Food Waste Target Guidance

Pathways to Food Waste Prevention

March 2023

BORD BIA
IRISH FOOD BOARD

Origin Green
IRELAND

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1 Introduction

Food waste is a drain on natural resources throughout the world, as the growing, processing, and transportation of food consumes a huge number of resources, such as land, water, energy, and fertiliser.

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1 Introduction

Food waste is a global problem, with approximately one third of all food produced ending as waste, which is equivalent to 1.3 billion tonnes per year.[1]

The EU fares slightly better but still estimates that around 20% of all food produced is wasted.[2] The Environmental Protection Agency (EPA) estimate that Ireland wastes approximately 770,300 tonnes of food each year and that 2020 estimates of food waste in the processing and manufacturing sector is approximately 219,500 tonnes.[3]

SECTOR	TONNES OF FOOD WASTE
Primary Production	70,400
Process and Manufacturing	219,500
Retail and Distribution	60,900
Restaurants and Foodservice	178,500
Households	241,000

Figure 1: Food waste statistics for Ireland released in October 2022 but data release presents key statistics on food waste in Ireland in 2020.[3]

While one in nine people in the world remain undernourished, food waste exacerbates the problems of food insecurity and malnutrition. This food waste is a drain on natural resources throughout the world, as the growing, processing, and transportation of food consumes a huge number of resources, such as land, water, energy, and fertiliser. If food is wasted, these resources are wasted too. It is estimated that wasted food has consumed approximately one quarter of all water used by agriculture.

1.1 Policy Framework

International: Sustainable Development Goal Target 12.3 "By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains".[4]

European: Waste Framework Directive. Circular Economy Package.

National: Food waste is identified as a priority waste stream within the National Waste Prevention Programme managed by the EPA. Published in 2022, the National Food Waste Prevention Roadmap 2023-2025[5] is Ireland's roadmap for food waste management. The roadmap describes the Irish approach to managing food waste, and links with a number of other national plans and policies including the Food Vision 2030 strategy. It commits to establishing a national baseline data on food waste from which it will achieve a 50% reduction by 2030, which is in-line with the EU's target. It also matches the level of ambition being shown across the EU through the European Green Deal, which includes the new Farm to Fork Strategy.

Company: The EPA Food Waste Charter[6], led by the EPA, is a voluntary agreement introduced in 2017 to support engagement on food waste with the grocery retail sector, using a set of general binding principles. The Food Waste Charter is a public commitment by companies and organisations in Ireland to fundamentally change how they think and respond to food waste. The signatories are pledging to take positive actions – through measuring; reducing; and reporting their food waste.

1 Introduction

1.1 Policy Framework *continued*

Food waste reporting is now a mandatory part of Ireland's National Waste Statistics obligations, reporting began in June 2022 using information collected for 2020. Ireland is required to report on food waste using a common methodology and with minimum quality requirements. Each of the sectors shown in Figure 1 must be reported separately.

1.2 Origin Green

Origin Green is Ireland's pioneering food and drink sustainability programme. The programme is the worlds' only national food and drink sustainability programme which enables the industry to set and achieve measurable sustainability targets that respect the environment and serve local communities more effectively.

The programme now encompasses 300 member companies comprising of manufacturers, retailers, and foodservice operators. Origin Green member companies commit to a mandatory mix of target areas specified by the Origin Green Charters; Manufacturing, and Retail and Foodservice. The mandatory areas, from which targets are set, form the basis of a business 5 year sustainability plan.

Addressing the food waste challenge is a key priority for manufacturing members under their waste target. Within their waste target, they will identify if food waste occurs in their operations, and if so will seek to integrate company-wide actions to increase food waste prevention across their operations. For the retail and foodservice charter, food waste is a mandatory target for all members.

The establishment of Origin Green member companies' waste targets are only possible through the support they receive, most notably from EPA's Food Waste Prevention Programme and FoodCloud.

See **Section 6** of this report to learn more about these organisations food waste supports amongst others.

1.3 Economic Rationale

Food waste reduction makes business sense too. The Waste & Resources Action Programme (WRAP) found that of 1,200 UK businesses that invested in reducing food waste, over 99% earned a positive return on investment. With the median return being 14:1, returning £14 for every £1 invested.[7] Businesses realised financial benefits like avoiding costs of buying further raw ingredients, introducing new product lines from otherwise lost or waste food, reducing waste costs like own labour costs and waste collection. Then there are staff costs and other overheads to store, prepare, and dispose of food waste.

£14

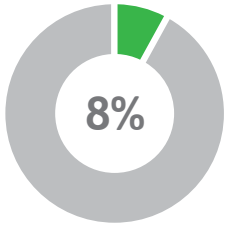
***return** for every £1 invested in reducing food waste in 1,200 UK businesses.*

1 Introduction

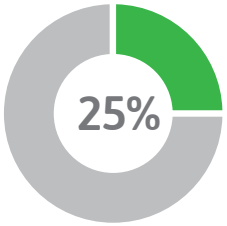
1.4 Environmental Rationale

Beyond the resources that are lost, there is also the contribution to climate change that this waste creates. Food waste generates approximately 8% of global greenhouse gas emissions, and if food waste were a country, it would be the third highest emitter of greenhouse gases in the world.[8] Therefore, reducing food waste is an effective climate action for both producers and consumers.

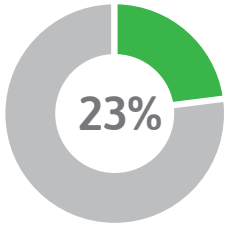
Global GHG Emissions from Food Waste



Agricultural Water used in Food Waste



Global Fertiliser Use lost to Food Waste



1.5 Commercial Rationale

In the first half of 2021, Bord Bia conducted **global sustainability insight**[9] research to better understand global sustainability demands around food and drink amongst international customers and consumers. The research found that food waste for food and drink companies, retailers, and foodservice operators, is becoming a top priority because it is a top consumer priority. Almost 9 in 10 buyers said that it is important for the business to tackle food waste/loss and this spikes for foodservice and retail operators.

From the companies that engaged we saw efforts and targets for reducing food waste in all retailer's sustainability plans. As one example, Kroger in the US, are prioritising their "Zero hunger, zero waste" policy which plans to eliminate food waste in their stores and hunger in the areas in which their stores operate. While this does not incorporate the full supply chain, we may see in the coming years efforts from trade to investigate the full supply chain, essentially Scope 3, for food waste. For example, Tesco have outlined that by 2030 they will have food waste targets for both their own operations and their suppliers' operations.

