Local Governance, The Circular Economy and Household Waste:

A practice theory approach to waste minimisation

UKERC Working paper

Kelly Prime, University of Brighton

March 2024

Introduction to UKERC

The UK Energy Research Centre (UKERC) carries out world-class, interdisciplinary research into sustainable future energy systems.

It is a focal point of UK energy research and a gateway between the UK and the international energy research communities.

Our whole systems research informs UK policy development and research strategy.

UKERC is funded by the UK Research and Innovation, Energy Programme.

About Energy SHINES

This paper is an output from Energy SHINES (Energy Social sciences and Humanities Insights for Non-Energy Sectors) – a project delivered through UKERC's Whole Systems Networking Fund.

Energy SHINES was set up to facilitate partnerships between women Early Career Researchers from energy social science and humanities backgrounds and organisations in key non-energy sectors undertaking work towards net zero.

Access all publications produced from the project here.

Contents

1. Executive summary

This brief has been developed as part of the Energy SHINES project, which sought to bring social science and humanities (SSH) insights to energy-related challenges faced by 'non-energy' sectors. It considers the role of local authorities (LAs) in fostering circular economy (CE) activities with a view to reducing the amount of household waste generated, thereby reducing the carbon emissions associated with the disposal of that waste.

This research was completed in partnership with a county council in England during the early part of 2023. As the waste disposal authority for the county, carbon emissions from the disposal of waste are a significant contributor to its Scope 3 emissions. The council has committed to reducing its Scope 3 emissions by 50% by 2030, and tackling household waste is a key area to meet this aim. It wanted to understand how CE principles could drive reductions in carbon emissions from household waste.

This brief uses waste tonnage and composition data for the county council, alongside key internal and external stakeholder interviews and relevant academic literature, to understand the issue. Recognising that changes in waste collection and disposal methods will only take us so far, it uses the framing of practice theory to consider how CE activities can be developed. Practice theory is critical of the idea that individuals make conscious decisions about resource use. Instead, actions are habitualised and unintended. Using this framing, the brief considers how an LA, alongside other actors, may encourage CE activities through their diverse services and responsibilities.

Recommendations for LAs

- **Consider the whole-lifecycle emissions of materials when making waste policy decisions** to avoid spill-over effects and increased emissions in other areas.

- **Take a whole organisation approach to fostering CE**, as departments outside of waste disposal can have an impact on what materials end up in household waste.

- **Collaborate across all departments and partner organisations**, as projects may require input from several departments and organisations.

- **Plan for CE** to ensure that CE infrastructures fit into, and will be used in, people's day-to-day lives.

- **Create a central resource of CE activities** to build knowledge and develop project ideas across several actors.

Recommendations for National Government:

- **Support LAs in transitioning to new waste strategies in a timely manner** to allow time for new routines and practices to develop.

- **Empower LAs to have a role in ensuring that materials are recycled and repurposed in a circular manner**, such as a legal duty for LAs to ensure that waste is repurposed in a way that deals with CE principles.

- **Consider policies which will encourage smaller circular businesses to start up**, as current rules and regulations may pose barriers to such businesses.

Recommendations for research:

- **Investigate cooking, eating and leftover practices and their impact on food waste** to develop more innovative waste prevention strategies.

- **Further research food waste separation practices across different demographics and housing types**, as recycling food is not a one-size-fits-all approach.

- **Focus research into the sharing economy on practices within peer-to-peer sharing**, as this area is less well researched.

CE Businesses may also find this research of interest, as practice theory can be built into business and product design.

2. Introduction

The Energy SHINES project saw women in social sciences and humanities research (SSH) bring SSH insights to energy-related challenges faced by 'non-energy' sectors as they transition to net zero.

This brief is the result of a collaboration with an external stakeholder organisation which wanted to understand how Circular Economy (CE) principles could drive carbon reductions from household waste. The waste sector accounts for 6% of the UK's greenhouse gas emissions, with landfilling of waste representing the main source (Climate Change Committee, 2020). As a county council, the partner organisation is responsible for the disposal of all household waste, and this contributes significantly to its carbon emissions.

The Resource and Waste Strategy for England 2018 (RWS) (DEFRA, 2018) sets out the National Government's plan to move away from linear modes of consumption where we take, make use of and throw, to more circular flows of materials. The county council wanted to understand how far the RWS could drive change in carbon emissions, and what more could be done to achieve its net zero goals.

Using waste composition data and interviews with key stakeholders, both within and outside the partner organisation, this brief will use SSH insights through the application of practice theory to consider how CE can drive reductions in emissions, and how we can move to a more circular use of materials and products. The following sections will provide an overview of the case study area, before highlighting the key policy proposals from the RWS. It will then provide an overview of practice theory and the insights it provides, followed by examples of its use across four different CE practices: food waste reduction; the sharing economy; repair; and recycling. Finally, informed by these examples, this brief makes recommendations for local authorities and beyond to support the development of CE.

