Assessment of the French metals demand induced by national consumption and its associated environmental footprint

Stéphanie Muller, Frédéric Lai, Baptiste Boitier, Jacques Villeneuve

To cite this version:

Stéphanie Muller, Frédéric Lai, Baptiste Boitier, Jacques Villeneuve. Assessment of the French metals demand induced by national consumption and its associated environmental footprint. SETAC Europe 29th Annual Meeting, May 2019, Helsinki, Finland. 2019. hal-02076471

HAL Id: hal-02076471
https://hal-brgm.archives-ouvertes.fr/hal-02076471
Submitted on 22 Mar 2019

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Assessment of the French metals demand induced by national consumption and its associated environmental footprint

Stéphanie Muller (BRGM), Frédéric Lai (BRGM), Baptiste Boitier (SEURECO) and Jacques Villeneuve (BRGM)

Two main characteristics of the circular economy (CE), as defined in the French strategy of energy transition towards a CE, are a resource efficient economy and a low carbon economy. To assess strategies to be implemented towards a CE, both of these characteristics have to be simultaneously assessed to avoid burden shifting. The aim of this work is to show how environmentally extended multiregional input output approaches (EEMRIO) can be used to do so.

EEMRIO databases were developed to take into account the environmental impacts of international trades; they consist in the coupling of two tables respectively describing the industries interdependencies in a given region along with the interregional interdependencies and the environmental interventions related to each industry. In this work, the EEMRIO databases WIOD and EXIOBASE v3 are used to determine both the metal and carbon footprints due to metal extraction and production (namely the “metal carbon”) induced by the French domestic consumption. Given their characteristics and their mathematical handling, the EEMRIO allow to access different types of results: the metal footprint and the metal carbon content of the products and services consumed domestically by France and the metal footprint and the metal carbon content of the economic activities induced by French domestic consumption.

Following these indicators with WIOD, from 1995 to 2009, the total metal footprint of the French domestic consumption raised from 101 megatons to 143 megatons while the metal carbon footprint decreased from 38.6 megatons CO$_2$eq to 32.9 megatons CO$_2$eq. Moreover, most CO$_2$ due to metal processing is emitted in France (the similar assessment performed with EXIOBASE v3 shows that this is due to iron and steel industries) while metals are no longer extracted in the French territory. As it is a bit more disaggregated, EXIOBASE v3 allows a more specific assessment of the metal sectors and its impacts, for example construction related products that contributes the most both to the metal footprint and to the metal carbon content.

EEMRIO permits the environmental assessment of the consumption flux in a national or regional level. Here the assessment was made on metals, but studies on material and carbon footprints can also be made on other products or services. One of the main drawback of EEMRIO, that has to be kept in mind when assessing consumption scenarios, is the age of the data available in publicly available databases.