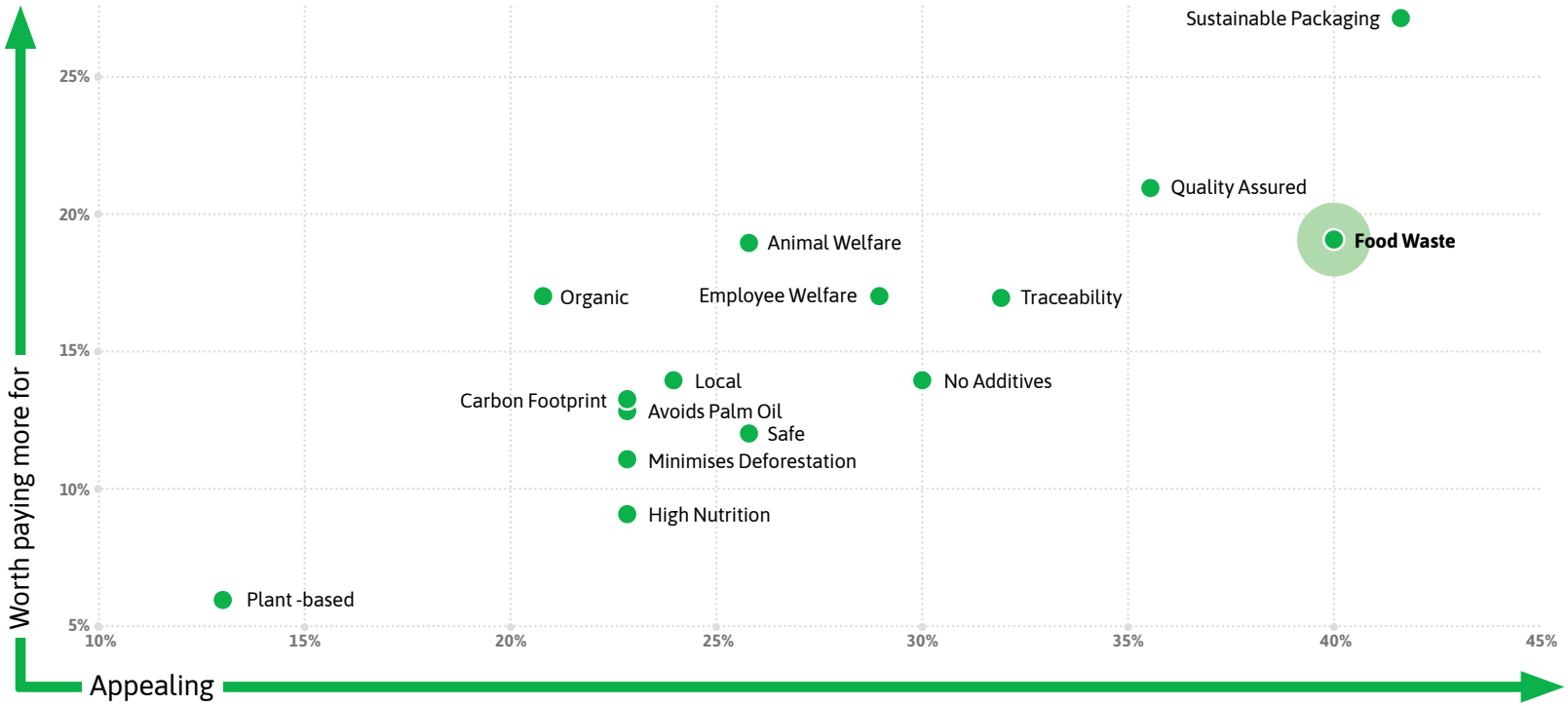
To deliver these food waste reductions, foodservice operators and retailers will need to work closely with their suppliers. Therefore it is essential for any suppliers into these channels to be able to credibly demonstrate and communicate their food waste efforts as well as identifying how they can leverage these food waste preventions within their brands to stand out with consumers.

Almost
9 in 10
***buyers** said that it is important for businesses to tackle food waste/loss.*

1 Introduction

1.5 Commercial Rationale *continued*

For consumers, food waste ranks highly as an influence of grocery decisions. The graph below displays what are the attributes shoppers/consumers care most about in Ireland. On this graph we can see how important food waste is for the Irish consumer, with it being one of the most influential sustainability attributes and associated closely with sustainability overall. Therefore, helping consumers in Ireland reduce their food waste is a great way for organisations to communicate a brand's care for sustainability. But also, it is integral for organisations to undertake efforts to reduce food waste in the supply chain.



1 Introduction

1.6 National Reporting Protocol

The EPA have developed guidance[10] for measuring and reporting food waste by the food and drink manufacturing and hospitality sectors. The Food Waste Measurement Protocol is the main standard for manufacturing and was made in to a simpler 4 step Pathway for food services. The standard measurement methodology aims to use information you already have to first estimate your food waste in a consistent manner. This will allow you track your performance over time, to compare your business with others in your sector and identify how you can reduce food waste and improve your bottom line.

This standard methodology is aligned with the Origin Green programme requirements, and a target for food waste in your Origin Green Sustainability Plan will enable you to collect and interpret the relevant information accurately and consistently, both for your own use and for reporting.

Once they have established a basic monitoring system, many members find that they wish to develop it further because the economic and environmental rationale is compelling.

2 Food Waste in your Organisation

To address food waste within your organisation, a critical step is to identify how and where you generate food waste.

2 Food Waste in your Organisation

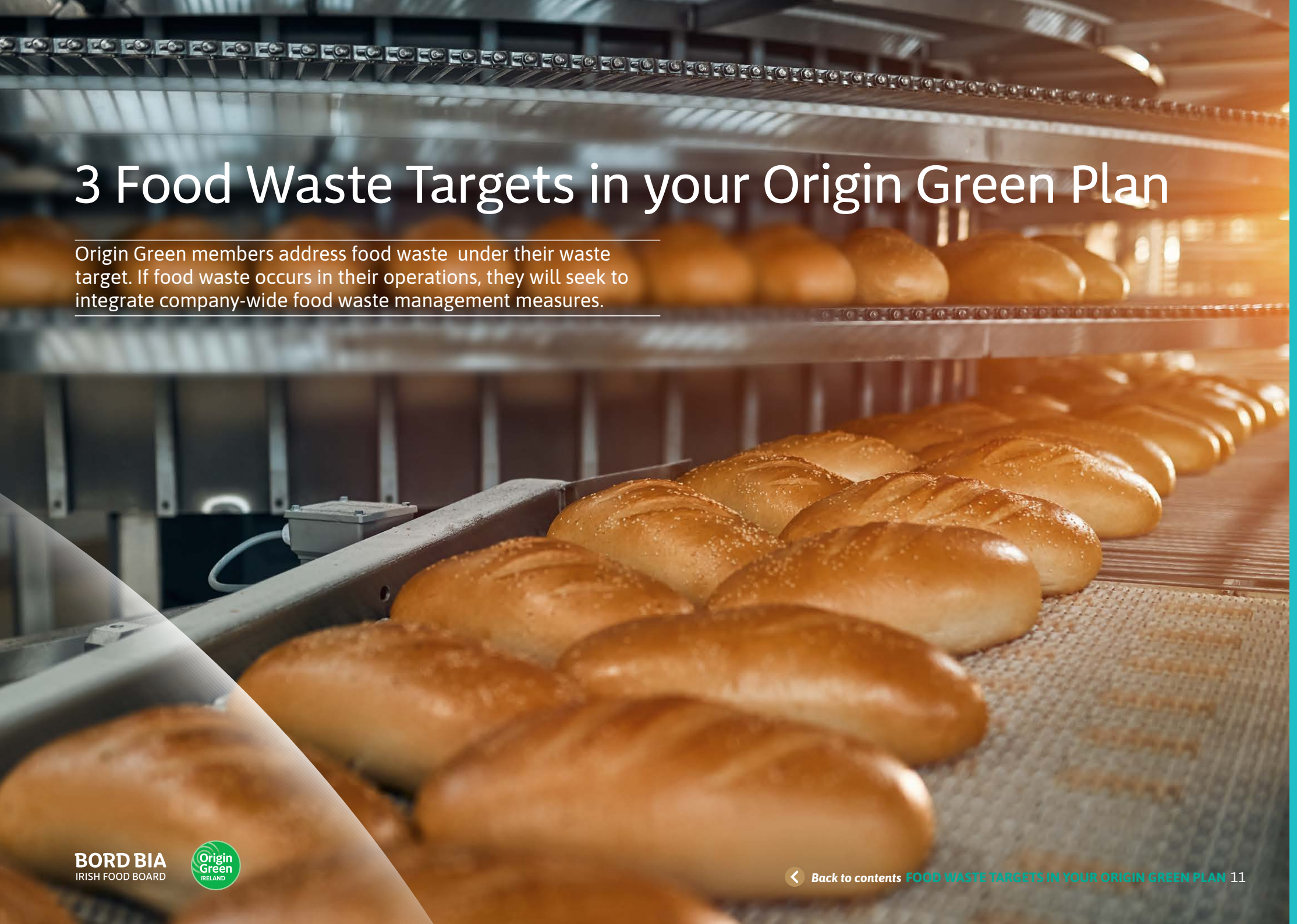
This guide considers food 'waste' to be any material output from a process which does not add value to your products. This differentiates it from food co-products (something produced as a result of your process which also has value for you) and by-products (something someone else uses to produce value).

