# LOW-CARBON MENUS: TOOLS AND TACTICS TO EMPOWER SME CHEFS

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# Contents

# Executive summary: a toolkit for action

**Based on original PhD research,[1] this report bridges the gap between food research, sustainability policy and everyday culinary practice. It connects what we know about food's carbon impact with how that knowledge can be applied in small and medium-sized enterprises (SMEs) to empower chefs to drive and support the wider adoption of low-carbon menus. It identifies the barriers facing SME chefs, and the actions that can overcome them.**

## Why this report matters

The hospitality and catering sector is under increasing pressure to respond to the climate crisis, yet the path from academic research to practical action is not always clear. While doctoral theses offer depth and rigour, they are often inaccessible to those working on the ground – the chefs, managers, and food service teams – who are central to driving change.

This abridged report distils the key findings of *Designing Low-Carbon Menus* – the original PhD research and thesis of Andrea Zick[2] – into a practical, sector-facing toolkit and links it to other work and resources. This toolkit offers a 'recipe' for change: a set of actionable insights and opportunities tailored to the realities of SME catering and the chefs who sit at the heart of them. By translating academic language into sector-relevant guidance, this report hopes to support experimentation, learning, and innovation in kitchens across the UK.

Crucially, this report is also a way of giving back. It honours the time, knowledge, and generosity of the chefs, managers, and stakeholders who contributed to the research. Their voices shaped the findings – and it is only right that the outcomes return to them in a form they can use. (See also About this report for more detail).

## SMEs and SME chefs: no longer overlooked

SME restaurants, pubs, casual dining, quick service, catering, cost sector and other Hospitality and Food Service (HaFS) environments have been largely overlooked in the research space compared with large operators. This toolkit addresses the gap by:

- identifying successful interventions to help chefs in SMEs adopt low-carbon menus
- quantifying greenhouse gas (GHG) and food waste impacts for an SME
- testing the suitability and effectiveness of WRAP food waste and ingredient-level GHG emission assessment tools for SME use.

## New insights into chef-led low-carbon menu transformation

The research underpinning this report is based on five complementary studies spanning literature reviews, stakeholder interviews, Participatory Action Learning and Action Research (PALAR) workshops, and 52 weeks of food waste and annual procurement GHG emission tracking. It is believed to achieve three academic firsts.

1. It identifies the perspectives of SME chefs on the barriers and enablers to changing menus.
2. It is the first research study to apply the Theory U framework[3,4] in PALAR workshops with chefs in the context of food systems change towards net-zero. Theory U is designed to help individuals, organisations, and societies address complex challenges by shifting from reactive, habitual patterns of thinking towards deeper awareness and co-creative action.
3. It is the first academic research assessment of ingredient-level GHG emissions and food waste impact in an SME. Thus, this research provides much-needed insight into the barriers and opportunities experienced by this under-researched demographic.

## Key findings at a glance

- **Chefs are central to reducing ingredient-related emissions.** Because ingredients drive the majority of emissions in food-led HaFS, chefs can have a major impact through the ingredients they buy and how they manage waste — but their potential to use these levers is often overlooked.
- **With the right support, SME chefs are critical changemakers.** Their ability to deliver low-carbon menus depends on support from their ecosystem – suppliers, management, owners, and service teams. SME chefs can drive significant change when backed with permission to act, training, good data, and decision-making authority.
- **Environmental awareness is growing among chefs. This is shaped by:**
  - societal discourse
  - political discourse
  - and economic pressures.

  However, translating awareness into consistent, low-carbon practices – such as modifications to menus, recipes, and procurement options – requires the right knowledge, skills, operational support, and agency.
- **Time for discussion and reflection must be prioritised.** This helps teams understand issues and work out practical, workable solutions together which can then be implemented and tested. Workshops based on PALAR and Theory U encourage reflection and learning which can be shared with the wider team. They help chefs tap into their own experience and insight, think about the influence they have, and see how different parts of the system connect. But lasting change needs ongoing support and opportunities to test ideas in the real-world.

- **Procurement teams, business owners and restaurant managers often have a greater influence over menu decisions than chefs.** Their support is therefore essential for adopting low-carbon menus and reducing food waste. Map out the '*who has influence where*', and adjust operating practices to empower chefs.
- **Chefs think best when moving or using their hands so keep training and brainstorming active.** Traditional training and meeting formats rarely engage them effectively, but practical, bite-sized brainstorming or learning sessions with movement and interaction align best with how many chefs work and think.
- **Operational constraints must be tackled to enable action.** Time, labour, and a lack of sustainability-specific skills often deprioritise sustainability. Overcoming these is essential for action. Design systems to survive churn and incorporate on-the-job training into daily routines.
- **Stakeholders at all levels should be involved** in transforming menus, and sustainability goals should be built into the way menus are planned and delivered so they can be put into practice.
- **Measure GHG emissions and food waste hotspots.** SMEs often operate "blind" without ingredient-level data. By analysing procurement and waste data, emissions and waste hotspots can be identified and targeted, and cost benefits quantified, enabling focused interventions.
- **WRAP tools can be used effectively to assess food waste and GHG emissions.** In SMEs, they work best when tailored to the kitchen's set up — for example, its menu cycles, suppliers, portion sizes, equipment, staffing, and time constraints — and when detailed data on purchasing, recipes, sales, and waste are connected.
- **GHG emission calculations for recipes and ingredients led to valuable learning and inspired chefs to redesign menus to reduce their impacts.** This happened both in theoretical settings, such as the workshops, but also in the real-world environment of the SME kitchen which conducted the waste audit.


Andrea Zick, research lead, facilitating chefs workshop
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# **Report context:** Robust and result-oriented research

To empower chefs, the PhD research underpinning this report draws on five interrelated studies exploring the real-world experiences, opportunities, and constraints SME chefs face in implementing low-carbon strategies. The full PhD, including detailed findings from each study, will be available on **ResearchGate** when published.[5]

Several of the individual studies have been published or are under review for publication in leading academic journals, including *Frontiers in Sustainable Food Systems*, *The International Journal of Gastronomy and Food Science*,[6] and the *Journal of Cleaner Food Systems*. Full texts and publication updates can be accessed via the same ResearchGate page.

## **Study 1:** In-depth literature review: HaFS, SMEs and environmental impacts

This examined the academic evidence on the environmental effects of the HaFS sector, focusing on GHG emissions, food waste, SMEs, and system transitions.

It highlighted food procurement and waste in food-led SMEs as key emission sources and identified menu transformation as a potential solution. The review also examined food system transitions like dietary shifts and sustainable sourcing, noting a lack of research on the operational realities of SME caterers. This highlighted the need to tailor strategies to smaller operations, as approaches designed for large organisations are unlikely to be workable in practice.

## **Study 2:** Rapid literature review: chefs as change agents

This rapid evidence assessment of published papers used **Ecological Systems Theory**[7] to analyse chefs' roles in carbon reduction.

It examined how chefs both influence and are influenced by micro to chrono level systems, and revealed limited research linking chefs to GHG emission reduction. The review highlighted the absence of frameworks connecting kitchen-level practices to broader food system dynamics, and positioned chefs as key connectors and influencers in sustainability transitions. It offers a practical way to look at how chefs' actions affect, and are affected by, the wider systems they work in.

## **Study 3:** Industry interviews: micro-system influences

In-depth interviews were conducted with 23 industry stakeholders to examine their perspectives on how skills, values, and team and department interactions affect chefs' ability to reduce GHG emissions and food waste.

The findings highlighted the central role of human resources (HR) in shaping a culture and working environment that aligns procurement, front-of-house, management, kitchen leaders, and sustainability teams around shared sustainability

key performance indicators (KPIs). In many SMEs, where formal HR functions are limited or absent, this responsibility often falls to the wider leadership team.

A key training gap was identified between learning and practice: chefs need more opportunities to apply knowledge in real settings and to understand how systemic factors – such as menu design, sourcing, and kitchen routines – embed emissions and inefficiencies within everyday operations.

## **Study 4a:** PALAR pilot chef workshop 1

A pilot Participatory Action Learning Action Research (PALAR) workshop broke new academic ground by utilising the **Theory U framework** with chefs to explore their perspectives on GHG emissions, food waste, and the wider factors shaping kitchen practices.

Despite a small sample of eight participants, it yielded rich insights and highlighted tensions chefs face, e.g. menu constraints, tradition versus innovation. The session demonstrated the value of participatory methods and Theory U as possible tools for transformational learning.

## **Study 4b:** Follow-up PALAR workshop 2

The second workshop, which built on workshop 1's findings, included 12 restaurant, hotel, catering and consultant chefs. It focused on stakeholder influence and menu priorities, revealing tensions between operational constraints and environmental goals. The workshop showed chefs' readiness to engage in thoughtful, systems-based dialogue and reinforced the potential of the menu as a practical tool, or "operational principle", for building sustainability into everyday decisions.

## **Study 5:** Food waste reduction tool feasibility and GHG emissions procurement assessment

This 12–15 month project evaluated the feasibility of utilising WRAP tools and procurement data to pinpoint food waste and GHG emissions hotspots in a catering SME. The study confirmed the feasibility of such assessments but highlighted challenges related to data quality, emissions factor accuracy, and seasonal variability. It also demonstrated the potential for using procurement data to inform targeted interventions and align menus with the Eatwell Guide.

Chef serving sustainable lunch
© Carlos Farinha

# Why focus on SMEs, chefs and ingredients?

*"Chefs within SMEs are emerging as key agents of change, influencing menu design, sourcing, and changes in kitchen practices."*

**Andrea Zick**, PhD author

Chefs and SMEs are vital to the UK's food sustainability transition, yet their role remains underexplored. The following evidence highlights their power and potential.

## How do SME chefs have the power to cut carbon?

- Food accounts for 38% of the UK's national emissions.[8]
- 5% of UK food systems' GHG emissions are associated with the HaFS sector.[9]
- Food and beverage purchases contribute between 62% and 73% of HaFS businesses scope 3 emission footprint.[10,11]
- 25% of calories are consumed outside the home[12] and other evidence suggests this proportion is increasing.[13]
- 8.67 million people eat out 2–3 times a month,[14] 98.5% eat out at least once a year.[15]
- Chefs influence menu design, sourcing, and changes in kitchen practices.[16,17,18]
- Out-of-home eating experiences can alter citizens' food knowledge and behaviours[19] and chefs can shape food narratives in the media.[20,21,22]
- Chefs' mainstream and social media can spark trends, boost sales and mainstream certain behaviours.[23] This is known as the "Delia Effect," named after Delia Smith, whose use of ingredients and gadgets led to sell-outs and shortages – Smith was even credited with increasing egg sales by 10%.[24]

These factors are why SME Chefs, both as operational leaders and cultural influencers, are increasingly recognised by research and industry as key agents of change.[25,26,27,28]

## Why are SMEs key levers?

- SMEs – businesses with fewer than 250 employees, including sole traders and micro-businesses – make up 99%[29] of the 135,000 catering enterprises in the UK.[30]
- They represent 50% of the £52.7 billion that HaFS adds to the UK economy.[31]
- They are the third largest employer in the UK (despite post-covid contraction).[32]
- They influence people's food practices by feeding large numbers of people.[33,34,35]
- As such a large employer, HaFS employee culture can ripple out to influence public behaviours.[36,37]

## Why does ingredient choice matter?

- The UK aims to achieve net zero by 2050, necessitating a transformation of food systems to address local and global challenges, according to DEFRA, 2022.[38]
- GHG emissions reductions of between 29–70% can be achieved by shifting global diets in line with current healthy eating guidelines.[39]
- The 2025 EAT-Lancet Commission found that a global shift towards mostly plant-based, minimally processed diets with unsaturated fats and limited added sugars and salt could prevent around 15 million premature deaths each year. This is 27% of total deaths worldwide.[40]
- It also concluded that, together with more sustainable production, such dietary change could keep food-system emissions within planetary boundaries that are compatible with Paris Agreement climate goals.
- The UK Climate Change Committee recommends a 25% reduction in meat consumption by 2040–2050 to lower agricultural emissions and free up land for nature.[41]
- Estimates from German research in HaFS suggest recipe reformulation and food offer change could reduce GHG emissions of HaFS operators by 44%.[42]

## Why is food waste so important?

- 11% of UK food waste comes from HaFS, WRAP estimates suggest.[43]
- This totals 1.1million tonnes a year.[44]
- 75% of the food wasted in HaFS could have been eaten.[45]
- It costs the average HaFS business £10,000 a year.[46]
- Wasting 1 kg of food creates more than 3 kg of greenhouse gas emissions (measured as $CO_2e$).[47]

## Where do the gaps remain?

**Despite their key role and impact, SMEs and SME chefs' needs have been overlooked.**

- The literature reviews conducted for Studies 1 and 2 demonstrated that the academic evidence on SMEs and SME chefs, as well as their challenges and impacts, remains limited.[48]
- Both SMEs and SME chefs are under-researched in their contribution to food system transformation, especially regarding GHG emissions and food waste reduction.
- Despite representing the vast majority of UK HaFS businesses,[49] the research shows that SMEs face persistent challenges in training, sustainability engagement, and organisational change.[50]

Research and frameworks in the HaFS low-carbon diet space often focus on strategy, without considering the needs, perspectives, knowledge, skills and constraints of those chefs and frontline staff expected to deliver change on the ground.