2.1 Case study

Like many councils across the UK, our case study has declared a climate emergency and has set ambitious net zero targets. This includes reaching net zero[1] across all activities in the county by 2045 and a reduction of 50% of its Scope 3[2] emissions by 2030. Waste disposal is a significant contributor to its Scope 3 emissions, accounting for just over a quarter of its total emissions in 2021/2022. In light of this, the council was interested in understanding how CE principles could deliver reductions in household waste and its carbon emissions.

---

[1] 'Net zero' means adding no more greenhouse gases to the Earth's atmosphere than the amount you are taking out.
[2] Scope 3 emissions include emissions from travel, waste disposal, purchased goods and services, distribution and other *indirect* operations that sustain an organization and its value chain.

The council currently landfills the residual waste it receives, after the waste has been put through a Mechanical Biological Treatment (MBT) process. This extracts recyclable materials (such as metals) and reduces the total weight of the waste through the breakdown of its biological component. Following this process, the remaining material is placed in landfill. The council is not responsible for the collection of household waste, but has formed a partnership with its district councils in order to ensure the efficient use of resources across the two levels of local government.

The vast majority of the organisation's carbon emissions from waste are a result of materials breaking down in landfill and releasing methane. Table 1 shows a breakdown of carbon emissions from waste sent to landfill by material for the county council. Certain materials, such as plastics, sanitary products, glass and electricals, do not break down in landfill and so do not contribute to the council's carbon emissions. This is because these materials take so long to break down and release their stored carbon. Five types of materials that contribute to the council's carbon emissions remain.

Table 1: Carbon Emissions Breakdown by Material

Material	Emissions Tonnes CO2e
Textiles	16,551
Food and Kitchen Waste	11,782
Paper and Card	10,873
Garden Waste	2,398
Wood	2,221

(Source: Council Carbon Data, 2021/2022)

Some changes in how CCC deals with the disposal of waste could see the reduction of carbon emissions. For example, the Resource and Waste Strategy for England 2018 (RWS) (DEFRA, 2018) proposes Anaerobic Digestion (AD) as the most environmentally preferable treatment option for food waste, with 500kg of CO_2e avoided per tonne in comparison to landfilling (DECC and DEFRA, 2011). This represents around a 12% decrease in carbon emissions if AD is chosen over landfill and all food waste is diverted into a separate food waste collection. While changes to legislation are being put in place to require weekly food waste collection, the associated funding for councils to make the change has been delayed by Central Government, with transitional arrangements being offered to councils that would be unduly burdened by the change.

Changes in how waste is disposed of can assist with emissions reductions, but only take us so far. The council seeks to reduce its Scope 3 emissions by 2030, and changes to waste disposal alone will not meet that target. Therefore, more needs to be done.

Furthermore, the way in which councils are required to report their Scope 3 emissions means that the calculations only take account of the carbon emitted as materials break down in landfill, and not the emissions created as a result of the extraction, processing and transporting of raw materials and goods. This is because LAs are at the end of the material's life-cycle and have limited influence on what happens to a product prior to it reaching the end of life and becoming waste.

However, the council's goals are twofold. It seeks to reduce its own carbon emissions, of which waste makes up a significant portion of its Scope 3 emissions, but it also aims to reach net zero across all of the counties, communities and businesses. In tackling its own Scope 3 emissions, it needs to be mindful of the impact any changes it makes will have on wider carbon emissions. Therefore, it should consider taking a more holistic approach and focusing on the carbon emissions across the life-cycle of a product, rather than the emissions created at the point of disposal.

Ultimately, reduce, reuse, repair and recycle will all be important behaviours, not only to reduce emissions from household waste, but for the county. This is why insights from practice theory and related social science fields have an important role to play, as I will outline in the following sections of this brief.

2.2   CE and the Resource and Waste Strategy England 2018

The Resource and Waste Strategy for England 2018 is a key document setting out the Government's intentions for the future of waste. It seeks to prolong the lives of materials and goods that we use and move towards a more circular economy.

CE is as an alternative, sustainable approach to resource management. It is based on cyclical material flows, where the value of a material is fully extracted through reuse, refurbishment and repair before being re-manufactured for raw material utilisation (recycling), before heading to combustion or landfill disposal (Korhonen, Honkasalo and Seppälä, 2018).

Implementing circularity is challenging. Firstly, while in theory it is possible to recycle everything using renewable sources of energy, this would require significant work and technological advancement. Materials break down and degrade over time (Korhonen, Honkasalo and Seppälä, 2018). Therefore, the aim should be to reuse materials in line with principles further up the circular economy cycle before opting for recycling, recovery or disposal.