2.1 Scope your Understanding of Food Waste

A critical step is to begin to identify some basic aspects of how and where your company generates food waste. A suggestion of questions to ask yourself when starting to consider your company food waste management are detailed in Table 1.

Table 1: Starting Points for Considering Food Waste

Materiality	**What is your primary business?** *Are you a producer, manufacturer, retailer or foodservice operator? Do you operate B2B or B2C? Is the business model based on scale or niche products?*
	What is the true value of food waste costing your business? *How much more ingredient(s) do you have to buy over what is in your products? What does disposal cost your business? How much do you pay staff to manage waste food? Do you have to resource specific cleaning or storage systems?*
	Is waste considered a problem in your sector? *Some food sectors have a greater exposure on food waste than others – what are your customers, competitors, and stakeholders saying?*
Understanding	**Where is your food waste coming from?** *Is the main source of your food waste from direct operations (manufacturing, warehouses) or preparation waste?*
	What is your food waste composed of? *Is your food waste composed of inedible parts, or edible parts which have not been utilised? What are the key food waste food items?*
	What are the stages where food waste occurs? *Does most of your food waste occur during purchase, storage, or specific stages of preparation of food?*
	What are the current destinations of your food waste? *Anaerobic digestion/ composting, landfill, redistribution for human consumption, sent for animal feed etc.*
	What are the types of avoidable food waste? *Was any of the food discarded edible at the time of disposal, e.g. overstocked perishables? Avoidable food waste can be redistributed or re-used.*
Management	**Are you currently measuring your food waste?** *Consider measuring process waste, preparation waste and spoilage separately for an idea of which waste to tackle for most significant change. Is there existing data that can be used to quantify food waste?*
	Are there currently any measures in place? *Do you use technology to prevent or recycle food waste? Are you currently engaging with staff to reduce food waste?*
	Are you collaborating with your value chain? *Can any wastes be eliminated by changing ingredient specifications? Are any materials used for other products, either by you or someone else?*



3 Food Waste Targets in your Origin Green Plan

Origin Green members address food waste under their waste target. If food waste occurs in their operations, they will seek to integrate company-wide food waste management measures.

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3 Food Waste Targets in your Origin Green Plan

Having gained a basic understanding of the significance of food waste management to your business, and the impacts it has on the environment, you should be positioned to start understanding the scale of management measures you may wish to implement.

Origin Green member companies work in a wide range of foods, and at a wide range of scales. As such it isn't possible to provide a one size fits all approach for food waste management, but the following techniques should help you tailor a programme that works for your organisation.

3.1 Setting SMART Targets

When identifying any set of improvement targets, a wide range of factors may come into play. The total production, the amount of food waste to begin with, the amount of resource you must put into implementing and monitoring the programme, and also the level of technology and efficiency of production processes may well impact the scale of your project and your targets.

In any case however, no matter what targets you set, you should follow the S M A R T acronym. This common and highly effective approach encourages targets to be set appropriately and better enables the achievement of positive outcomes.

S **Specific.** The target should be defined as clearly as possible, using simple terms and directed to significant food waste generation areas and/or areas of potential significant improvement. Good targets are unambiguous.

M **Measurable.** The means of monitoring (manual or automatic weight readings, waste bills) should be identified and the unit of the metric confirmed e.g. are you measuring in kilograms, tonnes or litres etc. in the absence of weights and normalising by kg, tonnes, litres of production output. This unit will be the basis of the established baseline. Consider how food waste savings from an implemented initiatives could be calculated to understand its effectiveness and whether further roll out or review of the initiative is necessary.

A **Achievable.** An improvement target should be based on a sound understanding of your current solutions and the potential for change. The business should consider setting ambitious targets that motivate and inspire the company to demonstrate leadership in their sector however this should be balanced by what is achievable. Where practicable the following approach is recommended to set an achievable target;

- *Identify potential initiatives across the company discussing opportunities both behavioural and engineered solutions (process controls, equipment maintenance/servicing, food processing equipment upgrades) where food ingredients are used and food waste created. Include representatives involved with production/ operations, facilities/maintenance, purchasing/finance, trusted suppliers of equipment etc. and consider how you capture 'ideas' from the wider workforce e.g. a suggestion box in the canteen.*
- *Calculate potential food waste savings from these proposed initiatives making note of estimates, assumptions whilst being conservative with savings where uncertainty lies.*
- *Discuss with management what the priorities are e.g. no/low cost initiatives in year 1, capex initiatives in year 2 with a simple payback within a desired period or larger capex investment projects where life-cycle cost analysis has been applied to obtain the true benefit over the lifetime of the change/asset.*

3 Food Waste Targets in your Origin Green Plan

3.1 Setting SMART Targets *continued*

- *Total the potential savings of all proposed initiatives for the plan to calculate your Plan food waste target. Then consider annual milestone food waste targets based on the likelihood of implementation of the initiatives across the Plan period.*
- *A quantified target such as a 20% food waste reduction normalised against production output (kg food waste/tonne product) over a 5 year plan period could either be split into 4% reduction each years one to five or based on planned initiative implementation e.g. 8% year one, 6% year two, 2% years three, four and five.*

It is not recommended to set an improvement target without a reasonable understanding of the initiatives you will undertake and how they will contribute to achieving the target.

R **Responsibility.** Assigning responsibility is critical to drive progress, reporting and changes where the target and/or initiatives are not being delivered as planned. Staff without sufficient authority or resources to drive change cannot be expected to achieve targets assigned to them. Delegating a responsible person per initiative is a requirement of the Origin Green programme. If the company are lacking in available resource a training initiative may help resolve this issue.