Even the highly regarded WRI *Food Service Playbook for Promoting Sustainable Food Choices* created by Pollicino, Blondin and Attwood, found that only four out of 15 priority levers for shifting menus towards healthy and sustainable food choices related to menu curation and the role of chefs.[51]

There are many initiatives designed to engage chefs, such as Climate Smart Chefs,[52,53] the Chef's Manifesto,[54,55] Guardians of Grub,[56] Great Taste Zero Waste[57] or roundtables hosted by the Sustainable Restaurant Association.[58] However, these campaigns have the potential to be even more effective with a deeper understanding of chefs' perspectives, including the barriers to action and opportunities.

## What does the existing research reveal?

Evidence from behavioural and hospitality research points to several factors influencing chef's capacity to act sustainably:

- General behavioural research shows that people's sustainable intentions are shaped by personal values and environmental awareness.[59]
- In foodservice and hospitality settings, organisational support and HR strategies have been found to influence the adoption of sustainable behaviours.[60,61,62]
- Among chefs and kitchen staff, operational constraints and perceived feasibility are key barriers or enablers to change.[63,64]

Thus, the extent to which chefs act on their values depends on their perceived behavioural control: whether they feel empowered and equipped to implement sustainable practices within their kitchen environments.[65] Organisational support, training, and leadership are critical enablers, as chefs often face operational constraints that limit their ability to act on their values.[66,67]

Consequently, understanding how SME chefs' environmental values interact with their workplace context is essential for designing interventions that enable meaningful behaviour change in HaFS.

In addition, while previous studies have used techniques such as interviews, literature reviews, surveys, observational studies, and, less commonly, focus groups, this PhD research combined all of these methods. Uniquely, it integrated them through the lenses of **Ecological Systems Theory**, **Theory U**, and the **Theory of Planned Behaviour** (see How this research was framed).

## How this research was framed

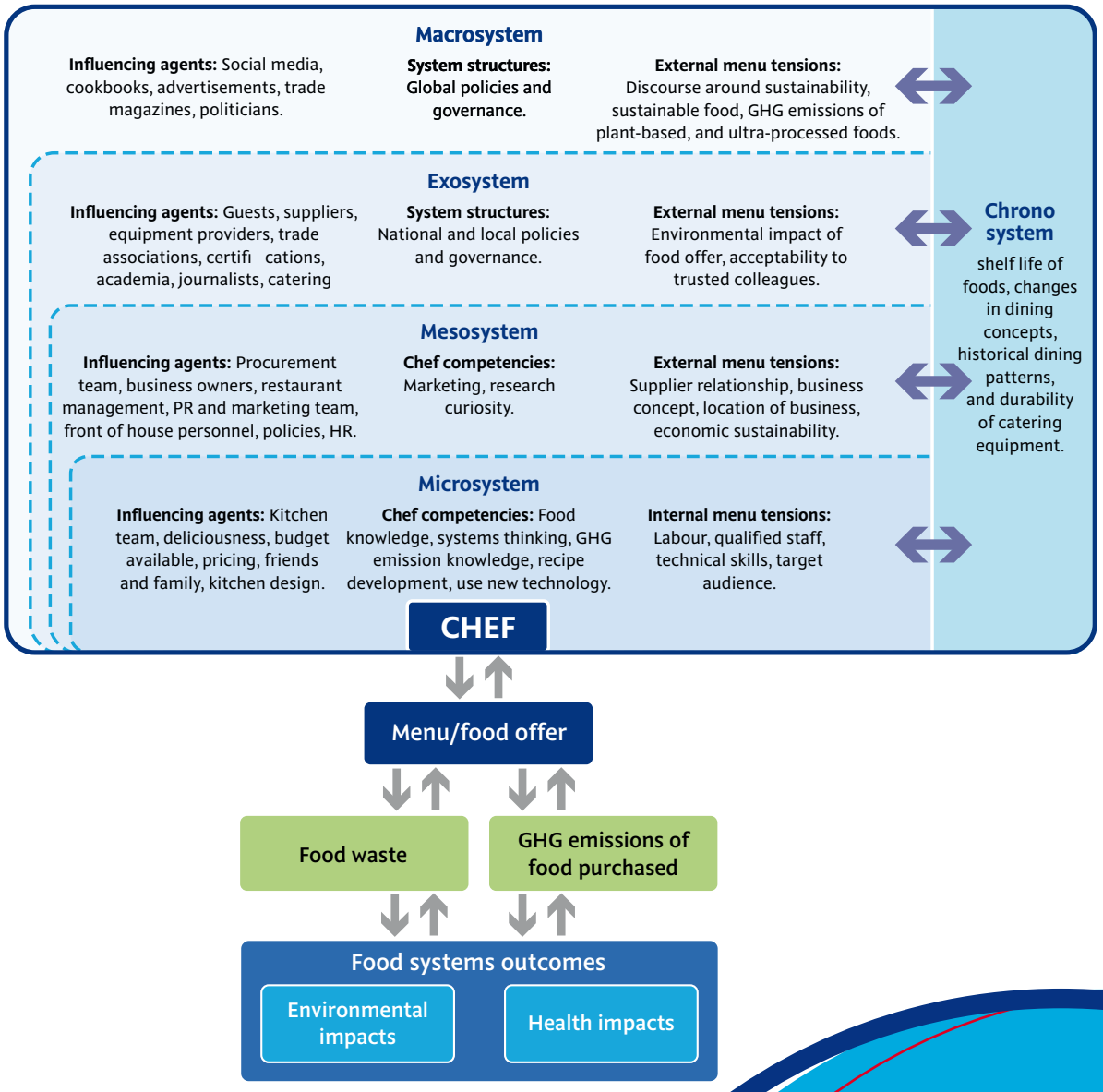
The PhD research employed a critical realist perspective: this means examining not only what chefs do but also the underlying social and structural factors that shape their actions.

### Ecological Systems Theory

Chefs operate within multiple, interrelated systems that both constrain and enable their decision-making.[68,69,70] According to Bronfenbrenner's Ecological Systems Theory (EST),[71] these systems – the micro, meso, exo, macro, chrono – range from the immediate, everyday environment to broad societal structures.

Looking through this lens makes it possible to see how constraints and enablers operate at different levels, and where interventions could be targeted, helping to identify scalable sustainability strategies. While chefs are not sole decision-makers, they can act as influential change agents when supported by supportive organisational structures.

**Figure 1:** Applying Ecological Systems Theory to chefs adapted from Zick (2025)[72]



## Theory U

Alongside understanding the different ecosystems and their impacts on chefs' abilities to engage in sustainable kitchen behaviours, the research used Scharmer's Theory U framework[73,74] in chef and food industry workshops to help participants shift from reactive, habitual patterns of thinking to deeper awareness and co-creative action.

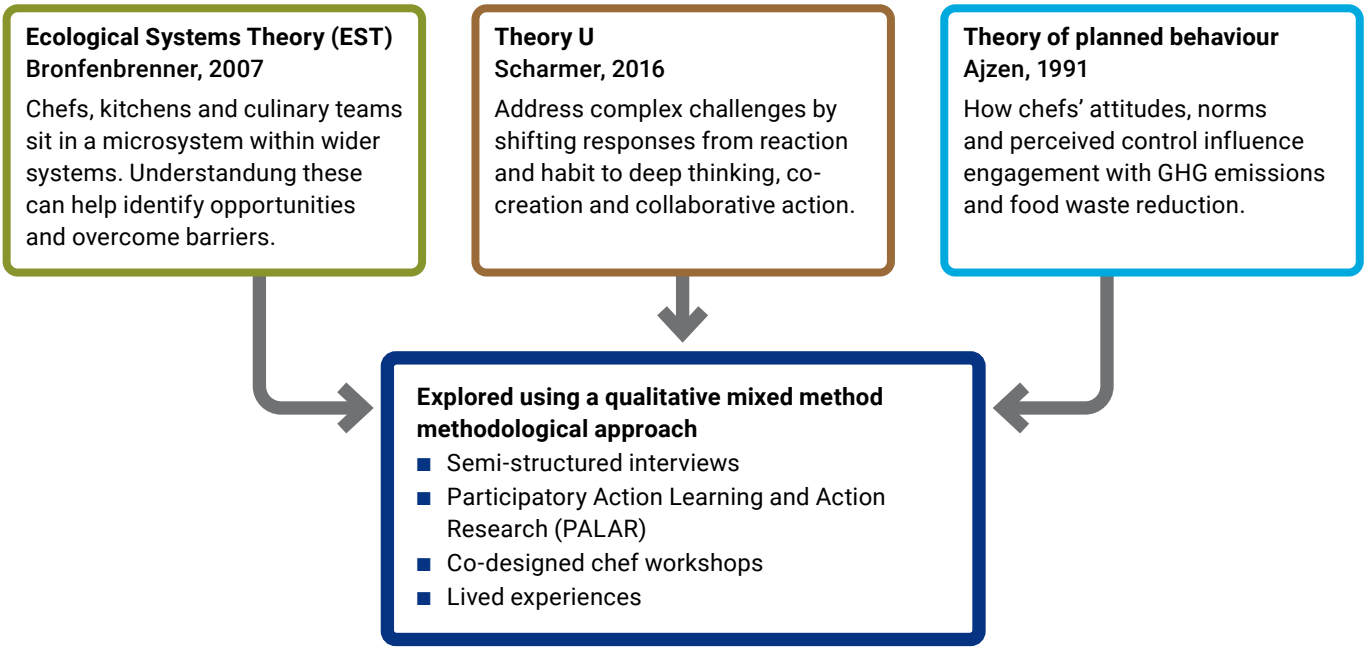
Theory U proposes that for a person to be willing to change, they must connect to their deeper values and sense of purpose, allowing them to imagine a different future.[75] Most complex system changes are challenging and require a shift in system paradigms and worldviews, but more frequently, processes and structures are redesigned rather than departing from underlying paradigms.[76] This paradigm shift happens at the bottom of the U process, where new mindsets emerge and participants begin to prototype – that is, testing out innovative ideas or practices to see what works in their real-world context.

This approach should support Poutiatine's principles of transformation.[77] This views transformation as an ongoing cycle. Individuals learn something new, reflect on it, apply it practically, and then repeat the process. Importantly, true transformation involves a deeper change – moving beyond past habits, skills, and knowledge. It is not just tweaking existing practices, but adopting a new perspective that reshapes how people think, act, and learn.