There were three key policy instruments from RWS that were discussed throughout the interviews with those working within the waste management departments. These were the implementation of a weekly separate food waste collection, the extended producer responsibility (EPR) and the deposit return scheme (DRS).

DEFRA has consulted on introducing separate food waste collections, as it intended to put this in place by the end of 2023. While assistance with the cost of implementing collections has been offered, this does not extend to costs involved in changing current waste disposal methods or contracts. Instead, DEFRA has offered transitional arrangements to those councils that will be unduly burdened by a change in waste management before current contracts come to an end. This will delay the implementation of separate weekly food waste collections across England.

The EPR is intended to place the cost of disposing of materials on the producer to encourage them to use more recyclable materials and reduce the amount of materials used (especially for packaging). It is also intended to help push materials upwards in the waste hierarchy by making it easier for products to be reused or repaired. This may result in more recyclable materials in the recycle flow, or produce a greater demand for recycled materials collected by local authorities.

Under the DRS, consumers pay a small upfront fee for single use drinks containers, which is returned to them when they recycle that item. This will require the implementation of new local infrastructure (such as reverse vending machines) and will also likely impact what materials LAs collect, as several of the materials likely to be covered by DRS are currently collected as part of the mixed dry recycling.

These policy instruments, while a worthwhile first step, are nevertheless not enough to achieve the required cuts in emissions from waste management. What is needed instead are more radical changes that result in reduced consumption overall, and a marked increase in behaviours around reuse and repair of products. As stated by one waste manager: "The one big thing that's missing from all the resource and waste strategies, is anything about reuse or waste minimisation." This brief will use the framing of practice theory to consider how we may go about focusing on these areas.

2.3   Circular economy through the lens of practice theory

Household waste is generated in the home, and many of the circular economy activities, such as reuse and repair, are undertaken by individuals. It follows, then, that any waste reduction policy must focus on what people do, and how these activities can be performed to create a greater circularity of materials. This is where practice theory offers valuable insights.

In policy, transformation processes tend to be rooted in changing individual perceptions and behaviours (Schulz, Hjaltadóttir and Hild, 2019). This often

manifests as interventions focusing on technological fixes or information campaigns. Despite such interventions, we often see what is described as the value-action gap, where there is a discrepancy between an individual's pro-environmental beliefs and the actions they take (Barr, 2006).

Practice theory offers an alternative way to think about this problem. A practice is not a process consciously driven by an individual. Instead, practices exist in and of themselves, and can be broken down into elements and analysed. Through these elements, practices recruit individuals who enact them repeatedly. This results in habitualised, unintentional actions (Castelo, Schäfer and Silva, 2021).

Shove, Pantzar and Watson (2012) provide a commonly used description of the elements that make up a practice. These are materials, skills and competencies, along with meanings. For example, when using a washing machine, the materials would be the washing machine itself, as well as the detergents used. Skills and competencies are the knowledge of what cycle to use, how to sort items or how much soap to use. Finally, meanings and social norms influence choices around how often to wash an item or when it has become dirty. All three elements must come together for a practice to be enacted.

In addition, practices do not exist as independent moments of doing, but are interconnected with others across time and space that also influence the arrangements of the elements of individual practices. Watson et al. (2020) suggest that we can use this understanding of how practices hang together to pinpoint moments in daily routines and patterns of doing which could impact resource use. In doing so, we may be able to consider alternative interventions which influence significant changes in practice.

It is beyond the scope of this brief to identify a comprehensive set of change points and potential policy interventions to support the implementation of a circular economy due to the wide range of practices that relate to household waste. Instead, in the remainder of this brief I will use the framing of practice theory to provide social science insights into alternative policy approaches that may foster more CE activities. This brings the ideas of waste *minimisation* to the fore, which, as noted above, is missing from current waste and resource strategies.

The next three sections of this brief will provide examples of how to frame different activities within CE using practice theory, and how this helps us to identify potential areas for policy development. Following this, I will outline some recommendations as to how local authorities may approach supporting the transition to a circular economy, alongside other actors, such as National Government and businesses.

3. Prevention

This section will look at two examples of prevention, sometimes called refusing or reducing. These examples are reducing food waste and the development of the sharing economy.

3.1 Reducing food waste

In 2018, the UK generated an estimated 9.5 million tonnes of food waste, 70% of which was avoidable (could have been consumed by people). Households were the main source of food waste, accounting for 70% of the total generated that year (WRAP, 2022a). In our case study, food waste makes up around a third of the total residual waste that the local authorities collect, with the majority of this (around two thirds) being avoidable (data from 2021). Food waste is the second highest contributor to carbon emissions from waste for the county council, and since the majority of this is avoidable, understanding how we can reduce food waste at the household level is key to reducing emissions from waste.