T **Time-bound.** Every action in the business should have a deadline. Progress towards a goal will be more consistent and likely if those responsible for it have a clear sense of the deadlines against which their progress will be assessed. Milestone targets for each plan year are expected to ensure appropriate reporting and where necessary, corrective action is taken to get the target on track or revised. What is considered a reasonable amount of time to complete an initiative to balance resource capacity but drive improvements sooner rather than later.

3.2 Review Processes

A starting point to developing food waste targets for your business should be gathering data for the amount and categories of food waste that is currently being generating within operations and the stages where they arise. A food waste audit can be conducted to measure the magnitude and causes of food waste, but your business may require better data before setting targets. You should consider scoping the project as you would any other business improvement project to describe the process and determine the resources required.

Creating a waste map can be useful at this stage to identify where waste is arising and where to focus attention. It can also include aspects such as components contributing to the cost of your waste – e.g., inputs and labour involved to the point of waste creation. A waste map helps to see potential locations for your monitoring stations to mark for gathering waste-related data.

Different approaches to gather the targeted data can then be zeroed if based on your targeted waste hotspots. A food safety map, like a HACCP plan, can be a good starting point, as it shows the individual stages that need to be considered. Engaging with staff can provide valuable insights of where and why waste is being produced.

Note: In some sectors there are parts considered inedible which it may be useful to manage separately, e.g. Cat 1 waste or fruit stones. These cannot be recovered for consumption but can be recovered for other purposes.

3 Food Waste Targets in your Origin Green Plan

3.3 Identify Metrics

Once the sources of waste have been identified and characterised, quantifiable data can be gathered by several methods, including installation of weighing equipment, mass balance, or referring to existing data or records. Set the boundaries and scope of your data by identifying the timeframe, material components of waste (edible or inedible), existing destinations of waste and food categories etc.

The choice of measuring process should be appropriate to the amount and nature of the waste and the level of detail required. Depending on the size and output of your business, other aspects to consider might include:

- **level of capital expense,**
- **operational investment, or staff time required to complete the process,**
- **choice of manual or automated methods,**
- **space for equipment,**
- **training requirements and capacity.**

Wastes should, wherever possible, be measured before they are mixed with any other waste to ensure the accuracy of the data. This ensures the 'granularity' of the data – the level of detail available – remains high. Remember that you can always add the waste figures from several processes together to make a meaningful total, but you can't split a single set of data up into meaningful figures for each stream, and this limits the use you can make of it.

Measurements are typically of weight, while volume may be more suitable for liquid wastes such as blood or oils. Counts of a container, for example the number of 1100l eurobins collected, is typically not appropriate because they are not typically filled to capacity on collection leading to possibly significant over-estimations. These measurements are referred to as metrics. Guidance is available on quantifying wastes for different sectors and can provide a suitable start to measuring food waste footprint:

- **The Food Waste & Loss Protocol** methodology provides guidance on how to measure food waste for food processors. The EPA Food Loss and Waste Measurement Protocol is based on this methodology.

- **The Grower Guidance** for measuring in-field food surplus and waste provides a practical guide for food producers.

In many small and medium sized companies, tracking food waste may most easily be accomplished using simple spreadsheets. The most important aspects of a measurement system are that the company can apply it consistently and understand the data produced.

Companies should aim for accurate and consistent data. It is often better to be consistent with a known level of error than to change a process and have no historical data to compare against.

3 Food Waste Targets in your Origin Green Plan

3.4 Set a Baseline

A baseline is the foundation of your target. It is the first set of data recorded over a full reporting period. Origin Green plans report over a one year period, so your baseline should be collected over one year as well. The baseline should also be representative of current, normal conditions, so should be set no more than two years before the start of the plan and after any significant change to the process, like the introduction of a new product range. For example, a plan starting in 2023 might use 2021 data as the baseline due to an incident in 2022 which reduced production for three months.

The EPA Food Loss and Waste Measurement Protocol is supported with a simple spreadsheet workbook that can be used to record and analyse data. Separate versions exist for manufacturing[11] and foodservice[12] businesses. They provide a good first step for a business that wishes to set a baseline for the first time, using information that is typically required for an Origin Green target. Completed annually, these tools allow a basic analysis of performance.

3.5 Understand Progress with Key Performance Indicators

Once you've identified your waste flows, categories, and destinations you need to organise this data into a useful set of information.
To make sense of your data, it is essential that it is presented clearly and simply, and the relevance to business objectives is made clear.
The process of sifting and combining the data to find the most useful information leads to the identification of **Key Performance Indicators** (KPIs).

A KPI should be simple, straightforward, and easy to measure, and an effective KPI is one that supports decisions without prompting additional questions. KPIs often, but not exclusively, relate two different metrics. The most common version of this is normalisation, where a metric for food waste is compared to a metric for production, such as total output.

You should aim for a KPI that:

- Relates to the **largest source of waste**, or the one with the greatest negative impact.
- Is **sensitive** enough to reflect performance on useful timescales – a KPI that enables a performance improvement analysis after one month is better than having to wait six months to find out if an improvement project was effective.
- Is clearly aligned to a **business objective**.

SOME EXAMPLES OF KPIs

Total **weight** of food waste per tonne of output, in kg/kg or kg/t.	As performance improves these metrics **reduce**, e.g. from 50kg food waste/tonne of production to 35 kg food waste/tonne of production.
Total **percentage** (of weight) of materials purchased which are converted into saleable product (percentage conversion rate).	As performance improves these metrics **increase**, e.g. from 85% to 93%.
Percentage of **total food waste** which is **redistributed** or diverted from disposal (percentage recovery rate).	

3 Food Waste Targets in your Origin Green Plan

3.6 Look Outside your Scope to Find Further Improvements

The internal review and performance monitoring process is very much part of the Plan Do Check Act cycle for continuous improvement, well known from ISO standards. They will help you to identify ways of reducing the amount of waste arising internally from the processes you control. However, in order for the food and drink sector in Ireland to achieve the aims of UN SDG 12.3, the national targets for waste or the EPA Food Waste Charter, businesses must consider the waste they can influence but is outside their direct control.

Looking beyond the boundaries of your own site and processes, exercises can be conducted throughout the supply chain. These are called Whole Chain food waste reduction Plans (WCPs), and mirror the Farm to Fork strategy. WCPs may result in reviews of your product design or opportunity for collaborations with suppliers and customers to reduce waste arising in their stages of the value chain. WRAP have developed a **WCP Toolkit** to provide guidance on completing a WCP.

Conducting a WCP can be managed like any other business partnership and reported through your Origin Green plan as any other target.

3.7 Food Waste Management Hierarchy

Once waste KPIs have been identified, and baseline data is being collected and categorised, opportunities for improvement can be identified and prioritised. A food waste management hierarchy prioritises the opportunities identified by a company to reduce their waste. To begin optimising processes for waste reduction, businesses can start with different approaches. The food waste hierarchy ranks waste management options from most to least preferable in terms of the whole-life impact they have, i.e. how much they reduce waste at all stages of production, not just the one under examination.