### Theory of Planned Behaviour

Layered onto Ecological Systems Theory and Theory U was Ajzen's Theory of Planned Behaviour.[78] This examines how a person's intentions – and ultimately their actions – are shaped by their attitudes, social norms, and perceived control over the behaviour. Incorporating this framework enabled the examination of how chefs' attitudes, social norms, and perceived behavioural control influence their engagement with GHG emission reduction and food waste practices.

**Figure 2:** Research methodology at a glance



# **Results part 1:**
# Actions to empower SME chefs

Top barriers, enablers and practical tips for turning insight into action from across the five research studies.

| At a glance: top barriers and enablers | |
|---|---|
| **Barrier** | **Enabler** |
| **1. Power and permission** | |
| 1.1 Chefs are unrecognised climate superheroes | Unleash chefs' climate power |
| 1.2 Chefs' needs and perspectives rarely heard | Use workshops to empower chefs-based solutions |
| 1.3 Chefs trumped by procurement, owners and management on menu | Map influencers and empower chefs |
| 1.4 Key influences overlooked | Build networks and share successes |
| **2. Mindset and motivation** | |
| 2.1 Menus architecture left untapped | Use placement, primacy and naming to nudge low-carbon choices |
| 2.2 Sustainability seen as a side dish | Blend sustainability into quality and profit |
| **3. Operations and data** | |
| 3.1 No time, budget, or bandwidth | Build bite-size training into daily routine and link cost savings to carbon cuts |
| 3.2 Data scattered and systems don't talk | Join the dots with simple integrated tools |
| 3.3 Flying blind without ingredient-level data | Focus on the big hitters first |
| 3.4 Reporting not required | Commit to voluntary frameworks |
| **4. Skills and learning** | |
| 4.1 Traditional learning doesn't cut through | Keep learning active, brief and hands-on |
| 4.2 No HR capacity to champion sustainability | Align people, purpose and performance around environmental goals |
| 4.3 Staff churn wipes out hard-won knowledge | Design systems that survive turnover |
| 4.4 Knowledge gaps make sustainability feel too distant | Make learning practical and goals tangible |

# 1. Power and permission

## 1.1 Barrier: chefs are unrecognised climate superheroes

Chefs can shape what is bought, cooked and wasted, yet their role in cutting emissions through ingredient choices and food-saving practices is often overlooked. In SMEs, sustainability efforts often focus on operational improvements such as switching to renewable energy, energy and water efficiency, and packaging reduction. Yet while important, these actions are usually outweighed by the carbon impact of the ingredients on the plate.

### Enabler: unleash chefs' climate power

Recognise that chefs have a substantial, direct influence on food-related emissions. Make sure they understand this influence and feel empowered to act on it. Embed this link clearly within strategy, training and performance goals.

### Turning insight into action

- Help chefs understand how their ingredient choices and food waste decisions impact the climate – as well as profit margins.
- Share practical examples of chef-led changes that have reduced emissions or waste.
- Celebrate and reward people and teams who demonstrate climate-positive innovation in the kitchen.

## 1.2 Barrier: chefs' needs and perspectives rarely heard

Despite being central to reducing GHG emissions and food waste in HaFS, chefs' needs and constraints are rarely considered in decision-making, with little time spent exploring their values, challenges, or motivations. Chefs' sustainability intentions are shaped by values, organisational support and feasibility, but action depends on perceived control – feeling authorised and equipped to act.[79,80,81,82,83,84]

### Enabler: Use workshops to empower chef-based solutions

Participatory approaches such as PALAR and Theory U workshops (see box below) involve chefs directly in working through trade-offs (e.g. waste saving versus staff time). This helps them combine new GHG knowledge with experience and apply it to real decisions like menu design. Sustained change requires continued support and organisational reinforcement.

### Turning insight into action

- Facilitate regular participatory workshops with chefs to co-create low-carbon menus as part of the regular menu development cycle.
- Follow up with leadership and HR to integrate agreed actions into roles and training.

## Explainer: how to run powerful participatory workshops

Although the PALAR workshops required significant time and resource; they proved highly valuable. The labour cost for eight chefs was estimated to be £886.40 (London Living Wage, £13.75/hour) yet the return was substantial: chefs developed practical learning and action plans, researchers gained proof-of-concept insights and industry engagement, and the process created laid the groundwork for future advisory networks.

Repeating participatory workshops in line with menu development cycles can also enhance their impact. By revisiting previous insights, chefs can consciously reflect on what worked, why, and where further improvement is needed. Embedding this reflective process within routine menu planning would help make menu development more intentional and less reactive, while reinforcing progress toward sustainability and broader business KPIs.

## The pilot and follow-up workshops suggest the following ingredients to facilitate effective workshops

**Ideal length:** 4.5 hours

**Format:** Chefs often think best while standing, moving or working with their hands. The workshops should reflect this by using flexible, active formats that mirror kitchen dynamics and allow for natural movement and interaction.

### Workshop structure

- **Introduction.**
- **Rule setting and expectations.**
- **Active ice breaker:** Explore what makes a dish "good" versus "sustainable."
- **Discussion 1: Mapping the chef's ecosystem.**
  - Who is involved, and what is their influence on menu development?
  - What other factors influence menu development (e.g. cost, customer preference, food trends, food waste, environmental impact)?
- **Discussion 2: Dissecting the "menu onion" or "menu ladder".**
  - What matters most when writing a menu?
  - How is menu content reinforced by current working practices?
- **Recipe reformulation exercise:** Select a dish and assess its impact using the TUCO GHG calculator[85] or the MyEmissions recipe calculator[86]. Participants reformulate and redesign the dish by adjusting ingredients, volumes, and sourcing to minimise their environmental impacts.
- **Blue-sky thinking:** Generate creative, unconstrained ideas for future menu development.
- **Implementation planning:** Identify practical next steps and responsibilities for applying insights in daily operations.

## 1.3 **Barrier:** chefs trumped by procurement, owners and management on menu

When unpicking who really holds power over what goes on the menu, the participatory workshops revealed that while chefs are responsible for delivering dishes, decisions about what appears on the menu are driven mainly by procurement teams, business owners and managers – meso-level actors with operational and strategic control. Macro-level influences such as media, cookbooks and policy shape the wider context, while suppliers and diners exert moderate influence. Micro-level networks – colleagues, family, and workplace infrastructure – have a lesser influence, shaping daily practices rather than strategic direction.

### Enabler: map influencers and empower chefs

Map who influences menus in your specific business and set shared, definable targets – e.g. profit, waste, emissions per meal – that motivate all actors but give chefs explicit permission to make carbon- or waste-saving changes.

### Turning insight into action

- Managers set targets for waste and emissions per meal; procurement publishes a list of pre-approved low-impact substitutions.
- Run regular chef procurement reviews, agreeing on at least two actions per cycle (e.g. one reformulation, one recipe which utilises surplus).
- Update supplier briefs with the top three hotspots and commit to regular volumes for one lower-impact item per menu cycle, thereby supporting suppliers in committing to lower-impact product lines.

## 1.4 **Barrier:** key influences overlooked

The literature reviews and primary research noted that chefs are shaped by a wide range of influences across social, business, media and economic networks, yet these are rarely mobilised to drive low-carbon behaviours. Added to this, large, well-resourced companies dominate the sustainability narrative but the strategies used by larger players are unlikely to be feasible for more SME operators who have smaller teams, budgets and buying power.[87,88]

### Enabler: build networks and share successes

Use chef, supplier and sustainability networks as levers of change. Share tangible SME wins through campaigns such as Guardians of Grub,[89] Love Food Hate Waste,[90] Chefs' Manifesto,[91] Food Made Good,[92] Climate Smart Chefs,[93,94] and Cool Food Meals.[95] Collaborate with suppliers and customers to make low-impact dishes visible and valued.

## Turning insight into action

1. Share one short case study per quarter through chef/supplier networks.
2. Sketch an influence map (social, business, media, economic) and set one action per area.
3. Tag campaigns and share inspiration on social media to create connections with like-minded peers and customers.
4. Co-create one dish with a supplier each quarter; add a one-line story and impact metric to the menu (e.g. “20% cauliflower waste saved by using stems”).

Sustainable lunch option
© Carlos Farinha

# 2. Mindset and motivation

## 2.1 Barrier: menu architecture left untapped

Menu design and behavioural nudges can prompt customers to choose more sustainable dishes, yet SMEs rarely use these tools due to limited understanding of ingredient-level climate impacts and/or knowing how to apply behavioural principles.

### Enabler: use placement, primacy and naming to nudge low-carbon choices

Research shows that placement, prominence and naming can shift choices toward healthier, plant-based or lower-carbon meals without reducing satisfaction. [96,97,98,99] Effective tactics include:

- Placement and sequencing – where items appear on the page or board (e.g. top-right corner, first/last positions, or grouped sections).
- Prominence – the use of boxes, icons, or chef's specials to draw attention to particular items, which drives sales.
- Naming and descriptions – evocative, benefit-driven wording that makes sustainable dishes sound appealing (e.g. "hearty Provençal bean stew" versus "vegetable stew").
- Pricing and anchoring – positioning low-carbon options next to higher-priced dishes so they appear better value.
- Visual cues – colours, imagery, or symbols that subtly highlight plant-rich dishes.

Industry examples show that combining menu transformation with chef training and visual enhancements can reduce GHG emissions while maintaining satisfaction.[100,101,102]

### Turning insight into action

- Place plant-rich dishes prominently at the top of each section.
- Use appealing, benefit-led names and subtle visual cues.
- Align reformulations with the Eatwell Guide.[103]
- Where possible, make the sustainable choice the default. Limiting options can simplify decisions for guests, streamline operations, and improve both profit and experience when fewer dishes are executed exceptionally well.

## 2.2 Barrier: sustainability seen as a side dish

The PhD research found that chefs are more likely to adopt environmentally friendly behaviours when these actions also enhance taste, quality, and profitability. Managers, in particular, are more likely to embed sustainability when it is seen as financially beneficial. Yet the taste, profit, and customer benefits of measures such as increasing plant-based options and turning surplus into appealing new dishes remain poorly understood by SMEs.

## Enabler: blend sustainability into quality and profit

Position waste reduction and lower-impact ingredients as routes to better taste, quality and margin. Tap into creativity and the desire to innovate; qualities that many chefs truly enjoy. Reinforce this through leadership messages, customer cues and industry signals.

## Turning insight into action

- Introduce portion tests at the beginning of service to ensure correct sizing and reduce plate waste.
- Show before-and-after profit per meal for reformulations.
- Celebrate teams achieving low-waste, high-quality dishes without affecting margins.


Menu transformation solutions co-creation
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# 3. Operations and data

## 3.1 Barrier: no time, budget, or bandwidth

In SME HaFS, labour is a major cost centre, so time away from core operational tasks such as food preparation and customer service must be justified in terms of return on investment. This prioritises efficiency and profitability over sustainability-related training or action, preventing good intentions from converting into practice.[104]

### Enabler: build bite-size training into daily routine and link cost savings to carbon cuts

Integrate training, knowledge sharing and idea generation into existing routines – briefings, recipe demos, coffee breaks or incentive sessions – so learning doesn't add extra labour cost.

It can also help to slow down. Although it sounds counterintuitive in a busy kitchen, taking time to focus on what really matters, listening to staff and customers, and doing a few things well can reveal where the best opportunities for change lie.

Prioritise actions that strengthen both profit and sustainability, such as cutting food waste to save on procurement, preparation and storage costs. Track progress through simple metrics – for example, gross profit and waste or carbon per cover – to demonstrate tangible value.

### Turning insight into action

- Consider the size of plates and bowls, as they may influence portion size and lead to plate waste.
- Share food waste hotspots at team tea breaks to brainstorm workable ways to reduce them.
- Nominate section champions to coach on-station and model positive behaviours.
- Replace one high-cost, high-impact ingredient with a lower-cost, lower-impact alternative (e.g. meat to plant-based) and track the savings.
- It may be controversial, but consider whether giving food away adds real value to the guest experience — or simply increases waste. Could charging for certain items, such as bread, drive improvements in quality (and perception of quality) and reduce waste?

