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## 44 Ooho from Notpla

Sector focus: Plastics and technological solutions

### Rationale

Every year, countless single-use plastic containers are discarded due to the rapidly expanding takeout food industry. Due to contamination from food leftovers, recycling takeout packaging is often impracticable; therefore, it ends up in the municipal solid waste stream. Upstream innovation in a circular economy is tracing a problem back to its source and addressing it there. It implies that instead of figuring out how to deal with an increasing mountain of waste, we try to avoid it in the first place. Wherever feasible, reusable containers should be used; however, this is not always possible, leaving a fraction of containers that are only used once. A London-based start-up, Notpla, has developed an edible and biodegradable material for drinks and sauces as a solution for these challenging takeaway items. The company designs natural packaging made from seaweed, which is one of nature's most renewable resources, with a daily growth rate of up to 1 m. It does not compete with food crops, does not require freshwater or fertiliser and helps to de-acidify our waters.

### Leadership

Notpla was started after the two co-founders met studying on an innovation design engineering, master's degree at university. After their initial video showcasing the product went public in 2013, they were invited to join Europe's largest climate-focused accelerator. They began testing the material at events, festivals and takeout restaurants with the help of scientists and chemical engineers. They quickly began developing a scalable manufacturing process.

They received money through a crowd financing site in April 2017, which allowed them to expand the business, manufacture the first machine and establish a manufacturing base in London. They received additional funding in the summer of 2018 to speed up the development of the second product and expand the chemical, commercial, engineering and design teams. They raised an additional £4 million in December 2019 to extend their product line, focusing on creating advanced packaging solutions that disappear, naturally. They still describe themselves as a sustainable packaging start-up and one of their core values is replicating what nature does best. They are driven by the interest in finding innovative alternatives to single-use plastic, which will enable the transition towards a circular economy by redesigning material loops.

## Approach

Nature inspired the concept, since fruits like oranges have their own biodegradable peel that serves as the ideal natural container. They mimicked nature by making their own biodegradable packaging out of edible components. The membrane can be thrown to the ground if needed and degrades in less than 6 weeks just like fruit peel. It provides a viable alternative to the flexible packaging commonly used in fast food and beverages, which has a low recycling value and can leak into the environment. In 2017, they perfected the strength, structure and shelf-life of the membrane technology.

They have formed various partnerships to test the potential application in various markets. For example, in 2019, they teamed up with the manufacturer of a well-known isotonic carbohydrate-electrolyte sports drink to conduct a large experiment. They handed out over 30,000 sports drinks to marathon runners. This proved an innovative solution to decrease long-term plastic consumption at mass-participation athletic events and it is now being promoted as the preferred hydration option for similar events.

During an 8-week trial with 10 London restaurants, they also replaced 46,000 sauce sachets. However, they needed to develop advanced production equipment and machinery to produce and fill single-use sachets on an industrial scale to fulfil demand. The seaweed material has the potential to be as cost-effective as plastic and aluminium as an input material at scale, but the production process proved problematic. Significant human interaction limited maximum manufacturing capacity to 300 units/day, indicating that, despite great commercial interest, they were unable to match the volume demands of restaurants, takeout, and retailers at a cost-competitive level. They applied for funding from the UK government to de-risk, enable and support innovation.

In 2021, they received further funding from the UK Government to support research and development to refine its composition, upscale and automate the technology to demonstrate viability as a biodegradable plastic-wrap replacement product within the cosmetics industry. Their long-term goal is to produce packaging for a variety of single-use liquid markets on an industrial scale, in a consistent, high-quality, low-cost way to satisfy both suppliers and customers.

## On reflection

Biodegradable plastics have been around for over a century. Although the majority of them are still in their infancy, the sector has seen a revival in recent decades. Only a few groups of biopolymer materials are currently regarded as competitive. When compared to their traditional equivalents, the primary disadvantages of biodegradable polymers in terms of market diffusion are performance and cost.

In the past, few businesses were worried about the impact of packaging on the environment. Now that packaging has become an item that everyone's fears may tarnish a brand's image or values, the market potential has shifted. The founders of this company have discovered a niche application in which to launch their product. However, they are still in the early stages of the diffusion process, when new products are costly and performance attributes are prioritised over economic considerations. Only after periods of commercial experimentation, and formation of an industrial basis, standardisation and mass production, manufacturing costs are expected to drop significantly. They have successfully utilised crowdfunding and government grants to support product development and are now looking at other markets for further applications.

There are wider societal questions around the requirements for 'on-the-go' products and whether we can reduce our current levels of consumption to minimise the impacts associated with these goods and services. There is also apprehension about a potential rebound effect, in which improvements in particular items are negated by an increase in material consumption and usage. Despite the ongoing discussion about the social dimensions of consumption and the potential need for adequacy-oriented lifestyles, this product hopes to eliminate the customer trade-off between convenience and sustainability.

## Source

<https://www.notpla.com>

