive agent – carbon monoxide and hydrogen from reformed fossil gas bind with the oxygen in iron ore without melting in a blast furnace – emits less GHG as compared to coal-based processes. Furthermore, systems that are configured now to use gas will more easily be able to transition to using hydrogen as hydrogen becomes more readily available. Table 6: Comparison of Facilities using assumption of 2019 baseline emissions intensity with 70% CCUS capture rate against IEA NZE Trajectory However, using fossil gas as a reductive agent is only a transitional measure and should not be encouraged after 2030. As shown in table 6, natural gas-based DRI-EAF (0.95 tCO2/tSteel) reduces emissions by 42% compared to BF-BOF (±1.65 tCO2/tSteel) but the emission reduction for this process is insufficient to meet IEA NZE trajectory for primary steel in 2040. However, keeping below the threshold can be achieved through Integrating CCUS in such facility which is projected to reduce emissions by 83%, based on the assumption that CCUS will capture at least 70% of all emissions as per CBI criteria. Therefore, in our opinion, fossil gas based DRI production line should only be eligible for CBI certification after 2030 if CCUS is integrated into the facility.	
	73.	Yes, the additional criteria seem acceptable.	No response needed
Adaptation & resilience (Refer to section 6.5 of the Criteria document and section 5 in the Background document.)	74.	We agree with the assumptions behind the A&R criteria. Ensuring that the asset is resilient to climate change through appropriate climate risk assessment and reduction is a sensible approach. However, there is a lack of steel-specific factors relating to climate adaptation and resilience noting the lack of knowledge and literature in this field. Location of the asset seems to be the key	Agreed, This is covered by the A&R checklist

20 – Do you agree with the assumptions that underpin the adaptation and resilience requirements? Is there anything else that needs to be considered?		towards determining the appropriate types of climate adaptation and resilience mitigations that would be relevant to the asset.	
	75.	Table 8 should add sea level rise and potentially mitigation against invasive species from shipping ballast water. Additional climate caused displacement of workers and local populations and how that could impact functionality of a facility long term. Particular concern in SE Asia where demand and production is predicted to rise and coastal India. Fresh water demand by EAFs and other facilities should also be examined as that demand could put humans and ecosystems at risk if they are not planned for. For example, further expansion in drought prone areas like Western US could add further risk.	This is covered by the A&R criteria, Clear boundaries and critical interdependencies between the facility/facilities and the system it operates within need to be identified and also risks based on this.
	76.	no comments	No response needed
Additional comments and feedback	77.	Overall, the proposed thresholds and targets seem like a C-minus effort at best and on par with BAU scenarios for the most part. The targets undermining what gets CBI approval do not raise the bar very much at all at if these CBI approved bonds are meant to be a bar for high achieving projects and companies to reach, then it risks slowing the rate of change needed in the industry. **Current criteria seem very industry friendly and risks being used to green-wash right out of the gate.** The pace of change for the steel sector will be most rapid in next 8 years. It would be critical then to review these standards sooner than every 36 months as progress and learning takes place. Also, CBI should put forth a specific grievance or review process for civil society or other stakeholders to appeal any company financing that may not truly be climate aligned. This would be a check on green washing and the more transparency the less risky it is. The phrasing “Low emissions” is bad messaging and accepts the premier that there will always be an acceptable rate of emissions. The phrasing of “zero and near zero emissions” is more ambitious and aligned with IEA and other messaging. "	These criteria are based in the IEA NZE pathway. Which models the transition needed for the global energy sector to achieve net-zero CO2 emissions by 2050 in a way that is consistent with a 50% probability of limiting global temperature rise to 1.5°C, without overshoot[4]. Other pathways used as reference and further discussed in the background paper include those developed by: MPP, E3G and PNNL, IDDRI. All the assumptions made in these criteria are based in the latest science available on the sector, in order to set this sort of requirements we need to keep a balance on ambition and what is feasible with current technologies (because this is going to be used in the market and actual investments, refinancing of facilities, loans, etc), and in the case of steel, the technologies are available, and it is possible to achieve net zero with what these criteria describes. This balance is the most difficult part of sectors in transition, because decarbonizing in this case (where e.g. 70% of global production relies in the heaviest emitting type of technology) means moving lots of finance to fundamentally transform the sector, and these criteria aims at that. The requirements have been approved by a renowned group of researchers that are part of our Technical Working Group.

[4] International Energy Agency, Net Zero by 2050, IEA, 2021

		There are no mitigation recommendations for met coal methane. Consult Ember for list of potential recommendations on how companywide mitigation measures could be taken and potentially financed in partnership with mines. They can also provide expert estimates of the scale of the issue and how material it is to overall sector. Overall, I do see increasing risk to human rights for local and front line communities with increased demand for resources going into hydrogen production and biomass. More robust cross cutting criteria derived or aligned with some of the criteria from Responsible Steel standard could be prudent. Major labor, human rights, and ecosystems negative impacts increases the risk for any project or company associated with them and increases political instability in affected regions."	As part of our development process we also review the criteria with an Industry Working Group (IWG) that provided critical and useability focused consultation and feedback on the Criteria but does not automatically endorse it, the last word is within our TWG. Then, part of the process is to bring the criteria for public consultation, where we receive feedback that we bring to the TWG for discussion. As a result of this process we have added some additional requirements that make the criteria even more robust, including additional criteria for those facilities using coal. Climate Bonds is an investor-focused not-for-profit, we aim at preventing green washing in the green finance market, by (among other things) developing the standard and sector criteria which are public good resources for the market. Currently our main focus is climate change mitigation and the resources we have in place are not able to and do not cover social aspects (only those related to Adaptation and resilience), we however encourage the use of other standards for this, like responsible steel.
		The separation of primary and secondary steel making decarbonization trajectories gives integrated producers a more lenient glide path while making many of the same products. As mentioned previously, the approach should be tied to steel products manufactured, as opposed to the different technologies utilized to make the same products. The identified trajectories in Table 5 are too aggressive and disadvantage secondary steel making which has already implemented decarbonizing technology and reduced emissions. The proposed target to reduce secondary intensity by more than 50% by 2030 is excessive and unrealistic. Primary steel making is given a distinct advantage with a target to reduce emissions by less than 25% during the same time frame.	See response in row 64

		There should be a table for List of Abbreviations/ acronym We understand that following this standard is voluntary.. plz confirm?	This standard is voluntary, and the acronyms are now included