## 3.2 **Barrier:** data scattered and systems don't talk

SMEs often lack integrated systems that link purchasing, point-of-sale (POS) data, menu specifications, and waste logs. This fragmentation makes it difficult to identify hotspots or track progress. Protocols such as WRAP's Scope 3 guidance[105] can feel overly technical and resource-heavy for small teams, deterring engagement and delaying insight.

### Enabler: join the dots with simple integrated tools

Start by connecting what already exists. Modify current spreadsheets or use low-cost systems to combine purchasing, waste and menu data, standardising product codes, units and categories. The key is to embed sustainability fields (e.g. GHG emissions, waste volumes) within existing workflows – purchasing, menu costing, reporting to make ongoing tracking as simple as possible.

Start with what is feasible in your context. If it's only possible to run a spot check once a year, begin there; if it can be aligned with existing reporting cycles, integrate it so it becomes part of business-as-usual rather than a one-off exercise. Over time, this approach helps make sustainability tracking a normal way of working.

Where possible, work with procurement partners to automate recipe-based emissions assessment alongside food cost and nutrition data. Consider collaboration – partners such as Business Improvement Districts or local boroughs increasingly fund case studies or offer practical support through guidance and time. Build relationships within the business ecosystem and grow the process from there.

### Turning insight into action

- Create a shared spreadsheet that links supplier spend, menus, waste logs, and emission values.
- Standardise product codes and units.
- If resources are limited, start with the top three or five ingredients by spend or volume (especially meat, fish, seafood and dairy).
- Join industry groups (e.g. WRAP,[106] Guardians of Grub,[107] Net Zero Now,[108] local food partnerships[109]) to support the development of SME reporting standards.

## 3.3 **Barrier:** flying blind without ingredient-level data

Many SMEs lack emission data at ingredient or recipe level. Without this, it's impossible to pinpoint high-impact items or compare dishes on emissions as easily as on cost.

### Enabler: focus on the big hitters first

Comprehensive footprinting is rarely feasible for operators, whatever their size, so focusing on high-impact categories – such as meat, dairy, and air-freighted produce – delivers the greatest gains. Study 5 demonstrated that procurement data can identify hotspots when paired with free resources, such as WRAP's emission factor database,[110] or the free MyEmissions[111] or Tuco Ltd recipe ranking tool.[112] There are

also more extensive paid services such as those offered by Foodsteps,[113] Klimato[114] and Nutritics.[115] Enlist the support of those in accounts/finance, as the data-handling and analysis skills required are similar and may support the development of an effective tracking sheet.

### Turning insight into action

- Build a recipe-ingredient sheet that imports supplier stock codes and assigns default emission factors.
- Use formulas to auto-calculate emissions per ingredient, dish or cover.
- Assign indicative factors and traffic-light coded ratings to ingredients and menus.
- Identify hotspots and test ingredient swaps, tracking sales, profit and emissions change.
- Build on existing tools – for example, start with the Guardians of Grub food waste tracking calculator[116] and adapt it to your needs, using the existing formulas, data fields, and layout but aligning it with your own accounting period.

## 3.4 Barrier: reporting not required

Businesses making mandatory or voluntary reporting commitments for environmental impacts (e.g. GHG emissions, food waste) are more likely to communicate internally, engage externally, and drive change. However, as mandatory frameworks such as the UK's Streamlined Energy and Carbon Reporting (SECR)[117]/ UK Sustainability Reporting Standards[118] and the EU's Corporate Sustainability Reporting Directive (CSRD[119]) don't apply to SMEs, environmental reporting among this sub-sector remains sporadic.

### Enabler: commit to voluntary frameworks

Sign up and use free voluntary frameworks such as WRAP's Scope 3 Protocol,[120] The Food and Drink Pact,[121] Guardians of Grub[122] and the Food Waste Reduction Roadmap.[123] or join membership-based collaborative groups like Zero Carbon Forum[124] and The Sustainable Restaurant Association[125] for credible guidance and peer support. Where resources are tight, focus on simple, regular reporting on one or two metrics and align with the most relevant subsector campaign.

### Turning insight into action

- Track one or two key metrics and share regular updates with the team, discussing what can be improved or changed. Celebrate successes and ask questions when progress stalls.
- Join a relevant voluntary scheme, then monitor and share progress with team members and customers against clear goals.

# 4. Skills and learning

## 4.1 Barrier: traditional learning doesn't cut through

Static sit-down sessions don't suit the way most chefs learn. Kitchens are fast, physical spaces – and expecting chefs to sit still and absorb information can switch them off before the learning even starts.

### Enabler: keep learning active, brief and hands on

Chefs think best when they're moving, using their hands, talking, tasting and experimenting. Interactive workshops that mirror these elements of kitchen life will be most successful at helping to turn abstract ideas into practical actions and spark genuine enthusiasm for change.

### Turning insight into action

- Run workshops in the kitchen or a similar space, not a meeting room.
- Keep sessions short, focused and full of movement – for example, live tastings, reformulation sprints or small-group problem solving.
- Encourage chefs to share experiences and ideas rather than sit through presentations.
- End each session with one clear action or change to trial in service.

## 4.2 Barrier: no HR capacity to champion sustainability

The research interviews, PALAR workshops and the literature reviews revealed a consistent gap: many SMEs lack HR capacity and formal structures to support sustainability training. Participants linked HR mainly to well-being, recruitment, post-COVID working conditions, and compliance, with few connecting it to actions which support Environment, Social and Governance (ESG) goals, such as food-waste or GHG reduction.

This matters because HR – through training, engagement and leadership development – translates ESG/Corporate Social Responsibility (CSR) goals into daily practice.

### Enabler: align people, purpose and performance around environmental goals

Align culture, roles and training with ESG frameworks. This cultivates a pro-sustainability culture, empowers chefs and kitchen teams as change agents, and embeds environmental values in procurement, menu design and waste management. Aligning HR processes also ensures chefs have clear decision rights and support to act – for example, permission to change specifications or menu components where sustainable options exist.[126,127,128]

### Turning insight into action

- Build sustainability into job descriptions and ongoing career development with environmental tasks and metrics.
- Add a short induction module outlining the business's ESG targets and how roles contribute.
- Create internal operational policies that outline the minimum standards and the associated expected practices for food waste and other environmental behaviours.
- Incentivise ESG: tie recognition and rewards to metrics such as food waste or GHG per cover.
- Recognise teams delivering ESG-positive outcomes (e.g. low-waste or low-carbon dishes).

## 4.3 Barrier: staff churn wipes out hard-won knowledge

Poor retention and high staff turnover were also cited by interviewees, workshop participants and other researchers (e.g. Kyriakidou & Maroudas, 2010[129]) as limiting knowledge retention and undermining consistent practice.

### Enabler: design systems that survive churn

Embed bite-sized training and simple routines that survive turnover. When possible, target recruitment towards those with sustainability knowledge and skills. Shift ownership to section leads rather than HR, and use peer learning and participatory workshops to build shared understanding and innovation within and across chef communities. Set time aside to co-create menus with agreed KPIs for the menu which include reducing food waste and environmental impacts. Working on this as a team can help generate more ideas, test what works in practice, and give everyone a sense of ownership.

### Turning insight into action

- Create a five-minute video explainer for agency or new staff on low-waste prep and waste measurement.
- Produce a one-page step-by-step standard operating procedure cheat sheet for briefings.
- Embed sustainability practices into daily routines so they are an everyday part of the process when new team members are shown the ropes.

## **4.4 Barrier:** knowledge gaps make sustainability feel distant

Many chefs and managers report that sustainability feels too broad or distant to act on. When goals are framed too broadly (e.g. “reduce emissions”), they fail to translate into tangible kitchen actions. Research grounded in the Theory of Planned Behaviour shows change is more likely when intentions are narrow and measurable – e.g. “reuse by-products” or “add one plant-based item per menu cycle” – rather than aspirational. This enables targeted interventions and clearer evaluation.[130,131]

Interventions can also fail from a lack of underlying knowledge and inadequate training.[132] Chefs struggle to see how procurement and menu choices affect GHG outcomes. The research found inconsistent understanding of ingredient-level emissions, which suppresses reduction behaviours.[133] Without the “why” and the “how”, compliance drops – for example with routine food-waste tracking.[134,135,136,137,138,139,140]

Discussing menu priorities
© Carlos Farinha

### Enabler: make learning practical and goals tangible

Combine on-the-job training with simple, measurable actions. Pair systems knowledge (farm to plate; cost, carbon, and waste levers) with hands-on application, such as identifying high-impact ingredients or tracking waste. Link each action to visible results to build confidence and momentum.

Support participation in collaborative initiatives and build non-technical skills such as leadership and communication to enable chefs as change agents.

### Turning insight into action

- Add a short module on carbon hotspots and dish-level GHG emissions to chef training.
- Define a specific intention per dish or menu cycle (e.g. reuse vegetable trimmings).
- Use free resources and training (The SRA/Restaurant Hero,[141] Worldchefs,[142] Climate Smart Chefs[143] and Guardians of Grub[144] all offer free online training).
- Run brief, on-station refreshers led by section champions; review results and recognise improvements.

# Results part 2:
## Practical tips for using WRAP tools to track food waste and procurement emissions

**For Study 5, a UK fine-dining SME tested WRAP's Guardians of Grub food waste calculator[145] and its Scope 3 Emission protocol[146] for 12–15 months. This was to assess whether these tools are feasible, practical and effective for small and medium-sized hospitality businesses seeking to track and reduce their food waste and ingredient-related emissions.**

## How was the study conducted?

**To measure procurement-related GHG emissions for ingredients:** 6,282 purchase lines were analysed and converted into kilograms. These were grouped into 941 unique commodities, each matched to one of 920 WRAP emission factors, creating a volume-based greenhouse gas (GHG) baseline for ingredients. Monthly procurement data was then used to estimate emissions and identify key hotspots.

**To tackle food waste:** 52 weeks of food-waste data were recorded using the Guardians of Grub food waste calculator. This allowed the team to track seasonal patterns, calculate GHG emissions per guest, and pinpoint the main sources of waste.

**To explore alignment with healthy and sustainable diets:** a simple "dietary gap" analysis compared the restaurant's purchasing mix with the Eatwell Guide,[147] revealing opportunities to rebalance menus towards lower-carbon, healthier food group proportions.

Together, these findings help other SMEs understand how to integrate these tools into everyday business practice, identify necessary adjustments, and utilise data to track measurable progress towards net zero.

## Key findings for SME settings

The pilot project produced valuable insights into both the fine dining restaurant's footprint and the practicalities of using WRAP tools in an SME setting.

- **High emissions per guest:** The average greenhouse gas (GHG) emissions per diner per eating occasion at the restaurant was 7.3kg $CO_2e$. This is substantially higher than the Eatwell Guide's recommended range of 4.1kg-5.8kg,[148] an allocation which covers the entire day, rather than just one meal, or eating occasion.
- **Clear emission hotspots:** Just five food categories – beef, lamb, poultry, crustaceans and fish – were responsible for around 70% of total food-related emissions, even though they made up only a small share of total purchasing volume. For example, beef accounted for about 31% of emissions but only 5% of what was bought.

