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Transparent Online Calculation of Product Carbon Footprint in Steel Industry

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Reliable carbon footprint calculations and certificates for the various steel products are increasingly demanded by the market. Many approaches are based on yearly production tonnage and average CO2 equivalents. A production management system allows to track the material and energy consumptions for each piece of produced material. Thus, it is able to transparently calculate the related greenhouse gas emissions on piece and product level, along the entire production chain from raw material preparation and processing in iron and steelmaking, via hot and cold rolling to commissioning for shipment after finishing lines, i.e. from cradle-togate. By configuration of process characteristics impacting the product carbon footprint and corresponding greenhouse gas emission factors as well as calculation rules for the resulting emissions, the presented solution can be adapted to the granularity of available process data in a steel plant. It is possible to define different emission values for each produced material like gross values including scrapped parts of a material, net values without such scrapped parts or the resulting class of green steel according to the recently published Low Emission Steel Standard. Thereby, a steel plant can start with implementation of a product carbon footprint tracking based on mass balances and produced material weights in defined plant areas. In a next step, if relevant process data are available and considered on the level of single production steps, the accuracy of emission calculations is increased accordingly for the related product. This procedure is exemplified by the implementation of a product carbon footprint tracking at Tata Steel Netherlands within PSImetals production management system.

Keywords: Product Carbon Footprint; Cradle-to-Gate Tracking; Production Management; Decarbonization

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