Warwick Business School

Group 64

HYPERION

Waste Management

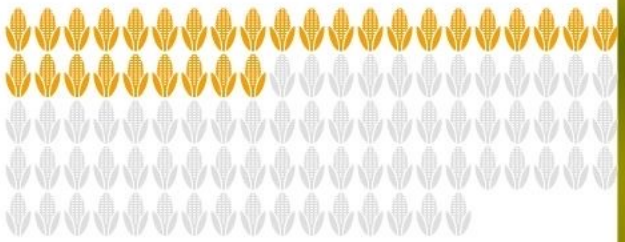
Problem

In the UK alone, there stand approximately 9.5 million tonnes of food waste, mostly in landfill sites (Materials Recovery, 2022). Gas emissions produced through food wastage in landfill sites are one of the most significant contributors to methane (Adhikari et al., 2006).

Festering uncollected food waste attracts microbial activity, insects and rodents, decomposing into organic matter, producing greenhouse gases and leachate (Medina, 2002)(Chakrabarti & Sarkhel, 2003). Therefore, conventional methods of food waste management, such as landfill sites, are contributing to global warming (Rasmussen & Khalil, 1984) (Cicerone & Oremland, 1988) (Dlugokencky et al., 1998)(Shipham et al., 1998).

Arguably, the most lethal greenhouse gas emitted through the decomposition of food is methane which traps 21 times more heat than carbon dioxide, exacerbating the effects of climate change at an alarming rate (IPCC, 2001) (Burton & Turner, 2003).

30% Over a third of all food produced globally goes to waste (Hall, 2023).



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Problem

This issue is ever-growing at an astronomical rate, alongside mass population growth, as more food waste is filled at landfills, adding environmental pressure (Adhikari et al., 2006).
Currently, biodiversity is threatened by chemical-derived fertilisers. Nitrogen deposition, to which farming is a significant contributor, has been categorised as one of the three major threats to biodiversity between 2000 and 2100 (Sala et al. 2000).

Furthermore, The Global Biodiversity Outlook 3 states that nutrient pollution is a massive contributor to growing pressures on biodiversity (OECD 2017). Consequently, conventional sources of fertiliser pollution devastate biodiversity; therefore, nitrogen deposition and landfill gas emissions have highlighted an opportunity for Hyperion Waste Management.

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Source: https://www.istockphoto.com/vector/illustrative-diagram-of-food-waste-recycling-process-gm1305673311-396484349

Solution

Hyperion Waste Management is a waste collection service for restaurants, takeaways and cafes in the west midlands to turn food waste into fertiliser. For our waste collection service, Hyperion provides a waste audit to customers to assist them in monitoring their waste level and propose the pickup frequency.

Food waste collected will be delivered to our decomposing factory. After removing the contaminant, Hyperion uses a specially built machine with multiple crusher units for aerobic digestion, which allows us to digest more food waste while composting for only 24 hours. The methane gas emitted during the decomposing process will be used for the power generation of our factory (Valera-Medina et al., 2017); this solves the landfill gas emission problem.

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Source: https://www.istockphoto.com/vector/illustrative-diagram-of-food-waste-recycling-process-gm1305673311-396484349

Solution

The organic fertilizer is sold to farmers, garden centres and other retailers using business-to-business and business-to-customer offerings. Our nitrogen-reduction organic fertilizer reduces nitrogen leaching loss. It increases the nitrogen soil residue (Huang et al., 2022), reducing the nitrogen deposition problem and implying SDG 12, Responsible Consumption and Production.

We also plan to donate our unsold fertilizer to charity; this could help grow agricultural products and food production, supporting SDG 2 Zero Hunger.

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Target Customer Segment

Hyperion Waste Management

Restaurants & Cafes

Business to Business

Source: https://www.greenbay.com/restaurants/?bounds=false&view=list&sort=qualityScore

Hyperion's first target customer segment is restaurants and cafes, whereby 70% of the country's food waste is produced yearly, with over 500,000 tons of food waste (Wrap, 2021). Logistics are crucial in operating the business. Therefore, the target consumer segment is reduced to food service firms within the West Midlands region to balance profitability and cycle time.

