

Vision 2020:

**THE NEW FOOD WASTE
HORIZONS REPORT**

ReFood
pure bioenergy

Greener. Safer. Cheaper.



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Foreword

In 2013, ReFood launched 'Vision 2020: UK roadmap to zero food waste to landfill'. A game-changing report informed by key industry stakeholders, the roadmap and subsequent campaign helped to inspire national debate around food waste in the supply chain.

To date, almost 800 organisations – from universities to Michelin-starred restaurants – have signed up to support the Vision's ambition.

In the six years since, much has been achieved. Driven in the main part by commercial and environmental benefits, numerous businesses have adopted food waste recycling solutions as a seamless part of their day-to-day business. From apps to help chefs eliminate waste in the kitchen, to new ways of monitoring and managing farms, it is exciting to see how the food waste challenge is being met.

Within the 'New Food Waste Horizons' report, we celebrate this success and highlight the considerable progress being made at each stage of the food chain. Furthermore, we discuss our view of the future, identifying opportunities to make eradicating food waste from landfill a rapid reality rather than a long-term ambition.

ReFood would like to thank John Gummer, Lord Deben; and Jeremy Jacobs, Technical Director at the Renewable Energy Association (REA) for their valuable contributions to the report.



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Why does food waste matter?



Food waste is a valuable resource and the goal of Vision 2020¹ has been to increase recognition of its enormous potential – as feedstock for anaerobic digestion (AD) facilities, provider of renewable energy and a bio-fertiliser that can return much-needed nutrients to the land.

In its April 2017 report on food waste², the Environment, Food and Rural Affairs Committee (EFRA) called for clear action, predicting that while national waste had declined by 1.6m tonnes since 2007, it was set to rise again by 1.1m tonnes by 2025.

While policy has not directly addressed the challenge, recycling innovation has continued to thrive under the auspices of a wide range of organisations. With WRAP³ at the hub, trade bodies such as the Institute of Hospitality⁴ (IOH), LARAC⁵, the Sustainable Restaurants Association⁶, British Retail Consortium⁷ (BRC), Institute of Grocery Distribution⁸ (IGD) and the Food & Drink Federation⁹ (FDF) have put food waste firmly at the heart of their sustainability agendas.

Food waste has many impacts. According to available estimates, approximately one-third of all food produced in the world intended for human consumption is lost or wasted. This amounts to economic losses of \$940 billion per year and means that more than a billion tons of food never gets consumed each year, while one in nine people remains undernourished. In addition, food loss and waste is responsible for an estimated 8 percent of annual greenhouse gas emissions. If it were a country, food loss and waste would be the third-largest emitter after China and the United States¹⁰.

In its December 2017 report 'Food Waste: A response to the policy challenge'¹¹, the Government Office for Science considers why addressing food waste is important, noting that meat results in more than twice the GHG emissions of nutritionally equivalent vegetarian food.

Defra¹² found that the marginal abatement cost of food waste prevention is a net benefit of approximately £1000 per tonne of CO₂ avoided in the UK. In addition to GHG emissions, there are a number of wider environmental benefits that could result from minimising food waste including reducing land and water use and deforestation, improving the health of the seas, and protecting endangered species.

1. <https://refood.co.uk/vision-2020/what-is-vision-2020/>
2. <https://publications.parliament.uk/pa/cm201617/cmselect/cmenvfru/429/429.pdf>
3. <http://www.wrap.org.uk/food-waste-reduction>
4. https://www.instituteofhospitality.org/info_services/business_climate
5. <http://www.larac.org.uk/events/national-food-waste-conference-0>
6. <http://www.toogood-towaste.co.uk/the-campaign/overview/>
7. <https://brc.org.uk/media/105827/10105-brc-food-waste-report-final.pdf>
8. <https://supplychainanalysis.igd.com/news/news-article/t/industry-collaboration-creates-food-waste-reduction-roadmap/i/18417>
9. <https://www.fdf.org.uk/sustainability-ambition2025-food-waste.aspx>
10. https://champions123.org/wp-content/uploads/2017/03/report_-business-case-for-reducing-food-loss-and-waste.pdf
11. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643557/food-waste-policy-challenge-response_-_FINAL.pdf
12. <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18118>

Landfill capacity

Until now, constraints on capacity and landfill tax reaching £80 a tonne have been key drivers for diverting food waste from landfill across the food supply chain. Overall, the tax has been instrumental in reducing the amount of waste landfilled by 44% since 2000¹³.

However, landfill capacity is in terminal decline. Registered landfills have fallen from mid thousands in the 1990s to approximately 500 in the early 2000s and an estimated 120-130 in 2016. At the current rate of landfill closures, the modelled 2030 treatment mix equates to 60-100 landfills nationally by 2030¹⁴.

In addition to this decline, the UK Government's latest waste strategy reinforces the need to find landfill alternatives, and to do so quickly, with its new challenging target of "working towards eliminating food waste to landfill by 2030¹⁵" – only a decade away.

Renewable energy subsidies have also made it attractive to convert food waste to energy via scalable AD technologies. In fact, there are now more than 250 active AD facilities in the UK¹⁶ with UK food waste sent to AD producing an estimated 1,000 GWh¹⁷ every year, enough to power one million homes for over one month¹⁸.

Food poverty

Another driver for addressing food waste has been the rise in food poverty in the UK. The number of three-day emergency food supplies given to people in crisis by Trussell Trust foodbanks in the financial year 2017-2018 was over 1.3 million¹⁹. This has increased from around 25,000 in 2009, and is a 13% increase on 2016-2017 figures.

When it comes to levels of severe food insecurity, the UK has the second highest rates in Europe. The UN estimates that 4.2% of the population in the UK is experiencing severe food insecurity (FAO/IFAD/UNICEF/WFP/WHO, 2017), compared to a European average of 1.6%. That amounts to 2.7 million British men, women and children.

In its 25-year Environmental Plan, the Government set out a commitment to support the redistribution of unsold edible and nutritious surplus stock from food businesses to individuals in need. As a starting point, WRAP announced at the end of last year a new £500,000 fund for charities that redistribute surplus food to those in need.

13. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/673203/25-year-environment-plan.pdf

14. <http://www.sita.co.uk/wp-content/uploads/2017/09/MindTheGap20172030-1709-web.pdf>

15. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

16. <http://www.wrap.org.uk/content/operational-ad-sites-map>

17. http://www.wrap.org.uk/sites/files/wrap/Estimates_%20in_the_UK_Jan17.pdf

18. <https://www.ofgem.gov.uk/ofgem-publications/76160/13537-elecgenfactsfs.pdf>

19. <https://www.trusselltrust.org/news-and-blog/latest-stats/end-year-stats/>



THE COST OF FOOD WASTE
TO AN AVERAGE
UK HOUSEHOLD
IS ESTIMATED TO BE

£470
PER YEAR

Wasting resources

According to WRAP Research²⁰ more than 10 million tonnes of food and drink is still wasted in the post-farm gate food chain each year in the UK. This has a value of over £20 billion and is associated with around 22 million tonnes of greenhouse gases (GHG). What's more, 60% could be avoided, while only 1.8 million tonnes is currently recycled.

In total, 7.1 million tonnes of household food waste is produced every year. Of this amount, 70% - or 5 million tonnes - is food that could have been eaten, costing households £15 billion every year.

Furthermore, figures published by WRAP point out that, in 2017, 44% of food waste still ended up in landfill, despite the likelihood that landfill gate fees would remain more expensive²¹ than energy from waste alternatives.

The Courtauld Commitment²², a WRAP-led voluntary agreement involving more than 50 retailers, brands and suppliers, has been instrumental in reducing food waste in the grocery supply chain. Its latest iteration, Courtauld 2025²³, aims to reduce food and drink waste arising in the UK by 20% by 2025, calculated as a relative reduction per head of population. Achieving the target would reduce per capita food waste from 156kg per person to 125kg per person, resulting in 1.5 million tonnes a year less food waste arising in 2025 compared to 2015²⁴. This will play a key role in achieving UN Sustainability Goal 12.3, a commitment to 'halve, per capita, global food waste at the retail and consumer levels and reduce food losses along production and supply chains, by 2030'.

In its 'Food Future Report' (2015)²⁵, WRAP highlights that greater emphasis on the circular economy and optimising the value from waste streams is providing a catalyst for innovative uses of food waste. It demonstrates how food by-products are being developed for use in a wide range of applications, from recovering metals during the manufacture of circuit boards, transformation into bio-plastics for the automotive industry, use as skin serums in cosmetic products through to special ingredients in food and pharmaceutical products.

