FOOTPRINT INTELLIGENCE

Cutting carbon in the commercial kitchen

Tips and tricks to help hospitality and foodservice operators achieve net zero back of house

MEIKO

MEIKO GREEN WASTE SOLUTIONS

Cutting carbon in the commercial kitchen

Tips and tricks to help hospitality and foodservice operators achieve net zero back of house

CHAPTER **1**

Why act? Carbon = a commercial imperative

CO_2

"The business case is utterly clear. We have to cut carbon to remain viable businesses, and to protect the future of our planet."

Paul Anderson, managing director, Meiko UK

Based on exclusive insights from industry experts, and with practical tips from farm to fork, *Cutting carbon in the commercial kitchen* explores how foodservice operators can meaningfully tackle the greenhouse gas emissions that exist in their 'back of house' operations to support the rapid reductions needed to meet the climate crisis head on.

Chapter by chapter, it provides a guide to the tangible steps operators can take, starting with the business case for taking swift action to set targets and tackle emissions.

1. Act with urgency

The evidence is clear: businesses need to act urgently to help prevent the worst impacts of climate change. The latest report from the Intergovernmental Panel on Climate Change (IPCC) concluded that climate change is already causing dangerous and widespread disruption in nature and affecting the lives of billions of people around the world[1].

Even at 1.5°C of warming, the IPCC warned the world faces "unavoidable multiple climate hazards" including increased heatwaves, droughts and floods which in turn are exposing millions of people to acute food and water insecurity.

"Our assessment clearly shows that tackling all these different challenges involves everyone – governments, the private sector, civil society – working together to prioritise risk reduction, as well as equity and justice, in decision-making and investment," said IPCC Working Group II co-chair Debra Roberts.

Tackling emissions from food and agriculture will be critical to staying within that 1.5°C threshold. The food system from farm to fork contributes around 29% of global greenhouse gas emissions[2]. In the eyes of many experts and campaigners, however, there was a giant food-shaped hole in the political discussion at the COP26 climate talks. "The Glasgow Declaration makes no reference to our food system, nor to food waste, despite the fact that our food system is one of the largest carbon emitters," says Jamie Crummie, co-founder of Too Good To Go, an app which allows people to purchase food that would otherwise go to waste.

However, as Mike Hanson, head of sustainable business, WSH, notes, the dialogue and attention that surrounded COP26 mean that it still helped to "create the necessity for businesses to act. Irrespective of the moral and climate argument, businesses are now thinking: 'I have to do this, or we're going to get left behind.'"

Businesses, including those in the foodservice and hospitality sector, are beginning to fill the policy void. In the past 18 months, major companies including McDonald's, Meiko, Nando's, Compass and Sodexo have committed to net-zero targets.

Collaborative groups and forums – such as the Zero Carbon Forum (ZCF), Wrap's carbon reduction forum and forthcoming protocol, and the Net Zero Now initiative – have been established to coordinate industry efforts and give businesses the knowledge and tools they need to establish their own emissions targets, and deliver them.

But progress remains slow against the urgency of the situation. ONLY

26

of the world's 350 largest food and agriculture companies are working to reduce greenhouse gas emissions in line with the Paris Agreement[3]

9%

of small businesses across the wider economy are measuring their carbon footprint[4]

SME SME SME

1 in 3 one SMEs is yet to seek advice or information to help them develop a net-zero roadmap[5]

22% CO_2

of SMEs don't fully understand the term net-zero[6]

This lack of SME engagement is a particular issue for a fragmented sector like hospitality. "The number of hospitality venues in this country is massive and predominantly small to medium size. We won't have a net-zero economy by 2050 if you leave small and medium businesses out of it and make this just a game for the big boys," says Sustainable Restaurant Association managing director Juliane Caillouette Noble.

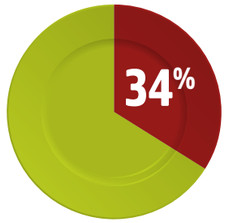
This means foodservice businesses, of all sizes, must act now. So support the forums and working groups designed to drive the necessary industry-wide shifts, and harness the tools available to understand your impacts and implement the changes needed to align your business with a 1.5°C future.

2. Benefit from the commercial case

For those who aren't persuaded by the moral imperative, then the commercial case is increasingly compelling too. (Regulation is coming but it is taking time. In October, for example, the government announced that businesses will be required to publish credible net-zero transition plans under new green finance rules[7]).

Investors are increasingly making investment decisions based on ESG performance. In a survey by Barclays, 60% of hospitality and leisure respondents said sustainability is important to their investors and shareholders[8]. Money is flowing into ESG funds, demand for green bonds is soaring[9], while investors with trillions of pounds worth of assets have called on governments to set targets to reduce agricultural emissions[10].

Consumer spending is also being channelled towards more sustainable brands.



of people chose brands with environmentally sustainable practices or values

had stopped purchasing brands or products because of ethical or sustainability-related concerns Deloitte, 2021

3. Make sustainable savings

Going green can also help the bottom line when foodservice businesses are still recovering from the financial damage wrought by the coronavirus pandemic. Reducing carbon can lead to cost saving across the entire business including buildings, kitchens and supply chains. "With energy and food costs spiralling, a net-zero carbon target that requires you to reduce your energy use, food waste and be more efficient across the board is a really good driver of cost savings," says Caillouette Noble.

Menu goes green for COP26

COP26 event caterer Levy UK ensured the delegate menu reflected a more sustainable food system[16,17].

60%

of purchases were vegetarian

40%

of the menu options plant-based

Meat portions were reduced

1%

food waste achieved by using all edible parts of vegetables, redistributing surplus and composting scraps

Focus on reusable bottles and cups, and water dispensers

£25,000 p.a.

per site wasted on the cost of overnight energy usage[12]

£10bn

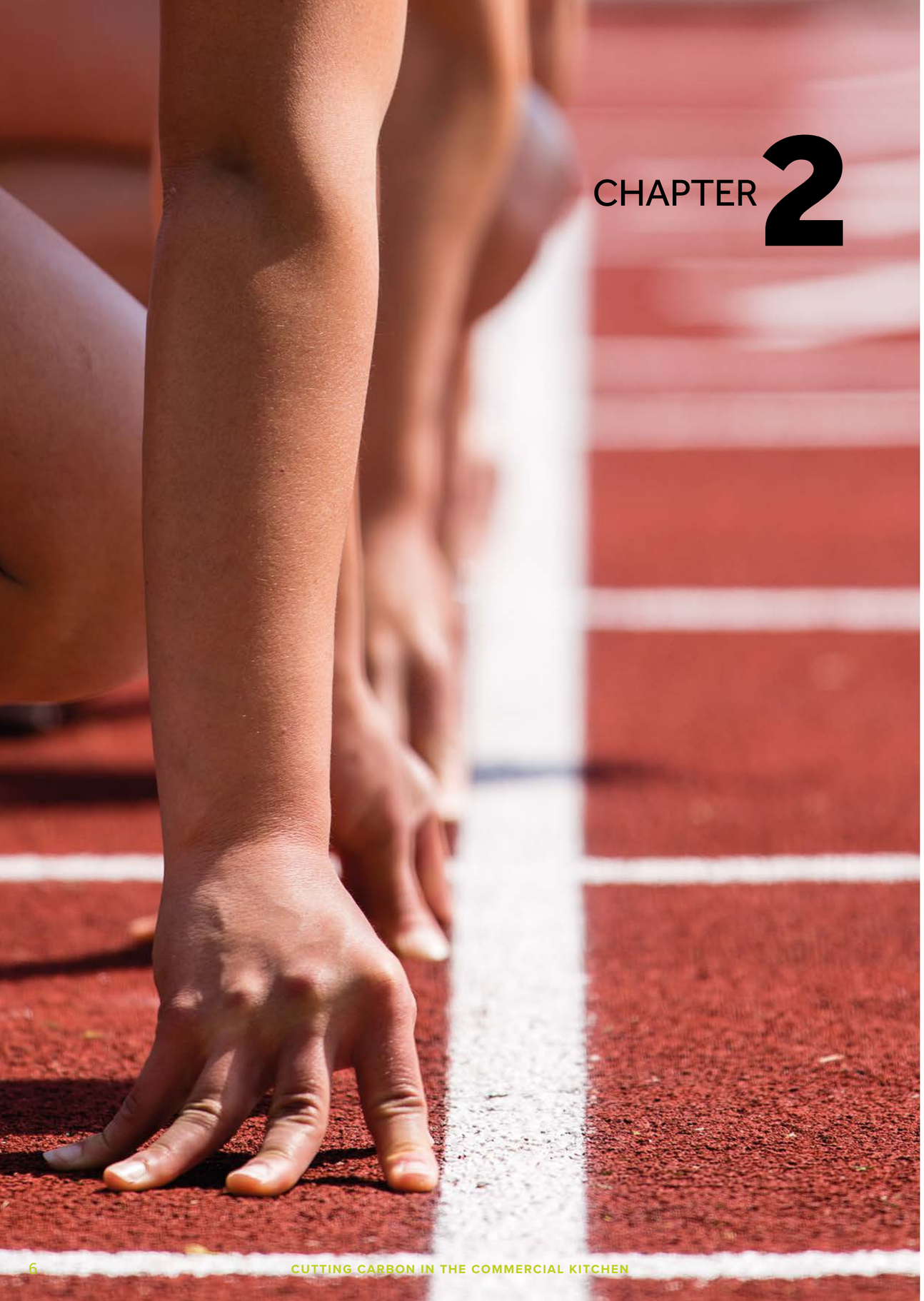
worth of food could be saved by halving food waste by 2030[13]

