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CONSTRUCTION AND DEMOLITION WASTE: A SYSTEMIC ANALYSIS TO IMPROVE RECYCLING

A.-L. FEVRE-GAUTIER^{1,*}, A. BEYLOT¹, M.-P. BOUTIN¹, P. MICHEL¹, L. ROUVREAU¹,
S. VAXELAIRE¹ and J. VILLENEUVE¹.

¹ Bureau de Recherches Géologiques et Minières (BRGM), Orléans, France

*Corresponding author: al.gautier@brgm.fr, tel.: +33(0)238643849, fax: +33(0)238643062.

Abstract

The results presented here derive from the work conducted for the ongoing ASURET project, funded by the French National Research Agency from February 2010 to March 2013 and led in partnership with *13 Développement*, the *French Scientific and Technical Centre for Building (CSTB)*, *INSAVALOR POLDEN* and *University of Troyes (UTT)*.

Modern society's development and construction activities in particular heavily depend on raw materials and energy extraction, ending up as stocks in the technosphere or emissions and waste in the environment. In France, construction and demolition activities are responsible for the annual production of nearly 350 Mt of waste, representing nearly 85% of waste from economic (excluding agriculture and services) and household waste [1]. The use of secondary raw materials, thanks to recycling, has to be strengthened to decrease pressure on ecosystems caused by natural resources extraction and waste elimination.

The ASURET project aims at identifying and analyzing barriers to C&D waste recycling, focusing on technical and non-technical factors including waste sorting and characterization, recycling and demolition processes and organizational or human aspects regarding the whole sector and its economic actors. Through a systemic approach, the project draws the basis of a long-term thinking, considering territories as evolutionary deposits of materials. An objective is to provide the C&D actors with a specific approach and decision-aid system, dedicated to resources and waste flows optimization in order to lower environmental impacts of C&D activities.

This research builds on a multi-level territorial approach, ranking from very local (the building) to national scale, considering the question of the geographic and temporal scale at which recycling and valorization networks must be thought in order to gather the best economical, technical and social conditions for material flows optimization. The work relies on an analysis of the production, availability and exchanges of C&D waste data, at different territorial scales, at the economic actors' level and throughout the whole responsibility chain of a C&D project. These data are used to conduct a territorial material flow analysis for stock estimation and input / output material flows accounting applied to C&D activities.

This methodology is being applied on two French case-studies: Orléans City and the Bouches-du-Rhône department. Expected final results will include the design of a decision-aid system to be tested with the two selected case studies. It will be based on recommendations for a multi-level territorial data collection system and multi criteria analysis, including the results of an economy wide life cycle analysis (LCA) based on the input / output LCA methodology and focused on the use of primary and secondary materials for construction.

References

- [1] Le recyclage des déchets du bâtiment et des travaux publics peut progresser. Le 4 pages, IFEN, numéro 116, 2007.