ResponsibleSteel GHG Requirements:
Stainless Steels
3rd February 2022
Antitrust statement

ResponsibleSteel™ is committed to complying with all relevant antitrust and competition laws and regulations. Failure to abide by these laws and regulations can potentially have extremely serious consequences for ResponsibleSteel™ and its members, including heavy fines and, in some jurisdictions, imprisonment for individuals. ResponsibleSteel™ has therefore adopted an Antitrust Policy, compliance with which is a condition of ResponsibleSteel™ membership and participation. You are asked to have due regard for this Policy today and indeed in respect of all other ResponsibleSteel™ activities.

Agenda:

- Antitrust, Minutes
- Review and discussion of two possible models for determining GHG performance levels for stainless steel:
  - Quick run through of the 2 models – clarifications only
  - Discussion
- Next steps
Model 1: based on stainless steel product families

- Camilla has developed an outline proposal for categorisation of stainless steels – see figure.
- The 2nd (green) column shows ISSF statistical families (with volume of global production).
- The 3rd (yellow) column shows a further subdivision based on the ranges of content of key alloys: Cr, Ni, Mo, Mn – this gives 12 categories, though it might be possible to merge some of these.
- The proposal is that it should be possible to determine an LCA-based carbon footprint for each of these [12] categories of stainless steel. And, that although there will still be some variation of emissions that depends on the exact proportions of alloy elements within each category, the category divisions will capture the main differences.
- A steelmaking site would be able to record the proportion of its annual production volume in terms of these [12] categories.
- This could be used to calculate a volume-weighted average expected GHG performance for that particular site.
- Different performance levels (level 1, level 2, level 3) could then be specified. The basic threshold would be that the site would have to be ‘better than the expected average performance’.
- Levels 2 and 3 could be ‘lower than X%’ (level 2) and ‘lower than Y%’ (level 3) of expected average performance, where X% and Y% are aligned with the levels specified for carbon steels.
Some issues, challenges to consider:

- Will need to agree the [12] categories – is it appropriate to base them only on the four metals Cr, Mo, Mn, Ni?
- Would the use of those [12] categories give a reasonable and fair basis for determining the ‘expected average’ performance of a site, considering stainless steel sites in all geographies, and with all production specialities?
- Is it practicable to determine realistic LCAs (mine to crude steel) for these [12] categories?
- The description of the model is not explicit about how scrap is considered in determining the current LCAs: how would the role of scrap be addressed in this model - both in terms of the original LCA determinations, and in terms of the application of the model to threshold performance definitions?
Model 2: based on proportion of Cr, Mo, Mn and Ni in outputs

- The model is somewhat similar to model 1, but rather than determine a site’s expected average performance on the LCAs for different stainless steel product categories, it would determine a site’s expected average performance on the LCAs for its production of the four key alloy metals contained in those product categories: Cr, Mo, Mn, Ni.

- A steelmaking site would be able to record the proportion of its annual production volume in terms of the proportion of these four metals contained in its products.

- This could be used to calculate a volume-weighted average expected GHG performance for that particular site.

- Different performance levels (level 1, level 2, level 3) could then be specified. The basic threshold would be that the site would have to be ‘better than the expected average performance’.

- Levels 2 and 3 could be ‘lower than X%’ (level 2) and ‘lower than Y%’ (level 3) of expected average performance, where X% and Y% are aligned with the levels specified for carbon steels.
Some issues, challenges to consider:

- Would the use of those 4 metals give a reasonable and fair basis for determining the ‘expected average’ performance of a site, considering stainless steel sites in all geographies, and with all production specialities?
- Is it practicable to determine realistic LCAs (mine to crude steel) for these 4 metals?
- The description of the model is not explicit about how scrap is considered in determining the current LCAs: how would the role of scrap be addressed in this model – both in terms of the original LCA determinations, and in terms of the application of the model to threshold performance definitions?
- In principle the model would be more accurate, as it could accommodate any specific proportion of the four metals – however, there are technical, methodological challenges associated with the need to determine a theoretical LCA for a pure metal, and there may be argument as to whether this is an appropriate reference point for the production of alloys from ferroalloy materials.
The role of scrap

For either model, we need to resolve the consideration of scrap

• The discussion around scrap use for stainless steels is fundamentally the same as it is for carbon steels:
  • The more scrap that is used as an input, the lower the absolute emissions intensity of production;
  • There is little GHG benefit for the steel sector (and world) as a whole by incentivising greater use of scrap, because the vast majority of available scrap is already re-used

• However, in the case of stainless steel there is some additional GHG benefit if high alloy scrap is used for stainless steelmaking, rather than the alloys being ‘lost’ in products for which the alloys do not add technical value. If high alloy scrap is used in stainless steel making it replaces the use of primary alloys with high carbon footprints. But if high alloy scrap is used in carbon steelmaking it replaces the use of ferrous material only, with a relatively low carbon footprint.

• We need to agree an approach that maximises GHG reductions for the steel sector (and world) as whole – that is the objective and responsibility of ResponsibleSteel.
In relation to carbon steels, we have an agreed approach (after long discussion!)

- RS certified steel labelling complements product carbon footprint data
- Threshold for RS certified steel is proportional to scrap use (the blue line)
- Basic threshold is (initially) ‘better than average’ taking account of proportion of scrap
- Basic threshold will become more demanding over time
- Different levels distinguish better performance: lower carbon, ‘near zero’ carbon (may be 3 or 4 levels)

Approach to GHG emissions intensity performance levels:
- 3 ResponsibleSteel GHG emissions intensity performance levels (1-3, as described in the figure)
- Thresholds to be reviewed every 5 years, with the expectation that they will be reduced over time to support progress towards ‘near zero’ performance being achieved in 2050

Level 1: ResponsibleSteel certification threshold, aiming to ensure that 50% of sites are below the threshold, based on 2020 data, for both high and low proportions of scrap input, but with a slightly shallower gradient in favour of scrap

Level 2: ResponsibleSteel ‘lower embodied carbon’ level, intermediate to the level 1 certification threshold, and the level 3 ‘near zero’ level

Level 3: ResponsibleSteel ‘near zero’ level, aiming to identify steelmaking which is close to the lowest practicable emissions for known, innovative technologies
The role of scrap in relation to stainless steel performance thresholds

How can/should the role of scrap be addressed in each model?

In Model 1:
• In principle, one could estimate two LCAs for each of the 12 stainless steel categories: a 100% scrap-based LCA, and a 100% primary metal based LCA
• In that case, one could calculate a proportional threshold for a given stainless steel site:
  • Determine the expected volume weighted average for the site if it used 0% scrap (this is the left hand end of the slope)
  • Determine the expected volume weighted average if it used 100% scrap (this is the right hand end of the slope)
• Then apply the same model as for carbon steels to determine whether the site’s performance is level 1, level 2 or level 3

In Model 2:
• In principle, one could estimate an LCA for the production of metal from 100% primary input materials – i.e. without the use of any scrap
• Can one also estimate an LCA for the production of metal from 100% scrap?
• If so, one could calculate a proportional threshold for a given stainless steel site as for Model 1. If not, is there another practicable approach?