£355m

savings from 140 Food Waste Reduction Roadmap businesses reporting year-on-year food waste data[14]

670,000 tonnes

GHG emissions potentially avoided through waste reduction[15]



CHAPTER 2

Carbon footprinting: where to start

"It's crucial to provide transparency about how carbon and impacts have been calculated."

Jamie Crummie, co-founder and director, Too Good To Go

1. Take targeted action

The hospitality and foodservice sector is estimated to directly account for 5% of UK scope 1-3 food system emissions compared with 6% for food manufacturing and 3% for food retail, according to Wrap[18]. Analysis by the charity showed a 50% reduction in food-related emissions by 2030 (in line with a 1.5°C trajectory) is possible, but action is needed in five areas:

- Continued focus on decarbonisation
- Developing a better understanding of wider supply chain emissions
- Achieving zero deforestation commitments in supply chains
- Taking action on food waste
- Influencing consumption behaviours

2. Establish your baseline

Businesses looking to neutralise or reduce their carbon footprint first need to understand their emissions baseline, and what targets are therefore needed for that business's actions be in line with the 1.5°C threshold. There are myriad organisations promising to help companies do this but it remains fiercely complicated.

There are, however, some standard practices that should be followed when setting a net-zero or carbon reduction target:

Follow the Greenhouse Gas Protocol[19].
This provides a set of standards and guidance by which companies can measure, manage and report greenhouse gas emissions from their operations and value chain.

Make targets science-based.
This means targets are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement. Science-based targets must cover company-wide scope 1 and scope 2 operational emissions. If a company's relevant scope 3 supply chain emissions are 40% or more of total scope 1, 2, and 3 emissions, a scope 3 target is also required. These scope 3 value chain emissions account for 83% or more of the emissions across each sub-sector of hospitality, apart from hotels, according to ZCF[20].
In October last year, the SBTi (science-based targets initiative) published a new corporate net-zero standard which requires businesses to set both near- and long-term science-based targets across all scopes[21].

Take care with offsets.
Criticism has been levelled at some businesses for their heavy reliance on offsetting to meet net-zero targets. Initiatives like Net Zero Now are clear that the purchase of offsets must be in line with the core Oxford Principles for Net Zero Aligned Carbon Offsetting[22]. These state that emissions reductions must take priority, high quality offset schemes must be used, and the composition of offsets must be regularly revised and updated to meet the latest scientific guidance.

Zero Carbon Forum

With members including Burger King, BrewDog and JD Wetherspoon, Zero Carbon Forum (ZCF) has emerged as one of the leading collaborative initiatives for hospitality businesses looking to collectively steer the industry towards a net-zero future.

The forum has created roadmaps for brewing and hospitality businesses to help guide them along the decarbonisation road[23].

Headline targets:

- 90% reduction in scope 1 and 2 emissions by 2030
- 57% -78% cut in scope 3 emissions by 2040

Zero Carbon Forum are also launching a carbon calculator and toolkit to offer a "cost effective, robust and comparable footprinting".

In the roadmaps, pathways to a 90% reduction in scope 1 and 2 emissions are laid out for each sub-sector. Each will have hotspots but for most it is the switch to renewable energy that offers the biggest gains (see *Bricks and Mortar*).

Scope 3 emissions are dominated by purchased goods and services, in particular food, and are as high as 97% for QSRs (quick service restaurants) and over 80% for every sector except for hotels (61%). Supply chain collaboration is therefore key to reducing scope 3 emissions.

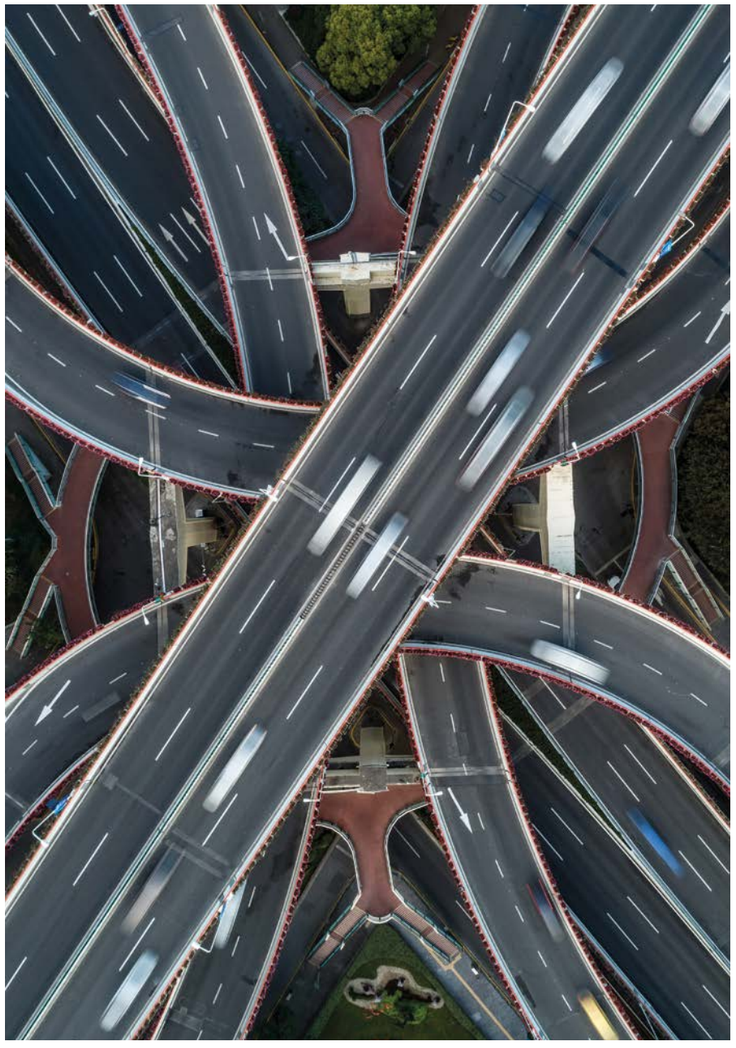
Net Zero Now

Net Zero Now is a new initiative that has worked with industry bodies, thought leaders and key industry players to create a range of sector-specific, industry-standard methodologies and tools[24]. The Sustainable Restaurant Association will support delivery of the hospitality program in the UK. Businesses are able to achieve accreditation against the Net Zero Now standard, with the protocol available to download at netzeronow.org.

Methodologies are based around a standardised five-step framework:

- Calculate
- Mitigate
- Compensate
- Validate
- Communicate

Businesses can upload information about emissions sources such as energy use, food purchases and employee commuting. The data is then verified by Net Zero Now and a "robust" carbon footprint calculated. "Our aim is to make the process as accessible as possible," says Johnny McCreesh, senior climate project manager at Net Zero Now, "so we can remove barriers and ensure all sizes and types of business can understand their climate impact and begin to actively reduce their emissions".



