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G7 STEEL POLICY SCORECARD ANNEX B

METHODOLOGY

September 2022

In this annex we outline the details of the scoring applied for the Steel Policy Scorecard, and reflect on challenges and room for improvement. The scorecard itself, with headline and country-by-country findings, is outlined in the main briefing document, while Annex A outlines the findings one policy lever at the time.

Reflections on method and continued tracking

This policy scorecard is a first attempt at tracking domestic policy action on steel decarbonisation. To benchmark government action towards steel transition, we have focused on seven key policy levers governments can apply to reduce emissions from steel. The levers build on the existing literature and political discourse. We recognise that our methodology does not capture the full spectrum of the policy space, but argue that it makes for a robust starting point. From here we can draw attention to the most important initial policy moves – while initiating a debate on how we can robustly track policy action over time.

Creating simplicity and clarity in complexity, yet without losing reality and nuance, is a well-known challenge in creating scorecards. This one was no exception – from the intricacies of different steel production pathways, to the murky waters of funding and the details of public procurement policies. We created a system of evaluation that was applicable across different country contexts, and doable without an immense set of resources. In this balancing act we believe that we have managed to bring out the most important aspects.

We recognise that there is ample room to scrutinise the scoring, and welcome thoughts and ideas for improvement. Below we provide some of our own reflections on the scoring and highlight some possible improvements for future iterations.



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1. Providing policy direction and clarity

Comparing and evaluating policy direction and clarity amongst G7 countries means dealing with a range of different policy contexts. Industrial and steel decarbonisation targets are found in everything from steel sector roadmaps to climate action plans to industrial decarbonisation strategies. The ownership and enforceability of these different documents is generally not clear. The evaluation of this policy lever could thus be strengthened by looking at whether targets are reflected in climate laws, and the extent to which they are legally binding and enforceable. We hope to do so in future iterations.

We have given some recognition to any outline of emission reduction pathways for industry or steel, even if they are not stated as a target. However, we set as the ultimate goal the existence of a decarbonisation strategy for steel with an ambitious emission reduction target. We define “ambitious” using the pathway and intermediate targets outlined in the 1.5 °C Steel report by E3G and PNNL.¹ In the coming years we also hope to see the setting of phase-out timelines for carbon-intensive steel production, such as commitments to no new unabated coal-based steel plants after 2025. These are currently not being discussed by any G7 government, but we hope to start seeing the emergence of such – and would like to look at including them in the evaluation process.

Lastly, we would like to note that for this iteration of the scorecard we have not given credit to the implicit targets provided through emission trading systems (ETS), such as in Canada or the European Union (EU). These headline targets matter for steel, but are partly muted due the inclusion of other sectors that are expected to decarbonise faster, such as power, and existing exemptions for steel, such as free allowances.

Scoring

| Policy focus and priority (Countries may score on one point from this list, receiving the highest points score for which they qualify. For example, a country with both a climate policy and a steel decarbonisation policy only receives points for the latter.) | Points |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Has a climate policy with focus on industrial decarbonisation | 0.25 |
| Has a climate policy with focus on industrial decarbonisation, including steel | 0.50 |
| Has an industrial decarbonisation strategy | 0.75 |
| Has an industrial decarbonisation strategy with focus on steel | 1.00 |
| Has a steel strategy with some focus on decarbonisation | 0.50 |
| Has a steel decarbonisation strategy | 1.50 |
| Targets (Countries may score on one point from this list, receiving the highest points score for which they qualify.) | Points |
| Shows an emission reduction pathway for industry | 0.25 |
| Shows an emission reduction pathway for steel | 0.50 |
| Is exploring a target for steel | 0.25 |
| Has an unambitious target for industry | 0.75 |
| Has an unambitious target for steel | 1.00 |
| Has an ambitious* target for industry | 1.25 |
| Has an ambitious* target for steel | 1.50 |

**Here we set the benchmark for an ambitious target at a 50% reduction by 2030 (relative to 2020), 95% by 2050 (relative to 2020), no more new blast furnaces without CCS after 2025, nearly all blast furnaces without CCS phased out by 2045. This is based on the modelling of the 1.5 °C Steel report,² in which ambition is higher than the IEA net zero pathway for G7 countries: -27% by 2030, -70% by 2040 and -95% by 2050.*

2. Enabling hydrogen and CCS for steel

As explained in the briefing, the current most viable technological routes for decarbonising primary steel production are shifting to direct reduced iron (DRI), ideally using renewable hydrogen, and retrofitting existing blast furnaces with carbon capture and storage (CCS). Therefore, the scoring methodology evaluates the policies and project deployment for both hydrogen and CCS at national level.