- **Food waste still matters:** Even though recorded food waste was low (around 1.7% by weight of procurement volumes, or roughly 3% when including inedible items such as bones used for stock), it was still the fourth-highest emission source. This highlights the significant impact of waste, even at low levels.
- **Results were robust:** A Monte Carlo sensitivity check was used to test the reliability of the results. This involved repeatedly recalculating the GHG totals using slightly different emissions factors to reflect the uncertainty in the data (for example, variations in how beef or fish are produced). By running thousands of these simulations, the researcher could see how much the overall results might change if the input data were less precise. The small variation that resulted – around 4% – showed that the findings were robust enough to give a dependable picture of where the main emission hotspots lay.
- **Menu balance opportunities:** The restaurant's purchasing mix was heavily weighted towards high-protein ingredients compared with the Eatwell Guide. Shifting the purchasing mix closer to the Eatwell proportions – i.e., modestly reducing animal protein and increasing plant-based foods – would lower emissions and align with recognised dietary guidance, without necessarily affecting quality or guest experience when the dishes are well designed. As referenced earlier, studies in hospitality and behavioural science have found that guests are just as satisfied with flavour and experience when plant-rich dishes are positioned attractively on menus, described appealingly, and prepared to the same culinary standard.[149,150,151,152]
- **Tool feasibility:** Overall, the WRAP methods proved workable for an SME. However, connecting procurement, point-of-sale and waste-tracking data on the same reporting cycle would make analysis easier and reduce manual data handling errors.

## Actions other SMEs can copy

Many of the insights from this pilot project reflect the same barriers and enablers identified earlier in the report. What follows translates those findings into practical, real-world actions that any small or medium-sized hospitality business can use. These examples show how the enablers – such as data integration, cross-functional collaboration and culture change – can be put into practice using existing tools and everyday routines.

1. **Focus on hotspots, not perfection**
   Start by identifying your highest-emission ingredients. WRAP's emission factors make it simple to rank your top ten categories. For most caterers, the biggest impacts come from beef, lamb, poultry, certain seafoods and dairy. Tackling just one or two of these areas can deliver visible savings and quick wins.
2. **Keep it monthly and consistent**
   Consistency matters more than complexity. Align your reporting cycles so that procurement and food-waste data are reviewed monthly. Keep a short note of any assumptions or data sources – such as which emission factors you used – so you can repeat the process accurately over time.

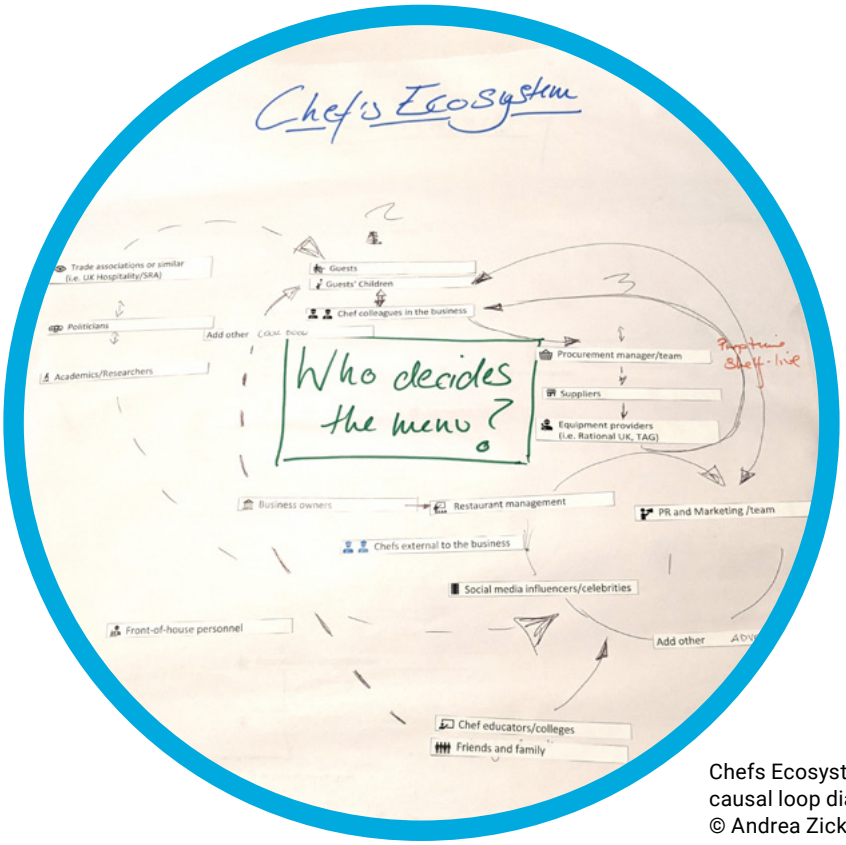
3. **Add default factors to your purchasing sheets**
   Create a column in your purchasing spreadsheet that lists a "default" GHG factor for each ingredient or supplier code. This allows emissions to be auto-calculated for every delivery or dish, helping teams see the carbon impact alongside cost and portion data.

4. **Rebalance the menu mix**
   Compare your ingredient spend against the Eatwell Guide proportions. Try one small change per menu cycle – such as replacing a beef dish with a legume-based option or swapping crustaceans for a lower-impact fish or plant-based dish – and track sales, gross profit and emissions per cover.

5. **Treat waste as a cost, not a by-product**
   Use the Guardians of Grub calculator to identify your top three sources of waste. Set a small, specific target – such as reducing prep waste by 20% – brief the team on it, and check progress after four weeks. Turning waste data into financial costs can also help teams see its bottom-line impact.

6. **Manage uncertainty where it matters**
   Some emission factors, particularly for meat and fish, vary widely. Apply conservative estimates and test a few simple "what-if" scenarios – such as increasing or decreasing factors by 10–20% – to check that your reduction priorities still hold true.

7. **Make it business as usual**
   Include two new metrics in your regular reporting: kilograms of $CO_2e$ per cover, and kilograms of waste per cover. Review them in chef and procurement meetings each month to keep progress visible and accountable, and to ensure tracking progress becomes part of normal management practice.




Chefs Ecosystem causal loop diagram
© Andrea Zick

# Results part 3:
## Recommendations for industry and research

**This research identifies how chefs in SMEs can act as catalysts for low-carbon transition when organisational and educational conditions enable them to do so. To build on these findings, the following sector-level actions are recommended.**

### For sector bodies, educators and ESG leads

- **Standardise and embed tools:** Work towards SME-friendly, low cost data systems which integrate carbon and waste tracking into procurement processes.
- **Reform training pathways:** Embed systems thinking, carbon literacy and participatory problem-solving into chef education and continuing professional development.
- **Champion chef-led change:** Fund and publicise initiatives that give chefs a direct voice in sustainability strategy and policy design.
- **Tailor support for SMEs:** Advocate for proportionate reporting frameworks, flexible funding and shared infrastructure to reduce administrative burden.

### For hospitality operators and SME leaders

- **Align sustainability with core operations:** Integrate low-carbon menu design and food-waste reduction into regular business cycles, not one-off projects.
- **Leverage HR as an enabler:** Use HR processes – from onboarding to incentives – to embed environmental performance within roles and culture.
- **Build cross-functional ownership:** Encourage collaboration between chefs, procurement, management and front-of-house teams around shared environmental KPIs.
- **Use data for decisions:** Apply simple tracking to identify emission "hotspots" and demonstrate the commercial case for action.

### For researchers and interdisciplinary practitioners

- **Extend participatory methods:** Develop and test frameworks such as PALAR and Theory U in varied SME contexts to understand what drives lasting change.
- **Make learning active:** Chefs are used to thinking on their feet – literally. Training and workshops work best when they build in movement and tasks that mirror how chefs collaborate and problem-solve in the kitchen.
- **Bridge research and practice:** Produce concise, sector-facing outputs – toolkits, workshops, and benchmarks – that translate evidence into usable guidance.
- **Foster ethical, cross-disciplinary collaboration:** Combine social science, hospitality and environmental expertise to examine real-world constraints and power dynamics.

# Tools and resources

| Name | What it does | Cost |
|---|---|---|
| Chef's Manifesto | Global initiative engaging chefs to promote sustainable, plant-forward food culture. | Free |
| Climate Smart Chefs | EU-funded initiative connecting chefs with climate action in food service. Includes free on-demand online training. | Free |
| The food service playbook for promoting sustainable food choices (Pollicino, Blondin & Attwood, 2024) | Report which synthesises evidence from 346 trials into 90 behaviour-change techniques (menu design, pricing, product mix, language, labels) to encourage sustainable dining. | Free |
| Footprint | UK-based sustainability intelligence platform for the foodservice sector, offering research reports, news, consultancy analysis, and media coverage on ESG, carbon, waste, and nutrition. | Free resources, paid consultancy |
| Global Reporting Initiative (GRI) | Widely used ESG reporting framework for sustainability performance, including food waste and emissions. | Free templates, paid support |
| Guardians of Grub (WRAP) | UK campaign and tools (trackers, calculators, protocols, training) to help hospitality measure and reduce food waste and GHG emissions. | Free |
| James Beard Foundation – Chefs bootcamp | Longstanding US programme training chefs as advocates for sustainable food systems. | Paid |
| Mapping the UK Food System Report (UKRI) | Diagnostic mapping of the UK food system's flows and actors. | Free report |
| Menus of Change | Culinary Institute of America and Harvard's practical, long-term vision to integrate nutrition, public health, environmental sustainability, and social responsibility in foodservice and beyond. | Free |
| MyEmissions | Online GHG emissions calculator for recipes and menus, used to identify emissions hotspots. | Free, paid consultancy |
| No Mise en Plastic | To provide pioneering information on agroecological foods we chefs should be celebrating on our menus right now. Chefs have the power to shape food trends and bring positive change to the food system. | Free |
| Social Productivity Index (UKHospitality, 2025) | Framework measuring the social and geographic value of sectors beyond GDP, using resilience, mobility, and accessibility metrics. | Free |
| State of the Nation Report 2024 (The Food Foundation) | Report which reviews 36 UK food businesses' transparency in Scope 3 and net-zero reporting. | Free |
| The Sustainable Restaurant Association (SRA) | Industry body providing certification, benchmarking, campaigns, and support for restaurants adopting sustainable practices. Free training available here: SRA/Restaurant Hero. | Free resources, paid consultancy |
| TUCO Greenhouse Gas Footprint Calculator | Free tool which lets users calculate the greenhouse gas footprint of menu options. | Free |
| UKHospitality Environmental Sustainability Guide (2022) | Sector-specific strategies for SMEs, including a carbon calculator and science-based food waste targets. | Free |
| WRAP Scope 3 GHG Measurement & Reporting Protocols | Practical protocols for measuring and reporting food-related Scope 3 emissions in HaFS. | Free |
| Worldchefs/Feed the Planet | Free on-demand online training course built to teach culinary professionals to think and act sustainably. | Free |
| Zero Carbon Forum | Collaborative forum which provides tools and guidance to help hospitality businesses measure, reduce, and report their carbon emissions on the path to net zero. | Free resources, paid consultancy |

# About this report

This report was funded by the UKRI and is based on the original PhD research and thesis of Andrea Zick. This was undertaken at the UK Food Systems Centre for Doctoral Training, supervised by Dr Ximena Schmidt Rivera and Dr Christian Reynolds. Andrea's employer, Harvey Nichols, supported her studies by allowing her to work flexibly part-time as PA to the General Manager at OXO Tower Restaurant, Bar and Brasserie, while continuing to chair the Harvey Nichols Sustainability Forum.

The research was shaped by collaboration and the generous sharing of wisdom and insights across the hospitality and foodservice sector. Heartfelt thanks and appreciation go to all those who contributed through interviews and workshops, and to the researchers who engaged with early outputs and provided critical reflections and suggestions. Particular thanks to colleagues at the UK Food Systems Centre for Doctoral Training, Brunel CEDPS, IFSTAL, and the Brunel skills support team, who also provided coaching in navigating ADHD and dyslexia-related language processing.

Andrea has worked in the hospitality and foodservice industry for over two decades. She is a passionate foodie and sustainability advocate, championing the transition to low-impact, low-carbon diets both practically in her professional roles and through her wider campaigning, research, and work as a Guardians of Grub Ambassador.

## Purpose and intention

While the full PhD thesis provides detailed academic analysis, this abridged, action-focused report has been curated so that its insights can be applied in practice. The aim is to make research findings accessible to the sector – so that caterers, chefs, and sustainability professionals can pick up actions, test them in their own contexts, and drive measurable change.

