



OPINION STATEMENT

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LKAB
Att. Stefan Savonen
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Independent Verification Report of “Carbon Footprint Report LKAB Pellets”

Objectives and scope of the verification:

The objective is to verify the Carbon Footprint cradle-to-gate of four varieties of iron ore pellets produced by the operator LKAB (“Operator”). The review refers to the inventory report “Carbon Footprint Report LKAB Pellets – Confidential” (“Carbon Footprint Report”) issued by the consultant Ecofys (“Consultant”).

The objective of the review is to assess the data, transparency, methodology and the conclusions of the work based on the information available in the report, and to assess whether the study is consistent with the ISO/TS 14067 and fulfills its requirements on a CFP external communication report. The verification and resulting Carbon Footprint can only be used for the stand-alone figures and not for comparative purposes.

Carbon Footprint details:

Product	Year	Carbon Footprint [kg CO ₂ e/tonne]	Level of assurance *
KPRS	2015	56,9	Limited
KPBO	2015	51,7	Limited
KPBA (incl. SPBA)	2015	46,7	Limited
MPBO	2015	32,5	Limited

* While audited data from the ETS reporting system, complying with reasonable level of assurance, was used as input for the calculations of the emissions from LKAB’s own operations, the calculation of upstream emissions and emissions from purchased fuels, some of which important for the CFP result, were based on proxies and assumptions. Hence, the overall level of assurance is limited.

Opinion:

We have conducted a verification of the Carbon Footprint data reported by Ecofys in the Carbon Footprint Report version 1.1, dated 5 January 2017, as presented above. On the basis of the verification work undertaken (see annex) these data are fairly stated.

Responsibilities:

SP Technical Research Institute of Sweden (“Verifier” or “Reviewer”) is responsible for carrying out the verification of the data independent of the Operator and the Consultant and to form an independent opinion, based on the examination of information and data presented in the Carbon Footprint Report. For the avoidance of doubt, the Verifier is not liable for any loss or damage, neither direct nor indirect or consequential, arising from the use by any party of the information set out in this document and/or its annex.

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Annex The review process

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The review process

The Carbon Footprint Report and its data were sent to the Reviewer in the following versions and each version has been subject to review:

Version	Date
0.1	07 Oct 2016
0.2	26 Oct 2016
0.3	25 Nov 2016
0.4	15 Dec 2016
1	22 Dec 2016
1.1	05 Jan 2017

Hence, the review has been conducted through a multi-step process; the comments from each review have been used to improve the data and next revision of the report by taking these comments into account and/or modifying the data and data quality.

The reviewers have not been involved in the different stages of the project (establishment, goal and scope phase, inventory, impact assessment and interpretation); hence the review is solely based on the final report of the project. The parts of the data originating from the emissions declaration in the emissions trading system (ETS) for 2015, have previously been subject to a separate verification according to ISO14064-3, conducted by the Verifier.

This review report does not cover any possible executive summary, since none was available when the review was carried out.

Goal and scope of the CFP report

The Carbon Footprint report “is intended to show the climate impact of LKAB’s magnetite-based iron ore pellets to LKAB’s customers”. It is a cradle-to-gate study, which is in line with this purpose; the results of the CFP are intended to be communicated to LKAB’s direct customers (i.e. steel producers) and other downstream players using steel made from iron ore pellets potentially originating from LKAB. As stated in the Carbon Footprint report, it is not to be used in comparative assertions intended to be disclosed to the public.

The functional units, one tonne of first grade pellets of four different varieties sold from the harbour (either Narvik or Luleå), are measurable and consistent with the goal and scope of the study.

Cut-off criteria are clearly defined. Excluded processes and activities are well described.

Calculation methodology

Allocation procedures are consistently applied.

Assumptions and limitations are addressed and accounted for in sensitivity analyses.

Data quality on upstream emissions (mostly from suppliers) have limited impact but could be improved.

Inventory

Sources for data and data collection procedures are sufficiently described. Guarantees of origins of the electricity mix, required to be able to claim specific emissions, have been provided.

The global warming potential of a fairly large amount of raw materials (e.g. flotation agents) is based on proxies. However, these proxies are assumed not to affect the results significantly.

Process descriptions (flow charts) are clear and tables well described, though still missing numbers.

Uncertainty regarding both inventory data and emission factors have been assessed using sensitivity analysis rather than increasing the level of details. This is assumed to be sufficient with regards to the intended purposes of the study.

The major uncertainty with considerable importance for the result is the fuel used by subcontractors that is not sourced from on-site fuel stations. In future versions of the CFP calculations and reports, this uncertainty needs to be reduced. Other data including uncertainties, though expected to be less important, are the amounts of cement and steel used. .

Hence, the procedures for data collection on quantities of fuel, cement and steel should be improved.

LCIA results and Interpretation

Appropriate characterization factors have been used, i.e. GWP_{100} given in IPCC (AR5, 2014) to assess the carbon footprint.

The CFP is reported per product, both as emissions per life cycle phase (absolute figures and relative contributions) and per process. To comply with GHG protocol, the CFP is also reported per scope according to this protocol.

In future versions, use of the upcoming standard on carbon uptake from carbonation should be considered.

Competences of the reviewers

The review team has consisted of Gunn-Mari Löfdahl, who has extensive experience and is a qualified verifier for Green House Gas emissions (ETS) and Katarina Lorentzon (M.Sc. Chem. Eng.), with extensive experience from LCA and systems analysis in research and consultancy assignments.

Reviewers' conclusions

The reviewers conclude that the Carbon Footprint Report is consistent with the ISO/TS 14067:2013 and the Greenhouse Gas Protocol Product Life Cycle Accounting and Reporting Standard.