



The Origin Green
Ambassadors Global
Insights Reports 2021

THE VALUE IN WASTE

Robyn Page-Cowman
& Pauline McKeon



BORD BIA
IRISH FOOD BOARD



Origin Green Ambassador Programme

Never has sustainability been so top of mind and globally important, and it is this convergence that has opened some important discussions among the global food industry. Bord Bia's Origin Green Ambassador programme is designed to open and facilitate these conversations and the role of Irish sustainability initiatives in export markets.

Created in 2013 with the Michael Smurfit Graduate Business School, this programme has at its heart two interlinked pillars: one focused on education in the sphere of Business Sustainability, and the other on partnership with major international food companies. The format of this 23 month programme towards an MSc in Business Sustainability ensures that high quality executives are placed in many of the leading Global Food & Drink companies, honing their skills while engaging on live sustainability projects. Working to embed sustainability best practices, strategic planning, refine policies and bring new thinking to their placements.

The Ambassadors are the connection between Ireland's Origin Green programme and its associated partner organisations who are world leaders in the global food industry. Over two years, modules focus on accelerating growth, sharpening business strategies, and anticipating change in an ever transient global economy. In partnering with major international food firms, these ambassadors can then build on an awareness of established Irish initiatives across key target markets.

In this series of global insights reports, the Ambassadors bring you their insights on some of the most pressing sustainability issues and opportunities facing our industry.



Robyn Page - Cowman

Robyn had her first placement working for Waitrose in their London HQ where she developed and delivered their food waste and surplus strategy. Her last two 2 placements were with Danone in London, developing carbon neutral roadmaps, developing insights and recommendations on circular innovations for their brands and developing their communication position for their Regenerative Agriculture & Biodiversity strategy.

<https://www.bordbia.info/ucd-2021/>



Pauline McKeon

Pauline spent her first placement in Amazon in London as Sustainability Advisor to the Packaging Manager for Amazon own brand. Her second and third placements were with Sainsbury's London working as part of their sustainability team on water stewardship, leading water conversation for COP26 "Water is the New Carbon", livestock carbon action plans and net zero pillars.

<https://www.bordbia.info/ucd-2021/>

Introduction



Living in lockdown made many consumers connect with the food they had and the food waste they were creating. A study by WRAP in the UK found consumers reduced waste due to having more time to prepare and plan meals, but also because more were feeling an acute sense of food 'insecurity'. The pandemic drove constraints in our food supply chain resulting in a lack of availability. We also saw a spike in poverty levels where due to the pandemic's impact on our economies. In Ireland, FoodCloud reported a 70% increase in the number of people seeking food support from March to June in 2020. As a result, businesses, consumers, investors and governments are more engaged with the business case behind reducing food waste - especially as this increases profitability where food waste costs the Irish industry €2 billion a year post-farm gate, and Irish consumers up to €1,000 according to the EPA. Moreover, food waste has the potential to open up huge commercial prospects for the Agrifood sector through the circular economy principles and innovation this unlocks in our waste streams.

The burning platform: What is food waste?

Food becomes waste when it is no longer deemed edible for human consumption, due to the “decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers” [\(FAO\)](#). The problem is that we are wasting too much food; a full third of all the food we produce globally ends as waste and much of this wasted despite still being edible for human consumption [\(FAO\)](#).

- Production of food which goes to waste requires 1.4 billion hectares of land globally; equivalent to 28% of the world’s agricultural area – or 200 Irelands [\(EPA\)](#).
- Food waste is responsible for 6% of global greenhouse gas emissions (GHGs) which cause climate change [\(Our World in Data\)](#). If global food waste was a country, it would be the world’s third largest emitter, after the US and China. [\(FAO\)](#)
- A study in 2018 found that food production accounts for 26% of GHGs and 24% of these emissions come from food that is lost in supply chains or wasted by consumers [\(Our World in Data\)](#).
- Despite all this food wastage, 8.9% of world’s population are food insecure (i.e. don’t have access to three meals a day) including 9.1%, or 1 in 11 people, in Ireland [\(Foodcloud\)](#).
- Finally, food waste costs. EPA Ireland estimates food waste costs the Irish industry €2Bn a year (post farmgate) and Irish households between €700 and a €1,000 every year. [\(EPA\)](#)

How can business address food waste?