Barriers

As with plastics, separate food waste collections are expanding in the UK, with Government now aiming to introduce legislation for mandatory separate food waste collections by 2023²⁶. However, a WRAP evidence review²⁷ has shown that food also poses barriers to effective recycling behaviour. It seems that householders do not always understand what is done with recycled food waste, how it can contaminate dry recyclables and what type of food waste is wanted in the collection system.

Common misconceptions and attitudinal barriers²⁸ can often deter participation in collection schemes. These include concerns about smells and hygiene, especially if caddies are stored near the food preparation area; concerns about vermin, flies and cross-contamination of fresh food; and people finding the contents of the food waste caddy unpleasant.

20. <http://www.wrap.org.uk/sites/files/wrap/Food-Surplus-and-Waste-UK-Key-Facts-23-11-18.pdf>

21. <http://www.sita.co.uk/wp-content/uploads/2017/09/MindTheGap20172030-1709-web.pdf>

22. <http://www.wrap.org.uk/content/what-is-courtauld>

23. <http://www.wrap.org.uk/content/what-courtauld-2025>

24. <http://www.wrap.org.uk/content/courtauld-2025-baseline-and-restated-household-food-waste-figures>

25. <http://www.wrap.org.uk/content/food-futures>

26. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

27. <http://www.wrap.org.uk/sites/files/wrap/WRAP%20Barriers%20Synthesis%20Full%20Report%20final%20121214%20PUBLISHED%20-%20PDF.pdf>

28. <http://www.wrap.org.uk/sites/files/wrap/Recycling-Tracker-Report-2017.pdf>

10M TONNES
OF FOOD IS WASTED
EVERY YEAR IN THE UK



Driving change

Back in 2013, at the launch of the 'Vision: 2020 UK Roadmap to Zero Food Waste to Landfill', the benchmark was set as follows:

- 14.8m tonnes of food wasted per year in the UK
- 40% of food waste sent straight to landfill
- 30% of UK vegetable crops unharvested
- Methane released from landfill with a global warming potential 21 times greater than carbon dioxide

In 2018, however:

- 10m tonnes of food wasted per year in the UK²⁹
- 4.1m tonnes of food waste sent straight to landfill
- No overall data on crop unharvests, but predicted to rise with shortage of EU labour post Brexit and climate impacts on crops (some data available from WRAP for strawberries and lettuce but described as a work in progress)³⁰
- Avoidable household food waste associated with 19 million tonnes of CO₂e, which is equivalent to the emissions generated every year by around 30% of the private cars on UK roads³¹

We have made considerable progress, driven in the main by widespread industry commitment to reducing waste, improving sustainability and realising the economic benefits. While there is clearly some way to go, and we need to get there quickly, it is also important to celebrate success.

29. http://www.wrap.org.uk/sites/files/wrap/Estimates_%20in_the_UK_Jan17.pdf

30. <https://www.thegrocer.co.uk/home/topics/waste-not-want-not/from-farm-to-food-waste-the-pre-farmgate-fight/559044.article>

31. http://www.wrap.org.uk/sites/files/wrap/Household_food_waste_in_the_UK_2015_Report.pdf



Progress across the supply chain



ReFood's Vision 2020 roadmap considered every aspect of the supply chain where food is wasted, with farm to fork analysis yielding key recommendations for activities that could help to reduce food waste. In this section, we review each sector individually to see how things have changed and explore plans for the future.

A. Agriculture

The latest Government conservative food waste estimate for the farming sector suggests that around 2.5 million tonnes a year, worth around £800 million, is lost³³ – although in some cases through unfair contractual practices. To address the latter, the Government is seeking powers through the Agriculture Bill to introduce sector-specific statutory codes of conduct to stop unfair practices which are often the cause of viable produce going to waste.

David Moon, Head of Sustainable Food at WRAP, explains: *“Tackling food waste in primary production is a key area of Courtauld 2025 and it’s crucial that we have the facts to prioritise and direct action. We’re using our experience in mapping waste and bringing together key stakeholders to pinpoint where, why and how much waste arises on farm. This work will help the UK food supply chain become more efficient and competitive, which is crucial in the coming years. It is also critical that we have the support of retailers and producers collaborating on projects to develop and share best practice. It’s an exciting new area of work and we’re delighted to have the support of key sector groups.”*

“We welcomed a recommendation from the Environment, Food and Rural Affairs Committee that supermarkets should relax rules and look to ‘normalise’ foods that may have slightly different colours, shapes or sizes. Farmers and growers want to minimise waste as much as possible, and they work hard to tackle pests and disease by improving agronomy, harvesting and processing techniques. The whole industry needs to pull together to identify solutions right across the supply chain and do their bit to keep waste to a minimum.”

NFU director of policy, Andrew Clark, added: *“Food waste is in no-one’s interest, least of all farmers. Improved forecasting, for example, would provide farmers and growers with an opportunity to plan ahead, secure land and pre-order seed. “We welcomed a recommendation from the Environment, Food and Rural Affairs Committee that supermarkets should relax rules and look to ‘normalise’ foods that may have slightly different colours, shapes or sizes. Farmers and growers want to minimise waste as much as possible, and they work hard to tackle pests and disease by improving agronomy, harvesting and processing techniques. The whole industry needs to pull together to identify solutions right across the supply chain and do their bit to keep waste to a minimum.”*

33. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

Successes

There is increasing acceptance of so-called 'wonky vegetables' to be used rather than thrown away, with many major supermarkets now introducing discounted veg boxes that contain misshapen produce for sale.³⁴

For some crops, as much as 25% of produce was being wasted because it failed to meet standards set by retailers for appearance. Whole crop purchase (WCP) contracts between farmers and food retailers are one tool being used to minimise waste, as such food can be used in the manufacture of soup or diced goods and reduce the incentive to farmers to over-produce. Such contracts have already allowed the supermarket chain Morrisons to sell 100% British produce in season, make use of 20% more of a potato crop, and control its supply chain more effectively.

Future opportunities

Agriculture is one sector clearly embracing innovation. From advanced monitoring systems implemented to increase input efficiencies and anticipate production risks, to emerging technologies (robotic tractors, automated milking, drones and urban soil-less high-rise farms³⁵), the industry aims to challenge established models of production and encourage new entrants into the marketplace.³⁶

Increasing transparency and real-time data combined with greater collaboration up and down the supply chain will help improve planning and forecasting, while a greater emphasis on flexibility and supply chain agility will enable farmers to find homes for produce in shorter timeframes as volatility in climate impacts on harvests.

WRAP is looking at a series of sector-wide projects tackling food waste in primary production that have brought together farmers, growers, producers, hospitality and food service businesses and retailers through the organisation's Courtauld Commitment 2025. These are designed to address common issues that arise in production, while WRAP is also piloting innovative models and interventions to help develop new guidance on best practice.

The projects³⁷ are the result of a roundtable meeting chaired by WRAP in 2016 that included the Agriculture and Horticulture Development Board (AHDB), BRC, the Fresh Produce Consortium (FPC) and the NFU.

34. <http://www.bbc.co.uk/news/business-39920234>

35. <http://www.independent.co.uk/life-style/food-and-drink/urban-city-farmers-growing-crops-hydroponics-warehouses-bomb-shelters-ikea-a8212331.html>

36. <http://www.wrap.org.uk/content/food-futures>

37. <http://www.wrap.org.uk/content/courtauld-commitment-2025>

A. Agriculture

Projects which have been completed under Courtauld 2025 include:

Improving crop forecasting and matching supply with demand more accurately

1. Under Courtauld 2025, Asda's sourcing arm IPL is adding to its commercial intelligence with expertise from Agrimetrics and the National Institute of Agricultural Botany (NIAB) to help its growers use a new yield forecasting tool. Growers now use smart phones to upload photos of their crop throughout the season, and intelligent software uses these images to assess the crop's potential in relation to data from local weather stations, and historical data. Growers, IPL and Asda receive a yield report to make accurate decisions earlier in the season that reduce the risk of both gluts, and shortages, at farm and retail level. At the end of the season growers can use the data to understand how to improve management of the crop in subsequent years to produce higher marketable yields.
2. Fresh Produce Specialists MyFresh, their grower Len Wright Salads and customers Pizza Hut Restaurants and The Co-op, have already been working collaboratively to improve communications around planning, forecasting and delivery - a key action in reducing primary production waste. Best practice will be shared to maximise impact across other supply networks.

