Circular Economy & The Power of Many

#CEPowerofMany

Key Messages / Summary:

- Targeting construction and demolition which is the highest producer of waste in the EU.
- Run over an 18-month period, the #CEPowerOfMany innovation project piloted a circular/closed loop take-back scheme for PVC offcuts and packaging materials that are delivered for an installation of roofline building products.
- The project, which involved a manufacturer of built environment products (Freefoam) and its supply chain partners, showcased how a circular supply chain business model can work to target C&D waste in Ireland (one of the top contributors to waste nationally and in Europe).
- The pilot yielded positive results, diverting the following total volumes away from landfilling or incineration through reuse and recycling:
- LDPE - 17,717kg | Cardboard – 13,548kg | PVC – 1,395kg
- The project has highlighted that ongoing engagement with key regulators, such as the EPA, will greatly assist in ensuring that closed-loop takeback schemes can be implemented in a way that allows for cost-effective and simplified regulatory compliance for Irish companies looking to advance circular business model innovations in their supply chains - and around nationally important material streams, such as C&D and Plastics.

Background Context

Freefoam Building Products Ltd. is a leading manufacturer of a wide range of fascia, soffit, and rainwater products. In relation to the #CEPowerofMany, Freefoam supplied Mulligan Guttering, a roofline installation company, with materials used on the construction of new homes on Glenveagh Properties PLC construction sites. These 3 partners worked together alongside Shabra Recycling, to prove that where segregation takes place at point of use, the materials can be recovered and reused in a circular model. This project also aimed to illustrate how to keep

the maximum value of the materials. The Construction and Demolition sector creates the highest amount of waste in the EU, with most going to landfill or thermal recovery.

What kind/scale of waste was occurring?

There are several materials which remain post installation of Freefoam products to either new builds or existing houses. These materials include minor leftover parts of the product installed (PVC offcuts) and protective packaging such as LDPE and cardboard, which protect the items en route to site.

From surveying a sample set of Freefoam's customers within Ireland, we found that only 15% of the actual product left over after installation was added into a recycling stream and only 25% of the packaging was added into a recycling stream. All the materials are recyclable in one form or another, but the problem is they are not being reused. Where customers reported adding post-installation offcuts or packaging materials into recycling streams on-site, this involved collecting the materials into general (mixed) recycling systems. By not being segregated, meaning these materials have to be separated and sorted by waste collectors - and thereby incurring additional costs, this reduces the value of the recycled materials.

The Solution:

There were several steps taken to maximise the impact of this project.

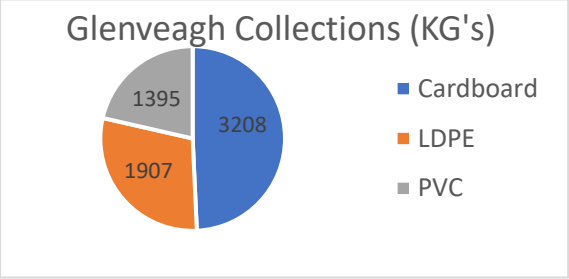
- Glenveagh – 2 balers were set up on 3 Glenveagh sites, one for LDPE packaging and the other for Cardboard.
    - Mulligan Guttering was responsible for the segregation of left over Freefoam materials, post installation. These materials were then baled by Glenveagh staff, along with some other suitable materials from other suppliers. These bales were then stored on-site.
    - Once enough bales were made, Glenveagh contacted Shabra to collect the bales for processing in their plant in Monaghan.
- Freefoam Cork –
    - Similar to the construction sites, 2 balers were set up for both Cardboard and LDPE packaging.
    - Again, once there was a sufficient of bales Freefoam made contact with Shabra who collected the bales and processed these with the bales collected from Glenveagh sites.
    - Freefoam also undertook a number of trials with Mulligan Guttering over the course of the project to reduce the simplify the packaging required, i.e. reducing the packaging requirement and reducing the variety of materials in the packaging.
- Shabra Recycling
    - As Shabra do not process cardboard, they were responsible for finding a suitable recycler.
    - Shabra reprocessed LDPE that was collected from Glenveagh construction sites and from Freefoam's plant in Cork to create new packaging from it for Freefoam to reuse, closing the loop.
    - Although PVC was collected, this could not be returned to Freefoam due to End-of-Waste regulations. Where Freefoam set up a similar take-back scheme in the UK.

