



## Business model

# RESOURCE EFFICIENCY AND RECYCLING

*Resource efficiency and recycling form the basis of circular economy. Resource efficiency means that material and energy are used in a sensible manner.*

The meaning of recycling is the reuse of raw materials from discarded products as well as coarse recycled materials for manufacturing new products and materials. Recycled raw material can originate from consumers or the industry. Sometimes several companies operate in the same area and agree that one's waste is another's raw material. This kind of cooperating network is called industrial symbiosis.

Resource efficiency and recycling can be achieved in every company. They offer a way to save in waste, material and energy costs. Meanwhile, the environmental impact of the company becomes smaller. Some companies specialise in the knowhow of resource efficiency and recycling, and then sell their expertise to other companies.

Companies should plan their products in a way that their materials could be recycled after use. A company can also ask their customers to return a used product back to them, thus acquiring more raw material for manufacturing new products. Also the selection of products made from recycled materials is increasing.

Source: Sitra





## PURE WASTE

*Pure Waste is 'rag-and-bone man 2.0' for the modern era of the circular economy: at the core of this business is upcycling, the sourcing of discarded textiles and their repurposing into new products.*



### Problem

Cotton farming and the dyeing process burden the environment by consuming vast volumes of water and chemicals, and crops take up large areas of land. Purchased clothes get relatively little wear – they have become almost disposable. Whereas previously prices were determined by textile manufacturers, today they are ultimately dictated by the consumers. Low prices mean lower quality and clothes are discarded quickly.

### Solution: a new lease of life for textile waste

Pure Waste recycles waste from the textile industry into new material and garments. The company produces yarn from cutting waste sourced from India's largest tricot production region and waste from yarn producers. Cutting and yarn waste is broken down into fibres and spun into new yarn. The recycled yarn is then used to sew or weave fabric. Pure Waste sells these yarns and fabrics and uses them to manufacture clothes primarily for labels and retail chains.

### Revenue logic and benefits to Pure Waste

Pure Waste buys the recycling materials by the kilo, and they are considerably cheaper than virgin cotton fabric. The company's revenue comes from the sale of yarn, fabric and finished garments. Its largest customers are B2B companies, consumer brands and retail stores, and Pure Waste also has its own store and an online shop. For business customers, Pure Waste offers material options, a manufacturing process and product design and/or consulting services.

### Benefits to customers and end users

Consumers can buy high-quality, 100% recycled products. Business customers can design products made from responsibly sourced material. Sustainable textiles can be used as a value proposition in marketing. Buying a Pure Waste T-shirt instead of one produced by conventional methods can save up to 2,700 litres of water.

Source: Sitra (2019): *The most interesting companies in the circular economy in Finland.* [www.sitra.fi](http://www.sitra.fi)





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# AMERPLAST

*Amerplast uses plastic waste from consumers and industry as raw material for plastic bags, thus helping conserve the environment and lowering manufacturing costs.*



## Problem

An enormous amount of plastic waste is produced around the world. It has been estimated that by 2050, there will be more plastic than fish in the seas. It has been also estimated that a total of over 100 tonnes of plastic packaging waste enters the Finnish market each year. Plastic is made predominantly from non-renewable fossil fuel: oil. Much plastic packaging contains various types of plastic, which makes plastic recycling challenging at times. The dirtiness of plastic also hinders recycling.

## Solution: collected plastic transformed into recycled plastic bags

Amerplast produces ESSI Plastic Bags from polyethylene separated from recycled plastic. Of the raw materials, half come from plastic collected from consumers via separate sorting points and half from packaging materials from Kesko's warehouse. Plastic waste is sorted and separated for various types of use at the Fortum processing plant. Amerplast purchases melt-ready polyethylene fractions separated from plastic waste to use as a material for its plastic bags. Used bags can be completely recycled again, except for their print colours.

## Revenue logic and benefits for Amerplast

Amerplast sells recycled ESSI Bags to leading retail sector stores. The company pays Fortum for the raw materials for its recycled plastic bags, but the use of recycled plastic costs the company less than the use of new fossil fuels. The company's objective is to also develop other products solely from recycled plastic. The development of the recycled plastic solution supports Amerplast's future business opportunities, as it facilitates better material efficiency and the reuse of plastic.

## Benefits to customers and end users

Numerous retail stores already purchase the ESSI bags, but only Kesko both supplies and sells the ready products. This solution allows Kesko to increase the share of recycled packaging waste at its central warehouse and to offer its customers a more sustainable plastic bag option. Other retail sector companies can also sell the ESSI plastic bags, and in this way, minimise their environmental footprint. By sorting plastics from other waste and putting them into plastic recycling bins, consumers can better recycle their waste for reuse.

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# GOLD&GREEN FOODS' PULLED OATS

*Gold&Green Foods' pulled oats have taken the market by storm. Pulled oats provide a healthy and environmentally friendly source of protein without compromising on taste.*



## Problem

The mass production of meat is problematic with respect to land use, animal rights, water consumption and carbon dioxide emissions. However, production continues to grow, as living standards continue to rise in many countries and more people that have traditionally favoured vegetarian diets choose to eat meat.