Increasing utilisation of what's produced

3. A number of 'wonky vegetable' initiatives have been introduced by retailers, which offer an opportunity to investigate those that have delivered the greatest impact on food waste, while delivering new business benefits. WRAP is focusing on carrot and parsnip schemes and working with several Courtauld 2025 signatory supply chains to gather data and opinions from growers and suppliers. This will be used to refine best practice to be shared throughout the sector to leverage greater impact.
4. A common cause of strawberry waste is product not meeting customer specifications, because of fruit being misshapen (the most commonly cited reason) or suffering from pest or disease-related damage. One way that growers can manage this is through improved growing systems, however the investment costs can be a barrier. The Co-op, IPL and Asda are tackling this together through a demonstration project that provides growers with data on investment costs and the returns they can make. This will help growers make better informed decisions about their businesses' future, whilst reducing food waste.



B. Food and drink manufacturing

Reporting on its food waste reduction ambitions in the manufacturing sector, the Food & Drink Federation³⁸ (FDF) outlines the steps it is taking with members to deliver on waste reduction targets through optimising prevention and recovery options. In addition to operational improvements and working with the wider supply chain to improve packaging and forecasting, it has also set a framework for food donations.

During 2016, it worked with FoodDrinkEurope to establish Every Meal Matters – food donation guidelines that are designed to make it easier for food manufacturers and retailers to donate their food surpluses to food banks where these cannot be prevented in the first place. FDF also shares guidance,³⁹ produced by the Food Standards Agency, on setting product shelf life that explains what factors affect the expiry date of a food product to help prevent food needlessly going to waste.

In April 2017, FDF announced the findings of its member survey⁴⁰ to determine whether the FDF membership had achieved its Five-Fold Environmental Ambition (FEA) target of sending zero food and packaging waste to landfill by (or before) the end of 2015.

Results show that FDF members participating in the waste survey reduced the amount of food and packaging waste sent to landfill to effectively zero in 2015 (0.04% of total waste arisings).

The survey responses showed around 96.6% of the total food processed was sold as intended, with around a further 1% redistributed to people or diverted to animal feed and the remaining 2.4% underwent some form of waste treatment. Between the first survey year in 2006 and 2015, it is estimated that FDF members diverted approximately 800,000 tonnes of food and packaging waste from landfill.

As a signatory to the WRAP Courtauld Commitment 2025, FDF intends to use the lessons from this survey to help inform its and others' contribution to the target to reduce UK food waste by 20% by 2025 per capita based on a 2015 baseline.

Dr David Moon, Head of Food Sustainability, WRAP, said: *"FDF and its members have long been an integral part of our work to reduce the environmental impact of food and drink through their involvement in the Courtauld Commitment, and we are delighted that they have achieved their goal of zero food and packaging waste to landfill by 2015. This impressive achievement has taken a lot of hard work by members and shows what can be achieved by working together, and how motivated the sector is long-term through both Ambition 2025 and Courtauld 2025."*

38. <https://www.fdf.org.uk/sustainability-ambition2025-food-waste-indepth.aspx>

39. <https://www.fdf.org.uk/product-shelf-life-guidance.aspx>

40. <https://www.fdf.org.uk/news.aspx?article=7790>



Successes

CASE STUDY: Food waste recycling partnership cuts the mustard

Mustard Foods is a speciality food production business, developing and delivering bespoke products to more than 400 restaurants across the UK. From sauces and soups to dressings, fillings and marinades, the company prides itself on customisation, quality, consistency and integrity.

As part of a strategic initiative to reduce waste, streamline preparation processes and improve corporate sustainability, Mustard Foods partnered with ReFood to implement an integrated food waste recycling solution. Since entering the agreement, the food production business has lowered unavoidable food waste volumes, cut carbon emissions and slashed waste management costs.

Although Mustard Foods already has a 100% non-landfill solution in place, the partnership with ReFood has enabled the business to take this a step further, collecting and recycling all excess produce, both packaged and non-packaged, plus library samples. This flexibility, combined with a collection schedule arranged to suit fluctuations in waste generation, meant that the whole process was simple and easy to implement.

Future opportunities

Industry 4.0 is offering manufacturers unprecedented opportunities to plan, deliver and monitor food production in a way that is more responsive to demand and that eliminates contamination and food recalls.

A new era of 'smart factories'⁴² will enable accurate and precise production, packaging and labelling, on-demand and help to minimise waste by finding new markets for surplus outputs.

The industry is investing to secure the skills and equipment it needs to compete in the future.

41. https://www.fdf.org.uk/corporate_pubs/Ambition-2025-booklet.pdf

42. http://www.wrap.org.uk/sites/files/wrap/Food_Futures_%20report_0.pdf

C. Food distribution

Food waste resulting from the distribution sector is not routinely measured in isolation. This does not mean that best practice should be ignored and losses not recorded, however.

Globally, the issue is being recognised, especially in the cold chain, and individual suppliers are offering solutions to address the issue. Food losses are already being reduced by greater forecasting and planning, with agile supply chains becoming critical to minimising waste. Third party logistics providers⁴³ see data and technology as central to being able create greater visibility in the supply chain to minimise losses.

Optimum and consistent temperature control throughout transit and in-store can also greatly impact on the shelf-life of perishable products⁴⁴, while innovation in refrigeration technologies and components and around packaging are being pursued by logistics providers to ensure food meets quality standards in store. Monitoring systems are going into trucks that allow companies to review quality and mitigate losses in real time and temperature sensitive ink is being placed on packaging to ensure retailers and consumers go on to store products at the right temperature.

43. <https://www.penskelogistics.com/industries/food-and-beverage/reduce-food-waste/>

44. <http://www.freshonedistribution.com/cold-chain-system-food-waste/>





Successes

Tesco is already innovating to cut the time it takes fresh fruit and vegetables to hit the shelves as part of its food waste reduction initiative.⁴⁵ It launched its food waste hotline in March 2017⁴⁶ to combat food waste in the supply chain by make it more responsive to challenges.

It has managed to extend the shelf life of some of its fresh produce lines by “up to 10 days” thanks to a change in its supply chain logistics. Tesco no longer uses packhouses to buffer supply. In fact, the number of cases of fresh produce that now bypass packhouses has climbed from two million to 14 million. This has also helped extend the shelf-life of produce bought within the EU by two days, while that from the southern hemisphere has been extended by up to 10 days.⁴⁷

Future opportunities

Technology is enabling the supply chain to plan and monitor food journeys more closely than ever before, helping to deliver consistency and quality and to minimise waste. Insight from the logistics industry highlights three key areas of focus for reducing food waste in the supply chain.⁴⁸

- 1. Increasing hubs and decision points** - Increasing the number of hubs can have a negative effect on quality, but consolidation has a negative effect on shelf life. Because at each hub a decision point can be installed, orders can be re-assigned according to the First Expired First Out strategy.
- 2. Intelligent containers** - Technologies such as time temperature indicators, gas indicators and biosensors can help to reduce food waste across the supply chain. Gas indicators, for example, monitor the change of atmosphere within packaging, typically signalling the presence or absence of oxygen or carbon dioxide.
- 3. Production location** - Considering production location is one way of reducing time that food spends in the supply chain. Chilled salmon is a great example. Because of high fat content, it is difficult to remove bones until four days after harvesting the salmon. These first four days can be used to move the salmon to industrial production sites closer to consumers increasing the ultimate shelf life when the product hits the stores.

45. <https://www.theguardian.com/business/2015/oct/19/tesco-tackles-food-waste-by-removing-packaging-stage>

46. <https://supplychainanalysis.igd.com/news/news-article/t/tescos-food-waste-hotline/i/16368>

47. <http://www.fruitnet.com/fpj/article/161057/tesco-alters-its-supply-chain-logistics-to-cut-food-waste>

48. <http://www.inboundlogistics.com/cms/article/ways-to-reduce-food-waste-in-the-supply-chain%20/>

D. Retail

The British Retail Consortium (BRC), in its report 'The Retail Industry's Contribution to Reducing Food Waste',⁴⁹ highlights many innovative initiatives that supermarkets are running to help reduce food waste, with progress being measured by WRAP under its Courtauld 2025 programme.

Over the past five years, the grocery retail market has undergone significant change, with the rise of discounters Aldi and Lidl, as well as rapid growth in smaller Tesco and Sainsbury's convenience stores⁵⁰ predicted to continue. Meanwhile, online and mobile shopping is all impacting on buying behaviours. Increasing focus on healthy eating is also influencing grocery retail.⁵¹

'Challenger brands' are emerging around convenience or around specific issues, like locally sourced food. One emerging player is FarmDrop⁵² which started as a fresh produce click and collect offer but last year raised nearly £750,000 to fund expansion; they now deliver the same day direct to customers.