Preventing food waste should start at the purchasing stage and should be considered at every stage thereafter.

To develop a food management plan for your business there might be other factors to consider such as which options meet your strategic goals and how viable they are economically and technically. Solutions can be prioritised based on implementation costs, efforts and benefits associated. An improvement plan can be created once the most appropriate solutions are identified.

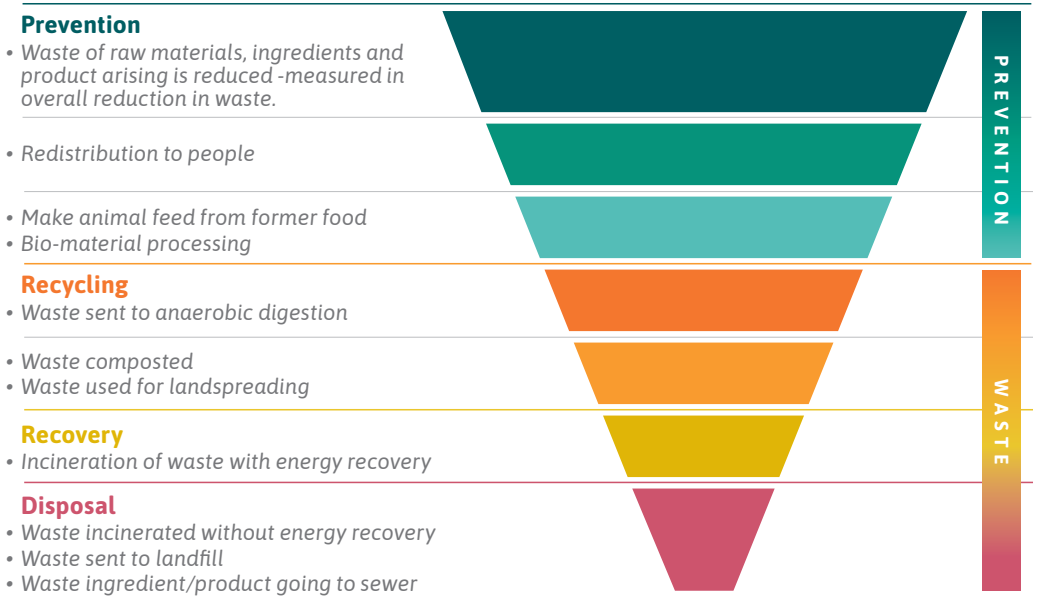


Figure 2: Mitigation Hierarchy, adapted from https://www.zerowastescotland.org.uk/sites/default/files/ZWS1557 EEBS HAFS food waste guide.pdf

3 Food Waste Targets in your Origin Green Plan

3.7 Food Waste Management Hierarchy

continued

Following the setting of KPIs, actions may be developed based on the Waste Hierarchy aimed at them. By monitoring the progress of targets and KPIs you can improve performance continuously and continue to look for further food waste prevention opportunities. It may be required to manage other non-food waste KPIs to implement selected solutions e.g., on-shelf availability, monitoring of pack sizes, logistic costs, staff costs etc.

Tracking food waste will depend on the quantification methods opted for and can involve maintaining records of waste bills, inventories, and purchase invoices etc.

3.8 Key Considerations from a Management Perspective

Does the targeted change align with the business strategy?
For instance, is it better to try to undertake a project to divert a by-product into New Product Development (NPD), in-house or is it more effective to look for a buyer? Environmental sustainability is important but the social and economic expectations of the business must also be considered.

Are there any constraints to how the process can be managed?
Do you have space to change the process, what waste management options/contractors are available to you?

Who will be responsible for delivering the project?
Do they have the required authority, competence, and resources (financial, human, and/or materials) to manage the target and deliver on associated initiatives?

Who will be responsible for monitoring the project?
Will you do this in house, or will you require a third party, such as a process engineer?

How will the change be managed, especially if the change is part of a wider programme?
What internal and external resources are required? Have the effects been discussed (change management) across the business to look for potential risks or related opportunities? Are there particular scheduling commitments or deadlines to be met?

What resources are required to support the project after it's been initially implemented?
Will you require particular or specialist tools? How will you report for food waste outside your operational boundaries/in your supply chain? What are the present and projected equipment you will use?

How will you engage staff and management with the target?
How will you motivate staff and encourage ownership of the target and maximise the chance of success?

Who outside the business needs to be involved in the target or have the results communicated to them? Do you need to consult certain departments, suppliers, regulators, or other stakeholders to ensure the achievement of the target, or could you draw on their input and expertise as partners?

3 Food Waste Targets in your Origin Green Plan

3.9 Make Projections to Monitor Progress

It is important over a multi-year improvement project that you can check progress regularly. This helps you keep focused and identify if you need to make a course correction. It also allows you to understand and celebrate achievements made, which can help with motivation and engagement more widely.

Understanding the impact of your initiatives is key to reducing risk in the plan. By looking at the expected impact of the initiatives you intend to take forward you can make reasonable projections of performance for each year of the plan. These projections are made based on the baseline data and your process review and help to ensure that your target is achievable. If the sum of the impacts of the initiatives identified is less than your target improvement, you will need to actively seek additional initiatives as the plan progresses. This doesn't mean your targets should be based only on known initiatives – Origin Green plans should be ambitious – it simply means that you understand the challenges early and can better plan for them.

3 Food Waste Targets in your Origin Green Plan

3.10 Origin Green Food Waste Examples

CASE STUDY

East Coast Bakehouse

Change management lessons

East Coast Bakehouse opened in 2016 making contract and own-brand biscuits. The company recorded a 71% reduction in food waste generation up to 2020. In 2021, the company scaled up the business and transitioned from one production shift to two. Unfortunately the key food waste metric, tonnes of waste per tonne produced, more than doubled during this change.

The company investigated and found that approximately 80% of the waste was arising in the packaging stage, but that it was as a result of out of specification product that didn't fit the packaging. This was going to waste, but also causing other problems such as factory hygiene issues and reducing the availability of the packaging equipment for in-specification products while it was cleaned.

The company carried out an investigation and found that the key issues encountered were:

- The transition could have been planned more effectively, with the cost of quality, resource requirements, and length of time required all underestimated.
- The experienced single shift was split into two, and the new staff incorporated did not receive effective training quickly enough to act with sufficient competence. Issues such as continuous control of oven settings were identified. Not enough resource was given to training and the systems in place relied heavily on operator experience without sufficient documented back up or management feedback.
- Communication along the production line (both within manufacturing and between manufacturing and packaging) broke down under pressure. This meant that issues that could be managed effectively were not and resulted in avoidable losses.

To address these issues the company has introduced an improved training system with a training mentor for key processes and a shift management layer added to ensure there was always direct oversight. East Coast Bakehouse have also looked at the workplace culture and are working to incorporate no-blame reporting and other communications improvements, in addition to some LEAN processes.