## Solution: sustainable plant protein from oats and legumes

Pulled oats developed by Gold&Green Foods combine all the nutritionally important amino acids, and the product is made of sustainable raw materials: oats, beans and peas. The most nutritious parts of these plants are used. Growing the raw materials for pulled oats requires considerably less water than meat farming. For example, it has been estimated that the current production capacity of pulled oats could have saved seven billion litres of water annually if pulled oats had been preferred to beef.

## Revenue model and benefits for Gold&Green Foods

Gold&Green Foods is a technology company whose Finnish plant produces patented products for the Finnish market and for export. In addition, the company licenses their product's manufacturing technology and brand of pulled oats to other producers, enabling its products to enter the markets faster without large export organisations or building more production plants. The company's own production facility also enables continued product development.

## Benefits to customers and end users

Distributors and large retail chains as customers gain an easy plant protein product that has become familiar to consumers and has been a great success since its initial launch. For consumers, pulled oats are an easy, fast and nutritious non-meat alternative, regardless of whether the choice was made for health or environmental reasons.

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## ZENROBOTICS

*After the mining industry, the construction industry is one of the largest producers of waste. Some construction material ends up in landfills because of insufficient waste sorting. ZenRobotics develops and sells waste-sorting robots, which reclaim various materials from waste and put them to use.*



### Problem

A huge amount of recyclable waste ends up in landfills or goes to incinerators. The low value of waste materials results in waste sorting by hand being unprofitable. The problem with mechanised waste-management facilities is that they have traditionally required a lot of financial investment and the facilities are not always able to adapt their operations in accordance with rapidly changing legislation, the price of waste materials and sorting needs.

### Solution: intelligent waste-sorting robot

ZenRobotics develops and sells waste-sorting robots, which separate different materials for reuse from waste. The user is able to teach the robot, which is based on artificial intelligence and sensor technology, what kinds of materials the robot should collect from the conveyor belt at the treatment facility. Whereas before, wood materials, for example, were separated from waste using outdated methods, now the robot is able to sort clean and unpainted wood, painted wood and impregnated wood into different piles. More precise sorting increases the opportunities for reusing waste materials. Over 95% of the waste materials that arrive at waste-treatment facilities equipped with robots can be sorted for recycling.

### Revenue logic and benefits to ZenRobotics

The company sells equipment to waste-treatment facility operators that process waste. Alternatively, a plant-building contractor can sell the ZenRobotics solution as a part of the waste-treatment facility being built for their customer. Currently, ZenRobotics focuses in particular on sorting construction waste, but other waste categories offer significant opportunities for the future.

### Benefits to customers and end users

Sorting provides lower waste-treatment costs for customers: less waste has to be delivered to landfills or incinerators. In addition, income can be generated from reused, sorted waste. Not as much usable material goes to landfills and natural resources are not wasted.

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# CAR WRECKERS

*Car wreckers demolish cars that are no longer used and salvage useable parts as spares. Metal is recycled and spare parts are sold. In addition, any hazardous wastes are disposed of accordingly.*



## Problem

The automobile industry has a great deal of environmental effects. Metals, oil based products, such as rubber and plastic, and electronics are used in car manufacturing, which consumes natural resources. Mining and refining metals destroy natural habitats, whereas the electronics industry uses metals and hazardous chemicals. Also the manufacturing of oil based products consumes chemicals and unrenewable resources. The car manufacturing industry consumes a lot of energy.

## Solution: parts for spare parts

The parts of retired vehicles have utility and should not be wasted. The sale of used spare parts reduces the need of producing new spare parts, thus decreasing the environmental effects. The viable spare parts continue to exist for the purpose they have been made for.

## Revenue logic and benefits to car wreckers

A wrecker's yard accepts obsolete vehicles. Cars usually cost nothing to the wrecker, so the only expenses are the demolishing costs. Sometimes the customer has detached the spare parts in advance, in which case the profit margin is even better. In addition, the car wreckers are compensated for the recycling of the metal junk. The more cars that are demolished, the better the employment effect is in the field. Renewing the vehicle fleet also removes the more polluting vehicles from traffic use.

## Benefits to customers and end users

The spare parts from car wreckers are considerably cheaper and classified by quality. Demolishing is done always in a professional manner and according to environmental regulations. The compatibility of original spare parts is guaranteed and is economically acquired from a wrecker. Car wreckers often have parts in stock where they are easy to access and find, even get them delivered. After bringing a car to a wrecker, the customer receives an official certificate of decommission.

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## GLOBE HOPE

*Globe Hope differentiates itself by using high-quality design to make use of discarded materials. The products are not only ecologically sustainable but also individual and cleverly designed. Globe Hope stays with its products over their life cycle by repairing and reselling them.*



### Problem

Textile production burdens the environment by consuming vast volumes of water and chemicals, and crops such as cotton take up large areas of land. Moreover, synthetic fibres like polyester are often oil-based and therefore environmentally unsustainable. There are also problems in the textile industry regarding human rights and the provision of humane working conditions. Good-quality textiles are often used for less time than they would actually last.

