



Upcycled Insulation

Converting disused mattresses, duvets, and pillows into insulation and padding.

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Read About:

- **In Ireland, c. 582k to 783k disused mattresses are discarded each year.**
- **Before this project, only the springs of the used mattresses were recycled in Ireland. The remainder of the used mattresses were going to landfill and incineration.**
- **Through this project, the partners developed a product range that uses previously unrecycled materials from the mattress to make new products, which in turn can be recycled multiple times.**
- **Through creating a sustainable business model and developing the market, the business will be able to scale and make a meaningful impact on the industry.**
- **Government intervention is needed to ensure civic amenity operators and recycling companies are encouraged to upcycle rather than incinerate used mattresses.**

Background

Each year, between 4,000,000 and 6,000,000 (5,000 tonnes) of used duvets and pillows and between 582,181 and 783,863 (14,000–19,000 tonnes) of used mattresses are discarded in Ireland.

Prior to this project, Ireland lacked the capability to recycle soft cushioning material, foam, fiber, shoddy, and coverings. These were either incinerated or landfilled. The only materials recycled were the metal springs.

Circular Demo Pilot

The pilot aimed to create market-ready products that use components from discarded mattresses, duvets, and pillows.

The project partners comprised: a mattress manufacturer and retailer that also provides a take-back scheme (Interior Creations), Tipperary County Council, who operate municipal recycling centres, Textile Recycling Limited (TRL trading as Clothes Pod) being the largest operator of clothing bins in Ireland, and Cirtex, which has manufacturing equipment, expertise in new product development, and also extensive experience in the bedding and furniture recycling industry. Through this project, Cirtex has tested several system levers for change, including:

The Upcycled Insulation Innovation Demonstration Project has been delivered in collaboration by:

Business model innovation, where obtaining payment to take in the secondary raw materials enables the company to sell the end-product at a discount.

Production systems, through developing their production process that is designed for circularity and closed-loop manufacturing.



Perceptions and social norms, through changing perceptions that, used mattresses, duvets, and pillows can be upcycled or repurposed.

Citizen participation and behaviour, by putting in place the infrastructure and systems for citizens to responsibly dispose of their mattresses, in addition to buying mattresses made from recycled materials. Greater access is needed for citizens to responsibly dispose of mattresses at civic amenity centres and through recycling companies.

Skills and capabilities by developing the skills and capabilities to create valuable products from materials diverted from landfill and incineration.

Policy and regulatory frameworks, where Cirtex is seeking immediate government intervention to prevent mattresses at civic amenity centres and recycling companies entering incineration on a purely cost saving basis: where Ireland's incineration levels are already reaching its ceiling. In the longer-term Cirtex would welcome an Extended Producer Responsibility (EPR) scheme approach like electronic goods. However, in the interim period we need to take positive action to prevent further harm.

Impact

With the assistance of Circuleire funding and support the project has developed the product and the market for the end-products. On a fully-scaled up basis (existing capacity of 2,000 tonnes p.a.) the potential benefits include:

CIRCULÉIRE – The National Platform for Circular Manufacturing has a €1.5m ring-fenced innovation fund supporting circular innovation demonstration projects over 2020-2022. See www.circuleire.ie

Direct environmental impact reduction, through diverting up to 2,000 tonnes of material from landfill and incineration in addition to the end-products are used in substitution for virgin materials (that are mostly imported).

Direct and in-direct economic impacts, where there are 15 FTEs in the company now and on a fully scaled basis will employ c.25 FTEs, plus additional employment through suppliers such as hauliers. Also, buyers benefit from buying the Cirtex product at a discount to alternatives.

Direct and in-direct societal impacts, where Ireland now can recycle and upcycle a much larger element of used mattresses (previously only the springs were being recycled).



Key Lessons Learned

The key insights for other companies seeking to enter the circular economy and develop a circular product are the importance of the following:

Involving potential buyers in the product development process to focus on developing products that buyers want.

Developing a viable business model that can be scaled, where they need to be deployed at scale to make a meaningful impact.

Early engagement with the relevant authorities and experts **to understand the legislative and regulatory requirements** before commencing the project.

Government intervention is needed to encourage positive changes in behaviours in relation to civic amenity operators and recycling companies to mandate them to make more environmentally responsible decisions.