Case Study 1

3 Foodservice

3.10 Origin Green Food Waste Examples

CASE STUDY

ABP Food Group

Continual improvement and supply chain control

ABP Ireland is part of ABP Food Group, one of Europe's leading food processors. Over 13,000 farms supply the company's seven abattoirs. The company have been able to move many of what were waste streams up the value chain by careful and data-led management of production. ABP have a target to reduce food waste by 50% by 2030, in alignment with the wider food and beverage sector and their retail partners, and achieved a 12% reduction between 2020 and 2021.

ABP has identified opportunities within its production facilities to reduce food waste. All processes are monitored to identify the root causes of potential losses and systems are put in place to minimise food waste. This selective "Target, Measure, Act" approach has delivered significant reductions across ABP facilities.

Key elements in the success include:

- **Identification of customers** – ABP do not produce a product that does not have an immediate customer.
- Improvements are "**metric-driven**" – the company's systems provide a detailed set of metrics and KPIs for each process and product.
- **Activity based** accounting – the company understands very accurately what each potential product will cost to produce and can quickly determine if it more or less value than an alternative use for the materials.
- **Staff training** is critical to protecting the value of by-products. All process outputs are treated with the same care.

Case Study 2

CASE STUDY

Meade Farm Group

Waste Valorisation

Meade Farm Group is a zero-food waste facility due to the successful implementation of a management strategy that channels impaired produce to processing/peeling lines, community foodbanks, stock feed, and co-products, like starch production. The company has been able to reduce the environmental impact of the operation by reducing wastage and ensuring that any waste has an end-of-life destination that maximises the value throughout the supply chain.

Meade Farm Group were aware that approximately 30% of the crop brought in was being lost before, or during, production, so the company found a new prepared foods division to attempt to valorise these wastes. As a result, the company began producing large volumes of low value grey starch from peeling potatoes. After dehydration of the potatoes and other exercises to identify potential products for the animal feed market proved commercially unviable, Meade Farm Group refocused and increased the investment to produce a food-grade native potato starch, which has been a successful venture. The new product creates a revenue stream but also supports the value of the company class 1 products and creates extra value for the producer.

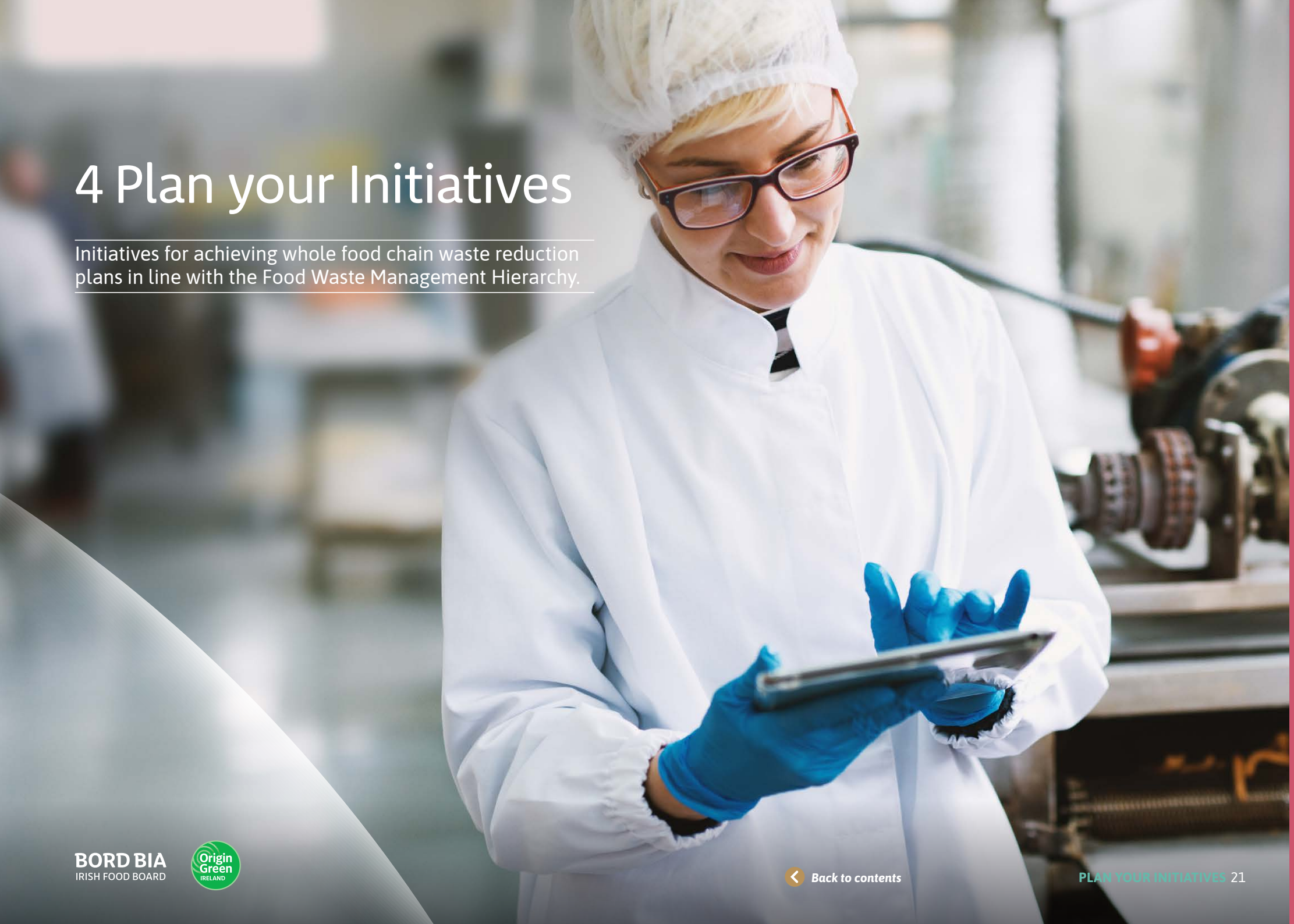
Key elements in the success include:

- **Recruitment of an R&D specialist** with the skills to develop and manage the new process.
- Acceptance of a **longer return on investment**. The original project had a much lower Capex but was not viable – the realisation of the new product required a longer view.
- The identified market was already well served but not by an Irish company, so there was opportunity to offer manufacturers and consumers **import substitution**.
- **Collaboration with other interested parties** to produce the volumes needed and identify new opportunities for waste from this process.

Case Study 3

4 Plan your Initiatives

Initiatives for achieving whole food chain waste reduction plans in line with the Food Waste Management Hierarchy.