Throwing food away is a practice that consists of material elements (provision of bins, bin liners, etc.), skills and competencies (knowing when food has gone bad) and meaning (visions of what is good to eat, etc.). As a practice itself, it is interrelated with various food related practices, of which six are commonly highlighted in the literature: planning, shopping, storing, cooking, eating, and managing leftovers (Schanes, Dobernig and Gözet, 2018).

The RWS for England attempts to tackle storage practices by looking into the use of best before dates and better information on the shelf life of products, both opened and unopened. It has also considered shopping practices, consulting with WRAP to investigate plastic packaging and food waste. WRAP concluded its research in 2022 with findings that plastic packaging has little-to-no impact on the shelf life of fresh produce (WRAP, 2022b). Selling fresh produce loose reduces plastic packaging, but could also offer shoppers the ability to buy what they need, reducing overbuying, which can lead to avoidable food waste.

However, over-buying of food is not only determined by the availability of loose or varied package sizes. For example, longer travel times have been linked to greater chances of over-buying, as shoppers seek to reduce the risk of having to make repeated trips (Lee, 2018). Therefore, retail provisioning can shape shopping practices: ensuring access to small food retailers in densely populated areas may reduce over-buying. A Planning Officer explains that for larger developments, the local authority does have specific policies in place to ensure that there is adequate retail provision in place. However, beyond ensuring the space is available, they are unable to say who the providers would be for that retail space.

Any retail provision would need to ensure that it complements existing shopping practices. For example, local shops are more likely to be used for smaller top-up shops (Lee, 2018), and so will need to provide produce in appropriate quantities.

Potential drivers for the appropriate uptake of retail space could include offering reduced rates to providers of no- or low-waste shops. Some interviewees expressed concern over the local authority favouring particular businesses over others, and how this may be seen as anti-competitive. I note these concerns, but framing the issue through practice theory demonstrates how we can start discussions around broader policies such as financial incentives for businesses that promote CE practices.

Online food shopping is another practice that has developed in recent years, and has been linked to increasing the likelihood of consumers wasting food (Ilyuk, 2018; Ananda, Karunasena and Pearson, 2023). There is little consideration of this in the RWS in relation to food waste, but given its increasing popularity, some focus should be placed here. For example, consideration of how minimum basket charges may contribute to over-buying, or how integration with food planning apps could help streamline virtual shopping baskets. Such innovations are more likely to be driven by the businesses themselves, along with national policy.

Less literature and fewer examples are dedicated to understanding how we may influence food practices that take place in the home, such as storing and managing leftovers. Some studies have looked into the use of food-sharing apps such as OLIO (see Harvey *et al.*, 2020; Mazzucchelli *et al.*, 2021), but do not focus specifically on peer-to-peer food sharing, as OLIO offers both this and redistribution of excess food from retailers. More studies which focus on the practices of food-sharing between peers may offer some insights into how we can minimise waste, once over-provisioning has occurred in the home.

3.2   Sharing economy

The sharing economy refers to activities where existing goods are loaned, borrowed or rented in order to tap into their excess capacity, which may otherwise be under-utilised (Vaskelainen and Piscicelli, 2018). This contributes to the circular economy, as fewer items are needed in circulation in order to carry out actions or activities that are actually required. As a Carbon Charity Representative put it, "You don't want the drill, you want the hole in the wall." Furthermore, fewer drills in circulation will result in fewer drills making their way into household waste.

The sharing economy can happen on different scales. For larger or more expensive goods, such as cars and houses, the sharing economy tends to work as a business model where individuals pay to rent a good for a certain amount of time. It can also operate on a much more local level, with informal sharing between family, friends and neighbours, through a community-based library of things or through the use of online applications.

Sharing practices are not well developed, as current habits tend to favour ownership of an item, which can then be stored for use at some point in the future. Therefore, the sharing economy requires entirely new practices to be formed, and the practice of searching for a loanable or rentable item before buying it needs to be adopted (Vaskelainen and Piscicelli, 2018). In the first instance, this is most likely to be

developed if people have positive sharing experiences. Therefore, access to sharing economies at all different scales will be important. However, this needs to be combined with a provision of service that creates these positive experiences by fitting in with the rhythm of everyday life.

Research into sharing economies has highlighted that consumers are interested in borrowing expensive items. However, in the space of peer-to-peer sharing, those lending may be wary of offering expensive items due to concerns of mis-use (Vaskelainen and Piscicelli, 2018). Community forms of sharing economies may offer an opportunity to meet these two requirements.

A local resident who attempted to set up a Library of Things explained that they had chosen a model that was based on purchasing a kit of high-quality items that would be kept in lockers in a public place. Consumers would then use an app to book and pay a fee for the use of the item. This model has been successful in London, which now has around 10 Libraries of Things running in the city. Despite general positive feedback from stakeholders, such as commercial spaces, libraries and community spaces, the resident was unable to secure a suitable location for the lockers and the project ultimately stalled.