Click and collect has emerged as a key online opportunity for supermarkets for general merchandise as well as food as it utilises existing store space and staff. The ability for consumers to pick up according to their own schedule and location is driving innovation such as ASDA's acquisition in 2015 of technology to allow their customers to collect shopping from stand-alone, temperature controlled Intelligent Pods in under 60 seconds. ASDA now has over 600 click and collect locations and plans to increase this to over 1,000, including through petrol filling station forecourts, by 2018. This trend will continue, though likely with a charging model for lower value purchases as seen with John Lewis in mid-2015.

Although a fraction of the food wasted, retailers are also working with charities to redistribute surplus food to those most in need. Apps and vending machines are part of a portfolio of technologies and tools helping to ensure that surplus food reaches those in need, including the homeless.⁵³

In March 2018, Waitrose announced it had hit a 100,000 milestone in meal donations to food redistribution charity FareShare.⁵⁴ It also launched its Live Wise Campaign in July 2017 to help consumers minimise food waste.⁵⁵

49. <https://brc.org.uk/media/105827/10105-brc-food-waste-report-final.pdf>

50. <https://www.globaldata.com/uk-food-grocery-convenience-market-will-grow-22-0-2022/>

51. <https://uk.kantar.com/consumer/shoppers/2018/feb-2018-uk-grocery-market-share/>

52. <https://www.farmdrop.com/>

53. http://www.sustainablebrands.com/news_and_views/waste_not/sustainable_brands/trending_vending_machines_apps_helping_redistribute_food

54. <http://www.fruitnet.com/fpj/article/174884/morrisons-hits-100000-meals-in-fareshare-donations>

55. <http://www.fruitnet.com/fpj/article/172843/waitrose-launches-new-food-waste-campaign>



Successes

CASE STUDY: Sainsbury's stores go green by turning food waste into energy

In 2016 Sainsbury's partnered with ReFood to power their stores with green gas. Produced entirely from waste food, the energy generated in a year was enough to power 5,000 homes*, or 10% of Sainsbury's entire national gas consumption for the year. In total, ReFood supplied the retailer with almost 50 million KWh of biomethane gas.

As part of the agreement, food waste was collected from Sainsbury's two depots in Sherburn-in-Elmet and Haydock, before being converted into gas, heat and fertiliser at ReFood's state-of-the-art anaerobic digestion processing facilities.

The green gas was then exported to the national gas grid by ReFood and, through a third party, was imported by Sainsbury's stores nationwide and being used to generate carbon-neutral electricity for power and heating. The agreement was one of the largest of its kind in the UK, seeing ReFood supplying both green gas and supporting certification.

Under the partnership, ten stores significantly increased their use of renewable energy, while lowering utility bills and helping to deliver Sainsbury's commitment to send zero operational waste to landfill, by finding a use for inedible waste products. All surplus edible food was donated to local charity partners.

Future opportunities

The arrival of new players combined with innovative technologies is changing both supply chains and customer expectations. Further expansion from disruptive innovators is expected, taking advantage of growing consumer desire for differentiation in the areas of local sourcing, sustainability and transparency, and powered by omnichannel and new methods of delivery or collection.

Established retail players are also entering the mainstream food market, such as Amazon. Their model allows consumers to order groceries and products from local restaurants and stores for same day delivery, all under Amazon Prime membership.

Food also benefits from greater innovation on delivery and collection with the number of click and collect points rapidly rising, whether in store, from transport hubs, or from a special parked vehicle location. The time slots for home delivery are shrinking, leading to more shopper convenience and greater immediacy and accuracy of delivery times.

Delivery technology is supporting the move towards instant gratification with the emergence and growth of drone deliveries. Amazon's so-called 'Prime Air' is currently trailing this method in the US with aircraft up to 25kg. While currently it is mired in technological and regulatory concerns, it is expected to be viable within a ten-year timescale.

A new fund was launched in December 2017 by the Government to further help food redistribution. The Food Waste Reduction Fund, administered by WRAP, will support local projects to help increase redistribution in communities. The £500,000 fund awarded grants in 2018 to organisations who redistribute food, and to charities who receive and share food with people in need.⁵⁶

56. <https://ciwm-journal.co.uk/500000-food-waste-reduction-fund-help-charities-feed-people/>

E. Catering and hospitality

The UK's hospitality and food services industry produces 1 million tonnes of food waste every year at an estimated annual cost of £3 billion⁵⁷ to the sector.

Under WRAP's 'Hospitality and Food Service Agreement',⁵⁸ there was a reduction in CO₂e emissions of 11% against the (2012) baseline over the three years of the Agreement. Food waste prevention activities saved an estimated 24,000 tonnes of food from being thrown away (£67 million worth). Redistribution of surplus food doubled to 760 tonnes.

To further help food businesses manage their waste, WRAP has introduced a Food Waste Reduction Roadmap to give advice on cutting waste and how businesses can replicate this with their suppliers and consumers. So far, over 89 companies have signed up to a range of ambitious milestones with WRAP also hosting the Food Waste Atlas^{TM59} - an online resource that brings global food loss and waste data together in one place, enabling the tracking of food loss and waste across food types, sectors, and geographies.

Food waste is a serious issue. For every meal eaten in a UK restaurant, nearly half a kilo of food is wasted – through preparation, spoilage and what's left behind on the plate. From a consumer perspective, celebrity chefs⁶⁰ are backing the too good to waste campaign, along with campaigners, food critics and journalists⁶¹ encouraging diners⁶² to take leftovers home in doggy boxes rather than doggy bags and helping FareShare and homeless charities as part of the initiative.

Hugh Fearnley-Whittingstall, celebrity chef, commented: *"Food waste in restaurants is a massive problem and doggy bags are one excellent way of cutting waste. There's no need to be shy – any of the chefs in our places would be more than happy to give a doggy bag. I'll be right behind the SRA's Too Good to Waste campaign. I've eaten in some pretty fancy places – I've asked for doggy-bags in Michelin-starred restaurants. Chefs are quite happy with the idea – this isn't something that is frowned-on. Frankly most of us take it as a compliment!"*

- 57. <http://www.wrap.org.uk/content/hospitality-and-food-service-wraps-work-0>
- 58. <http://www.wrap.org.uk/content/hospitality-and-food-service-agreement-taking-action-waste>
- 59. <http://www.wrap.org.uk/content/food-waste-atlas>
- 60. <http://www.toogood-towaste.co.uk/supporters/famous-chefs/>
- 61. <http://www.toogood-towaste.co.uk/supporters/celebrity-supporters/>
- 62. <https://pebblemag.com/magazine/eating-drinking/lets-get-wasted-british-chefs-talk-food-waste>



Successes

CASE STUDY: QHotels has no reservations over food waste

Working with ReFood, QHotels has been able to divert 100 per cent of its food waste from landfill, which is significant in a sector which is edging towards producing one million tonnes of food waste annually. What's more remarkable is that it has done this while making a positive impact on its bottom line.

With 3,650 bedrooms across 26 hotels in the UK, sustainability is firmly on QHotels' agenda and achieving the Green Tourism Accreditation at all of its hotels is testament to the group's success in this area. As is often the case in the hospitality industry, QHotels generates significant waste from both the food preparation process and leftovers from meals served. Establishing a comprehensive waste management programme was therefore vital.

Since partnering with ReFood, QHotels is now recycling 100 per cent of its food waste. ReFood estimates that 720,000 kWh of energy is generated every year, while 460 tonnes of fertiliser is produced and 800 tonnes of CO₂ saved. In addition to being a highly environmentally-friendly alternative to sending waste to landfill, QHotels has found that the service is also highly cost efficient, saving it an estimated 46% per cent on waste management costs.

Future opportunities

Technology is being touted as part of the solution for busy kitchens enabling chefs to track and trace ingredients, keep a tight grip on optimising spend and plan menus⁶³. In London a dining app has been launched that gives consumers the opportunity to buy Michelin-starred leftovers.⁶⁴

Food suppliers to the hospitality sector are also formulating tools to help chefs better manage kitchens to minimise waste.⁶⁵ As a signatory to Courtauld 2025, the Institute of Hospitality⁶⁶ has also set out a range of tools, guidelines and handbooks to help address food waste in the context of improving corporate social responsibility (CSR), increasing efficiency and profitability and cutting greenhouse emissions.

WRAP has set out four screencasts⁶⁷ to help environmental health officers advise businesses on food waste reduction opportunities as part of their inspection role.