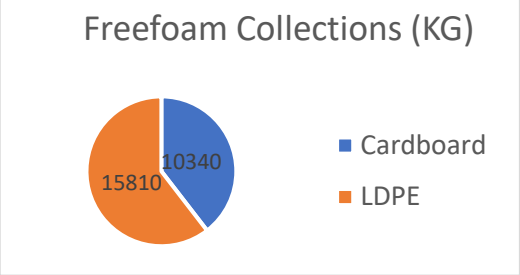
Recovered PVC offcuts were brought back to Freefoam, granulated and reintroduced into the production stream, without any major reworking.

The Impact:

Over the course of the project, there following materials were collected from Glenveagh and Freefoam. Stringent waste regulations meant that the project was unable to close the loop on the PVC offcuts as was envisaged. While this means the project is not able to achieve the environmental and economic impacts expected related to this, a take-back scheme rolled out in our sister plant in Northampton has proven that it is possible for us to close the loop on this material (re-introducing recycled PVC into Freefoam's UK production processes). Our hope is that by continuing to progress with testing out and evaluating our takeback scheme in Northampton, we will be in a good position to move quickly with replicating the scheme with our Irish customers once the regulatory hurdles encountered have been teased out.

There were several other changes within Freefoam and Glenveagh relating to recycling/reuse practices and resource management. One example of this is within both Freefoam and Glenveagh – polypropylene materials were identified in both locations, with no use to either company, an additional company (IFF Plastics - a member of CirculÉire) was identified to receive these materials and use them in the production of their long-life products.





Replication / Scalability potential

Due to transport costs, the replication of this scheme would not be viable at a small scale. These costs could be reduced greatly if waste carrier licences were significantly reduced (e.g. bringing them closer in line with the fees in other contexts like the UK).[1] In this case, as Shabra were the only partner with a waste carrier license, they had to make small collections from each site and Freefoam Cork. If the permitting system was updated to allow companies like Freefoam to piggyback its existing delivery vehicles for return logistics, this would mean that currently empty HGVs would be able to use return journeys to Freefoam's depots to return small volumes of collected materials, where they could be stored until Shabra has sufficient volumes to fill a truck. This would save both the transport costs and the environmental impact as the Freefoam trucks will already be on Glenveagh sites and returning to Freefoam.

Aside from packaging, this project could have had greater impact if Freefoam were allowed to accept the small quantities of PVC offcuts as is taking place in Freefoam UK. The inclusion of returned PVC in a take-back scheme would reduce Freefoam's reliance on virgin feedstocks, improve resource efficiencies and would help in the reduction of Freefoam's customers' left

[1] UK fees and timescale: £154 pounds, with a timeline of 3 weeks to implement.

overs. If the waste regulation system could be streamlined and simplified to make it easier, and more cost-effective to accept PVC offcuts and packaging materials from supply chain partners.

Overall, while the project has shown promise in the potential of a take-back scheme to collect and divert considerable volumes of high-value materials away from landfill and incineration through reuse and recycling strategies, it also highlights several of regulatory barriers that will need to be worked through if such circular schemes are to be rolled out and replicated beyond one-off pilots. This would require pragmatic interventions and guidance about how these materials can avoid unnecessarily entering the waste stream and simplified and proportionate reforms to regulations and licensing costs to enable smaller-scale operators to return lower-risk materials to be returned for closed-loop recycling and/or reuse to apply to allow small quantities of such materials to be collected, stored, transported and re-used. Such schemes are in place in other jurisdictions in Europe.