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4 Plan your Initiatives

Prevention

Undertake whole chain food waste reduction plans.
Procurement agreements. Engagement with suppliers to identify opportunities to reduce or eliminate incoming produce which is not required by your process.
Grade produce on acceptance. Effective grading allows more time for redirection to other users.
Plan production to reduce opportunities for waste, e.g.: · Make to stock rather than make to order were possible, · Just in time production to extend shelf life, · Reduce the number of changeovers where possible.
Employ lean-based thinking. Design out waste by improving process, e.g. redirect production line to reduce the distance to the chiller may reduce the potential for spillage or contamination.
Engage your workforce. Quality increases and waste decreases with well trained, motivated staff. They may even be able to offer insights which lead to new opportunities. Integrate with production, quality, or environment meetings.
Resize portions. Resizing portions to match the average weight of cuts of meat or fish and prevent offcuts.
Reduce changeovers. Increased length runs or a reduction in the number of SKU can reduce the amount of waste from the start and end of production runs.
Include potential wastes under hygiene control systems. This preserves the opportunity for them to be reused or redistributed as by-product, but if not controlled they can only be waste.
Conserve surplus production. Chilling or freezing surplus to allow it to be introduced into future production runs may be appropriate for your products.
Internal traceability. Capturing and using data about product journey can unlock previously discarded material to be used, e.g. ingredients in damaged packaging are assessed in a segregated area and if necessary, possibly reworked before going into production.
Standardise accuracy and tolerance on measuring equipment. Ensuring that measuring systems early in any process are producing the same results as the one at the end can reduce the amount of quality rejects.

4 Plan your Initiatives

Prevention *continued*

Manage and service equipment. Operational availability, quality, and efficiency may be increased by an enhanced service schedule, or by quickly remediating faults or realigning interfaces between different pieces of equipment. Include packaging equipment as well.

Modify equipment (where safe to do so) to be more easily serviceable, e.g. chutes that can be rotated to make blockages easier to clear allowing product to be recovered.

Install catch-plates and belt guards under and around equipment to intercept product that may be ejected from the production line. Although also manage and service equipment.

Place filters at drain points for any water-mediated process, e.g. gutting fish. This material may be reused to an internal product – respecting HACCP systems and regulations – but even if not can be more efficiently salvaged for redistribution or recovery.

Agree cosmetic standards with customers (where possible) that include some variation or have a separate process for lower – but still class 1 – specification products.

Anticipate seasonality. Quality rejects for many fruits and vegetables increase substantially toward the beginning and end of the growing season. While this may not be avoidable, it can be accounted for in production, planning, and preparation made to maximise value.

Modified Atmosphere Packaging. This can help to extend shelf life of certain products.

Redistribution

Feed humans. Edible food waste, for example quality reject for aesthetics or short date unfilled orders, can be redistributed to organisations such as Fare Share and FoodCloud.

Feed Animals. Note that this may require registration as a feed supplier.

4 Plan your Initiatives

Recovery

New Product Design. New products from ingredients which were previously considered waste.

Make into other products. Many production wastes can be a feedstock for another process, for example surplus or quality fail bread could be a feedstock for a microbrewery.

Valorisation. Many wastes contain valuable materials. For example, various fruit stones are the feedstock for production of activated carbon. Fruit, cereals, and fish are good candidates for valorisation.[13]

Depackaging systems. Final product that fails quality inspection is removed from packaging before disposal, allowing better recovery of the individual elements.

Waste controls. Colour coding bins to help keep wastes separate increases the opportunity for recovery.

Disposal

Engage with potential contractors to identify opportunities and different disposal routes.

Anaerobic Digestion. The organic content of the waste is recovered into a soil additive in a large reactor that captures methane and heat to generate electricity.

Composting. The organic content of the waste is recovered into a soil additive.

Land spreading. Some liquid wastes can be spread directly to land where they add nutrients to the soil.

Form groups. Outside large cities the waste management options may be limited, but businesses working together may be able to drive the development of new services or offer a viable collection route to another contractor.

Options for redistribution or recovery may become apparent through your engagement with the local community or other businesses in your area, and these would then also support the Community Engagement target within your Origin Green plan.

5 Foodservice

Waste arising in the foodservice and hospitality sector is materially different from that in manufacturing but also contributes a significant amount of food waste generated annually.

5 Foodservice

Waste arising in the foodservice and hospitality sector is materially different from that in manufacturing but also contributes a significant amount of food waste generated annually. This not only increases the environmental impact of the sector, but also has a real financial impact. The EPA estimated that foodservice waste amounted to over 178,500 tonnes in 2020.[3]

20% In 2013, the waste charity WRAP found that almost ***of the total weight of food purchased*** *by foodservice businesses ends up as food waste* – with roughly **75% of this being classified as avoidable food waste**.

On average, WRAP found that spoilage accounts for 21%, plate waste accounts of 34%, and food from preparation accounts for 45% of total generated food waste. These can be tackled through best practice techniques such as food waste measuring, monitoring and targeting initiatives, portion size reviews, controlled stock take, and ordering processes.

A study by the EPA of 45 commercial hospitality businesses in Ireland, between 2016 and 2018,[14] found that approximately two-thirds of food waste is avoidable, with hotel functions producing the highest fraction of avoidable waste at 87%. The sources of waste observed in this study were similar to that found by WRAP.

The EPA have developed guidance[15] for the hospitality sector. The four step Pathway aims to use information you already have to first estimate your food waste in a consistent manner. This will allow you to track your performance over time, to compare your business with others in your sector and identify how you can reduce food waste and improve your bottom line. As an indicative figure you can multiply your annual food waste tonnage by 3,000 to get a cost of purchasing the avoidable fraction of your food waste.

When considering the financial impact of food waste, waste management is typically the main consideration for foodservice businesses. However, it is important to highlight that this accounts for just a small percentage of the total cost. The true cost of food waste includes the cost of ingredients, labour, energy and utilities, administration, and consumables.

Further resources and guidance for reducing food waste in the hospitality and foodservice sector can be found in the appendices.