63. <https://blog.winnowsolutions.com/top-food-waste-tips-from-2017-that-can-still-help-you-this-year>

64. <https://www.cnet.com/news/karma-waste-food-dining-app-london-launch/>

65. <https://www.unileverfoodsolutions.co.uk/chef-inspiration/from-chefs-for-chefs/work-smart/food-waste-reduction.html>

66. https://www.instituteofhospitality.org/info_services/business_climate

67. <http://www.wrap.org.uk/content/preventing-waste-hospitality-and-food-service-sector>

F. Households

Household food waste in the UK was 960,000 tonnes lower in 2015 compared to 2007, which equates to a 12% reduction. Avoidable household food waste levels were 17% lower in 2015 compared to 2007, equivalent to £2.7 billion less food being wasted in 2015 compared to 2007.⁶⁸

Estimates by WRAP suggest that significant reductions in GHG emissions could be gained by following the guidelines recommended by Love Food Hate Waste,⁶⁹ such as making better use of domestic freezers, and planning portion sizes more effectively.

Packed with celebrity recipes, inspiring ideas for leftovers, case studies and seasonal initiatives, the Love Food, Hate Waste campaign sees a key driver for consumers being the potential cost savings.

As highlighted early in the report, local authorities in England continue to lag behind those in Northern Ireland, Scotland and Wales in terms of delivering separate food waste collections that would enable full recovery of the nutrient and energy value of food waste but also reduce contamination of other recyclables such as paper and plastics.

68. http://www.wrap.org.uk/sites/files/wrap/Estimates_%20in_the_UK_Jan17.pdf

69. <http://www.wrap.org.uk/content/love-food-hate-waste>

UK FOOD WASTE WAS
960,000
TONNES
LOWER IN 2015
COMPARED TO 2007



Successes

CASE STUDY: Halton Borough Council launches food waste recycling trial

Halton Borough Council launched a food waste recycling pilot scheme in partnership with ReFood to collect food waste from 1,200 homes in Hale in Widnes and Heath in Runcorn. The cost of processing separately collected food waste is significantly cheaper than the cost of dealing with general waste collected through black bins, making recycling a highly effective alternative.

The trial saw residents recycle plate scrapings, peelings and unused food – including that still in its packaging. ReFood then collected the waste for recycling via anaerobic digestion – capturing the biogas produced during food waste’s natural degradation process. The gas is upgraded and fed directly to the national gas grid where it is used by consumers to heat their homes. The process also produces a nutrient-rich fertiliser, ReGrow, which is being used by local farmers to grow new crops, creating a completely sustainable food chain.

Future opportunities

WRAP’s Love Food, Hate Waste⁷⁰ campaign is the key platform for inspiring consumers to reduce household waste. Recently, the campaign launched its “compleating” initiative, focusing on encouraging people to eat the whole ingredient or food and let not edible parts go to waste, for example, keeping the skin on potatoes and including vegetable stalks in recipes.

Steps have been taken to introduce clarity around labelling, best before and use by dates and, in November 2017, WRAP teamed up with the Food Standards Agency (FSA) to launch guidelines to help improve consumer understanding⁷¹. The move is to help tackle the two million tonnes of food wasted each year in UK homes purely from it not being used in time. A third of this food waste is triggered because of how shoppers interpret existing date labels.

70. <https://www.lovefoodhatewaste.com/>

71. <https://www.food.gov.uk/news-updates/news/2017/16752/wrap-launches-new-labelling-guidance>

Steps food waste to landfill

Vision 2020⁷² concluded that collaboration throughout the food supply chain would have a key role to play in achieving zero food waste to landfill. However, this collaboration must be driven by a strong and decisive commitment from UK Government.

Fast-forward to today, and the Government's recently released Waste and Resources Strategy offers just that, with a commitment to work towards eliminating food waste being sent to landfill by 2030⁷³.

It will continue to rely on initiatives such as WRAP's Courtauld 2025 and cost benefit analysis tools to continue to encourage businesses and local authorities to prevent more food waste and introduce more opportunities to re-use or recycle foods so that the amount of food waste sent to landfill continues to decline.

It has also committed to ensuring that, as food and catering contracts come up for renewal, central government departments and their agencies adopt the balanced scorecard⁷⁴ approach to deliver benefits to the environment, consumers and businesses alike.

Additionally, the strategy also highlights the need to address the tracking and reporting of food waste, particularly during the pre-farm gate section of the supply chain, and to examine methods of decreasing the environmental impacts of food production.

72. https://www.vision2020.info/assets/pdf/Vision_2020_roadmap.pdf

73. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

74. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/419245/balanced-scorecard-annotated-march2015.pdf

to ban waste dfill



Steps to ban food waste to landfill

In 'Vision 2020: UK Roadmap to zero food waste to landfill', we wanted the Government to legislate for a full ban on food waste to landfill by 2020 to encourage local authorities, the food supply chain and waste companies to work together, harness best practice and develop an optimum food waste collection and processing infrastructure. It would include mandatory separate food waste collections from homes and businesses so that it could be reprocessed to generate heat, energy and valuable nutrients.

Underpinning the success of the programme would be greater collaboration at every stage of the supply chain and between key stakeholders to accelerate the adoption of best practice, improve waste prevention, create efficiencies and maximise the value of food waste as a resource. It would also see the integration of food waste education into schools, colleges and profession training programmes, alongside increased support for WRAP's Love Food Hate Waste initiative.

With a new target date of 2030 for a landfill ban, it is in these last two areas that we have seen the most progress and offer the most hope for the future, with collaboration in particular at the heart of many of the success stories and part of many of the future initiatives that are being implemented by stakeholders.

Indeed, an evaluation of the Love Food Hate Waste initiative demonstrated the success of the campaign over a five-year period (2007-12), with a 1.1 million tonne, or 21%, reduction in household food waste, resulting in:

- £6.5 billion in household savings
- 3.4 million tonnes of GHG avoided – the equivalent of taking 1.4m passenger cars off the road for a year
- 1 billion m³ of water saved - equivalent to 400,000 Olympic-sized swimming pools per year

The avoided use of 430,000 hectares of land per year for food production – an area equivalent to twice the size of Luxembourg

Collaboration continues to remain the central plank of helping to plan, forecast and optimise the use of food produce throughout the supply chain. The increasing availability of real-time data and monitoring at every stage of the food chain, along with new smarter technologies such as intelligent packaging, and apps to enable redistribution of surplus stock, will strengthen the opportunities to eliminate food waste in the future.

It is encouraging that the momentum already achieved by those in the food supply industry appears to have motivated the Government to take a strong stance on the issue of food waste in its latest Waste and Resources Strategy. Government is supporting WRAP through £9.35m in funding, with household food waste and the Courtauld 2025 voluntary agreement one of its three key focus areas.

The abundance of examples and the Cost Benefit Analysis tools provided by WRAP should encourage more local authorities to seek out best practice in waste recovery in all corners of the UK and identify the added value that it can bring to their local communities, the environment and cost efficiencies.



When we consider recommendations from the Vision 2020 roadmap, there remain numerous opportunities to build on progress made over the past five years:

- We are pleased to see supermarkets promote misshapen or blemished fruits and vegetables to ensure they are not wasted and are keen to see that optimising the use of these foods in manufacturing, hospitality and retail continues to grow
- We welcome WRAP and the NFU's continued commitment to undertake more detailed research into food waste in the agricultural sector and the opportunities to find viable and suitable outlets for surplus crops to avoid them going to waste. In the future, it is likely to become urgent that the potential issue of not having the seasonal workers available to harvest the crops is addressed as part of the ongoing development of Brexit arrangements
- It remains vitally important that consideration of the food waste hierarchy is central to finding solutions for diverting food waste from landfill and that it is not incinerated without any opportunity to extract its nutritional value to enrich the UK's agricultural land in the future. This is especially important for the many local authorities that are still not separating out food waste and thereby ignoring its potential as a valuable resource. England lags behind other countries in the Union and we welcome the Government's latest commitment to consult on legislation to provide mandatory separate waste collections by 2023
- Better coordination between manufacturers, distributors and retailers is already happening and, as supply chains become increasingly transparent and responsive thanks to real-time monitoring and data flows, we see considerable scope for further collaboration between the various groups delivering positive change within the sector to coordinate efforts, share experiences and highlight insights and best practice to identify and eliminate waste on both a national and international basis
- The Government has taken strong steps towards banning food waste from landfill with its commitment to "eliminating food waste to landfill by 2030." We believe that this target offers the opportunity to boost awareness of the commercial and environmental benefits of the waste stream in its value for energy, nutrients for agriculture and, preferably, heat. The AD infrastructure is now in place to extract biogas, energy and nutrients from food waste. Encouraging businesses and local authorities to adopt the waste hierarchy will now be a key challenge for Government and the sector as a whole
- We wanted to see more done to optimise the shelf life of food produce, by sharing best practice and looking at storage and transit methods. We are pleased to see progress being made, with greater clarification around labelling and more innovative distribution models being adopted to get food onto supermarket shelves more quickly. There is still much to be done here but tools like intelligent packaging and improved cold chain monitoring are valuable areas for broader implementation
- We wanted to see the increase in food waste education programmes such as 'Love Food Hate Waste' and, since our last report, WRAP has become a charity to attract additional funding. While Defra's contribution has fallen from £56m in 2009/10 to just £12m in 2016/17⁷⁵ and education about food waste remains fragmented, we are glad to see that continued long-term support for such programmes have formed part of the Government's latest waste strategy. We all have a role to play in turning waste into resources and this should be emphasised going forward, not just in consumer campaigns but as part of hospitality and cost sector catering education programmes

