

Drivers and barriers of shredder fines valorisation

A forward looking investigation of the Swedish context to identify conditions for initiating change

Abstract

In concomitance with the EU targets for increased resource efficiency, many member states process shredder residue for resource recovery. Nevertheless, shredder fines, the fine-granular fraction of the shredder residue, is yet to be valorised. In Sweden, over the years, shredder fines has primarily been used as landfill cover material, while in certain occasions it is landfilled. Either way, it is more or less disposed without any effective recovery. Meanwhile, stringent policy demands for waste recovery, in concomitance with decreasing landfill space and increasing disposal costs are challenging this current practice. On the other hand, characterisation studies indicate some resource potential in shredder fines, nevertheless, the heterogeneity and high contamination levels render its valorisation technically challenging and economically unappealing. Hence, the future of fines is currently somewhat uncertain. Therefore, the aim of this article is to understand the underlying current conditions that govern the management of shredder fines, and their roles as drivers and barriers of its valorisation. Thus, an empirical approach based on interviews with industry practitioners was performed to establish the shredding company perspective in this regard. Based on these results, we discuss the necessary conditions to change towards the valorisation of shredder fines.

The current governing conditions are two-fold. That is, external conditions; by way of governmental policy (formal) institutional regulation, and the market for secondary resources, and internal conditions; by way of current practices on the generation and management of fines by shredding companies as business organisations. Governmental policy and legal framework has either direct or indirect influence on all of the external governing factors. The country's policy decision to eradicate landfilling and the likely European Union policy change on unrecognising backfilling as waste recovery are the primary external drivers of fines valorisation for shredding companies. EU targets for resource recovery and recycling also play a major role in driving fines valorisation. Nevertheless, such policy initiatives not having effectively followed through to the institutional regulation practices remains a major barrier. As far as the internal factors are concerned, the most significant driver is that the involved shredding company has, over time, increasingly recognised the significance of processing smaller size fractions of their waste due to various strategic reasons, and in conjunction, demonstrated its ability and willingness to invest in new advanced technologies for increased resource recovery. Nevertheless, the level of significance attributed to the economic gain in investment-decision-making criteria, could act as a barrier to fines valorisation in certain situations, despite the environmental benefits. Furthermore, the responsibility of fines management is somewhat obscured in how the shredding and post-shredder recovery processes are operationalised in the current organisational structure, which is the most significant internal barrier. Additionally, and consequently, effective communication on the significance fines management is missing across the different departments.

In concluding remarks, the regional and national policy initiatives for increased resource efficiency are challenging the current disposal practices of shredder fines, thus driving shredding companies towards its valorisation. Nevertheless, such valorisation also needs to be facilitated within the external policy and regulation environment via policy-induced market for secondary resources and the congruence between resource policies and institutional practices on the regulation of waste recovery, etc. On the other hand the shredding companies need to be responsive to the market demand in order to be competitive in providing secondary resources (valorised products) with sufficient quality. Improved internal organisation, focused on fines valorisation, is a pre-requisite in this regard.