Target Customer Segment

Hyperion Waste Management

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Hyperion's secondary target customer segment is purchasers of organic fertilizers. According to the UK government's statistical report on using fertilizers, agriculture accounted for 93% of total fertilizer use in the UK (National Statistics, 2022). Therefore, we aim to target agricultural farms within the West Midlands for easy access and transportation. However, modern farming heavily relies on chemical fertilizers; statistics show that less than 10% of fertilizers consumed by farms in the UK are organic (National Statistics, 2022). Therefore, Hyperion would transform the fertilizer industry targeting farms, gardeners and garden centres. Although both ends of Hyperion's consumers are in the West Midlands, our target market will grow with the business size.

Farmers & Garden Centres

Business to Business & Business to Consumer

Source: https://foodtank.com/news/2020/04/over-50-organizations-urge-congress-to-prioritize-small-mid-sized-farms-for-covid-19-relief/

First Users

Hyperion Waste Management

As our business aims to achieve SDG 2 Zero Hunger & SDG 12 Responsible Consumption and Production, our early adopters are expected to be environmentally conscious individuals and organizations willing to pay a premium to help sustainable development. We have two ends of our first users: source and fertiliser. Since we need feedback from our first users to help us improve our goods and services, we need to choose individuals and organizations that are easy for us to get in touch with as our first users.

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First Users

Hyperion Waste Management

Fertiliser Side

We expect environmentally conscious farms or gardeners looking for organic fertilisers.

Some gardeners care about the side effects of chemical fertilizers and want to use organic fertilizers instead. Similarly, businesses and farms trying to be more ethical may also make this switch.

Source：https://www.rhs.org.uk/education-learning/qualifications-and-training/rhs-qualifications

Source Side

We expect someone with objectives of promoting sustainability and reducing food waste.
The eco-friendly restaurant Courtyard opened inside Coventry University‘s student union don't offer or market goods made of single-use plastic (Hainey, 2019).
In line with our expectations and it is easier for us to communicate with the student union.
Similarly, the café in WBS, also use paper lunchbox instead of plastics one, and the location makes it easier for us to keep in touch with them and receive immediate feedback.

Source：https://www.coventrytelegraph.net/look-inside-new-cov-uni-16181989

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Value Proposition

Hyperion Waste Management

- Hyperion offers a sustainable solution to the problem of food waste. By converting food waste into fertilizer, we're diverting it from landfills where it would otherwise produce methane, a potent greenhouse gas that contributes to climate change.

- Food waste contributes around 8-10% of greenhouse gases, which is less than only China and the USA if equated to a country (Energy Saving Trust UK, 2023). We generate a unique value of creating a circular economy with our innovation as we reuse food to make fertilizer, then use it to help grow more food which will return into our cycle of being made into fertilizer rather than its decomposition.

- Our fertilizer is 100% natural and organic, making it an excellent alternative to synthetic fertilizers that harm the environment. Our compost is rich in nutrients and beneficial microorganisms that help to improve soil health and promote healthy plant growth. This makes it an attractive option for anyone who is looking for sustainable and effective ways to enhance their soil quality.

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Value Proposition

Hyperion Waste Management

- Our fertilizer will have fewer nitrates and phosphates than artificial ones have, being kinder to the soil. When it is washed out into nearby bodies of water, it won't be as harmful and less likely to cause eutrophication, a harmful process to aquatic ecosystems.

- Hyperion offers a cost-effective solution for local businesses to dispose of their food waste. Rather than paying to have their waste hauled and disposed of in a landfill, they can partner with us to convert it into a valuable product, saving them money and helping them reduce their environmental impact and enhance their corporate social responsibility.

- In summary, Hyperion offers a range of benefits to our customers and the environment. Businesses can save money, reduce their environmental impact, and promote sustainability by partnering with us. At the same time, our compost offers an effective and sustainable way to improve soil health and promote healthy plant growth.