Space is a key issue in the provision of a sharing economy. A District Council employee explained, "Space is at a premium as housing is quite expensive. The key thing is suitable space where people can readily access and store things. That is why we are now looking outside the city area into newer developments, where you can make a case for a small store allocated for a Library of Things."

The location of that space is also important. Being close to a sharing service increases the likelihood that it will be used, with usage of services such as car sharing declining when users live more than 500m from the car (Vaskelainen and Piscicelli, 2018). Distance is not the only consideration – another is the way picking up an item may fit into a person's day-to-day life. This can be seen in the Local Resident's comment on using OLIO: "I look to see 'Is that on my cycle route somewhere? No, it's not. I'm not going to get it.'" Therefore, sharing services do not just need to be available, they also need to be available in places where people pass or which are convenient to get to.

Sharing economies are still developing and require new practices to be formed. This needs to be done across all scales, with businesses growing and offering more products fostering sharing practices from the top down, and more smaller scale, grass roots sharing models working from the bottom up. National Government is better placed to develop policy to grow sharing businesses, whereas local governments may be better placed to create relationships to support the smaller grassroots initiatives, such as providing connections or access to space. As the sharing space develops, research can then better address how sharing practices develop alongside others.

4. Repair

The RWS highlights the importance of repair in preserving natural capital, and how access to affordable spare parts, technical advice and repair services is necessary to ensure consumers choose to repair. Much like the sharing economy, the repair economy can work at several different scales, with larger corporations providing repair through warranties or insurance for higher value, more complex products, such as laptops and fridge-freezers. However, repairs can also be done at home or within the local community through repair cafes.

Choosing to repair an item does not appear to be a one-time decision, but is related to how individuals value an object in terms of utility and trade value versus what is now available on the market (Jaeger-Erben, Frick and Hipp, 2021). Thus, repair practices are clearly bound within the meaning and value that individuals place on certain items.

In our case study area, a local charity has been successful in building up a large number of repair cafes across the county, which are well used. They explain that they run a model where the charity acts as a central hub, providing support, access to repairers and a toolkit to be used across the various repair cafes. This means that the repair cafes are driven by the communities themselves, which the charity considers is key to its success.

Academic literature notes that positive experience of repair is crucial in increasing the likelihood that an individual will go forward and choose to repair again, whether this is through self-repair or using repair services. Seeing items repaired also contributes to individuals considering repairing other items in the future (Korsunova, Heiskanen and Vainio, 2023). The repair cafés in the county embed this idea in their model and as part of the repair process. Those using the service must sit and watch the repair as it happens so that they can understand the process. The charity explains that "part of what we do is about fostering that culture of repair." They are not simply engaged in providing access to a repair (a material component of the practice of repair), but also in developing skills and competencies, to know how and when to repair alongside a cultural norm of repair.

However, the skills and knowledge to choose repair do not need to come simply from using repair shops; repair education can take the route of providing more general craft education, such as running workshops in sewing, darning, wood work and glass work (Korsunova, Heiskanen and Vainio, 2023). Therefore, providing access to space and skill-sharing within the community has the potential to foster more repair practices. This is also something that could be implemented into educational settings.

While they are pleased with the success of the repair cafés in the county, the charity representatives explain that, "ideally, longer term we want repair businesses, we don't want to rely on volunteers to do that sort of stuff." However, a County Councillor pointed out it can be difficult for a small startup business that deals with smaller scale (and possibly cheaper) repairs to find an appropriate and affordable

space from which to run their business. Previously, they may have run a startup from their home, but covenants in new towns now prevent this, creating a barrier. Therefore, alternative provisions may need to be considered to help smaller businesses using circular economy principles to thrive.

5. Recycle

Recycling remains an important part of the circular economy once materials can no longer be reused, repaired and refurbished. While recycling rates have increased significantly since the 1990s, since the mid-2010s, recycling rates have plateaued to around 45% nationally (Climate Change Committee, 2020). The amount of waste recycled needs to be increased to ensure that we are extracting the maximum amount of use from materials.

Many of the proposals in the RWS focus on increasing recycling rates. The EPR seeks to encourage producers to use more recycled and recyclable materials, which in turn will ensure that households are able to recycle their waste and create a demand for recycled materials. The DSR creates a financial incentive for individuals to ensure that materials are returned to the appropriate place for recycling, and the separate food waste collection seeks to provide more consistent disposal of food waste across the country.

However, taking the example of food waste demonstrates that simply providing more recyclable materials will not necessarily result in significant increases in recycling. Within the case study area, one local already offers a weekly separate food waste collection, which we can compare against other areas. The local which offers a separate food waste collection sees a reduction in the amount of food waste, which ends up in the residual waste bin. However, food waste remains the main component of the residual waste collection in this area, at just over a quarter of the total residual waste collected.