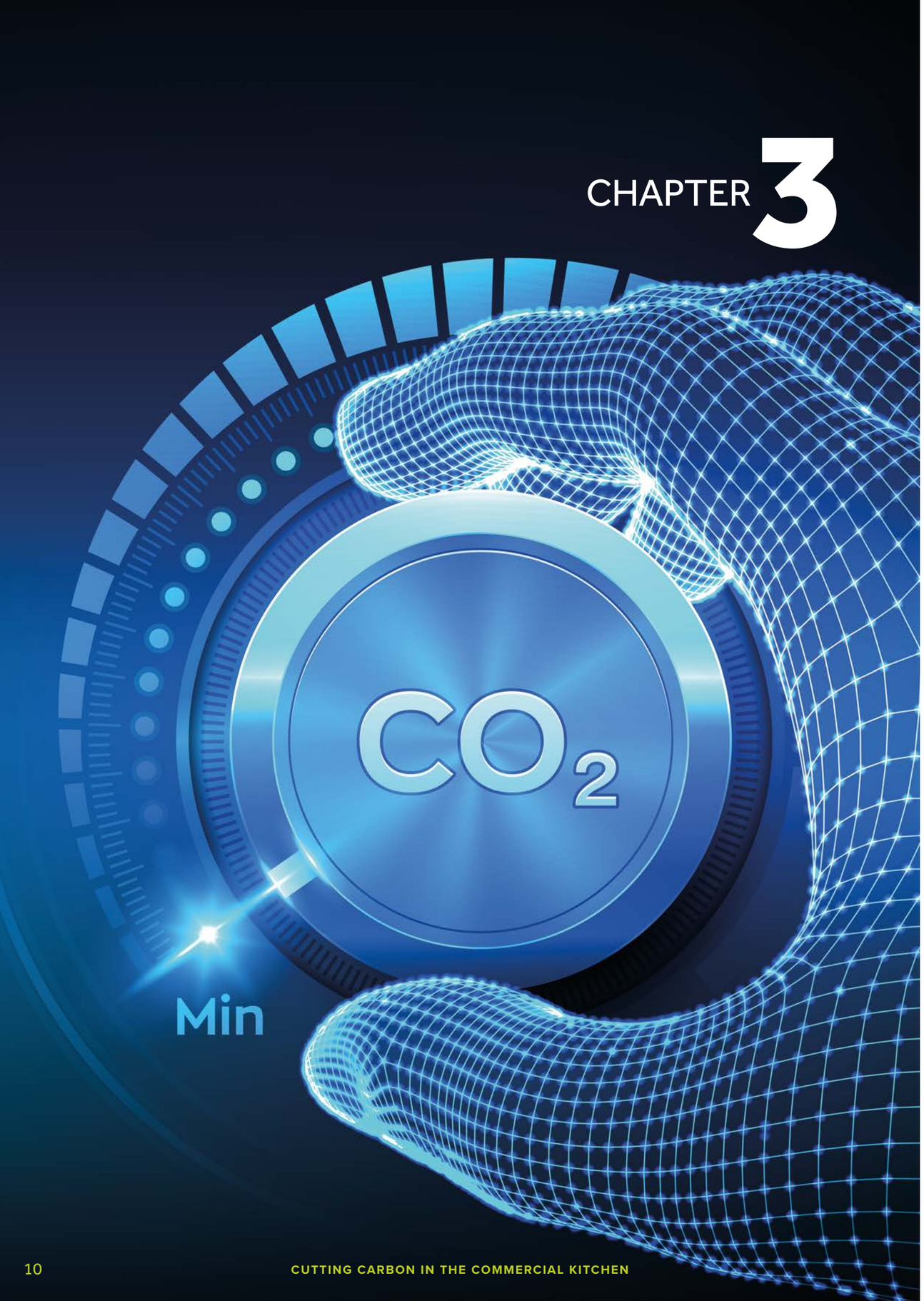
3. Act now to tackle scope 3

Some of the greatest challenges businesses face in establishing a carbon baseline involve the measurement of scope 3 supply chain emissions. While standard scope 1 and 2 emissions conversion factors are established by the UK government[25], there is no standard framework for measuring emissions that exist in the supply chain – and that is where the vast majority of hospitality and foodservice emissions lie.

Most businesses' scope 3 calculations currently rely on average emissions values for the country or region in which a product is produced rather than the specific method of production. Businesses looking for an accurate picture of their emissions must therefore commission (expensive) life cycle assessments (LCAs) for each ingredient or use average values from a variety of public data sets. "This is a burden for suppliers and makes it impossible to compare the information provided by different businesses," explained Wrap chief executive Marcus Gover as he launched a new working group in February which aims to create a standard way of measuring emissions from supply chains[26].

Wrap's head of climate action strategy Karen Fisher, who is leading the workstream, says that "without good measurement and data flows, there is no mechanism to be able to incentivise and reward good practices".

Wrap plans to publish a set of measurement and reporting protocols for UK food and drink businesses later this year. But businesses are not, and should not, wait around for perfect data to emerge. Sodexo corporate responsibility director Claire Atkins Morris speaks for many when she says that "whilst it is important to set a baseline and have the data to support taking action; focussing solely on reporting is not going to drive impact". She adds: "I'm nervous about the amount of resources and time that will be spent on calculating data and emission factors rather than on what we're actually trying to achieve. We need to work collectively within to report against standardised frameworks to support our value chain including suppliers and consumers".



Taking Action
Bricks and Mortar

"Making simple changes can have a big impact."

Cristina Covello, head of strategic growth, Fooditude

Much of the low-hanging fruit that can be picked off by businesses looking to reduce back of house carbon will be in their scope 1 and 2 direct operational emissions. Many of these gains can be unlocked in the buildings they operate.

Here are some key actions to take:

1. Switch to renewable energy and monitor energy use

"The easiest thing that any business can do is just switch to a renewable tariff," says Net Zero Now's McCreesh. Net Zero Now has calculated that pubs and restaurants can immediately reduce their emissions 10% by switching to a renewable tariff, and 30% by improving energy efficiency. Businesses are already making progress – around one in four (26%) of the 30 pubs involved in the initial pilot for the Net Zero Pubs and Bars initiative has switched to a renewable energy tariff.

Meanwhile, ZCF believes pubs can reduce scope 1 and 2 emissions 90% by 2030, with renewable energy accounting for 34% of the reduction. For a restaurant aiming at the same target, renewables account for more than 32% of the reductions; in breweries it reaches 43%.

Switching to renewable energy does not remove the need to focus on efficiency measures. Energy usage data from smart meters can provide operators with a clear view of their emissions hotspots and where potential savings can be made. "There are systems that can drill down into every single electrical circuit within a building to see how much energy it is using," says managing director Emma Brookes from grease and energy management specialists Quintex.

Energy and environmental management systems can also help monitor and control energy usage, potentially optimising

energy by managing peak flows via demand/supply regulation. Building management systems are less technical and can be used across a property portfolio to centrally manage heating, lighting, thermostats, ventilation and so on, to enable more effective measurement, management, and control of energy use.

2. Choose low-energy lighting

Replacing inefficient short-lived halogen lamps with LED alternatives can be an easy way to save energy and, in the long-term, money. Greene King recently took the decision to replace all lamps in the back-of-house areas of its pubs with LED equivalents[27]. Previously, many of the lamps used halogen technology, which uses around 10 times more power than the equivalent LED lamps. Approximately 42,000 LED lamps have been installed in kitchens, cellars, walk-in fridges, corridors and offices, resulting in a 65% reduction in the power requirement for back of house lighting across the managed Greene King estate.

Delivered-in contract caterer Fooditude has also installed more efficient LED lighting in its offices along with motion detectors so that lights turn off automatically when no motion is detected. The move has helped reduce electricity consumption by around 13% and has also saved money, according to Fooditude head of strategic growth Cristina Covello.

Case Study: Cool cellars

Greene King has recently rolled out Cellar Manager energy saving technology across 1,700 pubs following a successful pilot in the Greater Manchester area[31]. The technology is designed to save 30% of the main cellar cooler energy through the principle that beer in the keg increases in temperature at a much slower rate than the surrounding cellar air temperature. The product switches off the main cellar cooler as required, while maintaining the beer temperature at 12°C. This automatically reduces the energy used in the cellar, in and out of working hours.

3. Be hot on heating

Many buildings are still reliant on gas-fired boilers as their primary source of heat. Upgrading old boilers to newer condensing models has been shown to reduce annual energy consumption and associated carbon emissions and costs[28]. Over time, switching to air and water source heat pumps – albeit costly to install – can further improve energy efficiency[29].

Substantial amounts of heat can be lost through walls, floors, doors and windows so investment in insulation, glazing, intelligent air conditioning systems and superior heating will also improve the energy efficiency of buildings.

In addition, businesses can reduce energy wastage by using natural ventilation and smart technology. When a bedroom window is opened at The Zetter hotel in London, the air conditioning is programmed to cut out[30].

4. Reuse materials in refits

Make the most of materials already onsite, or source second hand or recycled materials such as furniture and IT equipment. This prevents materials going to waste, and saves the emissions associated with purchasing new products.

CHAPTER **THREE**

Case Study: McDonald's

McDonald's has reused materials in a creative way in its new restaurant in Market Drayton, Shropshire, which will act as a blueprint for future sustainable restaurants[32].