The UN's Sustainable Development Goal (SDG) 12.3 outlines a global commitment to "halve food waste by 2030." This target recommends businesses follow the food waste material hierarchy to ensure all edible food stays in the human supply chain and to responsibly dispose of food waste i.e. avoid landfill. The Irish Government and EPA have aligned with this, and as Origin Green members, you will be tracking food waste under the UN's International Food Waste & Loss Protocol methodology (FAO). Foodcloud is the largest food redistribution charity in Ireland. Any food which is edible should be donated as surplus to Foodcloud to help reduce food waste. If your business has a global footprint, Foodcloud can connect you with their global food-banking partners.



Source <https://www.origingreen.ie/who-is-involved/partners/foodcloud/>

Insights: Leadership in Food Waste globally

Businesses, investors, governments and consumers are increasingly concerned with and engaged by the environmental, social and profit impact of wasting food.

1. Tesco is a global leader in its food waste reduction plans; they are helping coordinate industry action and alignment to the UN Sustainable Development Goal (SDG) 12.3 through the UK's waste, resource and action programme (WRAP)'s Courtauld Agreement and the Global Consumer Goods Forum ([ESG Clarity](#)). In 2020, Tesco worked with over 70 of its key suppliers globally to publicly report on their food waste data and actions to reach the UN SDG 12.3 ([Resource](#)). Tesco And Tesco has also worked with WRAP and the UK government to pass legislation making the reporting of food waste mandatory for all UK food businesses by end of 2021 ([Resource](#)).
2. Fund managers and investors are increasingly concerned with how food waste reduces profitability. 1 billion tonnes of food are wasted per year – equivalent to \$1trillion in economic losses. Businesses are being asked to track their food waste reduction data and targets within their environmental, social and governance metrics for shareholders ([ESG Clarity](#)).
3. President Xi Jinping spoke in August 2020 outlining the “shocking and distressing” levels of food waste in China post-pandemic, and the risk this posed to China’s future food security. “Waste is shameful and thriftiness is honourable.” Local authorities immediately implemented food waste reduction programmes as part of ‘Operation Empty Plate’; legislation was implemented in December 2020 recommending large fines for businesses that enable or promote wasting food ([Guardian, 2020](#)).



<https://sdgs.un.org/goals/goal12>

Key innovations globally on food waste:

1. Industry Alignment

The UK's Waste Resources Action Programme (WRAP) and United Against Food Waste Netherlands are two industry-wide initiatives coordinating action on food waste from all retailers in these countries, requiring reporting from suppliers and collaborating with them on food waste innovations ([UNEP, 2021](#)). As of 2021, the UK is the only country on track to reach the UN's target by 2030, with 27% a reduction in food waste ([WRAP, Courtauld Report 2020](#)). Australia, Japan, Austria, Belgium, Denmark, Kenya and NZ have specific food waste reporting legislation for retail ([UNEP, 2021](#)).

All UK retailers and over 250 food businesses are signatories of WRAP's Courtauld Agreement – to reach the UN SDG 12.3 ([WRAP](#)). WRAP's Food Waste Reduction Roadmap ([WRAP](#)) provides open resources on food waste reduction – and Irish businesses can work with UK retailers and customers through WRAP's farm to fork whole supply chain analysis projects on food waste. In 2020, 45 businesses publicly reported data, demonstrating WRAP's food waste reduction resources helped save them collectively £300million of food ([WRAP](#)).

In 2020, WRAP's Meat in a Net Zero World report established a strategic task-force and KPIs for the meat supply chain to address the 380,000 tonnes per year of meat which is wasted; one KPI commitment will measure mortality as a factor of food waste ([WRAP](#)).



<https://archive.wrap.org.uk/food-waste-reduction-roadmap>

2. Consumer

Albert Heijn uses AI to add dynamic pricing based on products at their best before dates to encourage consumer purchasing. ([Albert Heijn](#)).

Mimica adds a 'sensory' touch to this AI technology: consumers touch a label on the pack on pack which visually shows if the product is still edible. ([Mimica](#)).