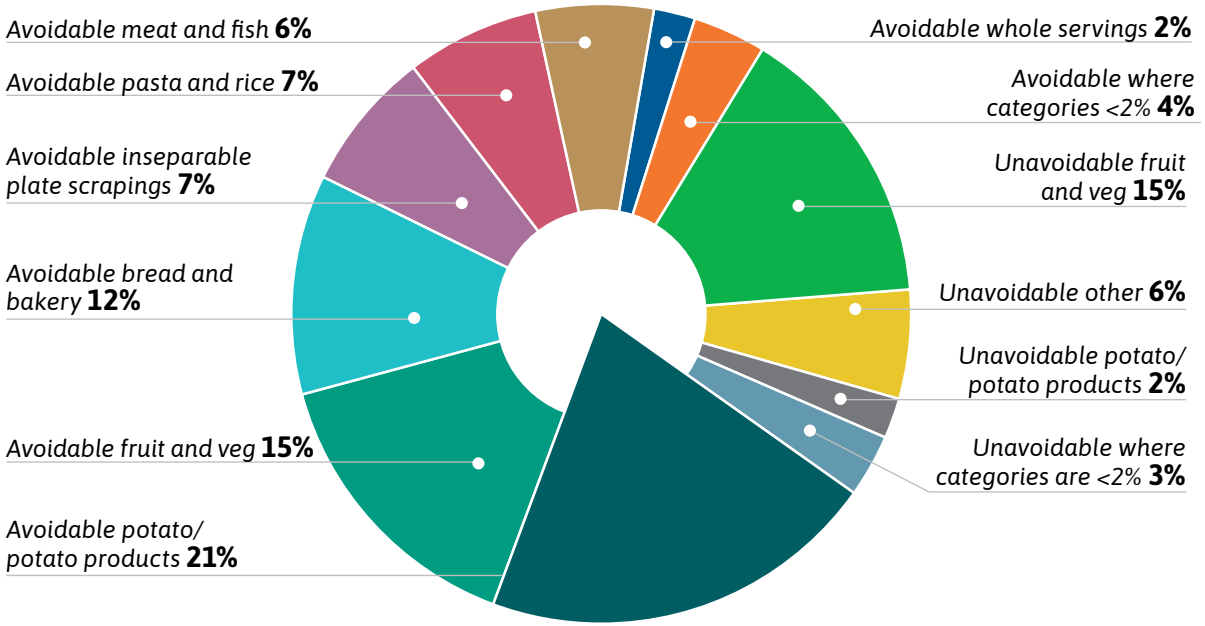
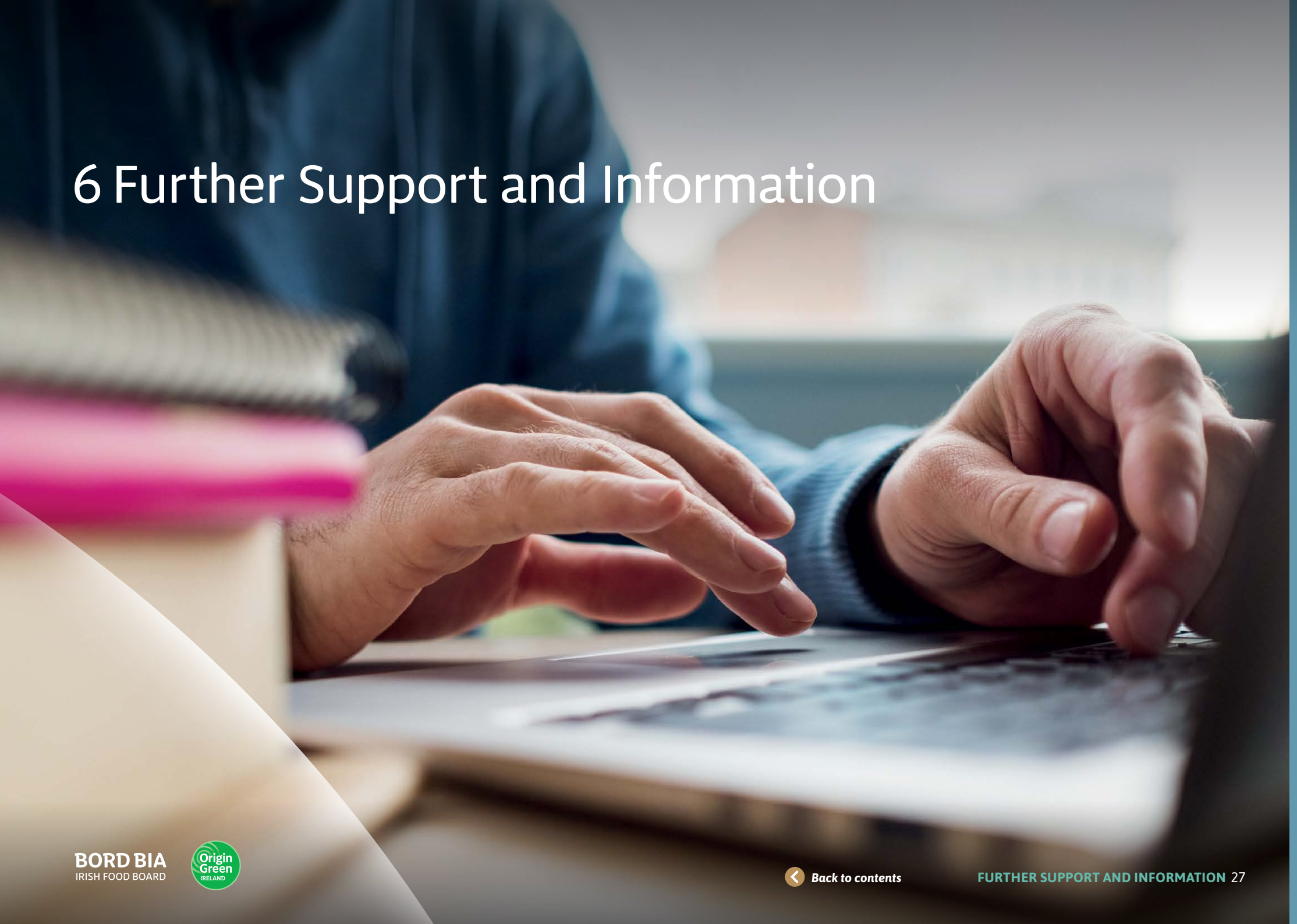


Figure 3: sources of waste in the UK foodservice and hospitality sector, from WRAP, 2013.[16]

6 Further Support and Information



6 Further Support and Information

Environmental Protection Agency, Ireland
https://www.epa.ie/our-services/monitoring--assessment/circular-economy/food-waste/

Waste & Resources Action (WRAP)
https://wrap.org.uk/

FoodCloud
https://food.cloud/

The Sustainable Restaurant Association
https://thesra.org/

The Food Waste Charter
https://foodwastecharter.ie/

Sustainable Hospitality Alliance
https://sustainablehospitalityalliance.org/about-us/

The Carbon Trust – Food Preparation and Catering
https://www.dcproducts.co.uk/documents/carbon_trust_food_preparation_and_catering-2.pdf

Tools

Food waste review sheet –
https://wrap.org.uk/resources/campaign-assets/your-business-food-manufacturing-food-waste-review-sheet

Trial Tracking Tool –
https://supplychainanalysis.igd.com/news/news-article/t/trial-tracking-tool/i/17177

Wrap Hotspot identification tool
https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwrap.org.uk%2Fsites%2Fdefault%2Ffiles%2F2020-10%2FWCP-toolkit-Hotspot-identification-tool.xlsx&wdOrigin=BROWSELINK

WRAP Food Waste Reduction Road Map
https://wrap.org.uk/taking-action/food-drink/initiatives/food-waste-reduction-roadmap

WRAP Whole Chain food waste reduction Plan
https://wrap.org.uk/resources/tool/whole-chain-food-waste-reduction-plan-toolkit#:~:text=WRAP%20and%20IGD%20are%20inviting,UK%20Food%20Waste%20Reduction%20Roadmap

6 Further Support and Information

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4 Champions 12.3 (2022). Target 12.3. World Resources Institute.
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Available at: www.fao.org/3/a-bb144e.pdf

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Available at: https://www.bordbia.ie/industry/insights/global-sustainability-insights/

10 EPA (2022). Food Waste.
Available at: https://www.epa.ie/our-services/monitoring--assessment/circular-economy/food-waste/

11 EPA (2022). Food Waste Protocol for Manufacturing Sector
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12 EPA (2022). Food Waste Pathway for Hospitality Sector
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Available at: https://foodwastecharter.ie/wp-content/uploads/2019/07/CTC-Research-Report-EPA-282.pdf

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16 WRAP (2013). Overview of Waste in the UK Hospitality and Food Service Sector.
Available at: https://wrap.org.uk/sites/default/files/2020-10/WRAP-Overview%20of%20Waste%20in%20the%20UK%20Hospitality%20and%20Food%20Service%20Sector%20FINAL.pdf

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