However, as either pathway can largely decarbonise the primary steel sector by itself, it is not necessary to pursue them both simultaneously, so countries are evaluated based on their advancements in either hydrogen or CCS. Given the



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higher emissions abatement potential of a switch to DRI facilities, hydrogen-related advancements are scored higher than CCS, as the latter alternative would enable the continued use of metallurgical coal-fuelled blast furnaces, without completely eliminating emissions. Very high capture rates (>90%) are difficult to achieve and there is a significant energy efficiency penalty incurred by the application of carbon capture technologies. In other words, we only score a government on one or the other, and only on hydrogen if policy and infrastructure projects are in place for both.

In this iteration of the steel policy scorecard, the scoring on policy and implementation does not comprehensively differentiate between the various types of hydrogen – green (generated by electrolysis using renewable energy), blue (generated from fossil gas with CCS) and grey (generated through unabated steam methane reforming). It needs to be noted that national policies and decarbonisation strategies are at times unclear regarding the source of hydrogen foreseen to be used as a reducing agent in steel production. It is recommended that both governments and companies should provide more specific details on their plans. In future iterations of the policy scorecard, we plan to delve deeper into the hydrogen-sourcing plans of both governments and companies and to increase the granularity of the scoring criteria related to hydrogen scoring

Having said this, it is important to mention that even in the current iteration of the scorecard achieving the full score available for this category requires the availability of green hydrogen for steel production, as it represents the end goal for the *near*-complete decarbonisation of the sector. (A source of carbon would be necessary for reducing iron, which can come from pulverized coal, captured CO₂, biomethane or other sources of biogenic carbon, each option having a different impact on overall emissions.) Green hydrogen is highlighted only in the third scoring criterion in this category.



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Scoring

| As a dedicated policy priority (Countries may receive one or both points for CCS OR one or both for hydrogen. If aspects of both are in place they are scored on hydrogen) | Points |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| CCS is a national priority as demonstrated through its inclusion and focus in national decarbonisation plans or through a dedicated strategy | 0.25 |
| When CCS represents a national priority, there is a clear focus in the relevant plans and strategies on its application in the steel sector | 0.25 |
| <i>OR</i> | |
| Hydrogen is a national priority as demonstrated through its inclusion and focus in national decarbonisation plans or through a dedicated strategy | 0.50 |
| When hydrogen represents a national priority, there is a clear focus in the relevant plans and strategies on its application in the steel sector | 0.50 |
| Already being in the making (implementation) (Countries may receive points for CCS OR one or for hydrogen. If both are in place they are scored on hydrogen) | Points |
| CCS infrastructure for use in the steel sector is being rolled out | 0.75 |
| <i>OR</i> | |
| Hydrogen production facilities for use in the steel sector are being rolled out | 1.00 |
| Final stage; where we want to get to in order to enable the decarbonisation of steel production (Countries may receive points for CCS OR for hydrogen. If both are in place they are scored on hydrogen) | Points |
| Carbon capture, transport, and storage infrastructure is available and in use in steel production | 2.50 |
| <i>OR</i> | |
| Green hydrogen is available and in use in steel production | 3.00 |



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3. Providing funding for steel decarbonisation

In evaluating the extent to which governments are also committing to funding parts of the steel decarbonisation process we have looked at government announcements as well as operational funds through which companies can access financial support. We have also considered the extent to which there is explicit funding for steel, hydrogen and CCS.

We recognise that funding announcements are not necessarily binding, and that monetary pledges may falter with changes in government or pending crises. What is more, it is challenging to distinguish between large umbrella announcements and the smaller announcements of money for steel, hydrogen and CCS – when are they coming out of the same pot, and when are they not?

Tracking the extent to which announcements materialise and how could be an important part of future iterations of the scorecard. “Following” the money announced into their materialisation through actual funds and investments is an intricate job that requires substantial resources.

In looking at operational funds it could be useful to distinguish between different types of funding, whether it is going towards research, development and innovation, towards pilot projects, or for scaling up and commercialisation. The lines here are, however, often blurry, and boxing funding into one or the other category was found to be challenging. It is however something that could be valuable for future iterations of the scorecard.

Lastly, in future iterations we would like to go beyond the focus on announcements and grants, to include the use of finance mechanisms that are currently being explored – such as Climate Contracts for Difference (CCfDs).