3. Brand

Rubies in the Rubble turns surplus from farm into new products – for example Ketchup using tomatoes and surplus pears as a substitute for sugar. These products essentially make profit from waste or produce that is paid for by retailers in their supplier contracts, but are left on farm fields and not sold to consumers due to tight retailer specifications on produce. Rubies' is nationally listed in Ocado, Waitrose, Morrisons and Sainsbury's. ([Rubies](#)).

4. Policy

By 2023, the UK and EU want to make segregated recycling mandatory. This will make food waste data reporting mandatory in the UK by 2023, and the EU is hoping to install deposit return schemes across member states by 2030. South Korea reviewed their waste disposal in the 1990s. By 2006, it was illegal to send food waste to landfills, therefore citizens were required to separate waste into designated 'deposit return scheme' bins. Today, South Korea recycles 95% of food waste. ([HuffPost](#))



How is the Irish Agri-Food industry currently addressing food waste?

Food waste has accelerated on the global agenda post-pandemic, either because we saw food still being wasted while food insecurity increased, or because stay at home orders and limits on food availability drove greater consumer awareness of the cost of food waste.

The EPA's National Attitudes Survey in September 2020 found 3 in 5 Irish consumers now actively think about food waste – and 47% of Irish consumers state the financial loss of food that is bought but left uneaten is their biggest concern. 89% of people feel that consumers have a responsibility in preventing food waste [\(EPA\)](#).

- In March 2021, WRAP led the industry's first 'Food Waste Action Week' due to increased consumer interest in reducing food waste with national media coverage, along with all retailers leading in-store and online activity.
- Food cloud's recent consumer-facing campaign mirrored this across Irish media. Both campaigns positively connected the tangible contribution individuals can make to the climate crisis through simple food waste reduction measures; e.g. writing a shopping list or storing food properly in the fridge.
- WRAP's campaign demonstrates the wider impact businesses can make through collaboratively working on a consumer-facing campaign with Foodcloud.



Source: <https://wrap.org.uk/taking-action/citizen-behaviour-change/love-food-hate-waste/key-campaigns/food-waste-action-week>

- Carrefour and Danone are two of many brands to partner with Too Good To Go (TGTG) – a start-up aiming to help consumers reduce food waste. In retail, the TGTG uses smartphones to identify unsold food baskets at low prices for consumers ([Carrefour](#)). With FMCGs, TGTG helps demystify date labelling confusion which drives 10% of Europe’s food waste, through their “Look Smell Taste Don’t Waste” campaign and on pack labels ([Too Good To Go](#)). In 2020, 68% of Irish consumers say they don’t understand best before/use by date labelling, and that this causes them to waste food ([EPA](#)).
- The Global Food Security Index report 2021 outlined how global food security is deteriorating. The Index measures 59 factors on the state of food affordability, availability, quality, safety and natural resources/ resilience in 113 countries. Finland came top for food security and Ireland second ([World Economic Forum](#)). Increasingly, financial industry stakeholders are interested in how their asset groups are addressing ESG and there is an opportunity for Irish businesses to meet these expectations by addressing the social impact of food waste and food security. Foodcloud outlines that 1 in 11 people in Ireland experience food insecurity, and their technology platforms connect the charity sector with food businesses and retailers to redistribute food in Ireland, the UK and globally ([Foodcloud](#)).

These examples highlight the value creation opportunities in food waste. The UN’s Business Case for Reducing Food Loss and Waste ([UN](#)) found for every dollar invested in food waste and loss reduction, companies saved \$14 in operating costs. Investor and lender markets increasingly want to quantify their portfolio resilience by referring to their ESG metrics. We both worked on ESG and TCFD projects on placement; and food waste is a popular data and investment point considered within ESG targets due to this potential 1400% return on investment. ([Advisorpedia](#))





The opportunity: the circular economy

WRAP is a fascinating case study and a missed opportunity in Ireland. However, to address food waste, increase food security and create new innovations, Irish companies could lead in adopting a circular economy roadmap – i.e. move beyond ‘zero waste’ or linear food waste models.

The circular economy has three principles to address waste: Reuse, Recycle and Regenerate. This breaks the traditional linear model to waste: Take, Make, Waste – as seen in the food waste material hierarchy. Instead it looks to reuse products to design out waste, recycle to reduce pollution, and regenerate our natural systems through circular production.