This indicates that once a separate weekly food waste collection is embedded across the UK, more needs to be done ensure that food waste ends up in the correct kerbside bin. A representative from the local already offering this service explains that they had run a WRAP-funded project, which provided new caddies, liners and stickers on bins to remind people not to put food waste in the residual waste bins. This had increased the amount of food waste collected separately, although this did tail off after some time. This demonstrates that attempts to increase rates of separating food waste through information sharing alone is not sufficient to ensure all food waste is collected. Practice theory can help to identify other ways in which we can influence recycling rates.

There are two key papers that give me some background on food waste separation practices. Metcalfe et al. (2012) use mixed methods to understand individuals' relationality with food waste caddies, and a project by RELondon (Resource London, 2018) used ethnographic studies to understand recycling habits in flats.

'Space and place' is a key theme across the two papers. The kitchen is seen as the default space for recycling, and where to place the waste food caddy differed depending on participants' concerns over smell and ideas of cleanliness. For example, 'waste' being kept on counter tops was seen as undesirable, as this is a food preparation area. Therefore, kitchen design could be considered an area of

intervention, ensuring there is space for the caddy, but that it sits within 'normal waste areas' and remains visible.

Movement of the waste from the caddy to the main recycling bin is also an important factor. Those who produce less food waste (due to eating practices – for example, eating out) may feel the need to move waste out to the main bin in smaller quantities to avoid the build-up of smelly food or mould in the kitchen. How individuals negotiate this will be influenced by the wider infrastructure. For example, in Metcalf et al. (2012), residents of a semi-detached house were prepared to use a smaller homemade caddy and visit the main bin more often, while residents of a first-floor flat felt this was too much hassle for the small amounts of food waste they produced, and thus they put their food waste in the residual waste bin. This finding is in line with ReLondon's work, in which they found that flat residents were unlikely to make special trips for recycling, as they consider them to be a waste of time and energy. Furthermore, residents of flats wanted disposal of recycling to fit within their preferred exit route efficiently as part of their planned journey.

Because of the varying practices of food consumption and recycling routines, the introduction of a food waste caddy is not a one-size-fits-all approach. Therefore, further consideration of how caddies are designed, and planning around routes to main bins is a potential point of intervention.

6. Conclusions and recommendations

CE is recognised as necessary to reduce waste in the UK, as the RWS places a focus on more circularity of materials. Policy focuses on offering access to infrastructure, better information and financial nudges in order to create behaviour change. This places responsibility on individuals to make conscious decisions to 'do the right thing'. However, we continue to see a gap between the values of an individual and the actions that they undertake in relation to reduce, reuse, repair and recycle. Practice theory offers an alternative framing to the problem of implementing CE, and instead allows us to focus on the practices themselves which lead to waste generation. In doing so, it helps us to understand how practices are shaped in everyday lives and are thus repeated by numerous actors across space and time. In understanding this, we can begin to consider different interventions which may result in the greater adoption of CE practices.

The previous three sections of this document have sought to provide examples as to how practice theory can reframe the issues and elicit ideas of alternative interventions for the various CE practices. The overall aim of the Energy SHINES project and the resulting briefs, however, was to provide social science and humanities insights for the host organisation. In this case, a county council in England.

Local authorities do have a role in helping to shape CE practices, as they implement many National Government policies on a local scale. However, practice theory demonstrates the complexity and interconnectedness of everyday actions, which means that they cannot be responsible alone for creating a move to CE. Given this complexity, traditional forms of measurability, where we can identify a direct cause and effect, becomes difficult (Watson, 2020). This is not a reason to shy away from using insights from practice theory, but instead encourages us to consider other forms of measuring success and outcomes, such as social benefits alongside CE benefits.

Keeping this in mind, the following subsection provides recommendations on how local authorities may encourage the development of CE. In recognition that it is not local authority actions alone which will foster the movement to CE, the remaining subsections will address how other actors, such as National Government, businesses and researchers, can contribute towards the development of CE.

Recommendation for Local Authorities

1. **Consider the whole-lifecycle emissions of materials when making waste policy decisions.** Reporting on emissions can vary from area to area, but in cases where organisations focus on their own carbon emissions in silos, they run the risk of pushing emissions into other areas. Taking a whole lifecycle approach to considering the carbon emissions of waste seeks to mitigate this

potential by encouraging us to think about how carbon is generated at all stages, and how policy may have unintended consequences in other areas.