Walls are insulated with sheep's wool, while cladding is made from recycled IT equipment and white household goods. In total, the equivalent of 250 square metres of recycled materials has been used in the design.

Kerb stones have each been made from 182 recycled plastic bottles, reducing CO2 emissions by 25kg per kerb compared to using concrete. Inside the restaurant, wall art is made from recycled polystyrene cups, fixed in place with potato starch.

By 2023, all new McDonald's furniture will be made from recycled or certified materials and designed for reuse.

CHAPTER **FOUR**

Taking Action
Everyday practice

> "It's impossible to achieve a net-zero sector without addressing food waste."
>
> **David Jackson, director of marketing and public affairs, Winnow**

A small change to an everyday practice or behaviour may not of itself deliver a significant reduction in emissions but the aggregation of lots of changes over time can make a big difference.

From the kitchen to the company car, here are some top tips for reducing emissions by changing everyday practices.

1. Prioritise pots, pans and hobs

Opus Energy has published a number of helpful tips for saving energy in a kitchen environment . These can be as simple as matching the size of kitchen pots and pans to the heating ring or oven to avoid wasting energy; not overfilling saucepans or kettles and using lids to prevent heat escaping; and ensuring hot storage of cooked food is kept to a minimum to avoid continuously firing heat.

2. Ensure staff are well trained and take responsibility

Behaviour change is about "creating awareness" and giving employees "the right kind of training" so they have the knowledge which enables them to use resources and equipment efficiently as a matter of course, according to Meiko UK managing director Paul Anderson. Train staff on how to use equipment, ensuring they know how to use energy and water saving features, and know how to prepare, produce, procure and store food efficiently. Sometimes savings can come from basics like ensuring staff are using the right program for the job, such as using a less intensive cycle for lightly soiled laundry.

It's also important to add sustainability responsibilities to job adverts and descriptions, with KPIs set around meeting specific sustainability criteria.

3. Keep good food from being wasted

Food waste costs the hospitality and foodservice sector an estimated £3.2bn every year, according to Wrap[34]. The link between food waste and carbon emissions is less well understood, but Wrap says emissions associated with UK food waste are 36MtCO2, equivalent to 23% of total food system emissions[35].

As Sodexo head of environmental sustainability Simon Mussett explains: "What you're throwing away isn't just the organic waste, it's the embodied carbon in producing that food in the first place as well as the transportation and the on-site energy used to cook and create dishes that then end up being wasted."

Wrap recommends adopting a Target, Measure, Act approach to tackle food waste, where food waste is measured by food left on the plate, preparation waste and spoilage at the end of every service, to identify hot spots and to keep food waste reduction efforts front of mind. Wrap's Guardians of Grub campaign provides free tools and resources – including training – to support the industry in food waste reduction[36].

Footprint's recent Empowering Sustainability Heroes report also contains tips for keeping good food from being binned[37]:

- Be creative with menus to use up offcuts and surpluses, both from within the kitchen and in the supply chain
- Plan and prepare efficiently to ensure production matches demand

- Collaborate with third parties like FareShare, Olio and Too Good To Go, so that any edible food that can't be eaten finds a way to feed people through redistribution
- Offer diners 'doggy bags' or takeaway boxes for their leftovers
- Optimise portion sizes to minimise plate waste
- Streamline SKUs and menu items to make demand forecasting easier

2. Drive down fuel emissions

Another relatively straightforward change is switching company car fleets from petrol or diesel to electric vehicles (Evs). Compass is pursuing a 100% electric policy for all new fleet cars by 2024, while Sodexo is in the process of replacing all company petrol and diesel cars with electric and hybrid alternatives[38].

Businesses are also starting to install EV charging stations at offices or venues to help employees and customers make the switch to electric. Kent-based brewer and pub operator Shepherd Neame has begun the rollout of electric charging points across its 301-strong pub estate . The first station has been installed at The Wharf, Dartford which now has two rapid pay-as-you-go charging points in its car park. Marston's has also been rolling out rapid charging points for Evs across its pub estate .

Asking questions and collaborating with supply chain partners to support their delivery vehicle emissions also helps reduce the supply chain emissions, particularly for frequently delivered items like ingredients.

Footprinting school meals

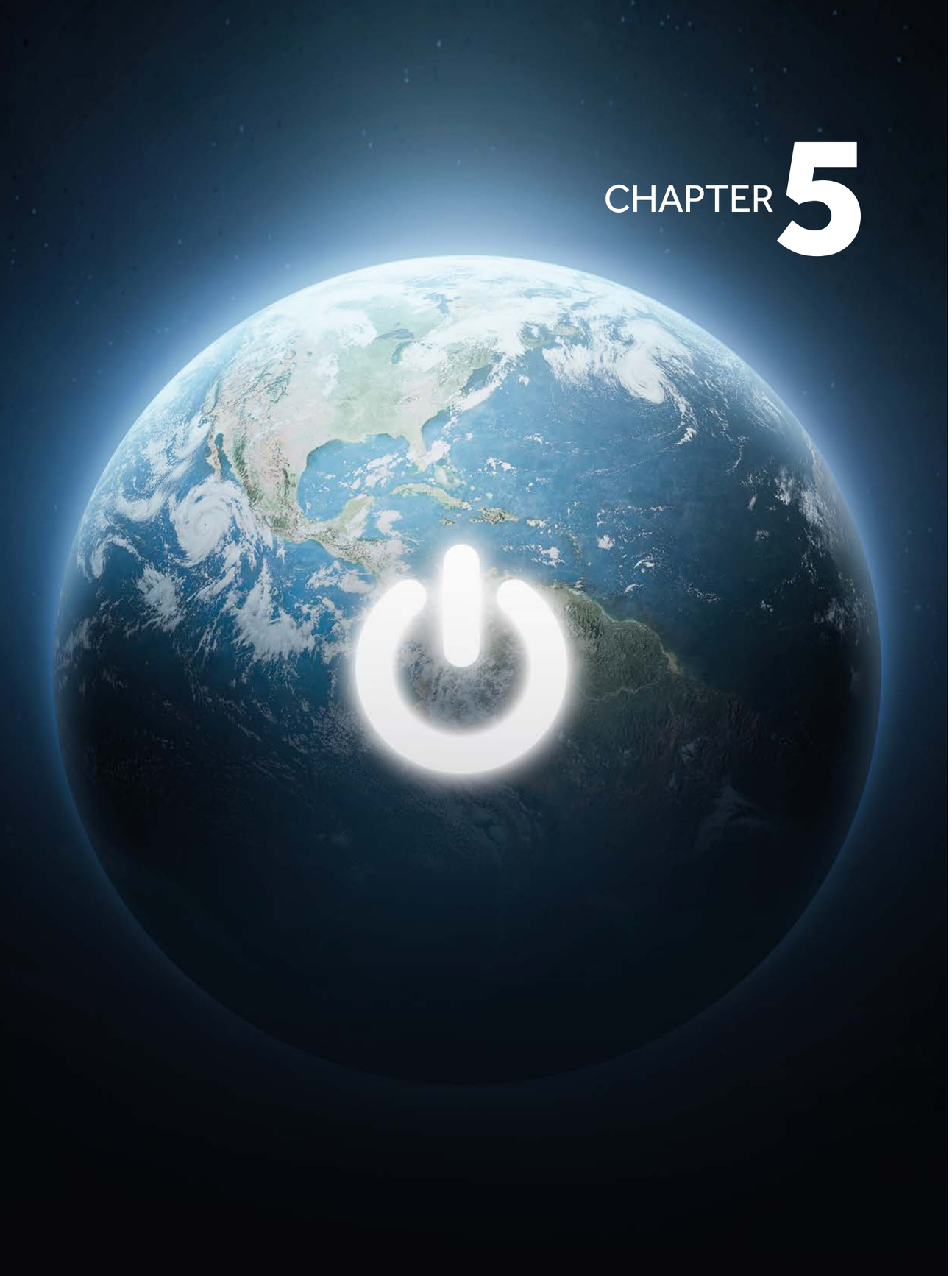
To calculate the impact of meals in education catering, researchers at the University of Edinburgh and Impact Measurement Ltd have developed a free Meal Analyser tool. Originally created as part of the European research project Strength2Food, the tool allows any organisation running a public catering service to calculate the annual carbon, and economic impacts of that service, including the impacts of food waste. It shows where carbon emissions are coming from, and how they compare across different types of food, transport and disposal. "We are currently working on a new version of the tool," says Professor Angela Tregear, professor of marketing, University of Edinburgh, "to provide even more granular results and added functionality."