The EPA reports that 55% of Ireland’s food waste derives from manufacturing, processing and farms, and around 40% of Ireland’s food wasted annually occurs at the processing level ([EPA, 2020](#)). These waste streams are, in their raw format, inedible for human consumption, and processed responsibly under the food waste material hierarchy; i.e. they are redirected for animal feed or energy production via waste incineration.

The circular economy model calls this product ‘biochemical feedstock’, that is, ingredients either both edible or inedible which through biochemistry can be innovated or commercialised into new product, ingredients and other value streams, for both food and non-food markets. This process is called VALORISATION (Ellen Macarthur Foundation, [Towards a Circular Economy Report](#)). Supply chain waste provides higher valorisation opportunity because that produce is closest to the farm-gate, therefore has a highest nutrient value, is less likely to be processed and is not yet ‘mixed’ with other waste materials/ packaging/etc (Circular Investment Opportunities [Report](#)).

Circuléire is Ireland's new circular economy platform for the manufacturing industry. They estimate that a circular economy model could yield €2.32billion per year for the Irish economy, not just filling the estimated €2billion cost of food waste, but creating further value every year for the Irish economy. This value is created because materials are constantly reused under the circular economy (**Circuléire**). A number of Origin Green members are key strategic partners of Circuléire's food and drinks pillar, along with the EPA, Ireland's Department of Environment, Climate & Communications, the Department of Agriculture & Food, as well as the EIT Climate KIC group (**Circuléire**).



<https://circuleire.ie/circular-economy-knowledge-library/>



<https://www.epa.ie/>

Valorisation:

The term valorisation is defined as the process of reusing, recycling or composting waste materials and converting them into more useful products including materials, chemicals, fuels or other sources of energy. There is great unrealised potential in the high volumes of discarded food waste and by-products that flow from our farms, processing sites and manufacturing facilities. According to the Ellen MacArthur Foundation in the current Take, Make, Waste, linear system, less than 2% of these valuable nutrients are put to productive use (Ellen MacArthur, 2020). Herein lies an opportunity to find commercial value in “waste” and create whole new products to enter new markets.



Source: https://www.researchgate.net/figure/The-linear-economy-The-take-make-and-waste-approach-of-production_fig2_323809440

Meade Potatoes, an Origin Green Member, provides a great example of how to go beyond the ‘zero waste’ target towards a circular economy:

- Meade Potatoes challenged themselves to go beyond being a “Zero Waste Facility.” Before developing their surplus starch product, Meade were classified as a “zero-food-waste facility” using all surplus as livestock feed and distributing to community foodbanks like FoodCloud. They set out to find higher food value, alternative markets for their surplus. Identifying a gap in the foodservice/catering market for premium quality peeled and chipped potatoes, Meade invested in a peeling line. The by-product from the peeling process was initially fed to beef cattle, as were all surplus-to-requirement potatoes. However, the new installation of a starch extractor uses all these potatoes, giving Meade their food-grade starch to be sold on the open market or used in complementary products.
- Meade’s example demonstrates how analysing your supply chain and waste streams can create markets from product and waste that you already own.

Environmental Benefits

Not only is waste valorisation an opportunity to grow your business, it's also a cost-effective way of meeting your ESG commitments on waste reduction and reduced environmental impacts. Valorising your waste is viewed positively by customers who are looking for supplier initiatives and products that help them meet their sustainability commitments from food waste to reducing their carbon footprint.

