

Value Generation of Construction and Demolition Waste Originated in the Building Rehabilitation to Improve Energy Efficiency; From Waste to Resources

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Abstract : The lack of treatment of the waste from construction and demolition waste (CDW) is a problem that must be solved immediately. It is estimated that in the world not to use CDW generates an increase in the use of new materials close to 20% of the total value of the materials used. The problem is even greater in case these wastes are considered hazardous because the final deposition of them may also generate significant contamination. Therefore, the possibility of including CDW in the manufacturing of building materials, represents an interesting alternative to ensure their use and to reduce their possible risk. In this context and in the last years, many researches are being carried out in order to analyze the viability of using CDW as a substitute for the traditional raw material of high environmental impact. Even though it is true, much remains to be done, because these works generally characterize materials but not specific applications that allow the agents of the construction to have the guarantees required by the projects. Therefore, it is necessary the involvement of all the actors included in the life cycle of these new construction materials, and also to promote its use for, for example, definition of standards, tax advantages or market intervention is necessary. This paper presents the main findings reached in "Waste to resources (W2R)" project since it began in October 2014. The main goal of the project is to develop new materials, elements and construction systems, manufactured from CDW, to be used in improving the energy efficiency of buildings. Other objectives of the project are: to quantify the CDW generated in the energy rehabilitation works, specifically wastes from the building envelope; and to study the traceability of CDW generated and promote CDW reuse and recycle in order to get close to the life cycle of buildings, generating zero waste and reducing the ecological footprint of the construction sector. This paper determines the most important aspects to consider during the design of new constructive solutions, which improve the energy efficiency of buildings and what materials made with CDW would be the most suitable for that. Also, a survey to select best practices for reducing "close to zero waste" in refurbishment was done. Finally, several pilot rehabilitation works conform the parameters analyzed in the project were selected, in order to apply the results and thus compare the theoretical with reality. Acknowledgements: This research was supported by the Spanish State Secretariat for Research, Development and Innovation of the Ministry of Economy and Competitiveness under "Waste 2 Resources" Project (BIA2013-43061-R).

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