75. <https://www.letsrecycle.com/news/latest-news/mps-call-for-wrap-food-waste-funding-support/>

London's calling



In London, the Mayor recognises that processing food waste will play an important role in boosting the city's recycling and composting rates. Sending less of London's food waste to landfill is becoming an urgent priority for practical reasons too: the Greater London area contains very little landfill capacity, and sites outside its boundaries accepting municipal waste are expected to be full by 2025.⁷⁶

Each year in London, 900,000 tonnes of food is thrown out by households, of which 540,000 tonnes (60%) is good food and drink that we could have been used, the equivalent of spending £1.4 billion on food destined for the bin.

- Disposing of London's food waste costs waste authorities more than £50 million each year
- Food waste generates approximately 19 million tonnes of CO₂ emissions. Simply reducing the amount of good food thrown away could remove the equivalent of 1 in 4 cars from the roads
- Food waste contributes more to climate change than packaging waste
- For every 5 bags of shopping bought, an entire bag of good food is thrown away that could have been used to feed the hungry. London is a city where both needless food waste and food poverty co-exist⁷⁷

A report published by the London Assembly Environment Committee in February 2018⁷⁸ was critical of two million tonnes of waste being sent to Energy from Waste (EfW) facilities last year – more than doubling in the last decade. It says as the city strives to be greener and more sustainable, "urgent change is needed to stop recyclable and biodegradable material being incinerated."

Mark Sommerfeld, Policy Analyst at the Renewable Energy Association, said:
"The circular economy is all about getting the most out of waste by using all available technologies, as no one solution is able to utilise the entire waste stream. Energy from Waste has a crucial role to play at the end of the waste hierarchy, ensuring that the amount of waste going to landfill is minimised and that we are able to recover energy in the form of power, heat and renewable transport fuels. At the same time, London must focus on increasing recycling rates through ensuring local authorities are able to invest in new recycling infrastructure and separate collection systems, while making it as straightforward and standardised as possible for consumers to recycle their waste. This includes ensuring we are making the most of the substantial volume of food waste being produced by the city that should be going to anaerobic digestion for the production of renewable power, heat or green gas for transport. This will ensure we make the most of this valuable resource which is only set to increase as London grows."

76. https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/Bag%20it%20or%20bin%20it%20-%20Managing%20London's%20food%20waste.pdf

77. <https://www.recycleforlondon.com/london-food-waste-facts>

78. <https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/energy-waste>

London's calling

Estimates suggest that London could reduce its waste by 60% by 2041 through a circular economy approach. LWARB's circular economy programme is targeting a £50m investment by 2020 to make London a city where businesses utilising closed-loop systems can "flourish". The route map sketched more than 100 practical actions that can kickstart this transition.

With the aim of maximising the resource value of the Capital's food waste, in July 2017, ReFood's state-of-the-art anaerobic digestion (AD) facility in Dagenham was officially opened by the Deputy Mayor for Environment and Energy, Shirley Rodrigues.

One of the most important single site investments in the history of SARIA Group, ReFood Dagenham converts inedible food waste collected from customers in and around the London area into renewable energy and sustainable biofertiliser. The site is capable of processing more than 160,000 tonnes of food waste every year, generating 14 million m³ of biogas which is enough to power 12,600 homes per annum.

Thanks to the site's state-of-the-art technology, both solid and liquid foodstuffs can be handled from shops, supermarkets, restaurants, cafés, food producers, manufacturers, hospitals, schools and local authorities within a 50-mile radius.

As well as displacing 73,600 tonnes of CO₂, the equivalent of taking 14,431 cars off the road, ReFood Dagenham supports Transport for London's (TfL) Clean Air Action Plan through the generation of biomethane for gas-powered vehicles.

ReFood Dagenham not only processes the food waste of thousands of customers, it supplies farmers within the South-East region with ReFood's award-winning bio-fertiliser, ReGrow, helping to close the local food supply chain. The facility is one of the most advanced and largest of its kind in Europe, and a pre-eminent recycling resource for London.

The facility was built to limit harmful emissions and excessive use of energy. This includes thermal mass self-cooling (reducing the need for air-conditioning), the use of a biological scrubber to remove hydrogen sulphide from its biogas (instead of chemical or carbon filters) and roof-mounted solar electric panels which help power plant machinery. The site itself was constructed from recyclable products and is zero carbon-dependent.

Unlike many competitors, ReFood's facilities use computerised raw material control systems, so they can plan and achieve optimised gas yields. They also employ specialist de-packing machines to separate food waste from packaging. Packaging is then recycled and water is squeezed, for re-use in the AD process. Rainwater is also collected and used throughout the process, ensuring that no resource is wasted.

The company has embedded sustainability as a focus across all aspects of the development and this will be a continuing theme in the site's future.

2025

The Greater London area contains very little landfill capacity, and sites outside its boundaries accepting its municipal waste are expected to be full by 2025.





EACH YEAR IN LONDON
900,000 TONNES
OF FOOD IS THROWN OUT BY HOUSEHOLDS

540,000 TONNES (60%)
COULD HAVE BEEN EATEN

THE EQUIVALENT OF SPENDING
£1.4 BILLION
ON FOOD
DESTINED FOR THE BIN



Chapter 6

Insight from the industry



“Back in 2013, food waste wasn’t seen as a problem. In the five years since Vision: 2020, our national approach has changed entirely.

“Today, it’s remarkable how much best practice is taking place across the food supply chain. From wonky veg sales in supermarkets, to zero food waste pledges by manufacturers, industry continues to lead the way.

“Unfortunately, there is considerable lack of energy at central government and local authority level. As such, consumers are yet to play a driving role in the fight against food waste. Our biggest opponent seems to be district council responsibility – an outdated idea which continues to inhibit the entire recycling sector.

“Next steps must be a revolution in country-wide best practice. District council’s won’t like it, granted, but we need to be thinking about the future, not the past! Wales is a prime example of how this can work, as well as how we can realise the associated economic and sustainable benefits. We need a shake up of the old system.

“Personally, I’d prefer no waste at all. But this is an idea for the future – whereby the system could be run by retailers themselves; with grocery retailers stocking fridges and big data-driven algorithms informing ordering and quantities.”

John Gummer, Lord Deben

“Our concern is that mandating zero food waste to landfill simply won’t happen. The logical, economic, sustainable and emotive arguments have been drilled into government, but are apparently falling on deaf ears.

“Despite challenging targets for reduction and recycling, waste continues to fall further down the hierarchy. Rather than innovation, news headlines are filled with movements to co-mingled collections, static rates and cost-cutting measures. Global warming is seemingly a concern of the past, we want the easy option.

“How can we ignore the argument? Despite government-level talk of the circular economy, leading the debate and embracing innovation, we still only recycle 14% of food waste in the UK. This is a travesty. We must keep making the point!

“Let’s not talk about the future, let’s talk about the present. We have a real opportunity to minimise reliance on dwindling landfill capacity, return nutrients to the soil, create renewable energy, secure a sustainable source of vehicle fuel and challenge global warming. The government must listen.

“Unless we ban food waste to landfill, we can’t move forward. It’s as simple as that.”

