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ENVIRONMENTAL IMPACT ASSOCIATED TO SCHOOLS IN THE SUDOE REGION: LIFE CYCLE ASSESSMENT AND EXTERNAL COSTS ANALYSIS

A R Gamarra^{1,2}, I Herrera¹ and Y Lechón¹¹Energy Systems Analysis Unit, Energy Department -CIEMAT (Spain)²Universidad Politécnica de Madrid, Spain

This study provides an exhaustive assessment of the performance of schools in terms of their environmental impacts. Energy and resources consumption during the normal school activities were analysed in detail. Results can be used as representative of the public educational sector in the transition towards a Low Carbon Economy. Life Cycle Assessment methodology was used to assess the impacts and identify the key activities. The selected environmental impacts were Global Warming and Human Health. The analysed system includes the activities and processes referred to the performance of the schools and are clustered in three subsystems: management of the school building, educational activities and mobility and transport. The case studies are primary schools as well as high schools located in Spain and Portugal, within the Southwest of Europe (SUDOE region). The functional unit for which results are reported is the activity of one student in one school year. The schools' performance has been characterized through the quantification of consumption of resources and energy, and the estimation of emissions, wastes and effluents produced along a school year. The data was collected in audits, interviews surveys and bills analysis. The assessment makes possible compare the contribution to each environmental impact of each activity per school. Global warming results show important differences between schools due mainly to Transport and Mobility, but this is not the higher contributor in every case. The activities related to energy consumption, such as heating and electricity consumption are also key activities. The impacts due to the educational activities are the lowest in every case. As for the human health impact and external costs, results are different between schools. Educational activities are the main responsible for the potential affection to human health in most of the schools, and the main contributor to the external costs. The work has been carried out in the framework of the INTERREG SUDOE project CLIMACT.

Biography

Ana R Gamarra has worked for the last years as Junior Researcher in CIEMAT-ESA unit. She contributes to different projects related to the life cycle analysis of different energy product and process chains. Currently, she is Member of different projects such as ClimACT Project Team an MUSTEC Project. Recently, she started the PhD studies at the Polytechnic University of Madrid, where she completed MSc in Environmental Engineering, focused in the development of a sustainability framework for energy systems' analysis.

anarosa.gamarra@ciemat.es