### Solution: functional clothing and accessories from surplus materials

Globe Hope manufactures functional design products from various discarded materials, such as surplus army textiles, canvas, advertising materials and safety belts. Most of the products are destined for companies, but some are also sold via retailers and Globe Hope's own stores. A customer company supplies a large quantity of one material, and Globe Hope then designs and manufactures products such as corporate gifts and sells them back to the customer. Reusable materials are recovered, and the need for virgin raw materials is reduced.

### Revenue logic and benefits to Globe Hope

Globe Hope's cash flow comes from the sale of manufactured products. Approximately 65% of its sales are B2B sales. The company receives materials for free or buys them depending on the need. The product design and material processing are the most valuable parts of the process.

### Benefits to customers and end users

Corporate customers can reduce their waste and disposal fees by offloading their surplus materials to Globe Hope for repurposing. Consumers are increasingly keen proponents of a sustainable lifestyle, also buying into the story of the material. All Globe Hope products are designed with sustainability in mind: each product comes with a warranty, and the company offers a repair service. Used Globe Hope products can be brought into a store for resale in exchange for a gift voucher.

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# TRACEGROW

*Agriculture is not the first thing that comes to mind when considering what could be done with used batteries. Nevertheless, Tracegrow has developed a cost-effective method for capturing minerals from used alkaline cells. These can be used on fields as nutrients, which helps to reduce the need for virgin minerals extraction.*



## Problem

Alkaline batteries often end up in landfills where they pollute the environment. They contain zinc and manganese, which are extracted as non-renewable virgin resources by mining and refining. Refineries and end-product technologies require expensive investments. The sorting and recycling of alkaline batteries disposed of by consumers generates vast volumes of alkaline mass. The mass contains manganese and zinc, which are difficult and expensive to recover with current methods.

## Solution: a new technology for the processing of used alkaline batteries to produce agricultural nutrients

Alkaline batteries are collected, sorted and crushed. The new technology developed by Tracegrow enables the recovery of a mineral compound which contains zinc, manganese, sulphur and potassium. The mineral is diluted and spread onto fields in conjunction with irrigation or pesticide application to give crops a boost. Global population growth and the loss of arable land mean that increasingly high yields will be required. The manganese–zinc mineral compound manufactured from recycled material is an efficient and environmentally friendly solution.

## Revenue logic and benefits to Tracegrow

The mineral product can be offered to a growing market: the value of the global market is estimated to reach €13 billion by 2021. The sale and licensing of technologies will represent a significant part of the business.

## Benefits to customers and end users

Minerals produced from recycled materials are an environmentally friendly and competitively priced alternative. Their use in agriculture is environmentally more responsible and thus good for image. Virgin manganese reserves are limited, and the availability of recycled manganese will help to protect against highly fluctuating prices and ensure price stability.

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## HELSIENI

*Helsieni provides coffee drinkers with a novel method for using coffee grounds as a cultivation platform for mushrooms. This solution helps consumers reduce waste while also producing truly sustainable local food.*



### Problem

Many people throw out waste that could be used as a breeding ground for food. For example, coffee grounds from a Finnish-style coffeemaker are usually put either into the regular waste or into biowaste containers. At the same time, the need for alternative, sustainable protein sources for meat is increasing as the world population, and therefore also the need for protein, grows. Local protein production is needed to diminish the emissions from food value chains.

### Solution: mushrooms on your coffee

Helsieni grows oyster mushrooms on used coffee grounds. The company sells both mushrooms and do-it-yourself kits to anyone who wants to grow mushrooms themselves. The mushrooms are sold directly to restaurants in the Helsinki area and the DIY kits are sold in recycled plastic containers that Helsieni collects from the restaurants. For the kit users, the company provides the mushroom spawn that is needed for growing the mushrooms in the kit as well as growing instructions, and the customers use their own coffee grounds. Oyster mushrooms are one of the fastest growing mushroom species and can provide a local, sustainable source of food.

### Business model and its benefits to Helsieni

The company's business model is based on growing and selling the mushrooms and putting together and selling the self-starter kits. The mushroom spawn is sourced from the Netherlands and the plastic containers are given to Helsieni for free by restaurants. The biggest cost source for the company is labour. The business model allows Helsieni to really know its customers, as they sell locally. Local food is also a growing trend.

### Benefits to customers and end users

Mushrooms are one of the most carbon-neutral sources of food and growing them on coffee grounds can even make them carbon negative. Being able to replace meat with much healthier mushrooms is one obvious benefit the products have for Helsieni's customers. Also, the amount of organic or regular waste is decreased when using waste as a growing ground, therefore decreasing the costs and emissions from waste. If eating mushrooms becomes more popular, it can also bring new jobs to people who want to grow and sell them.

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