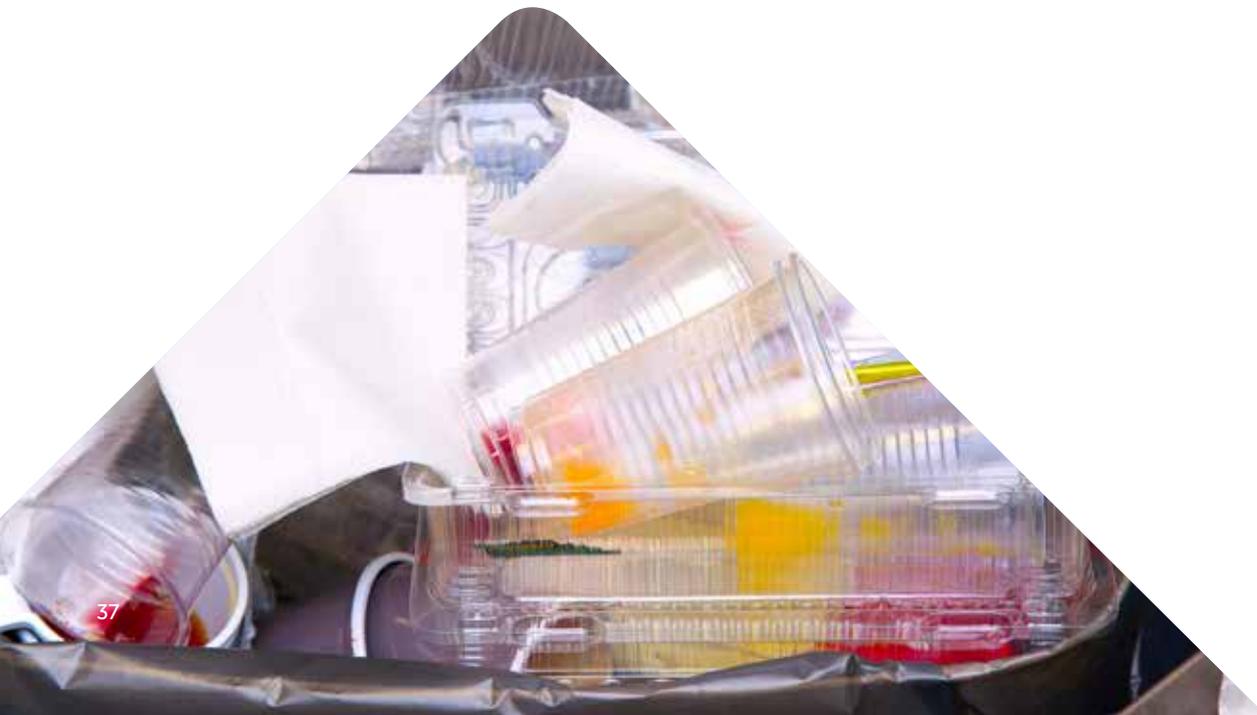
Jeremy Jacobs, Technology Director at the REA



Where next?

There is already a great deal of work going on across the food supply chain to reduce and recycle food waste. It makes commercial as well as environmental sense to do so, especially as the UK looks to increasingly diversify and decarbonise its energy and transport infrastructures.

Innovation offers exciting opportunities, especially in terms of capturing and sharing valuable information. The revolution in data availability and the arrival of the internet of things (IoT) is transforming all aspects of business and communication. It has the potential to fundamentally change the way the food supply chain system operates by increasing transparency, helping to eliminate waste through better resource planning and identification of opportunities to improve efficiency, eliminate contaminants and reduce the risk of recalls through increased monitoring and tracking opportunities. IoT is well-suited to the sector, where high levels of product variability means flexibility can generate productivity gains.



Active and intelligent packaging

Advances in packaging materials and technologies have significant potential to deliver reductions in food waste, food safety improvements, brand protection and improved supply chain traceability. Through the use of technologies such as RFID and nanotechnologies, future packaging will help track, preserve and monitor the food it protects.

Biofuels

Food waste is well established as a feedstock for electricity generation and is increasingly being used to deliver biogas to grid and to support biofuels for transport. At its 2017 Conference⁷⁹, the Anaerobic Digestion and Bioresources Association (ADBA) focused on the contribution that biomethane from AD could make to decarbonising transport, particularly for heavier vehicles such as HGVs, buses and tractors, with supermarkets such as Waitrose already running vehicles on fuel derived from food waste.

Energy storage

Battery storage is developing fast as technology improves and costs fall. In 2018, the Government has made grants available to farmers⁸⁰ to support distribution and energy storage systems for on-farm renewable energy systems.

Web 3.0 Chain of Custody

Blockchain technology⁸¹ is poised to deliver robust supply chain transparency, reassuring customers that products have not been adulterated and are not associated with poor social and environmental practice. The database technology provides a digital paper trail that is almost impossible to tamper with and is expected to revolutionise the way that grocery businesses guarantee the chain of custody in a cost-effective manner.

79. <https://waste-management-world.com/a/adba-huge-potential-for-biogas-from-organic-wastes-as-a-transport-fuel>

80. <http://www.fwi.co.uk/business/grants-available-farm-energy-storage-distribution.htm>

81. <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/strategy/us-cons-supply-chain-meets-blockchain.pdf>



Climate change

By 2025, the food system is expected to be experiencing the 'perfect storm' of food, energy and water shortages. Climate change will affect food supply chain resilience through its impact on food safety, raw material availability and food quality.

According to WRAP's 'Food Futures' report, a variety of crops and livestock products will be challenged by climate change in the coming decades. Examples include:

- **Bananas** - Half of the current global growing area is likely to become unsuitable for banana cultivation by 2060
- **Nectarines** - Warming temperatures are expected to mean that certain regions can no longer provide enough chill hours to set fruit
- **Fish** - Temperature changes will have a mixed effect on fisheries as waters warm across the globe. Some species will be negatively affected and others positively
- **Wheat** - Global wheat production has been estimated to fall by 6% for each 1°C increase of local temperature, barring adaptation. Yields will also become more variable, creating more volatility
- **Sheep** - Bluetongue virus, a sheep disease, is spreading into northern Europe with rising temperatures

"Some of the most productive agricultural land in England is at risk of becoming unprofitable within a generation due to soil erosion... Without further action the natural environment will be severely harmed by climate change."⁸²

Population growth

A demand-supply analysis of UK land requirements in 2030 indicates the potential for an additional seven million hectares to meet the needs of a population of 70 million, equivalent to an increase of 35% of the UK's current agricultural land. While some of this demand can be met by more efficient production, and less food waste, the future will place higher demands on our finite land resources. With increasing pressure on land, the optimisation of multiple functions becomes essential; whether for food cultivation, flood risk alleviation, natural habitats or energy production.

Diversity in food supply sources (insect proteins, etc.)

Global meat consumption is expected to increase by 76% by 2050⁸³. Rising household incomes are leading to greater demands worldwide for more meat. However, livestock production generates greenhouse gas emissions, causes land use change, requires 33% of global arable land for feed and causes high water demands.

Alternative proteins are being pursued for livestock feed and as food for direct human consumption. Sources of alternative proteins range from bacteria to insects, from mycoprotein to artificially cultured meat. The next generation of proteins will depend on proving food safety, production costs, nutritional qualities, scalability and consumer acceptance.

Likely areas of innovation include precision agriculture and the use of advanced monitoring and data systems as well as biological innovations in genomics and plant breeding. Some emerging approaches will also challenge established models of food production through the use of alternative systems such as soil-less growing and urban indoor farming⁸⁴.

By 2030, almost two thirds of fish for human consumption could be produced by the aquaculture sector.

82. Committee on Climate Change 2015 Report to Parliament

83. <http://www.wrap.org.uk/content/food-futures>

84. <https://www.standard.co.uk/lifestyle/esmagazine/how-londons-new-underground-farms-will-revolutionise-the-way-we-source-our-food-a3267221.html>

Conclusion

Where next to ban food waste to landfill?

WRAP's Food Futures document offers an exciting glimpse into what is possible. With AD facilities available throughout the country to make the most of food waste, there should be no reason in the long term to incinerate it or send it to landfill. By partnering with the waste industry, local authorities should be able to find ways to enable the circular economy without increasing costs during a time of austerity and tightening budgets.

Working towards this and recognising an overall deficit in data, Government's latest waste strategy pledges to work with partners and stakeholders to develop a shared vision and bold new approach, with responsibility for collecting and reporting data sitting with those who use resources and produce waste. In relation to food waste, Government will consult on the annual reporting of food surplus and waste by food businesses, and on seeking legal powers for food waste targets and surplus food redistribution obligations.

Redistribution features heavily in the overall waste strategy following research from WRAP that identified⁸⁵ 205,000 tonnes of food that could potentially be redistributed rather than going to waste, with a little under half of this – enough food for about 250 million meals a year – being edible and readily available. 2019 has already seen the Government establish a pilot scheme to reduce this food waste, supported by a £15 million fund for redistribution projects. It has also appointed a 'food surplus and waste champion' who will work with business leaders to ensure that this issue remains at the top of their agendas.

The food surplus and waste hierarchy

Government also sets out its food surplus and waste hierarchy in its waste strategy: "Ideally, surplus food should be redistributed for people to eat. The next best outcome is that it is used in the production of animal feed or for bio-material processing. In both these managed scenarios, the food surplus is not food waste. If neither scenario is possible, food waste should be treated through recycling by anaerobic digestion, or through composting when it is mixed with other bio-waste (such as garden waste). If anaerobic digestion or composting are not possible, it should be treated via energy from waste in preference to landfill."