Case Study: Food saving menu planning

Fooditude has made a number of changes to reduce food waste in the kitchen, starting with the way menus are planned. "We try to make sure that if we were having roast cauliflower, then the cauliflower leaves are kept and turned into cauliflower leaf kimchi, or broccoli stems would go into coleslaw the next day," explains head of strategic growth Cristina Covello.

Fooditude has also started to hold more food back in the fridges or in hot cupboards towards the end of a service rather than put it out on buffets after which it can't be given away because of food safety implications. Anything that is left over is collected and taken away for redistribution.

CHAPTER **FOUR**



Taking Action **Equipment**

"Interrogate equipment suppliers. Ask: where do your components come from? Do you choose the manufacturer with the lowest carbon footprint? Do you minimise transport emissions? Can the machine be reused/recycled/upgraded? What are its in-use energy/carbon/water/detergent impacts?"

Paul Anderson, managing director, Meiko UK

Some of the greatest direct energy use in the hospitality sector comes in the commercial kitchen. A 2013 study published in the *International Journal of Low-Carbon Technologies* looked at electricity consumption data from 14 pub restaurants[41]. The researchers found on average, 63% of the premises' electricity consumption was attributed to the catering activity.

There are myriad ways in which this energy consumption can be reduced.

1. Switch to save

To ensure only the heat needed is used when cooking on hobs, to prevent chefs from leaving gas rings burning unnecessarily during service, and to keep kitchens cooler so they need less extraction and are more pleasant working environments, make the investment in switching from gas to induction.

Matt Drew, head of food & beverage at the National Trust, explains that traditionally Trust kitchens would have been equipped with a gas hob with up to eight rings on it. Chefs would often switch all of the gas rings on and leave them on throughout service. "We're now replacing all of our gas hobs with induction hobs to prevent that from happening," says Drew.

The National Trust has also put doors on its self-selector fridges, which reduces energy.

Moving away from inefficient 'walk-in' spaces, like walk-in freezers, to using self-contained freezer drawers or chests is another switch with energy saving potential.

Operators should also use equipment in a way that optimizes energy efficiency, turning items on only when needed and choosing a program intensity to match the job required. Graham Veal, managing partner at foodservice tech consultancy GCA Management, recommends that items such as a combi steamer and oven, which are typically used to cook in intervals, are put into idle mode during quieter periods to reduce energy consumption, before heating them back up when needed. Such settings can sometimes be preprogrammed or set to default.

Operators can also request that equipment is supplied with a data logger as standard "so that the operator is always able to effectively log on and identify at a glance

Case Study: LoCooker

Steam ovens and water baths can offer a more cost effective and sustainable way of cooking food by consolidating the energy where it is most required. Welsh company Clyne Energy secured government funding to develop its LoCooker energy efficient oven, which works by spraying water over the food, producing steam which is moved around by air convection, keeping temperatures below boiling point and preserving nutritional value and flavour[42].

Keeping water boiling requires over 200 times more energy than keeping water at a temperature just below boiling. Its creators say the LoCooker prevents the temperature of the water from exceeding the boiling point of 100°C and keeps the entire cooking chamber at a consistent temperature to an accuracy of 1°C.

exactly how much energy is being consumed", suggests Veal.

Drinks fridge sensors that turn on chilling when they sense movement behind the bar can also lead to big energy saving wins. Similar reductions can also be achieved manually. "If you're not serving white wine until lunchtime," suggests the SRA's Caillouette Noble, "turn the fridge on in the morning when the first person gets into the restaurant instead of having it running all the time. Drinks have still got time to chill and it saves dramatic amounts of energy".

2. Consider the whole life cost

Low-cost equipment may ultimately cost the operator more in the long-term if it is expensive and energy hungry to run and needs repairing or replacing more frequently; breakdowns can also lead to disrupted service and higher food spoilage costs.

Energy is also used in the extraction of fumes and smells, dishwashing, lighting and refrigeration – with inefficient or faulty machines increasing these burdens.

Businesses are increasingly using 'whole life costing' as a key criterion in purchasing decisions. "We've looked at our equipment specifications and select those with the lowest whole life costs, and best water and energy efficiency to get the most environmentally-friendly equipment we can find," says Drew at the National Trust. "This kit might be more expensive at the beginning, but over its life it's more efficient."

There are also moves by manufacturers to make equipment easier to repair so that major parts can be swapped in and out without the whole appliance having to be replaced. "If you buy an oven or refrigerator today, it should be capable of being the carcass of an effective appliance in 20 years' time," says GCA's Veal. "Initiatives such as Loopcycle's Cyclecode, which allow both foodservice operators and manufacturers to access a product's lifecycle by scanning its unique ID, via smart device, also reinforce this movement towards re-use and re-cycling." New regulation is also coming which requires manufacturers to make spare parts for domestic washing machines and fridges, but it is not clear yet whether this will extend to commercial equipmen[43].

3. Embrace innovation

Innovation – both in the equipment itself and the way people are trained to use it – is helping

boost efficiency and curb emissions.

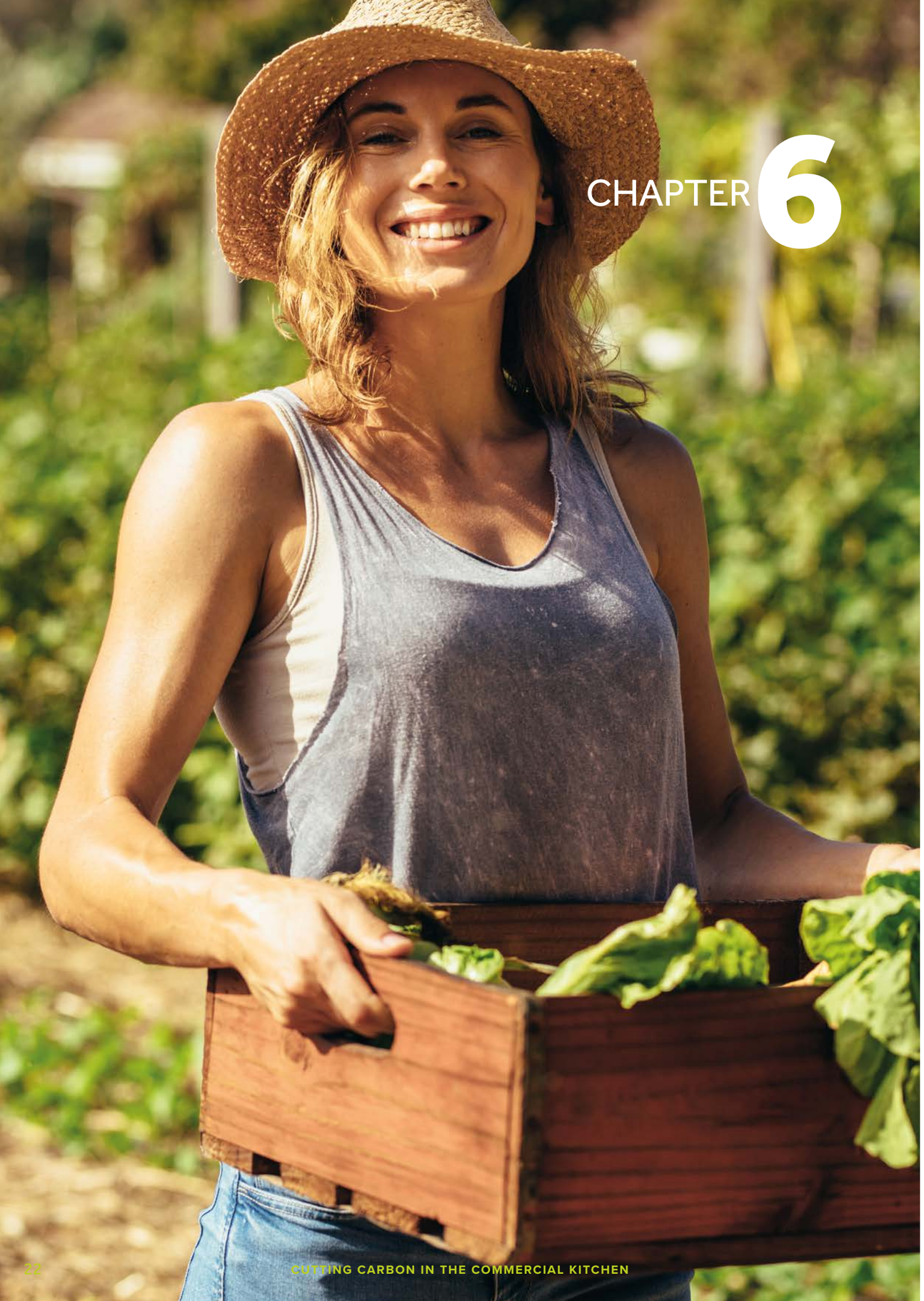
For example, GCA's Veal notes how more precise humidity control in refrigerators can help operators maintain food products, such as different cuts of meat, at optimum temperatures and therefore in better condition, for longer. "Refrigeration 10 years ago didn't give you this level of control," Veal adds.