2. **Take a whole organisation approach to fostering CE.** In relation to waste, local authorities' responsibility lies within the requirements to collect and dispose of waste and recyclable materials. Therefore, they may be more inclined to consider policies in these areas for waste reduction. Local authorities also have responsibilities in several areas of public services and infrastructure, such as housing, transport, social care and libraries. These are spaces in which CE practices can be formed, as they constitute parts of everyday life. To support this, during any decision-making process within the organisation, encouraging consideration of how the policy may impact CE could be helpful. For example, projects in social care may seek to consider what skills they can develop in areas such as repairing, upcycling or sustainable cooking, while meeting other needs.

3. **Cross department and organisation collaboration for CE.** The structure of local authorities in England differs from area to area. These vary from Unitary Authorities and Metropolitan Areas or Districts, which are responsible for services across the area, to two-tier district and county councils where responsibilities are shared. In the domain of waste, district councils are responsible for the collection of household waste, while county councils are responsible for the disposal. In the case study covered in this brief, the county and district councils had strong working relationships in relation to waste. However, this could be expanded to create more collaboration across different departments in the two organisations. This could support greater integration of CE policies across all levels of local governance.

4. **Plan for CE.** From providing space in communities for sharing practices, to shaping shopping practices, to deciding where to place refuse bins, planning is a key area of influence on CE practices. Using practice theory to frame how these different pieces of infrastructure fit into, and will be used in, people's day-to-day lives could increase the impact that they have on CE practices.

5. **Create a central resource of CE activities.** There are numerous materials which end up in household waste, and how they end up there is a result of interconnected elements and practices coming together. This amounts to a large number of potential change points, all of which may influence and impact upon each other. A central resource documenting circular economy activities within the locality and decisions made within the organisation may assist in knowledge sharing and generating ideas which would feed back into recommendation number two.

Recommendations for National Government

National Government could also take inspiration from the recommendations for local authorities listed above. CE practices are intrinsically related with production and consumption practices, and developing them will need to go beyond waste management. Therefore, building-in a CE consideration to all policies across departments could integrate more practice-based approaches to CE policy.

In addition to this, there were further areas highlighted during interviews in which National Government could support the development of CE practices.

1. **Support LAs in transitioning to new waste strategies in a timely manner.** New habits and practices are not formed instantly and require time to be adopted across society. In the example of separate food waste collection, we have seen that providing the collection alone is not enough to ensure that all food waste is recycled. Therefore, further work will need to be done to develop food recycling practices, which will take time. Therefore, delaying the implementation of this policy through the use of transitional arrangements could further delay achieving carbon reduction goals in this area.

2. **Empower LAs to have a role in ensuring that materials are recycled and repurposed in a circular manner.** One council employee explained, "We don't have a legal duty to ensure that the waste we collect is repurposed in a way that aligns with circular economy principles. But we could if we were empowered to do that." Currently, recyclable materials are passed on to a contractor who deals with it accordingly. More consideration could be given to what policies would support local authorities to push for these materials to be used in a circular manner, either through these contracts or their own waste management systems.

3. **Consider policies which will encourage smaller circular businesses to start up.** As can be seen in the share and repair examples, small business will be important in developing practices in these areas, as well as large corporations. However, there are potential barriers to smaller startup businesses, such as the costs or renting space. Policy makers may consider what mechanisms could be provided to encourage such businesses and the repair of lower-value items.

Recommendations for businesses

1. **Build practice theory into business design.** Businesses building on repair and sharing models could utilise practice theory in a similar way to policy-makers to better understand their customer base and how their product or services fit into everyday lives. In doing so, business decisions such as location and key performance indicators could be shaped to increase consumer engagement.

Recommendations for research

1. **Investigate the ways in which cooking, eating and leftover practices could have influences over food waste.** While shopping practices and their impacts on household food waste are well researched within the academic literature, cooking, eating and dealing with leftovers are less well explored. More focus in this area may hold the key to more innovative ideas on how to prevent avoidable food waste once food has been prepared.

2. **Further research into food waste separation practices across different demographics and housing types.** There is not a one-size-fits-all approach

to the provision of infrastructure for separate food waste collection, and understanding different practices across different places and demographics may help to understand how we can do things differently.

3. **Focus research into the sharing economy on practices within peer-to-peer sharing.** Peer-to-peer sharing is a less researched area in comparison to sharing businesses and apps. Understanding how peer-to-peer sharing can be developed in very local spaces given the level of convenience required could help to understand how to increase this practice.

7. References

Ananda, J., Karunasena, G.G. and Pearson, D. (2023) 'A comparison of online and in-store grocery shopping behaviour and its effects on household food waste', *Technological Forecasting and Social Change*, 194, p. 122698. Available at: https://doi.org/10.1016/j.techfore.2023.122698.

Barr, S. (2006) 'Environmental Action in the Home: Investigating the "Value-Action" Gap', *Geography*, 91(1), pp. 43–54. Available at: https://doi.org/10.1080/00167487.2006.12094149.