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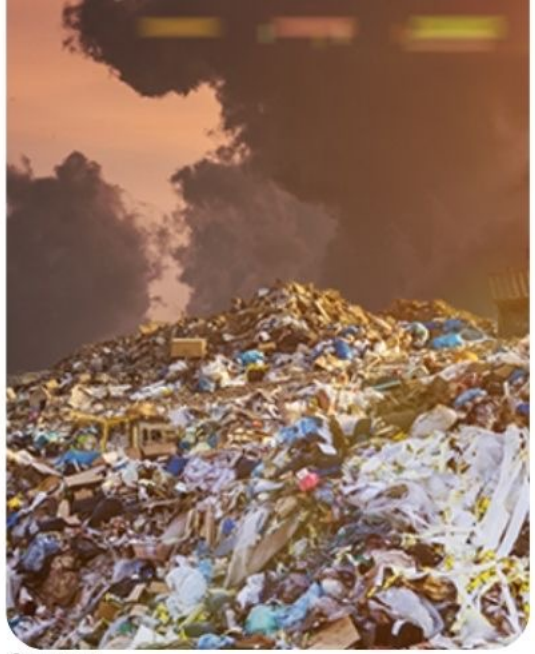
Unfair Advantage

Hyperion Waste Management



Source: https://www.circularonline.co.uk/features/time-to-bury-landfill-for-good/

Helping The Environment

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- Our key advantage over competitors is our core mission of helping the environment. Most food waste companies work to move food waste from bins to a landfill. We go the extra mile to repurpose the food into an organic fertiliser that will be kinder to the environment, a far better alternative to the methane released from food in landfills.

- Our competitive advantage is that any company that choose us will gain CSR benefits for no extra cost, improving brand image and reputation.

Source:https://leverageedu.com/blog/bs environmental-science/

Unfair Advantage

Hyperion Waste Management

Locality

- Additionally, we benefit from locality which helps us establish a close relationship with our partners and a strong reputation amongst restaurant and café owners. Therefore, on our supply side, creating a large user network, allows us to have an increased inventory for our demand-sided customers e.g. farmers, garden centres.

Source: https://exchange.nottingham.ac.uk/blog/tackling-food-waste-with-too-good-to-go/

Competitors

- One competitor we acknowledge is the too-good-to-go industry. We understand that food good enough to eat should be eaten rather than sent to landfills. This only affects our company to a moderate extent as we still have non-edible food waste items at our disposal, which is still the majority of food waste.

Too Good To Go

Source:https://leverageedu.com/blog/bsc-

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Key Costs/Resources

(Achieving 100% of the target market)

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Item	Costs	Notes
	Fixed Costs	
Food disposal bins	£2,384,976.00	There are approximately 4,517 restaurants in the West Midlands, each bin costing £528
Food transformation machine	£2,000,000.00	
	Monthly Variable Costs	
Factory wages	£277,200.00	There will be 90 employees in the factory working 7 days and being paid £110 per day
Lorry hire	£241,920.00	The cost of hiring a suitable lorry is £432 per day, there will need to be 20 lorries on hire for 7 days per week
Factory rent	£10,000.00	
Distribution of fertiliser	£5,000.00	
Marketing	£3,000.00	