Quintex's Cheetah demand control ventilation system saves energy by slowing fans down automatically when there's little or no demand for cooking[44]. The Cheetah system works on the principle of the 'Affinity Laws for Centrifugal Loads', whereby a fan running at 40% of its normal operating speed will only consume 6% of the energy required to run the fan at 100% of its operating capacity. "You still find kitchens being specified with a manual controller on the wall and staff are expected to turn it up and down to save energy. Well, they're never going to do that," says Quintex's Brookes.

4. Harness YouTube and equipment interfaces for training

The hospitality sector is known for having a high turnover of staff so efficient training is essential. Modern equipment now tends to have interfaces which enable users to be trained on how it is used, via a touchscreen control panel, for example, or an instructional video link that can be viewed on the equipment, or via a tablet or phone. YouTube also hosts a plethora of instructional videos which can help staff quickly get up to speed.

Equipment is also being designed with a nod to supporting operators' own sustainability initiatives. Meiko has launched its own bottle washing system with a flexible wash rack and adapter suitable for cleaning reusable bottles of different sizes[45].



Taking Action
On the plate

> "The greatest impact is from the food we buy, where we buy it from, and how much we waste."
>
> **Mike Hanson, head of sustainable business, WSH**

For a foodservice operator, the food that ends up on the plate is almost without exception the most impactful part of its footprint.

Whilst challenging, much can still be done to reduce the carbon footprint of the plate, beginning with the menu itself.

1. Put plants on plates

Data on the greenhouse gas emissions from animal-source foods varies depending on region, production system and protein, but what's clear is that aggregated emissions from meat and dairy are higher than from vegetables, pulses and other plant ingredients.

Menu changes will form an important part of many companies' net-zero commitments. Businesses are looking at ways to increase the proportion of plant-based ingredients on dishes and across menus both by serving more vegetarian and vegan dishes (and fewer meat ones) and reengineering meat-based dishes to reduce meat content and incorporate more vegetables and pulses.

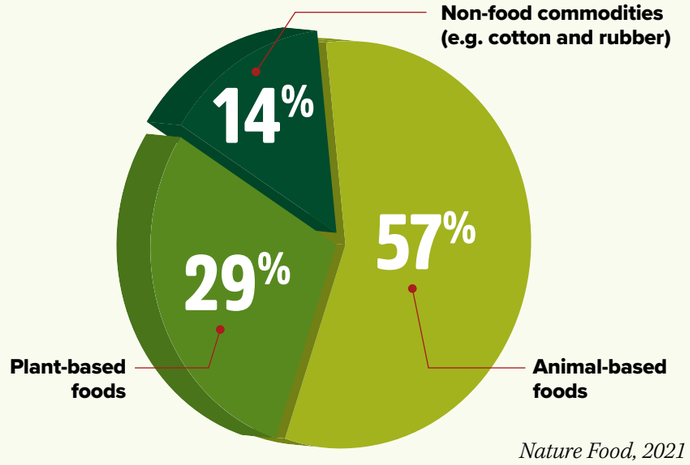
Compass is targeting a 40% switch to plant-based proteins by 2050. Aramark says future dishes will be made from 50 key ingredients and more plant-based meals, while Sodexo has committed to promote plant-based meal options to achieve its target of 33% of its menus being plant-based by 2025.

"We're not saying you have to be vegetarian or vegan," says Sodexo's Atkins Morris. "We're trying to provide customers with a really enticing meal choices so people choose a plant-based option because it's the best thing there."

2. Support regenerative agriculture

The way in which food is produced can also have an impact on the emissions created. Although it lacks an agreed standard definition, regenerative agriculture is generally accepted to mean farming systems that add carbon and fertility to the

% of global greenhouse gas emmisions from food/crop production



Nature Food, 2021

soil as well as having a positive impact on biodiversity. This can include meat produced as part of a mixed farming system where livestock manure acts as a fertiliser for crops thereby reducing the need for fossil fuel-based artificial fertilisers.

Businesses across the value chain are committing considerable funds to regenerative agriculture[48].

Business sourcing targets for regenerative agriculture:

Compass – 70% of top five food categories by 2030

Nestlé – 20% of key ingredients by 2025

PepsiCo – seven million acres by 2030

Fisher at Wrap says measuring the carbon stored in soils has historically been challenging but she adds that approaches are being developed to create more standard, consistent global guidance on accounting for soil carbon.

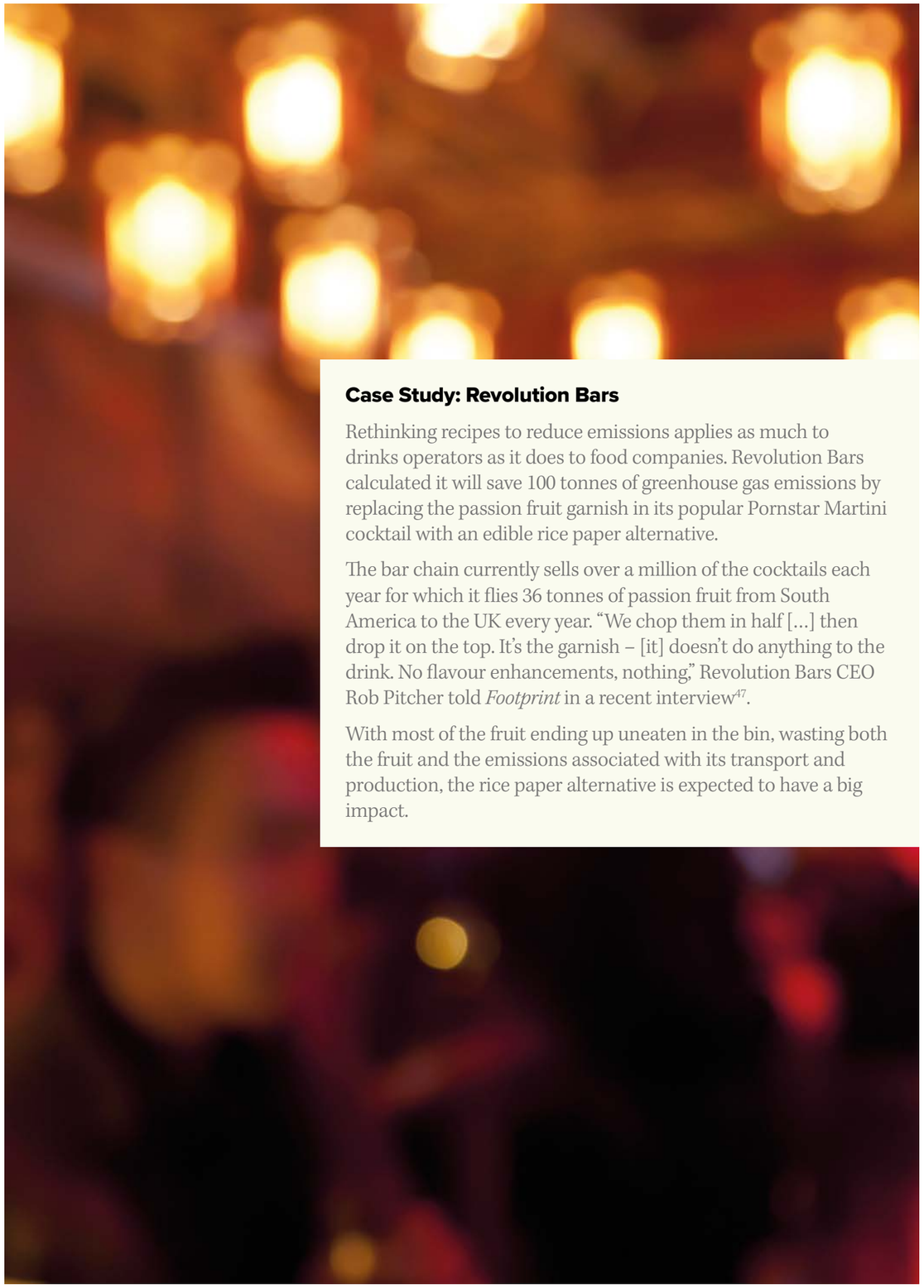
It's important to note however that not all experts are convinced by the carbon abating potential of regenerative approaches. The World Resources Institute (WRI) has said it believes increasing carbon sequestration in soils through practices broadly referred to as regenerative agriculture has limited potential for agricultural emissions reduction[49].