Castelo, A.F.M., Schäfer, M. and Silva, M.E. (2021) 'Food practices as part of daily routines: A conceptual framework for analysing networks of practices', *Appetite*, 157, p. 104978. Available at: https://doi.org/10.1016/j.appet.2020.104978.

Climate Change Committee (2020) 'The Sixth Carbon Budget: Waste'. Available at: https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Waste.pdf.

DECC and DEFRA (2011) 'Anaerobic Digestion Strategy and Action Plan'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69400/anaerobic-digestion-strat-action-plan.pdf.

DEFRA (2018) *Our waste, our resources: a strategy for England*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf.

Harvey, J. *et al.* (2020) 'Food sharing, redistribution, and waste reduction via mobile applications: A social network analysis', *Industrial Marketing Management*, 88, pp. 437–448. Available at: https://doi.org/10.1016/j.indmarman.2019.02.019.

Ilyuk, V. (2018) 'Like throwing a piece of me away: How online and in-store grocery purchase channels affect consumers' food waste', *Journal of Retailing and Consumer Services*, 41, pp. 20–30. Available at: https://doi.org/10.1016/j.jretconser.2017.11.003.

Jaeger-Erben, M., Frick, V. and Hipp, T. (2021) 'Why do users (not) repair their devices? A study of the predictors of repair practices', *Journal of Cleaner Production*, 286, p. 125382. Available at: https://doi.org/10.1016/j.jclepro.2020.125382.

Korhonen, J., Honkasalo, A. and Seppälä, J. (2018) 'Circular Economy: The Concept and its Limitations', *Ecological Economics*, 143, pp. 37–46. Available at: https://doi.org/10.1016/j.ecolecon.2017.06.041.

Korsunova, A., Heiskanen, E. and Vainio, A. (2023) 'Consumer decision-making on repair in a circular economy: A process model based on experiences among young adults and stakeholders in Finland', *Journal of Cleaner Production*, 405, p. 137052. Available at: https://doi.org/10.1016/j.jclepro.2023.137052.

Lee, K.C.L. (2018) 'Grocery shopping, food waste, and the retail landscape of cities: The case of Seoul', *Journal of Cleaner Production*, 172, pp. 325–334. Available at: https://doi.org/10.1016/j.jclepro.2017.10.085.

Mazzucchelli, A. *et al.* (2021) 'How to fight against food waste in the digital era: Key factors for a successful food sharing platform', *Journal of Business Research*, 124, pp. 47–58. Available at: https://doi.org/10.1016/j.jbusres.2020.11.055.

Metcalfe, A. *et al.* (2012) 'Food waste bins: bridging infrastructures and practices', *The Sociological Review*, 60(S2), pp. 135–155. Available at: https://doi.org/10.1111/1467-954X.12042.

Resource London (2018) 'Recycling in Real Life - Ethnogrpahic Research with Residents of Purpose-Built Flats in London'. Available at: https://relondon.gov.uk/wp-content/uploads/2021/02/Recycling-in-reality-report.pdf.

Schanes, K., Dobernig, K. and Gözet, B. (2018) 'Food waste matters - A systematic review of household food waste practices and their policy implications', *Journal of Cleaner Production*, 182, pp. 978–991. Available at: https://doi.org/10.1016/j.jclepro.2018.02.030.

Schulz, C., Hjaltadóttir, R.E. and Hild, P. (2019) 'Practising circles: Studying institutional change and circular economy practices', *Journal of Cleaner Production*, 237, p. 117749. Available at: https://doi.org/10.1016/j.jclepro.2019.117749.

Shove, E., Pantzar, M. and Watson, M. (2012) *The dynamics of social practice: everyday life and how it changes*. London: Sage. Available at: https://www.vlebooks.com/Vleweb/Product/Index/321699 (Accessed: 24 March 2021).

Vaskelainen, T. and Piscicelli, L. (2018) 'Online and Offline Communities in the Sharing Economy', *Sustainability*, 10(8), p. 2927. Available at: https://doi.org/10.3390/su10082927.

Watson, M. *et al.* (2020) 'Challenges and opportunities for re-framing resource use policy with practice theories: The change points approach', *Global Environmental Change*, 62, p. 102072. Available at: https://doi.org/10.1016/j.gloenvcha.2020.102072.

WRAP (2022a) 'Food Surplus and Waste in the UK - Key Facts'. Available at: https://wrap.org.uk/sites/default/files/2023-01/Food%20Surplus%20and%20Waste%20in%20the%20UK%20Key%20Facts%20December%202022.pdf.

WRAP (2022b) 'Reducing Household Food Waste and Plastic Packaging'. Available at: https://wrap.org.uk/sites/default/files/2022-02/WRAP-Reducing-household-food-waste-and-plastic-packaging-Full-report.pdf.