Key Costs/Resources

(Achieving variable % of the target market - Monthly

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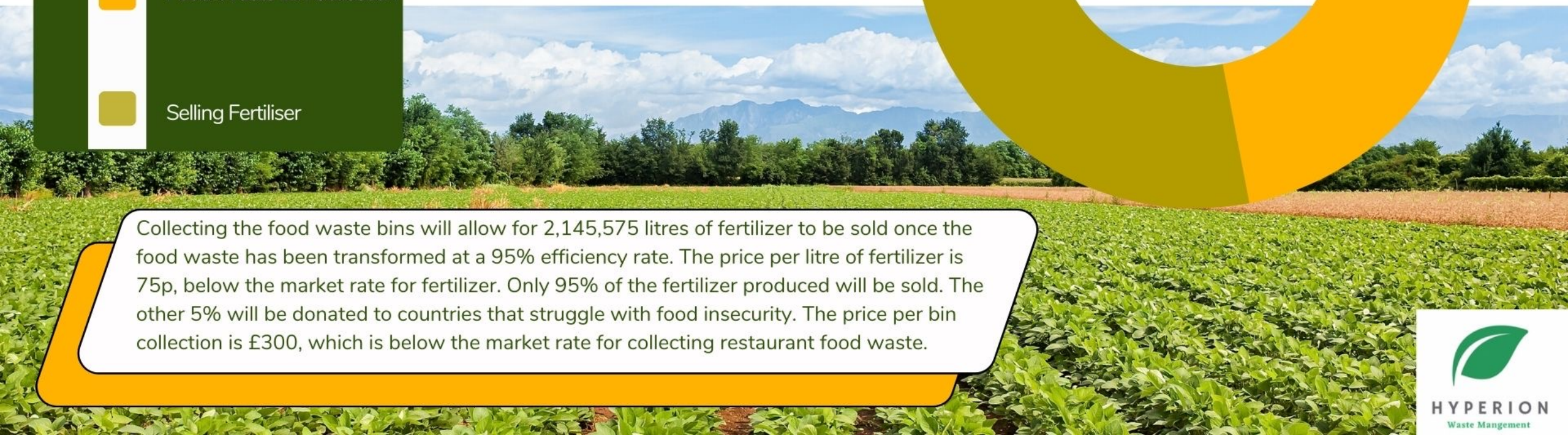
Item	Different percentages of the target market					
	85%	70%	55%	40%	25%	15%
Food disposal bins	£212,660	£148,862	£116,963	£85,064	£53,165	£31,899
Food transformation machine	£142,666	£124,833	£98,083	£71,333	£44,583	£26,750
Factory wages	£235,620	£194,040	£152,460	£110,880	£69,300	£41,580
Lorry hire	£205,632	£169,344	£133,056	£96,768	£60,480	£36,288
Factory rent at 100% target market	£8,500	£7,000	£5,500	£4,000	£2,500	£1,500
Distribution of fertiliser	£4,250	£3,500	£2,750	£2,000	£1,250	£750
Marketing	£2,250	£2,100	£1,650	£1,200	£750	£450
Total	£811,578	£649,679	£510,462	£371,245	£232,028	£139,217

The food transformation machine cost is variable to the percentage of target market achieved because for smaller percentages a smaller machine will be needed and for larger percentages two or more machines can be used. The factory rent is also variable because as the percentage increases production will be able to move to a bigger factory. The same strategy is for wages, as the percentage increases the number of staff required in our operation will increase. Food disposal bins and the food transformation machine are finance on 12 months credit at an interest rate of 7%.

Revenue Model

(Achieving 100% of the target market)



Collecting the food waste bins will allow for 2,145,575 litres of fertilizer to be sold once the food waste has been transformed at a 95% efficiency rate. The price per litre of fertilizer is 75p, below the market rate for fertilizer. Only 95% of the fertilizer produced will be sold. The other 5% will be donated to countries that struggle with food insecurity. The price per bin collection is £300, which is below the market rate for collecting restaurant food waste.

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Revenue Model

Achieving variable percentages of the target market

Revenue Streams	Different percentages of the target market					
	85%	70%	55%	40%	25%	15%
Selling Fertiliser	£1,299,413	£1,070,105	£840,797	£611,488	£382,180	£229,308
Food waste bin collection	£1,151,835	£948,570	£745,200	£542,040	£338,775	£203,265
Total per month	£2,451,248	£2,018,675	£1,586,102	£1,153,528	£720,955	£432,573

At 55% of the target market, Hyperion Waste Management will have 2,484 bins in operation at different locations. The combined revenue the food waste bin collections will generate is £745,200 per month. The food waste from the bins will be transformed into fertilizer. At 55% of the target market, 1,180,066 litres of fertilizer will be produced, which will generate £840,797, factoring in donations.

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Funding Plan

Based on achieving 55% of the target market and a D/E ratio of 1.5

£420,000

DEBT FINANCING

- Debt Financing options:
- Business Loans
- Start-up Loans
- Peer-peer Lending
- Overdrafts

£280,000

EQUITY FINANCING

- Debt Financing options:
- Venture Capital
- Private Equity
- Crowdfunding

(Boyle, 2022) states that a D/E ratio should not be above 2, as a stat-up a D/E ratio of 1.5 is healthy as not too much debt is in the capital structure.

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