3. Look local where appropriate

Sourcing food locally isn't the automatic sustainability win it is sometimes perceived to be. A tomato grown in a greenhouse in England in winter, for example, can require more energy to produce than one grown in natural sunlight and shipped from Europe50. However, there are instances – especially when sourcing local fruit and vegetables that are in-season – when going local can deliver carbon benefits so capitalise on these opportunities.

Some hospitality venues are removing all transport emissions from the supply chain by growing their own vegetables on-site. Kitchen teams at National Trust properties are encouraged to produce local recipes with many choosing to incorporate produce grown in their own kitchen gardens within meals.

CHAPTER **SIX**



Case Study: Revolution Bars

Rethinking recipes to reduce emissions applies as much to drinks operators as it does to food companies. Revolution Bars calculated it will save 100 tonnes of greenhouse gas emissions by replacing the passion fruit garnish in its popular Pornstar Martini cocktail with an edible rice paper alternative.

The bar chain currently sells over a million of the cocktails each year for which it flies 36 tonnes of passion fruit from South America to the UK every year. "We chop them in half [...] then drop it on the top. It's the garnish – [it] doesn't do anything to the drink. No flavour enhancements, nothing," Revolution Bars CEO Rob Pitcher told *Footprint* in a recent interview[47].

With most of the fruit ending up uneaten in the bin, wasting both the fruit and the emissions associated with its transport and production, the rice paper alternative is expected to have a big impact.

CHAPTER **7**

Taking Action
Technology and blue sky solutions

"The growth in technology and the appetite to want to try and use it over the last couple of years has gone off the scale."

Vance Fairman-Smith, supply chain director, Greene King

Whether it's electric cars or smart sensors, hospitality operators are unlikely to be able to meet their carbon reduction objectives without embracing new and emerging technologies. From farm to fork, technology is being employed to deliver both resource and cost efficiencies in innovative ways.

1. Connect up the kitchen

Internet of things (IoT) technology usually refers to equipment and everyday items from smart phones and sensors to date labels that can 'talk' to each other via the internet. For foodservice, this means remote operators can see what's going on with connected equipment in the kitchen like fridges, ovens and fryers, and diagnose and correct problems before they result in failure.

Meiko's 'Connect' function, for example, allows users to access machine- and hygiene-related data about their dishwashing machines via a smartphone .

The practical implications of connected equipment are significant. "If a fridge-freezer fails overnight and the operator loses all the stock inside, the implications are massive," explains Quintex's Brookes. "If a system can tell them that the equipment is going to fail soon, they can be proactive as opposed to reactive."

These kind of data can also be used to monitor the energy efficiency of appliances in much the same way as smart meters now do for households. "The operator is always able to effectively log on and identify in a glance exactly how much energy is being consumed," says Veal from GCA.

2. Plan demand through data

Technology is also being employed to more accurately forecast demand for products with benefits for both procurement and wastage. The coronavirus pandemic has accelerated the shift towards caterers using pre-order apps for certain clients, including those in corporate services. "The biggest technological change, which has happened incredibly fast, is pre-ordering," says Mike Hanson, head of sustainable

Case Study: WSH

WSH is developing a new section of its website dedicated to supply chain provenance and information for consumers. The idea is to place a QR code on menus or counter displays which will tell the customer the story of the food on the plate when scanned.

"If there's a jacket potato on the counter, a QR code will take you through to information about [WSH's supplier] Beeswax Dyson," says WSH head of sustainable business Mike Hanson. "There will be a link to who they are, what they stand for, and our relationship with them. There will perhaps be a video showing one of our development chefs using the products and an interview with me chatting to their sustainability manager."

CHAPTER **SEVEN**

business at WSH. “I think clearly that helps with stock control.”

If businesses know the items customers want to choose in advance they can prepare the precise quantity of dishes rather than have to forecast demand in advance of a service.

3. Gain a window into waste

Technology is benefiting food waste reduction in other ways too. Winnow, like other food waste monitoring providers such as LeanPath and Chefs Eye, produces artificial intelligence tools that allow foodservice operators such as Elior, ISS and Compass Group to know the types and quantities of food they are throwing away and take targeted action to address the problem areas.

“If your waste profile was very heavily skewed towards proteins and carbon intensive ingredients you can evidence that reduction,” explains Winnow director of marketing and public affairs David Jackson. Winnow is also developing the capability to show businesses the tonnes of equivalent carbon emissions saved by reducing waste of different ingredients.

4.Embrace blue sky solutions

And what of the next generation of sustainability solutions – both tech-based and otherwise? Businesses are exploring all corners of the supply chain to find innovations that support resource efficiency and carbon reduction. “We’ve got condiments being made from surplus food. We’ve got beers being made from surplus bread. We’ve got smart bins, we’ve got redistribution platforms. We’ve got all sorts of innovative technology helping businesses be more sustainable,” says Crummie from Too Good To Go.

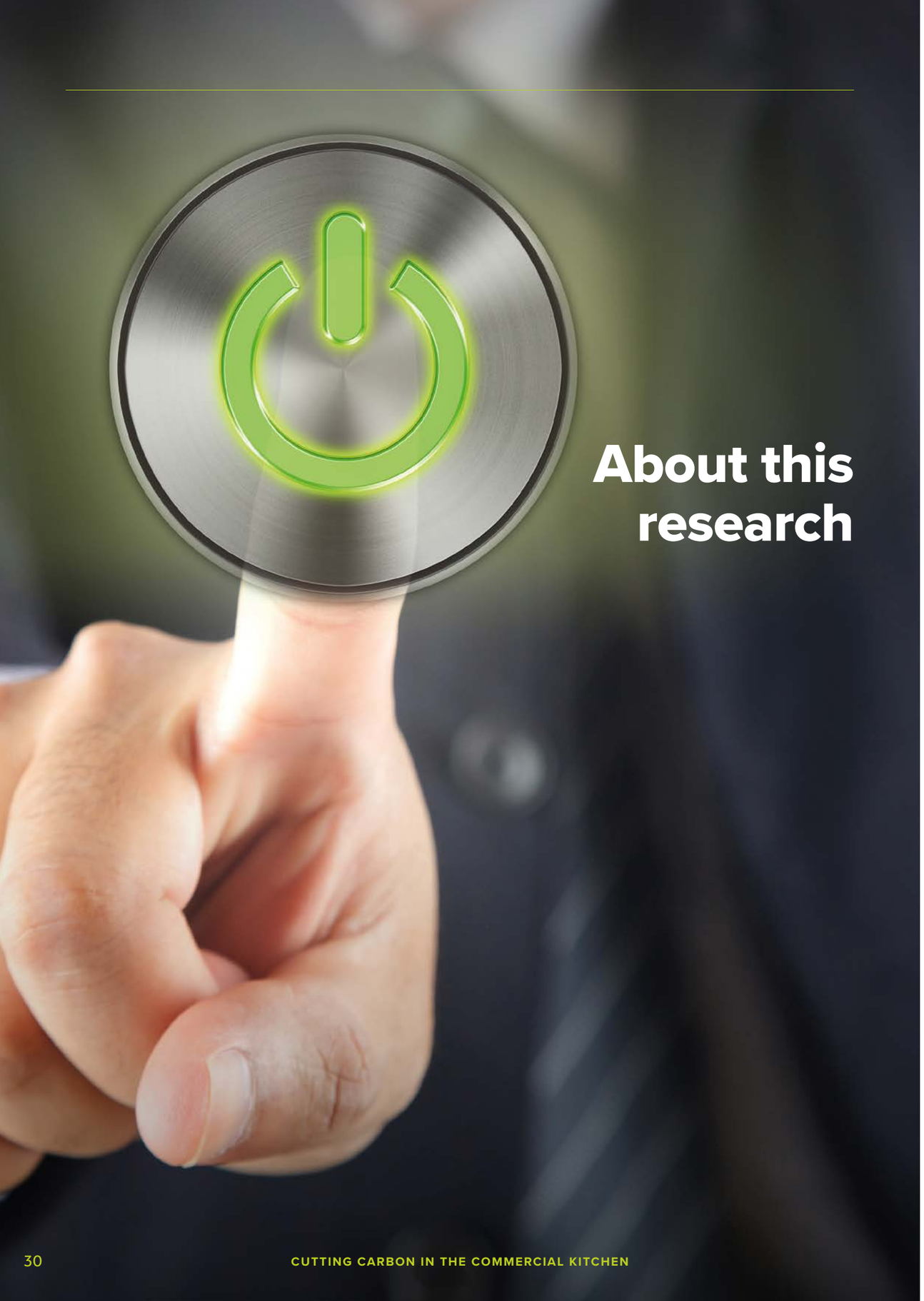
So embrace the ideas and innovations that are the right fit for your business. Ideas to explore include:

- Investor money is pouring into meat alternatives, and cell-based meat, as a way of replicating the taste and texture of animal protein but with a fraction of the emissions, according to the manufacturers
- Alternative protein sources such as insects and algae are also being pitched as low-carbon alternatives to animal feeds like soya, which has been linked to deforestation
- Brewers including Brewdog are looking at the potential to capture all of the CO2 emitted in the fermentation process and then use it to carbonate their beers
- The next generation of electric haulage vehicles is nearing commercialisation. Zero emission vehicle manufacturer Volta Trucks recently raised €230m that will enable it to start production of a 16-tonne, all-electric truck in 2023[52].