The intention behind curating this report is threefold:

- To move academic knowledge into practical application, supporting the sector in learning through doing.
- To ensure the research, which was informed by and developed alongside industry, gives back by offering usable tools and tested solutions.
- To encourage continuous experimentation and feedback across the hospitality and foodservice ecosystem, turning insight into impact.

## Report writer

This abridged, action-focused toolkit was prepared by Amy Fetzer, a sustainability consultant, author and researcher specialising in practical, evidence-based strategies to reduce environmental impact across the hospitality and foodservice value chain. Her work spans thought-leadership reports, behaviour change programmes, food waste reduction initiatives, stakeholder engagement and training – helping organisations, their teams and the wider industry translate sustainability goals into measurable, tangible action.

# References


1 Zick, A. (n.d.) *Andrea Zick – ResearchGate profile*. Available at: https://www.researchgate.net/profile/Andrea-Zick

2 Zick, A. (n.d.) *Andrea Zick – ResearchGate profile*. Available at: https://www.researchgate.net/profile/Andrea-Zick

3 Scharmer, O.C. (2016), *Theory U: leading from the future as it emerges*. 2nd edn. San Francisco, CA: Berrett-Koehler Publishers

4 Scharmer, O. (2022), *Transforming our economies from ego to eco: Earth4All deep-dive paper 11*. The Club of Rome. Available at: https://www.clubofrome.org/publication/earth4all-scharmer/

5 Zick, A. (n.d.) *Andrea Zick – ResearchGate profile*. Available at: https://www.researchgate.net/profile/Andrea-Zick

6 Zick, A., Schmidt, R.X. and Reynolds, C. (2025), "Operationalising sustainability in professional kitchens: The interplay of chef competencies, environmental values and human resource management strategies", *International Journal of Gastronomy and Food Science*, 101330. Available at: https://doi.org/10.1016/j.ijgfs.2025.101330

7 Bronfenbrenner, U. and Morris, P.A. (2007), "The Bioecological Model of Human Development", in Damon, W. and Lerner, R. (Eds.), *Handbook of Child Psychology*, Wiley. Available at: https://doi.org/10.1002/9780470147658.chpsy0114

8 Hasnain, S., Ingram, J. and Zurek, M. (2020), *Mapping the UK Food System – a Report for the UKRI Transforming UK Food Systems Programme*, Oxford

9 WRAP (2021), *WRAP Pathway 2030: Delivering a 50% reduction in the GHG footprint of UK food and drink*. Banbury. Available at: https://www.wrap.ngo/sites/default/files/2021-10/WRAP-Pathway-2030-Delivering-a-50%25-reduction-in-the-GHG-footprint-of-UK-food-and-drink-summary-report_0.pdf

10 Compass UK & Ireland (2024), *Beyond the Bottom Line: Climate, Food and the Health of People and Planet*. Compass Group UK & Ireland

11 Yum! Brands (2023), *Our Recipe for Good Growth*. Available at: www.yum.com/impact

12 World Health Organization (2022), *The out-of-home food environment: report of a WHO Regional Office for Europe and Public Health England expert meeting, 10 June 2021*. Copenhagen: WHO Regional Office for Europe. Available at: https://www.who.int/europe/publications/i/item/WHO-EURO-2022-5714-45479-65098

13 Papagiannaki, M. and Kerr, M.A. (2024), "Food portion sizes: trends and drivers in an obesogenic environment", *Nutrition Research Reviews*, pp.1–17. Available at: https://doi.org/10.1017/S0954422424000027

14 Statista (2023), *Restaurant Usage in the UK Frequency*. Available at: https://www.statista.com/statistics/586195/restaurant-usage-in-the-uk-frequency/

15 WHO (2022), *The out-of-home food environment: report of a WHO Regional Office for Europe and Public Health England expert meeting, 10 June 2021.* Regional Office for Europe. Available at: https://www.who.int/europe/publications/i/item/WHO-EURO-2022-5714-45479-65098

16 Pereira, L.M., Calderón-Contreras, R., Norström, A. V., Espinosa, D., Willis, J., Lara, L.G., Khan, Z., et al. (2019), "Chefs as change-makers from the kitchen: indigenous knowledge and traditional food as sustainability innovations", *Global Sustainability*, Vol. 2 No. 16, pp. 1–10. Available at: https://doi.org/10.1017/S2059479819000139

17 Richardson, L. and Fernqvist, F. (2022), "Transforming the Food System through Sustainable Gastronomy – How Chefs Engage with Food Democracy", *Journal of Hunger and Environmental Nutrition*, Taylor and Francis Ltd. Available at: https://doi.org/10.1080/19320248.2022.2059428

18 Fetzer, A (2021), *Empowering sustainability heroes: from chef to front of house, CEO to procurement, your guide to being a sustainability hero, whatever your title, in association with Nestlé Professional*. Footprint Intelligence. Available at: https://foodservicefootprint.com/preview-empowering-sustainability-heroes-in-association-with-nestle-professional/

19 Claessens, I.W.H., de Ridder, D.T.D. & Gillebaart, M. (2023), "Personal values, motives, and healthy and sustainable food choices: examining differences between home meals and restaurant meals", *Appetite*, 182, 106432, pp. 1–12. Available at: https://doi.org/10.1016/j.appet.2022.106432

20 Diaconeasa, M.C., Popescu, G., Maehle, N., Nelgen, S. and Capitello, R. (2022), "Media Discourse on Sustainable Consumption in Europe", *Environmental Communication*, Routledge, Vol. 16 No. 3, pp. 352–370. Available at: https://doi.org/10.1080/17524032.2021.1999295

21 Matwick, K. & Matwick, K. (2019), *Food discourse of celebrity chefs of Food Network*. Cham: Palgrave Macmillan

22 Noci, G., O'Connor, T., Pizzi, G., Petruzzellis, L. and Guercini, S. (2022), "Food discourse: ethics and aesthetics on Instagram", *British Food Journal*, 125(13/14), pp. 34–52. Available at: https://doi.org/10.1108/BFJ-06-2022-0522

23 Lengyel, A. (2023), *Celebrity Chefs and the Social Construction of Taste in Contemporary British Society*. University of West London. Available at: https://doi.org/10.36828/xvqy0595

24 National Science and Media Museum (2020), *The Delia Effect*. Available at: https://blog.scienceandmediamuseum.org.uk/the-delia-effect/

25 Pereira, L.M., Calderón-Contreras, R., Norström, A. V., Espinosa, D., Willis, J., Lara, L.G., Khan, Z., et al. (2019), "Chefs as change-makers from the kitchen: indigenous knowledge and traditional food as sustainability innovations", *Global Sustainability*, Vol. 2 No. 16, pp. 1–10. Available at: https://doi.org/10.1017/S2059479819000139

26 Richardson, L. and Fernqvist, F. (2022), "Transforming the Food System through Sustainable Gastronomy – How Chefs Engage with Food Democracy", *Journal of Hunger and Environmental Nutrition*, Taylor and Francis Ltd., Available at: https://doi.org/10.1080/19320248.2022.2059428

27 Fetzer, A (2021) *Empowering sustainability heroes: from chef to front of house, CEO to procurement, your guide to being a sustainability hero, whatever your title, in association with Nestlé Professional*. Footprint Intelligence. Available at: https://foodservicefootprint.com/preview-empowering-sustainability-heroes-in-association-with-nestle-professional

28 Lengyel, A. (2023), *Celebrity Chefs and the Social Construction of Taste in Contemporary British Society*. University of West London. Available at: https://doi.org/10.36828/xvqy0595

29 Ignite Economics (2023), *The Economic Contribution of the UK Hospitality Industry*

30 Hasnain, S., Ingram, J. and Zurek, M. (2020), *Mapping the UK Food System – a Report for the UKRI Transforming UK Food Systems Programme*, Oxford

31 Ignite Economics (2023), *The Economic Contribution of the UK Hospitality Industry*

32 Ignite Economics (2023), *The Economic Contribution of the UK Hospitality Industry*

33 Diaconeasa, M.C., Popescu, G., Maehle, N., Nelgen, S. and Capitello, R. (2022), "Media Discourse on Sustainable Consumption in Europe", *Environmental Communication*, Routledge, Vol. 16 No. 3, pp. 352–370. Available at: https://doi.org/10.1080/17524032.2021.1999295

34 Matwick, K. & Matwick, K. (2019), *Food discourse of celebrity chefs of Food Network*. Cham: Palgrave Macmillan

35 Noci, G., O'Connor, T., Pizzi, G., Petruzzellis, L. and Guercini, S. (2022), "Food discourse: ethics and aesthetics on Instagram", *British Food Journal*, 125(13/14), pp. 34–52. Available at: https://doi.org/10.1108/BFJ-06-2022-0522

36 Zientara, P. and Zamojska, A. (2018), "Green organizational climates and employee pro-environmental behaviour in the hotel industry", *Journal of Sustainable Tourism*, 26(7), pp. 1142–1159. Available at: https://doi.org/10.1080/09669582.2016.1206554

37 Chawla, G., Lugosi, P. and Hawkins, R. (2022), "Factors Influencing Hospitality Employees' Pro-Environmental Behaviours toward Food Waste", *Sustainability (Switzerland)*, MDPI, Vol.14 No. 15. Available at: https://doi.org/10.3390/su14159015

38 Buckton, S.J., Fazey, I., Doherty, B., Bryant, M., Banwart, S.A., Carmen, E., Connolly, A., et al. (2024), "Transformative action towards regenerative food systems: A large-scale case study", edited by Ashardiono, F., *PLOS Sustainability and Transformation*, Vol. 3 No. 11, p.e0000134. Available at: https://doi.org/10.1371/journal.pstr.0000134

39 Springmann, M., Charles, H., Godfray, J., Rayner, M. and Scarborough, P. (2016), "Analysis and valuation of the health and climate change cobenefits of dietary change", *PNAS*, Vol. 113 No. 15, pp. 4146–4151. Available at: https://doi.org/10.1073/pnas.1523119113

40 Rockström, J., Thilsted, S. H., Willett, W. C., et al. (2025), "The EAT–Lancet Commission on healthy, sustainable, and just food systems", *The Lancet*. Available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)01201-2/fulltext

41 Climate Change Committee (2025), *The Seventh Carbon Budget Advice for the UK Government*. Available at: www.theccc.org.uk/publications

42 Speck, M., Wagner, L., Buchborn, F., Steinmeier, F., Friedrich, S. and Langen, N. (2022), "How public catering accelerates sustainability: a German case study", *Sustainability Science*, Springer, Vol. 17 No. 6, pp. 2287–2299. Available at: https://doi.org/10.1007/s11625-022-01183-2

43 WRAP (2025), *UK food waste and food surplus: key facts July 2025*. Banbury: Waste and Resources Action Programme (WRAP). Available at: https://www.wrap.ngo/sites/default/files/2025-06/WRAP-UK-Food-Waste-and-Food-Surplus-Key-Facts-July-2025-v5.pdf

44 WRAP (n.d.) Guardians of Grub. Available at: https://www.guardiansofgrub.com

45 WRAP (n.d.) Guardians of Grub. Available at: https://www.guardiansofgrub.com

46 WRAP (2013), *The true cost of waste in hospitality and food service*. Banbury: Waste and Resources Action Programme (WRAP). Available at: https://www.wrap.ngo/resources/report/true-cost-waste-hospitality-and-food-service

47 WRAP (2020), *Guardians of Grub: becoming a champion – starter guide*. Banbury: Waste and Resources Action Programme (WRAP). Available at: https://guardiansofgrub.com/wp-content/uploads/2020/12/GOG_Starter_Guide_V4.pdf

48 Zick, A., Schmidt, X.R. and Reynolds, C. (2024), "A rapid systematic literature review on research linked to chefs, greenhouse gas emissions (GHGE) and the food system", in CHME (ed.) *The Hospitality Industry: Its Impact on the Environment, Community, and Workplace*. Leeds. Available at: https://www.researchgate.net/publication/380817128