It's our view that this strategy offers a firm policy direction for food waste that builds on the exciting foundations established over the past five years since the launch of the Vision 2020 Roadmap.

The Government is clear in its promotion of best practice and the need for greater measurement of food waste, with data that can drive and inform future behaviours, as well as potential new legislation to tackle historic commercial practices. The recognition of the importance of understanding what happens in the pre-farm gate section of the supply chain is a welcome first step towards decreasing the environmental impacts of food production.

85. <http://www.wrap.org.uk/sites/files/wrap/Food%20Surplus%20Redistribution%20Estimate%202017%20-%20Information%20sheet.pdf>

What benefits will we see immediately?

In its Food Waste Recycling Action Plan published in 2016⁸⁶ WRAP put a lot of groundwork into building a strong business case for benefits of prevention, re-use and recycling of food waste. This included a cost benefit analysis tool and also engaged key stakeholders in the food supply chain, including ReFood and many other participants in the original Vision 2020 campaign to maximise the amount of food waste collected, and to secure the supply of food waste to the Anaerobic Digestion (AD) & In-Vessel Composting (IVC) sectors.

Benefits, from household cost savings, to business efficiency and productivity, as well as reducing greenhouse gases and redistribution of surplus food, are already happening. Creativity, innovation and technology will continue to evolve food production, processes, packaging and storage of food with the re-purposing of food waste to ensure its value is optimised gaining increasing traction with resulting commercial, environmental⁸⁷ and societal benefits.

What benefits will we see in the future?

The key benefit of eradicating food waste from landfill, is that it forces behavioural change further up the supply chain. These changes are increasingly well documented, through case studies and insight by various organisations. The key driver for business will be to see the impacts that best practice offers and as the evidence grows to support the benefits of simple changes. Technology offers us a real opportunity to quantify these benefits in much more detail and even in real-time.

86. <http://www.wrap.org.uk/content/food-waste-recycling-action-plan>

87. <https://www.independent.co.uk/environment/carbon-emissions-cut-food-waste-clothing-electronics-climate-change-green-alliance-a8345641.html>

Conclusion

Who needs to lead this?

While WRAP will continue to be the central driver for multiple initiatives up and down the food supply chain to eradicate food waste from landfill, there are lots of other influencers who are already having an impact and who will continue to catalyse change in the future. From trade organisations that identify and share best practice among members, to high profile celebrities and entrepreneurs, there is an enthusiastic cohort of individuals who have continued to push boundaries.

Ultimately, responsibility lies with all of us, with businesses, with Government, with local authorities, educators and consumers. We can all play our part, whether that is preventing food waste in the home, asking for doggy bags in a restaurant, donating surplus food, or simply taking every opportunity to re-use and recycle whenever possible.

Government has stepped back from taking a leadership role in recent years, even drawing criticism for the amount of food waste occurring within Parliament⁸⁸. But, set against social backdrops such as food poverty and plastic in our oceans, the environment is currently high on nation's moral and political agenda.

Scotland has increased recycling rates for its organic and food waste by more than 20% and is on target to achieve household recycling rates of 70% by 2025. While the waste collection landscape in England is very fragmented, there is no doubt that the Government's new waste strategy offers the opportunity to drive positive change.

88. <https://www.thecatholicuniverse.com/get-house-order-food-waste-catholics-tell-mps-16946>

Timescales?

Over the past 18 months, there have been some very positive initiatives announced, from supermarkets choosing to abandon best before dates on fruit and veg⁸⁹ and giving away food with use by or best before dates on that day to community groups and charities⁹⁰, to new apps⁹¹ that help connect people to surplus food as well as the introduction of more appealing bins to help encourage recycling in the youngest members of the community⁹².

Overall, the news is good and the ambition remains strong among stakeholders at every level of the food supply chain to continue driving the message home that it makes commercial, societal and environmental sense to maximise the recovery of food waste as part of a wider circular economy approach that will improve resource efficiency across the board.

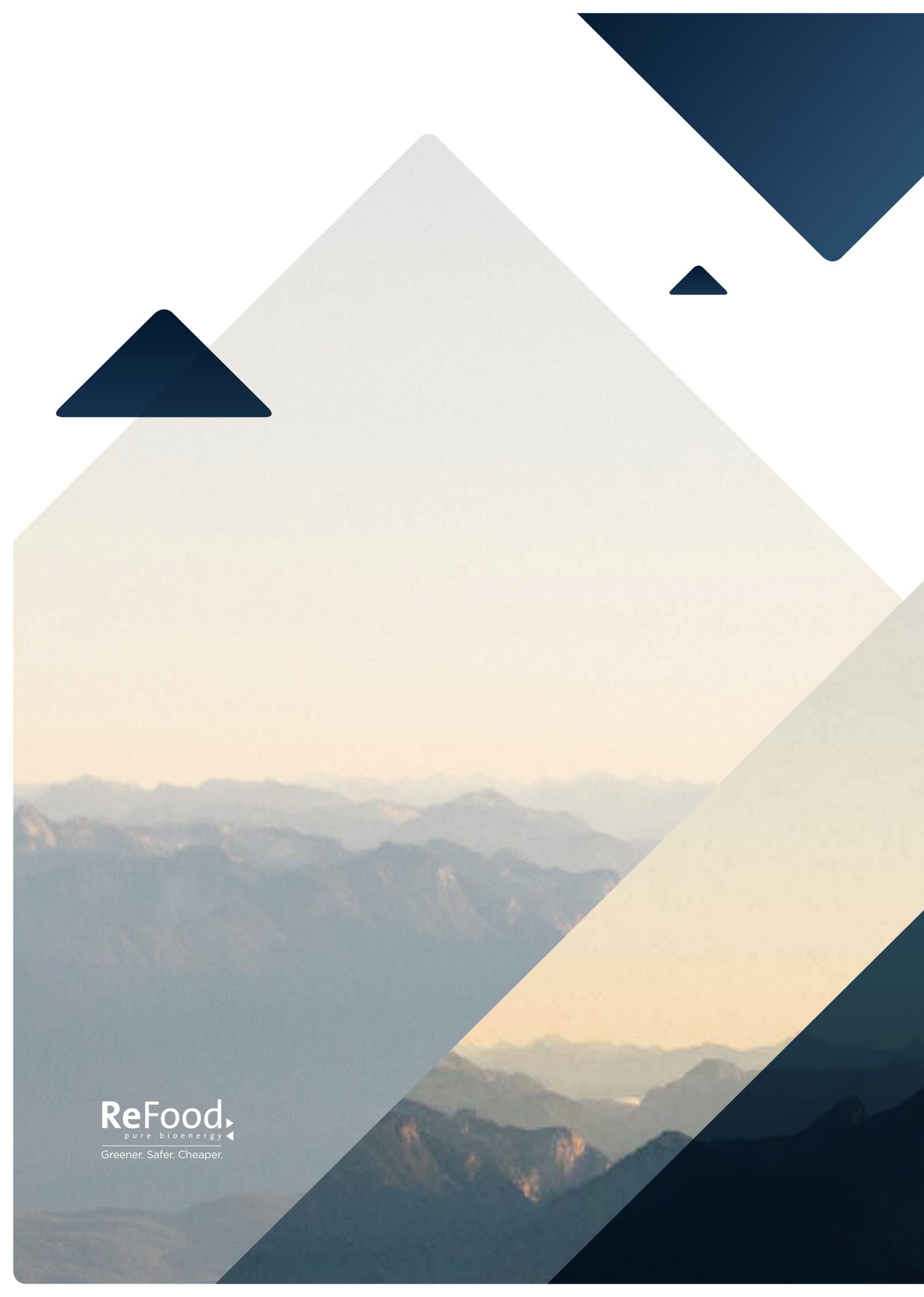
We fully anticipate that when we reflect on progress again in 2020, we will be able to see clear and measurable benefits in terms of cost savings, cutting greenhouse gases and responding to food poverty have been achieved. We are excited by many of the initiatives talked about in this report and look forward to continuing to engage with partners to turn the shared ambition of eradicating food waste from landfill into reality.

89. <https://www.independent.co.uk/news/business/news/tesco-best-before-dates-remove-food-waste-fruit-vegetables-a8362731.html>

90. <https://www.theguardian.com/business/2018/may/17/co-op-fight-food-waste-donation-scheme>

91. <https://olioex.com/>

92. <https://www.bristolpost.co.uk/news/bristol-news/bristol-waste-bins-cartoon-recycling-1637222>



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