There are many other examples besides.

When leading edge technologies are fused with practical carbon- (and often cost-) cutting measures and an institutional desire to find solutions to the climate crisis, the potential for the hospitality sector to drive change is huge.

Businesses no longer lack access to the knowledge to decarbonise their operations. The challenge now is in delivering the low-carbon future the world and the planet needs.



About this research

Sustainably driven

Meiko is sustainability driven and has publicly committed to carbon neutrality for our main Offenburg production facility by 2025.

A foundation with no stock market shareholders, we have the freedom to re-invest profit into sustainability, R&D and training apprentices. Meiko has spent decades improving the sustainability of our dishwashing and food waste recycling equipment. Our goal is simple: To make the world cleaner and environmentally better by using innovative technology for warewashing, food waste handling, cleaning, and disinfection.

These are early days in our quest to make the planet environmentally better, but the pioneers are blazing the trail and we've mentioned a few in this guide.

There is help if you need it, from the suppliers and experts mentioned, and I hope sincerely that we have shed some light to help you move forward sustainably.

Each one of us can and will make a change for the better.

Footprint Intelligence

The ever-shifting sustainability debate makes it vital for businesses to have accurate intelligence to make informed decisions. Footprint Intelligence is Footprint Media Group's research and analysis division, helping companies develop successful strategies in the context of responsible business practices.

Footprint Intelligence aims to drive, promote and share best practice by helping industry resolve pressing sustainability issues. It asks tough questions and finds answers. It uses research and industry insight to bring businesses together to identify solutions, opportunities, trends and challenges.

Contributors

Report and research lead:
Amy Fetzer
Research support: Chris Terry
Report copywriter: Nick Hughes
Subeditor: David Burrows
Design: Trevor Marshall

Acknowledgements

Footprint Intelligence was commissioned by Meiko UK to create a guide to cutting carbon in the commercial kitchen. The results are a mix of desk-based research and semi-structured interviews with industry experts.

Footprint Intelligence is indebted to the industry experts who generously gave their time and insights as part of the research process. We would like to thank the following for their time, insights and knowledge which were essential to creating this report: Fooditude, Greene King, GCA Management, Meiko UK, the National Trust, Net Zero Now, Quintex, Sodexo UK & I, the Sustainable Restaurant Association, Too Good To Go, Winnow, Wrap, WSH and Zero Carbon Forum.

REFERENCES

1 https://www.ipcc.ch/report/ar6/wg2/
2 https://wwfint.awsassets.panda.org/downloads/wwf_cop26_food_policy_recommendations.pdf
3 https://www.worldbenchmarkingalliance.org/news/big-food-companies-failing-on-climate-and-human-rights/
4 https://www.britishchambers.org.uk/news/2021/08/carbon-footprint-a-mystery-to-9-out-of-10-small-businesses
5 https://www.britishchambers.org.uk/news/2021/08/carbon-footprint-a-mystery-to-9-out-of-10-small-businesses
6 https://www.britishchambers.org.uk/news/2021/08/carbon-footprint-a-mystery-to-9-out-of-10-small-businesses
7 https://www.foodservicefootprint.com/government-to-mandate-net-zero-transition-plans/
8 https://home.barclays/news/2021/09/hospitality-and-leisure-tops-industries-most-concerned-about-red/
9 https://www.refinitiv.com/perspectives/future-of-investing-trading/top-6-esg-investing-trends-in-2021/
10 https://www.foodservicefootprint.com/investors-demand-progress-on-agricultural-emissions/
11 https://www2.deloittecom/uk/en/pages/consumer-business/articles/sustainable-consumer.html
12 https://www.brita.co.uk/news-stories/going-full-circle
13 https://wrap.org.uk/sites/default/files/2021-09/WRAP-Food-Waste-Reduction-Roadmap-Progress-Report-2021.pdf
14 https://wrap.org.uk/sites/default/files/2021-09/WRAP-Food-Waste-Reduction-Roadmap-Progress-Report-2021.pdf
15 https://wrap.org.uk/sites/default/files/2021-09/WRAP-Food-Waste-Reduction-Roadmap-Progress-Report-2021.pdf
16 https://levy.co.uk/latest/levy-uk-plus-i-champions-sustainable-food-at-cop26/
17 http://go.greenbiz.com/v/MjExLU5KWS0xNjUAAAGBPngh0L-btUK-Tusq73yEYPGWk1aZivsWmR3gtajlQ8CUg6055w1cUQ7MnleRRlJM1r_32Ew
18 https://wrap.org.uk/sites/default/files/2021-10/WRAP-UK-Food-System-GHG-Emissions-Technical-Report.pdf
19 https://ghgprotocol.org/
20 https://zerocarbonforum.co
21 https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf
22 https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-2020.pdf
23 https://zerocarbonforum.com/
24 https://netzeronow.org/
25 https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021
26 https://wrap.org.uk/media-centre/press-releases/consistent-measure-scope-3-emissions-food-and-drink-industry-coming\
27 https://brewinggreen.org/greeneking/
28 https://gb.gleeds.com/globalassets/news--media/publications/net-zero-hotels/gleeds_nzc-existing-hotels_final.pdf
29 https://gb.gleeds.com/globalassets/news--media/publications/net-zero-hotels/gleeds_nzc-existing-hotels_final.pdf
30 https://thezetter.com/sustainability/
31 https://brewinggreen.org/greeneking/
32 https://www.mcdonalds.com/gb/en-gb/newsroom/article/News.uk_net_zero_carbon.html
33 https://www.opusenergy.com/help/energy-efficiency-in-food-preparation-and-catering/
34 https://guardiansofgrub.com
35 https://wrap.org.uk/sites/default/files/2021-10/WRAP-UK-Food-System-GHG-Emissions-Technical-Report.pdf
36 https://wrap.org.uk/taking-action/food-drink/initiatives/guardians-grub
37 https://www.foodservicefootprint.com/preview-empowering-sustainability-heroes-in-association-with-nestle-professional/
38 https://www.foodservicefootprint.com/foodservice-revs-up-for-ev-drive/
39 https://www.shepherdneame.co.uk/news/shepherd-neame-begins-roll-out-electric-car-charging-stations-across-pub-estate
40 https://www.marstonspubs.co.uk/news/marstons-rolls-out-rapid-EV-chargers.aspx
41 https://academic.oup.com/ijlct/article/11/1/66/2363520?login=false
42 https://www.gov.uk/government/case-studies/energy-efficient-cooking-locooker-steams-ahead
43 https://www.gov.uk/government/news/electrical-appliances-to-be-cheaper-to-run-and-last-longer-with-new-standards
44 https://www.quintex.co.uk/cheetah/
45 https://www.hospitalityandcateringnews.com/2020/05/monitoring-and-mirroring-sustainability/
46 https://www.nature.com/articles/s43016-021-00358-x
47 https://www.foodservicefootprint.com/the-bar-chain-leading-a-carbon-revolution/
48 https://www.foodservicefootprint.com/is-regenerative-the-future-of-farming/
49 https://www.wri.org/insights/regenerative-agriculture-good-soil-health-limited-potential-mitigate-climate-change
50 https://assets.wwf.org.uk/downloads/how_low_report_1.pdf
51 https://www.meiko.info/en/products/background-knowledge/knowledge-topics/iot/
52 https://www.businessgreen.com/news/4045256/volta-trucks-raises-eur230m-start-production-electric-haulage-plans

FOOTPRINT INTELLIGENCE

MEIKO GREEN WASTE SOLUTIONS