Scale

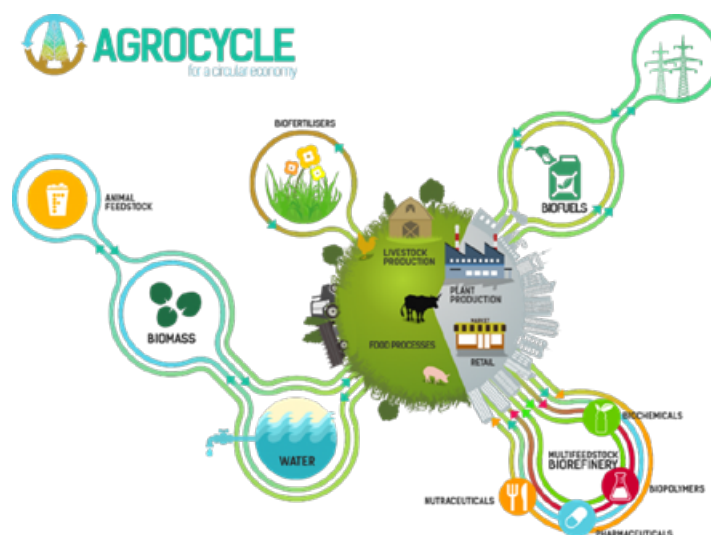
The final benefit of waste valorisation to your business is the ability to address waste within your remit of the supply chain. While on-farm waste may only allow for incremental changes due to supply chain complexities, valorising your direct waste streams is within reach and can help you meet your ESG commitments from the social to the environmental via emissions reductions and food waste reductions. Within your own facilities you can make these changes at scale.

As highlighted by Ellen MacArthur, globally, waste valorisation remains a largely untapped opportunity; maintaining a linear approach to waste. For instance, the food waste material hierarchy still looks at moving waste down the waste supply chain.

Waste in the Irish Agri-Food supply chain provides new value streams for our industry. For example:

- **Dunylie Foods:** exploring 'co-products' from farm waste streams - from food to energy from livestock (**Dunylie Foods**) - to develop new tools for farmers to help reduce both their financial and environmental costs, such as an innovative silage clamp cover made from vegetable puree which adds value and replaces costly plastic sheeting. There is also a novel way to help pig farmers comply with legislative requirements to provide animals with manipulable material while reducing financial and environmental costs. Additionally, a carbon credit voucher scheme is in development for users of low-carbon co-products (**Dunylie Foods**).
- **Arla:** Arla's UK operations use waste from its own farms to power its vehicles and help the UK farming sector reach its net zero goal for 2040. The process also creates nutrient rich, natural fertiliser which Arla farmers can put back on to farms (**Arla**).

- **Biorefinery Glas:** is supporting farmer diversification into the circular bioeconomy via small scale farmer-led green biorefineries. This EU-led project is a first step towards changing the role of farmers in the bioeconomy, from suppliers of biomass to producers of finished and semi-finished products. The biorefinery approach converts freshly harvested grass into a range of products, including: an optimised cattle feed fibre, a non-GMO protein concentrate feed and a grass whey for fertiliser or bioenergy applications (**Biorefinery Glas**, 2020).
- **REFLOW** turning wastewater into sludge then into ash to use as fertiliser. This EU-led study is developing and demonstrating processes for the recovery and reuse of phosphorus products from dairy processing waste (DPW), to establish their fertiliser value and optimum application rates.



Source: <https://www.cibe-europe.eu/agrocycle>

The Ellen MacArthur Foundation coined this model and released a report in 2019 which predicted that by 2050, the circular economy model can unlock overall benefits worth \$2.7trillion a year. In January 2020, Blackrock, the world's largest asset management and investor group, launched a \$900million investment fund with the Ellen MacArthur Foundation to support companies which met Blackrock's ESG criteria who wanted to explore the circular economy (**edie**).

Current uptake of the circular economy is concerningly low with the Circularity Gap's 2021 Report revealing our world is only 8.6% circular – a decrease from 9.1% in 2019 (Circularity Gap Report, 2021 **Report**). This outlines a gap the Irish Agri-Food industry could help fill for investors and innovation.

Our key recommendations for the Irish Agri-Food industry

Reuse, Recycle, Regenerate creates the greatest opportunity for businesses to reduce waste through creating new value streams via new product development, enhancing brand reputation with consumers and investors, enhancing food security programmes, and accessing new market innovation opportunities.

We have presented you three key insights on food waste reduction and circular economy adoption.

1. Commit to UN SDG 12.3 and track food waste using the food waste and loss protocol.



2. Where surplus (i.e. food that is edible) exists, connect with Foodcloud to redistribute all surplus to the human supply chain and, where your business footprint exists in other markets, use Foodcloud's network to redistribute to local food banks.



3. Adopt the circular economy principles of Reuse, Reduce, Recycle and Regenerate. Where your company can fully use all waste streams to design out waste and pollution, adopt reuse models, and do this to regenerate our natural systems; i.e. through circular production, agriculture, industries and economies.



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