Scoring

| Domestic industrial decarbonisation funding announcements (Countries may score on one OR the other) | Points |
|-----------------------------------------------------------------------------------------------------|--------|
| On the scale of > €5 billion | 0.50 |
| On the scale of < €5 billion | 0.25 |
| Operational funding infrastructure (Countries may score on both points) | Points |
| Operational national decarbonisation funding infrastructure | 0.50 |
| Operational regional decarbonisation funding infrastructure | 0.50 |
| Dedicated steel decarbonisation fund | Points |
| Present | 0.50 |
| Funding earmarked for (explicitly mentions) (Countries may score on all points) | Points |
| Steel | 0.50 |
| Hydrogen | 0.25 |
| CCS | 0.25 |

4. Implementing carbon pricing

There is plenty of scope for getting lost in the details of carbon pricing. For clarity and simplicity we have chosen to look at whether an emission trading system (ETS) or carbon tax applicable to the steel sector exists. Then we evaluate ambition, in terms of exemptions and intentions for the phase-out of free allowances or other types of (partial) exemptions.

While not explicitly in the scoring we also note some important nuances. For example, there is a big difference between a benchmark for free allowances set at the 10% best performers, such as in the EU ETS, versus at a historical average emission intensity, like in Canada. Going forward it will be important to include such nuances more explicitly in the evaluation.

Scoring

Countries may receive one score from the following table. All refer to operational carbon pricing.



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| Low ambition carbon pricing | Points |
|------------------------------------------------------------|--------|
| ETS with free allowances | 1.00 |
| Insignificant carbon tax | 1.00 |
| Medium ambition carbon pricing | Points |
| National ETS with free allowances and a set phase-out date | 2.00 |
| Significant carbon tax with some steel exemptions | 2.00 |
| High ambition carbon pricing | Points |
| ETS running and no free allowances | 3.00 |
| Significant carbon tax (with no exemptions) | 3.00 |

5. Adopting a green steel definition with an emissions intensity threshold and a measurement standard

As outlined in Annex A, agreement on a green steel definition is considered to be an important move in order to create a market for green steel.

Not many assessment steps exist when it comes to evaluating and tracking movements towards a green steel definition. As indicative steps in the right direction we have included membership of international initiatives, including one working towards the adoption of a common international definition (IDDI) and one that has already set a definition for what qualifies as near-zero-emission steel (FMC). We also recognise being part of a forum or coalition that has formally expressed a movement towards adopting a common definition, such as the G7. We further recognise national announcement of a green steel definition adoption being in progress as a strong indicative step.

The adoption of an ambitious definition with related emissions intensity threshold and measurement standard, which has been integrated into reporting and national industrial and climate policy, is the end goal.

We hope that in future iterations of the scorecard the focus will be on how adopted definitions are being integrated into reporting and policy. The scoring would thus expand to a more granular analysis of the enforcement and implementation of an adopted definition.

Scoring

| Recognising the importance of adopting a definition with an emissions intensity threshold and measurement standards (Countries may score on all points) | Points |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Is a member of IDDI | 0.25 |
| Is a member of FMC | 0.25 |
| Is part of an intergovernmental forum/coalition (e.g. G7, G20, EU) that has formally expressed a movement towards the adoption of a definition | 0.25 |
| Movement towards national adoption of a definition | Points |
| National announcement of a green steel definition adoption being in progress | 1.00 |
| Adopting and implementing a definition (A score on this section overrides any scores from the above sections, as this is seen as the ultimate goal) | Points |
| Have a formally adopted definition of green steel, with related emissions intensity threshold and measurement standard | 2.50 |
| Have a formally adopted (ambitious) definition, with related emissions intensity threshold and measurement standard, which has been integrated into reporting and national industrial and climate policy | 3.00 |

6. Creating lead markets through green steel public procurement

As outlined in Annex A, governments can play a pivoting role in building a market for green steel through public procurement.

Public procurement processes already include a large variety of often highly detailed requirements or voluntary measures on sustainable or environmentally friendly procurement. These can implicitly or explicitly cover steel, either through public works projects or building material requirements, or through requirements related to various products (e.g. the government's car fleet). We give some credit to these and differentiate between those that are voluntary or mandatory as well as whether they explicitly cover steel. We note that the complexity of the public procurement space made for a difficult scoring process, even while keeping only to national level processes.



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As reflected in our scoring the ambition that we are looking for is explicit, mandatory targets or requirements¹ for steel, as well as pre-purchase agreements with producers being entered into. As a middle step, here we recognise the announced intention to do so, as well as membership of initiatives that are working towards this end. The IDDI is currently the only actor working towards **government** commitments.

If sufficient progress is made in the space of public procurement, we hope that in future iterations of this scorecard we can focus on more granular scoring of the ambition of targets, requirements and agreements.