49 Ignite Economics (2023), *The Economic Contribution of the UK Hospitality Industry*

50 Kyriakidou, O. and Maroudas, L. (2010), "Training and development in british hospitality, tourism and leisure SMEs", *Managing Leisure*, 15(1–2), pp. 32–47. Available at: https://doi.org/10.1080/13606710903447998

51 Pollicino, D., Blondin, S. and Attwood, S. (2024), *The Food Service Playbook for Promoting Sustainable Food Choices*, World Resources Institute. Available at: https://doi.org/10.46830/wrirpt.22.00151

52 Climate Smart Chefs (n.d.) *Climate Smart Chefs*. Available at: https://climatesmartchefs.eu

53 Martin, S., O'Brien, K., Nicholson, W., Magnani, A., Antonelli, M., Castaldi, S. and Kirwan, L.B. (2023), "LIFE Climate Smart Chefs; qualitative insights for a sustainable food service", *European Journal of Public Health*, Vol. 33 No. Supplement_2

54 Richardson, L. and Fernqvist, F. (2022), "Transforming the Food System through Sustainable Gastronomy – How Chefs Engage with Food Democracy", *Journal of Hunger and Environmental Nutrition*, Taylor and Francis Ltd. Available at: https://doi.org/10.1080/19320248.2022.2059428

55 SDG2 Advocacy Hub (n.d.) *Chefs' Manifesto*. Available at: https://sdg2advocacyhub.org/chefs-manifesto

56 WRAP (n.d.) Guardians of Grub. Available at: https://www.guardiansofgrub.com

57 EIT Food. (2024), *Great Taste Zero-waste*. Available at: https://www.eitfood.eu/projects/great-taste-zero-waste/about-the-project

58 Sustainable Restaurant Association (n.d.) *The Sustainable Restaurant Association*. Available at: https://thesra.org

59 Bouman, T., Steg, L. and Kiers, H.A.L. (2018), "Measuring values in environmental research: A test of an environmental Portrait Value Questionnaire", *Frontiers in Psychology*, Frontiers Media S.A., Vol. 9 No. APR. Available at: https://doi.org/10.3389/fpsyg.2018.00564

60 Filimonau, V., Matute, J., Kubal-Czerwińska, M. and Mika, M. (2024), "How to encourage food waste reduction in kitchen brigades: The underlying role of 'green' transformational leadership and employees' self-efficacy", *Journal of Hospitality and Tourism Management*, Elsevier Ltd, Vol. 59, pp. 139–148. Available at: https://doi.org/10.1016/j.jhtm.2024.04.005

61 Filimonau, V., Sezerel, H., Ashton, M., Kubal-Czerwińska, M., Bhaskara, G.I. and Ermolaev, V.A. (2024), "How chefs develop the practice to manage food waste in professional kitchens", *International Journal of Hospitality Management*, Elsevier Ltd, Vol. 119. Available at: https://doi.org/10.1016/j.ijhm.2024.103712

62 Suleman, A.R., Nejati, M., Shafaei, A. and Redmond, J. (2025), "Green human resource management practices in the hospitality and tourism industry: An integrative multilevel systematic review", *Journal of Hospitality and Tourism Management*, Elsevier Ltd, Vol. 62, pp. 46–56. Available at: https://doi.org/10.1016/j.jhtm.2024.12.009

63 Ashton, M., Sezerel, H., Filimonau, V. and Gunay, S. (2024), "Gender dynamics and sustainable practices: exploring food waste management among female chefs in the hospitality industry", *Journal of Sustainable Tourism*, Routledge, pp. 1–26. Available at: https://doi.org/10.1080/09669582.2024.2397655

64 Filimonau, V., Sezerel, H., Ashton, M., Kubal-Czerwińska, M., Bhaskara, G.I. and Ermolaev, V.A. (2024), "How chefs develop the practice to manage food waste in professional kitchens", International *Journal of Hospitality Management*, Elsevier Ltd, Vol. 119. Available at: https://doi.org/10.1016/j.ijhm.2024.103712

65 Filimonau, V., Sezerel, H., Ashton, M., Kubal-Czerwińska, M., Bhaskara, G.I. and Ermolaev, V.A. (2024), "How chefs develop the practice to manage food waste in professional kitchens", *International Journal of Hospitality Management*, Elsevier Ltd, Vol. 119. Available at: https://doi.org/10.1016/j.ijhm.2024.103712

66 Ashton, M., Sezerel, H., Filimonau, V. and Gunay, S. (2024), "Gender dynamics and sustainable practices: exploring food waste management among female chefs in the hospitality industry", *Journal of Sustainable Tourism*, Routledge, pp. 1–26. Available at: https://doi.org/10.1080/09669582.2024.2397655

67 Zientara, P. and Zamojska, A. (2018), "Green organizational climates and employee pro-environmental behaviour in the hotel industry," *Journal of Sustainable Tourism*, 26(7), pp. 1142–1159. Available at: https://doi.org/10.1080/09669582.2016.1206554

68 Ashton, M., Sezerel, H., Filimonau, V. and Gunay, S. (2024), "Gender dynamics and sustainable practices: exploring food waste management among female chefs in the hospitality industry", *Journal of Sustainable Tourism*, Routledge, pp. 1–26. Available at: https://doi.org/10.1080/09669582.2024.2397655

69 Filimonau, V., Matute, J., Kubal-Czerwińska, M. and Mika, M. (2024), "How to encourage food waste reduction in kitchen brigades: The underlying role of 'green' transformational leadership and employees' self-efficacy", *Journal of Hospitality and Tourism Management*, Elsevier Ltd, Vol. 59, pp. 139–148. Available at: https://doi.org/10.1016/j.jhtm.2024.04.005

70 Filimonau, V., Sezerel, H., Ashton, M., Kubal-Czerwińska, M., Bhaskara, G.I. and Ermolaev, V.A. (2024), "How chefs develop the practice to manage food waste in professional kitchens", *International Journal of Hospitality Management*, Elsevier Ltd, Vol. 119. Available at: https://doi.org/10.1016/j.ijhm.2024.103712

71 Bronfenbrenner, U. and Morris, P.A. (2007), "The Bioecological Model of Human Development", in Damon, W. and Lerner, R. (Eds.), *Handbook of Child Psychology*, Wiley. Available at: https://doi.org/10.1002/9780470147658.chpsy0114

72 Zick, A. (2025), *Designing Low-Carbon Menus: A Mixed-Methods Study of Food Waste and Greenhouse Gas Emissions Reduction in UK Small and Medium Enterprise Catering.* Unpublished PhD thesis. Brunel University

73 Scharmer, O.C. (2016), *Theory U: leading from the future as it emerges.* 2nd edn. San Francisco, CA: Berrett-Koehler Publishers

74 Scharmer, O. (2022), *Transforming our economies from ego to eco: Earth4All deep-dive paper 11*. The Club of Rome. Available at: https://www.clubofrome.org/publication/earth4all-scharmer/

75 Scharmer, O.C. (2016), *Theory U: leading from the future as it emerges*. 2nd edn. San Francisco, CA: Berrett-Koehler Publishers

76 Scharmer, O. (2022), *Transforming our economies from ego to eco: Earth4All deep-dive paper 11*. The Club of Rome. Available at: https://www.clubofrome.org/publication/earth4all-scharmer/

77 Poutiatine, M.I. (2009), "What is transformation?: Nine principles toward an understanding Transformational Process for transformational leadership", *Journal of Transformative Education*, Vol. 7 No. 3, pp. 189–208. Available at: https://doi.org/10.1177/1541344610385249

78 Ajzen, I. (1991), "The Theory of Planned Behavior", *Organizational Behavior and Human Decision Processes*, 50(2), pp. 179–211. Available at: https://doi.org/10.1016/0749-5978(91)90020-T

79 Bouman, T., Steg, L. and Kiers, H.A.L. (2018), "Measuring values in environmental research: A test of an environmental Portrait Value Questionnaire", *Frontiers in Psychology*, Frontiers Media S.A., Vol. 9 No. APR. Available at: https://doi.org/10.3389/fpsyg.2018.00564

80 Pereira, L.M., Calderón-Contreras, R., Norström, A. V., Espinosa, D., Willis, J., Lara, L.G., Khan, Z., et al. (2019), "Chefs as change-makers from the kitchen: indigenous knowledge and traditional food as sustainability innovations", *Global Sustainability*, Vol. 2 No. 16, pp. 1–10. Available at: https://doi.org/10.1017/S2059479819000139

81 Filimonau, V., Matute, J., Kubal-Czerwińska, M. and Mika, M. (2024), "How to encourage food waste reduction in kitchen brigades: The underlying role of 'green' transformational leadership and employees' self-efficacy", *Journal of Hospitality and Tourism Management*, Elsevier Ltd, Vol. 59, pp. 139–148. Available at: https://doi.org/10.1016/j.jhtm.2024.04.005

82 Filimonau, V., Sezerel, H., Ashton, M., Kubal-Czerwińska, M., Bhaskara, G.I. and Ermolaev, V.A. (2024), "How chefs develop the practice to manage food waste in professional kitchens", *International Journal of Hospitality Management*, Elsevier Ltd, Vol. 119. Available at: https://doi.org/10.1016/j.ijhm.2024.103712

83 Ashton, M., Sezerel, H., Filimonau, V. and Gunay, S. (2024), "Gender dynamics and sustainable practices: exploring food waste management among female chefs in the hospitality industry", *Journal of Sustainable Tourism*, Routledge, pp. 1–26. Available at: https://doi.org/10.1080/09669582.2024.2397655

84 Suleman, A.R., Nejati, M., Shafaei, A. and Redmond, J. (2025), "Green human resource management practices in the hospitality and tourism industry: An integrative multilevel systematic review", *Journal of Hospitality and Tourism Management*, Elsevier Ltd, Vol. 62, pp. 46–56. Available at: https://doi.org/10.1016/j.jhtm.2024.12.009

85 TUCO Ltd (2018), Greenhouse Gas Footprint Calculator. Available at: https://www.tuco.ac.uk/ghgcalculator/index.html

86 MyEmissions. (2025), Free food carbon footprint calculator. Available at: https://myemissions.co/resources/food-carbon-footprint-calculator

87 Gomez, M.L. and Bouty, I. (2011), "The emergence of an influential practice: Food for thought," *Organization Studies*, 32(7), pp. 921–940. Available at: https://doi.org/10.1177/0170840611407020

88 Chesbrough, H., Kim, S. and Agogino, A. (2014), "Chez Panisse: Building an open innovation ecosystem", *California Management Review*, Berkley, Vol. 4 No. 54, pp. 144–171. Available at: https://doi.org/10.1525/cmr.2014.56.4.144

