

## New products made out of recycled coffee cups

LIMM Recycling uses recycled plastic (polystyrene) coffee cups to make a new sustainable raw material, to create new products.



### Description of the case study:

#### ***The process***

LIMM Recycling delivers plastic coffee cups, made of polystyrene [1], in various colours and sizes to companies (as well as other organisations such as football clubs, dentists, etc.) and recollects the used cups. To do this, LIMM provides boxes to store the cups after use. In this way, used cups can be kept efficiently, separated from the waste. When new cups are delivered, the boxes with old cups are picked up. A box fits 900 cups, and for an average company this results in a reduction of 70% of the general waste volume. LIMM does inventory control to ensure that there are always plenty of coffee cups.

After collection, the used cups are processed to become a new, clean material, using a grinding mill, friction pump (to create pressure to press the plastic through the grinder), and dryer, and afterwards granulated. At the moment, this material is then sold to a local recycling company, but on the longer term LIMM wants to process the material by itself. The granulated plastic can be used to create new products, such as coat hangers and flowerboxes. In collaboration with students of the *industrial product design* major at Windesheim university of applied sciences, possible future applications of the plastic material are being considered. Therewith LIMM may launch a specific new recycled product.

#### ***Objectives and results***

For LIMM, plastic (and specifically polystyrene) is a sustainable material, that can be reused to create other plastic products. If plastic is separated well from other waste, costs are low, and plastic can be reused efficiently. In practice, however, many plastic cups are thrown in the general waste, which results in more expensive waste separation. As a result, plastic often ends up in waste incineration plants.

LIMM wants to ensure that as much as possible of the plastic of coffee cups is reused in new products, and therefore aims to keep the process of collection, processing, and recycling of the cups as much as possible in their own hands. By doing this on a regional scale, long-distance transport is avoided.

In contrast to what is often assumed, plastic coffee cups are more environmentally friendly than paper cups, provided that they are recycled. To paper cups, a layer of paraffin wax is added to make them suitable for

beverages, but this means they cannot be recycled with other paper waste. Plastic on the other hand can be separated by the companies themselves, and then be recycled.

### ***Challenges and lessons learned***

A challenge for L IMM is to deal with existing market structures and market parties. For example, the large coffee suppliers usually also provide cups to companies, which means that companies are held to a contract. It would be easier if companies leave the cups out of their coffee contracts. Other market parties include the waste treatment companies, that lose part of their market when coffee cups are being recycled.

Another challenge is the scale. As the company was set up using private capital, L IMM at first had to look for companies that use coffee cups on a relatively small scale, as L IMM's scale of operations was not yet ready for serving large companies.

A final objective for L IMM would be to be able to recycle the polystyrene cups independently, and reuse them as coffee cups. Technically, this is possible, but at the moment it is legally not allowed to reuse recycled plastic for food and beverage purposes. Therefore, at the moment other products are made out of the recycled plastics.

Director Lenze Leunge: "L IMM Recycling is still a small business, but we are developing quickly! With their solutions, small businesses can contribute to the development of the circular economy in the Netherlands!"

### **What was the type of green solution? Please select the type of solution.:**

Technology/Product [2]

### **What does the featured solution contribute to?:**

Environmental protection,  
Resource efficiency

### **Which technology area(s) does the case study belong to?:**

Materials [3], Other materials [4], Waste treatment and recycling [5], Solid waste management [6], End of life product recovery [7]

### **How was the green solution financed?:**

Private funds [8]

### **Capital costs description:**

For the users, there are no capital costs, except for a small investment in the metal container to store the cups.

### **Operating and maintenance costs description:**

For the users, there are operational costs for the delivery and collection of coffee cups by L IMM.

### **Cost savings description:**

Customers often reach cost savings up to 30%, among others by reducing the general waste.

### **Regulatory framework prerequisites and constraints?:**

According to L IMM, there should be a stricter obligation on recycling of plastics (including coffee cups), and separation at the source of the waste (e.g. the company). It would also be good if companies use one type of plastic (e.g. polystyrene) for all types of plastic products used in their operation, so that separation and recycling is made easier.

### **Operating and maintenance costs:**

Yes, low O&M costs

### **Would you characterize the green solution as:**

Capital-free investment (i.e. almost no costs)

### **Partners:**

Company name

- L IMM Recycling [9]

### **Relationship type:**

Company that produced the green solution,

Company that supplied or installed the green solution

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**Source URL:** <http://greeneconet.eu/new-products-made-out-recycled-coffee-cups>

### **Links**

[1] <http://en.wikipedia.org/wiki/polystyrene>

[2] <http://greeneconet.eu/type-green-solution/technologyproduct>

[3] <http://greeneconet.eu/technology-area/materials>

- [4] <http://greeneconet.eu/technology-area/materials/other-materials>
- [5] <http://greeneconet.eu/technology-area/waste-treatment-and-recycling>
- [6] <http://greeneconet.eu/technology-area/waste-treatment-and-recycling/solid-waste-management>
- [7] <http://greeneconet.eu/technology-area/waste-treatment-and-recycling/end-life-product-recovery>
- [8] <http://greeneconet.eu/financing/private-funds>
- [9] <http://greeneconet.eu/limm-recycling>