# AN ALTERNATIVE MANAGEMENT SCHEME FOR PLASTICS FROM CONSTRUCTION & DEMOLITION WASTE

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Key Words: Construction & Demolition Waste; Waste Plastics; Life Cycle Assessment; Hexabromocyclododecane; Legacy additives

Construction and Demolition Waste (C&DW) is a priority stream in the circular economy agenda, since it accounts for more than a third of all wastes generated in the European Union. About 1.8 Mt/y of these C&DW are plastics, whose valorisation has to overcome several obstacles: i) Current legislation recycling targets are established in terms of total recycled mass (Iodice et al., 2021), hence can be easier obtained by focusing on heavy fractions, i.e. metals and inert materials; ii) Plastics in buildings are often embedded behind walls, under floors and inside roofs: this complicates their gathering and separation (EC, 2021); iii) C&DW plastics often contain substances of concerns, allowed in the past but restricted by the current legislation (Wagner and Schlummer, 2020): the long lifetime of plastics in buildings - from about 15 years up to, sometimes, 100 years – it is thus a further technical obstacle for recycling; iv) Recycling entails high costs and needs specific policy actions to be implemented, such as landfill ban and the creation of a competitive market for secondary raw material (Pantini and Rigamonti, 2020). These constrains make collection and management schemes complex and variable from country to country. Moreover, the rare utilisation of a selective demolition as alternative to a conventional demolition further worsens the quality of recoverable materials.
This study describes an LCA implemented to investigate alternative strategies for C&DW plastics management as defined in the framework of a Horizon2020 project (Nontox, 2021), and to compare the related innovative management scheme with that currently adopted in Europe. The novel scheme involves the utilisation of a dissolution/precipitation process (CreaSolv®) for the recovery of EPS and PVC (with high levels of undesired compounds such as flame retardants as well as plasticisers and stabilisers) followed by an upgrading stage, if necessary. Results (Figure 1) show that the Innovative scenario can provide important improvements with reference to the Current scenario, for all the analysed impact categories. The results are mainly related to the avoided production of virgin PVC and, to a lower extent, to that of EPS. However, the reported improvements strongly rely on the possibility to have a selective demolition, which would help the collection of plastics and their separation based on the type of polymer. Preliminary improvements of environmental performances could be achieved just through the adoption of a landfill ban (“Current no landfill” scenario), even though this implies a higher utilisation of Waste-to-Energy process and a worsening on global warming impact.

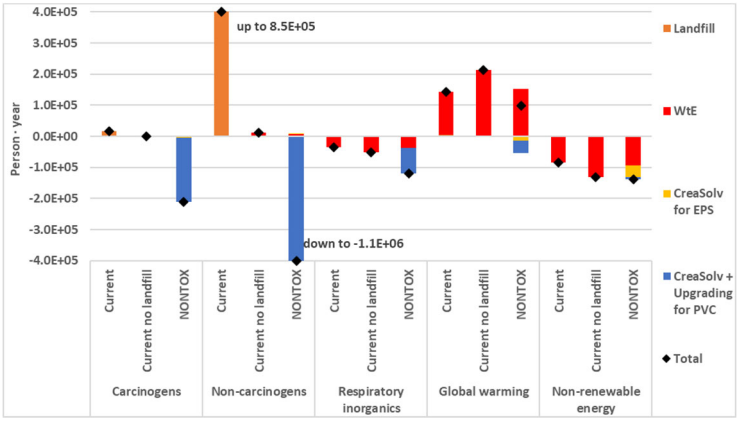


*Figure 1 – Normalised results of LCIA for the analysed scenarios, with the contribution of each single stage of the life cycle. Results refer to the amount of currently non-recyclable plastics (1.3 Mt/y) WtE = Waste-to-Energy. Shaded rhombus indicate the total value for each impact category.*

EC – European Commission, 2021. Circular Plastics Alliance – Construction and demolition waste.
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