89 WRAP (n.d.) Guardians of Grub. Available at: https://www.guardiansofgrub.com/

90 WRAP (n.d.) Love Food Hate Waste. Available at: https://www.lovefoodhatewaste.com/

91 World Resources Institute (n.d.) Cool Food Meals. Available at: https://coolfood.org/coolfoodmeals/

92 Sustainable Restaurant Association (n.d.) *The Sustainable Restaurant Association*. Available at: https://thesra.org/

93 Climate Smart Chefs (n.d.) Climate Smart Chefs. Available at: https://climatesmartchefs.eu/
94 Martin, S., O'Brien, K., Nicholson, W., Magnani, A., Antonelli, M., Castaldi, S. and Kirwan, L.B. (2023), "LIFE Climate Smart Chefs; qualitative insights for a sustainable food service", *European Journal of Public Health*, Vol. 33 No. Supplement_2
95 World Resources Institute (n.d.) Cool Food Meals. Available at: https://coolfood.org/coolfoodmeals/ (Accessed: 29 October 2025)
96 Flynn, A.N. et al. (2025), "Dish swap across a weekly menu can deliver health and sustainability gains", *Nature Food* [Preprint]. Available at: https://doi.org/10.1038/s43016-025-01218-8
97 Gavrieli, A. et al. (2022), "Appealing dish names to nudge diners to more sustainable food choices: a quasi-experimental study", *BMC Public Health*, 22(1). Available at: https://doi.org/10.1186/s12889-022-14683-8
98 Parkin, B.L. and Attwood, S. (2022), "Menu design approaches to promote sustainable vegetarian food choices when dining out", *Journal of Environmental Psychology*, Academic Press, Vol. 79. Available at: https://doi.org/10.1016/j.jenvp.2021.101721
99 Wansink, B. (2014), *Slim by design: Mindless eating solutions for everyday life*. New York: William
100 Sodexo (2025), Food as a lever for climate action, Case Study – Blog. Available at: https://uk.sodexo.com/insights/case-studies/2025/net-zero-focused-menus
101 Pollicino, D., Blondin, S. and Attwood, S. (2024), *The Food Service Playbook for Promoting Sustainable Food Choices*, World Resources Institute. Available at: https://doi.org/10.46830/wrirpt.22.00151
102 Reinders, M.J. et al. (2020), "Portioning meat and vegetables in four different out of home settings: A win-win for guests, chefs and the planet", *Appetite*, 147. Available at: https://doi.org/10.1016/j.appet.2019.104539
103 NHS (n.d.) *The Eatwell Guide*. Available at: https://www.nhs.uk/live-well/eat-well/food-guidelines-and-food-labels/the-eatwell-guide/
104 Ashton, M., Sezerel, H., Filimonau, V. and Gunay, S. (2024), "Gender dynamics and sustainable practices: exploring food waste management among female chefs in the hospitality industry", *Journal of Sustainable Tourism*, Routledge, pp. 1–26. Available at: https://doi.org/10.1080/09669582.2024.2397655
105 WRAP (2024), Scope 3 GHG Measurement and Reporting Protocols for Food and Drink. Available at: https://www.wrap.ngo/resources/guide/scope-3-ghg-measurement-and-reporting-protocols-food-and-drink
106 WRAP (n. d.) The UK food and drink pact. Banbury: Waste and Resources Action Programme (WRAP). Available at: https://www.wrap.ngo/take-action/uk-food-drink-pact
107 WRAP (n.d.) Guardians of Grub. Available at: https://www.guardiansofgrub.com
108 Net Zero Now (n.d.) Net Zero Now. Available at: https://netzeronow.org
109 Sustainable Food Places (n.d.) Local food partnerships. Available at: https://www.sustainablefoodplaces.org
110 WRAP (2024), *Scope 3 GHG Measurement and Reporting Protocols for Food and Drink*. Available at: https://www.wrap.ngo/resources/guide/scope-3-ghg-measurement-and-reporting-protocols-food-and-drink
111 MyEmissions. (2025), Free food carbon footprint calculator. Available at: https://myemissions.co/resources/food-carbon-footprint-calculator
112 TUCO Ltd (2018), Greenhouse Gas Footprint Calculator. Available at: https://www.tuco.ac.uk/ghgcalculator/index.html
113 Foodsteps (n.d.) Foodsteps. Available at: https://www.foodsteps.earth
114 Klimato (n.d.) Klimato. Available at: https://www.klimato.co
115 Nutritics (n.d.) Nutritics. Available at: https://www.nutritics.com
116 WRAP (n.d.) *Operational resources: tracking calculator.* Available at: https://guardiansofgrub.com/resources/downloads/operational-resources-tracking-calculator/

117 Department for Business, Energy & Industrial Strategy (BEIS) (2019), *Environmental Reporting Guidelines: Including streamlined energy and carbon reporting guidance*. London: BEIS. Available at: https://www.gov.uk/government/publications/environmental-reporting-guidelines-including-mandatory-greenhouse-gas-emissions-reporting-guidance

118 Department for Energy Security and Net Zero (DESNZ) (2025), *UK Sustainability Reporting Standards (UK SRS)*. Available at: https://www.gov.uk/guidance/uk-sustainability-reporting-standards

119 European Commission (n.d.) *Corporate sustainability reporting*. Available at: https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

120 WRAP (2024), *Scope 3 GHG Measurement and Reporting Protocols for Food and Drink*. Available at: https://www.wrap.ngo/resources/guide/scope-3-ghg-measurement-and-reporting-protocols-food-and-drink

121 WRAP (n.d.) *The UK food and drink pact*. Banbury: Waste and Resources Action Programme (WRAP). Available at: https://www.wrap.ngo/take-action/uk-food-drink-pact

122 WRAP (n.d.) Guardians of Grub. Available at: https://www.guardiansofgrub.com/

123 WRAP (2023), Food Waste Reduction Roadmap Toolkit. Available at: https://www.wrap.ngo/resources/tool/food-waste-reduction-roadmap-toolkit#download-file

124 Zero Carbon Forum (n.d.) Zero Carbon Forum. Available at: https://www.zerocarbonforum.com/

125 The Sustainable Restaurant Association (n.d.) The Sustainable Restaurant Association. Available at: https://thesra.org/

126 Filimonau, V., Matute, J., Kubal-Czerwińska, M. and Mika, M. (2024), "How to encourage food waste reduction in kitchen brigades: The underlying role of 'green' transformational leadership and employees' self-efficacy", *Journal of Hospitality and Tourism Management*, Elsevier Ltd, Vol. 59, pp. 139–148. Available at: https://doi.org/10.1016/j.jhtm.2024.04.005

127 Filimonau, V., Sezerel, H., Ashton, M., Kubal-Czerwińska, M., Bhaskara, G.I. and Ermolaev, V.A. (2024), "How chefs develop the practice to manage food waste in professional kitchens", *International Journal of Hospitality Management*, Elsevier Ltd, Vol. 119. Available at: https://doi.org/10.1016/j.ijhm.2024.103712

128 Chawla, G., Lugosi, P. and Hawkins, R. (2022), "Factors Influencing Hospitality Employees' Pro-Environmental Behaviours toward Food Waste", *Sustainability (Switzerland)*, MDPI, Vol. 14 No. 15. Available at: https://doi.org/10.3390/su14159015

129 Kyriakidou, O. and Maroudas, L. (2010), "Training and development in british hospitality, tourism and leisure SMEs," *Managing Leisure*, 15(1–2), pp. 32–47. Available at: https://doi.org/10.1080/13606710903447998

130 Yuriev, A., Dahmen, M., Paillé, P., Boiral, O. and Guillaumie, L. (2020), "Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review", *Resources, Conservation and Recycling*, Elsevier B.V., Vol. 155. Available at: https://doi.org/10.1016/j.resconrec.2019.104660

131 Suleman, A.R., Nejati, M., Shafaei, A. and Redmond, J. (2025), "Green human resource management practices in the hospitality and tourism industry: An integrative multilevel systematic review", *Journal of Hospitality and Tourism Management*, Elsevier Ltd, Vol. 62, pp. 46–56. Available at: https://doi.org/10.1016/j.jhtm.2024.12.009

132 Filimonau, V. and Sulyok, J. (2021), "'Bin it and forget it!': The challenges of food waste management in restaurants of a mid-sized Hungarian city", *Tourism Management Perspectives*, Elsevier B.V., Vol. 37. Available at: https://doi.org/10.1016/j.tmp.2020.100759

133 Chawla, G. and Lugosi, P. (2025), "Driving pro-environmental practice change and food waste reduction in (and around) professional kitchens: Connecting materiality and meaning", *International Journal of Gastronomy and Food Science*, Vol. 39, p. 101126. Available at: https://doi.org/10.1016/j.ijgfs.2025.101126

134 Filimonau, V. and Krivcova, M. (2017), "Restaurant menu design and more responsible consumer food choice: An exploratory study of managerial perceptions", *Journal of Cleaner Production*, Elsevier Ltd, Vol. 143, pp. 516–527. Available at: https://doi.org/10.1016/j.jclepro.2016.12.080

135 Filimonau, V. and Sulyok, J. (2021), "'Bin it and forget it!': The challenges of food waste management in restaurants of a mid-sized Hungarian city", *Tourism Management Perspectives*, Elsevier B.V., Vol. 37. Available at: https://doi.org/10.1016/j.tmp.2020.100759

136 Chawla, G. and Lugosi, P. (2025), "Driving pro-environmental practice change and food waste reduction in (and around) professional kitchens: Connecting materiality and meaning", *International Journal of Gastronomy and Food Science*, Vol. 39, p. 101126. Available at: https://doi.org/10.1016/j.ijgfs.2025.101126

137 Ashton, M., Sezerel, H., Filimonau, V. and Gunay, S. (2024), "Gender dynamics and sustainable practices: exploring food waste management among female chefs in the hospitality industry", *Journal of Sustainable Tourism*, Routledge, pp. 1–26. Available at: https://doi.org/10.1080/09669582.2024.2397655

138 Filimonau, V., Sezerel, H., Ashton, M., Kubal-Czerwińska, M., Bhaskara, G.I. and Ermolaev, V.A. (2024), "How chefs develop the practice to manage food waste in professional kitchens", *International Journal of Hospitality Management*, Elsevier Ltd, Vol. 119. Available at: https://doi.org/10.1016/j.ijhm.2024.103712

139 Scharmer, O.C. (2016), *Theory U: leading from the future as it emerges*. 2nd edn. San Francisco, CA: Berrett-Koehler Publishers

140 Scharmer, O. (2022), Transforming our economies from ego to eco: Earth4All deep-dive paper 11. The Club of Rome. Available at: https://www.clubofrome.org/publication/earth4all-scharmer/

141 Sustainable Restaurant Association (2024), *Don't miss this new free sustainability course for hospitality businesses.* Available at: https://thesra.org/news-insights/news/dont-miss-this-new-free-sustainability-course-for-hospitality-businesses/

142 Worldchefs (n.d.) Sustainability education for culinary professionals. Available at: https://worldchefs.org/sustainability-education-for-culinary-professional

143 Climate Smart Chefs (n.d.) Online course. Available at: https://climatesmartchefs.eu/online-course/

144 WRAP (n.d.) Guardians of Grub courses. Available at: https://guardiansofgrub.com/courses/

145 WRAP (n.d.) *Operational resources: tracking calculator.* Available at: https://guardiansofgrub.com/resources/downloads/operational-resources-tracking-calculator/

146 WRAP (2024), *Scope 3 GHG Measurement and Reporting Protocols for Food and Drink*. Available at: https://www.wrap.ngo/resources/guide/scope-3-ghg-measurement-and-reporting-protocols-food-and-drink

147 NHS (n.d.) *The Eatwell Guide*. Available at: https://www.nhs.uk/live-well/eat-well/food-guidelines-and-food-labels/the-eatwell-guide/

148 Scheelbeek, P., Green, R., Papier, K., Knuppel, A., Alae-Carew, C., Balkwill, A., Key, T.J., et al. (2020), "Health impacts and environmental footprints of diets that meet the Eatwell Guide recommendations: analyses of multiple UK studies", *BMJ Open*, BMJ Publishing Group, Vol. 10 No. 8. Available at: https://doi.org/10.1136/bmjopen-2020-037554

149 Parkin, B.L. and Attwood, S. (2022), "Menu design approaches to promote sustainable vegetarian food choices when dining out", *Journal of Environmental Psychology*, Academic Press, Vol. 79. Available at: https://doi.org/10.1016/j.jenvp.2021.101721

150 Pollicino, D., Blondin, S. and Attwood, S. (2024), *The Food Service Playbook for Promoting Sustainable Food Choices*, World Resources Institute. Available at: https://doi.org/10.46830/wrirpt.22.00151

151 Reinders, M.J. et al. (2020), "Portioning meat and vegetables in four different out of home settings: A win-win for guests, chefs and the planet", *Appetite*, 147. Available at: https://doi.org/10.1016/j.appet.2019.104539

152 Wansink, B. (2014), *Slim by design: Mindless eating solutions for everyday life.* New York: William

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