Scoring

| Green public procurement (GPP) (Countries may only score on one of the below) | Points |
|------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Has a mandatory or voluntary GPP that does not explicitly cover steel | 0.25 |
| Has a voluntary GPP that explicitly covers steel | 0.25 |
| Has a mandatory GPP that explicitly covers steel | 0.50 |
| Membership of global initiatives | Points |
| Is a member of IDDI | 0.25 |
| Intention setting | Points |
| Has announced intention for setting an explicit green steel PP target or requirement | 0.50 |
| Explicit green steel public procurement (A score on this section overrides any scores from the above sections, as this is seen as the ultimate goal) | Points |
| Has a mandatory GPP with ambitious GPP target or requirements for steel | 2.50 |
| Pre-purchase agreements (Points awarded independently from scores in sections above) | Points |
| Has entered into pre-purchase agreements on steel | 0.50 |

¹ To distinguish between targets and requirements: A target could be that all steel sourced for public works projects is green steel by 2040, while a requirement could be that 80% of steel products supplied under a public works contract must be green steel.



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7. Policy direction on material efficiency and circularity

Steel material efficiency and circularity play a central role in emission reduction pathways for steel. However, there is a general lack of clarity and direction in terms of where and how an **overarching** direction of change can be set through government policy – and how this then splits into a coherent yet diverse set of policies.

Using steel differently entails working with a lot of different people and sectors, and with a variety of regulations and policies – such as for building codes, product design, recycling and waste. We argue that recommendations are needed for a combination of policies through which government can ensure a coherent shift in the use of steel across different sectors. These should include yet not be limited to recommendations that enable:

- > Expansion of the secondary steel making route, with scrap.
- > Reduction in steel waste in the production process of for example the automotive industry.
- > Inclusion of calculations of embodied carbon early on in the building process.
- > Experimentation with new building methods (while upholding safety standards).
- > Product design that enables reuse and recycling.

We have here chosen to focus on circular economy policy and initiatives as the umbrella – the space through which to set the direction of change for steel. The fact that the diverse set of policies needed thereunder is not explicit could be said to be somewhat unimportant at this stage. Circular economy plans, strategies and roadmaps are generally in their infancy, and make scattered or no reference to steel.

Some individual regulation and policy spaces may exist through which more efficient use, or increased reuse and recycling, can be addressed independently of a direction set within circular economy policy. While these may in some way or another be making moves in the right direction, we recognise that these are not currently captured.



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Scoring

We note that given the very nascent nature of this policy space, and as the ultimate policy ambition cannot be outlined, scoring below only goes to a maximum of 1.5.

| Clear national policy direction (Countries may only score on one of the below) | Points |
|--------------------------------------------------------------------------------|--------|
| Dedicated circular economy plan/strategy/ roadmap | 0.50 |
| Dedicated circular economy plan/strategy/ roadmap with a steel focus | 1.00 |
| Clear regional policy direction | Points |
| Dedicated regional circular economy plan/strategy | 0.25 |
| International circularity initiatives | Points |
| Partnership in circularity initiatives | 0.25 |

Converting scores to scorecard colours

For each policy lever a government can receive a maximum of 3.² The scores have then been converted as per the table below.

| Score | Colour | - | + |
|--------------------------------------|--------|--------|--------|
| 0 up to and including 1 | Red | 0-0.25 | 0.75-1 |
| Greater than 1 up to and including 2 | Orange | 1.25 | 1.75-2 |
| Greater than 2 up to and including 3 | Blue | 2.25 | 2.75-3 |

The cut-off date for data collection was 8 September 2022. Developments thereafter have not been included.

Missing elements

We would like to close by reflecting on a key element that we believe is missing in this scorecard: trade-related aspects. The role of international trade is increasingly evident in the steel decarbonisation process. There is a need to level the playing field for green steel products that will, at least initially, come out at a premium price, and there is a need to avoid carbon leakage. In future, trade and

² This is only with the exception of that on material efficiency and circularity, as outlined above.



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investment policy will need to play a vital role in lowering costs and diffusing green steel technology around the world. This must all happen in a global environment where trade is both a political and economic tool, and where historical responsibility is still contested. The nascent discussions around trade and green steel are not yet providing enough direction for a policy lever to emerge, nor may national government policies be appropriate. None the less, we recognise that trade must, in some way or another, be addressed in future iterations of the scorecard as it has the potential to be both a blocker and an enabler.

About E3G

E3G is an independent climate change think tank with a global outlook. We work on the frontier of the climate landscape, tackling the barriers and advancing the solutions to a safe climate. Our goal is to translate climate politics, economics and policies into action.

E3G builds broad-based coalitions to deliver a safe climate, working closely with like-minded partners in government, politics, civil society, science, the media, public interest foundations and elsewhere to leverage change.

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¹ Yu, S., Lehne, J., Blahut, N., & Charles, M. (2021). 1.5°C Steel: Decarbonizing the Steel Sector in Paris Compatible Pathways.

² Yu, S., Lehne, J., Blahut, N., & Charles, M. (2021). 1.5°C Steel: Decarbonizing the Steel Sector in Paris Compatible Pathways.