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This Changing World

Waste management in England and the 'circular economy' model

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Recycling rates for household wastes in England were as low as 11.2% in 2000–01 (Defra, 2019a). However, the focus of waste policy since then has been to ask local authorities to do more (for example, through the segregation of collected waste) and to support or nudge the 'end-user', i.e. households and businesses (for example, by raising awareness of the need to recycle more waste). This approach has led to greatly improved results on the ground: by 2016–17 the recycling rate in England shot up to 43.7%, with the whole of the UK averaging 45% (Defra, 2019a). Although this is lower than the 50% target set by the EU for 2020 (EC, 2008), the effort is admirable. Yet more needs to be done.

In an attempt to meet such targets, over the last two decades, policy-makers in England (and in the UK) have been engaging with a number of important questions[1], which include:

- How can we best increase awareness and raise levels of recycling?
- What can be done to overcome local barriers to recycling participation?
- How can we reduce the levels of biodegradable waste reaching the landfill?
- What are the key drivers and barriers to waste minimisation?

What happens when England eventually starts meeting these targets will be interesting in the short to medium term, because the targets are set either in the EU, or (depending on what emerges post-Brexit) in the UK.[2] Part of the answer lies in understanding how the emerging 'circular economy' discourse might impact on future waste management practices.

However, to fully understand the issue, we have to look back at what has occurred over the last two decades. By tracing the emergence of waste strategy in the country, leading up to the most recent strategy launched in 2018, this article aims to aid the development of a shared understanding of what 'waste' means. It also looks at emerging and competing interpretations of waste locally, nationally and at EU level; as well as the shifting roles and responsibilities of the various stakeholders.

The review presented below is followed by a discussion on the role of 'circular economy' approaches. The article concludes by posing challenges for future policy-making in the waste sector.

Household waste arisings

Terminology

'Waste' is defined by the EU Waste Framework Directive as 'any substance or object which the holder discards or intends or is required to discard' (European Commission (EC), 2008; see also Gillespie, 2015). According to the OECD, wastes are 'materials that are intended for disposal' (1998). This commentary focuses primarily on municipal household waste management. Given that different datasets from the last two decades will be referred to, it is helpful to clarify the usage of terminology.

'Household waste' includes 'regular waste from household doorstep collections, bulky waste collection, hazardous household waste collection, communal collection of garden waste, plus waste from schools, street sweepings and litter' (Strategy

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Unit, 2002). Some of the datasets referred to in certain policy documents talk about 'municipal waste' that includes household waste (accounting for 89% of municipal waste), street litter, waste from council recycling points, municipal park and garden waste, council office waste, and commercial waste from shops and small trading estates where local authority waste collection agreements are in place (Strategy Unit, 2002). Also included within municipal household wastes are 'biodegradable wastes'. Biodegradable wastes are defined in the Waste and Emissions Trading Act 2003 (section 21) as 'any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard'. 'Biodegradable municipal waste' (BMW) is the fraction of municipal waste that will decompose within landfill to produce methane (a potent greenhouse gas); among other materials BMW includes food waste, green waste, cardboard and paper. 'Other organic wastes' includes green garden waste, mixed garden and food waste, wood for composting and other compostable materials. 'Dry recycling' includes paper and card, glass, waste electrical and electronic equipment (WEEE) and scrap metals (including those reclaimed from incinerator bottom ash), as well as other materials.

Facts and figures

Broadly, in terms of the scale of waste arisings (the amount of waste collected) from the household sector[3] in England in 2014, wastes from households and commercial/industrial sectors hovered around 22 million tonnes. The construction, demolition and excavation sector generated just over 120 million tonnes of waste arisings (Defra, 2018a). As an indicator, one 240-litre wheelie-bin will hold 0.24 cubic metres of household waste, which is equivalent to 0.0648 tonnes. Of all the waste collected and treated each year in the UK, household wastes account for 9% of the total (Defra, 2007; Cole *et al*., 2014). Figure 1 shows the available data on household waste arisings in England since 1995.

Roles and responsibilities

The overarching EU waste legislation is the Waste Framework Directive (Directive 2008/98/EC) (European Commission (EC), 2008). The key waste legislation in England is The Waste (England and Wales) Regulations 2011 (The Stationery Office (TSO), 2011). With regard to waste management operations, two key EU pieces of legislation shape (i) household waste management practices (Directive 2000/76/EC), and (ii) the incineration of waste (Directive 1999/31/EC) (see column two, Figure 3 for details).

Figure 1: *Household waste arisings in England, 1995–2017. See text for terminology. Notes: * excludes incineration bottom-ash metal; + EU target: to restrict landfilled BMW to 35% of 1995 baseline. Sources: (a) Defra, 2019a; (b) Defra, 2018a; (c) Strategy Unit, 2002.*

Year	Waste arisings from households (thousands of tonnes)[a]	Percentage recycling rate for waste from households [a,*]	Municipal waste to landfill (thousands of tonnes)	Percentage of BMW of total municipal wastes (percentage of BMW against 1995 baseline value)[a,+]	Separately collected food waste, as a percentage of total household waste[b]	Other organic wastes, as a percentage of total household waste[b]	Dry recycling, as a percentage of total household waste
1995	-	-	29,030	21	-	-	-
1996	-	7.5[c]	-	-	-	-	-
2000	-	11.2[c]	-	-	-	-	-
2010	22,131	41.2	20,298	50.8 (35.6)	-	-	-
2011	22,170	43.3	18,421	50.8 (32.2)	-	-	-
2012	21,956	44.1	16,187	50.2 (28.0)	-	-	-
2013	21,564	44.2	14,780	49.7 (25.3)	1	17	26
2014	22,355	44.8	13,714	49.9 (23.6)	1	18	26
2015	22,225	43.9	12,215	48.9 (20.6)	1	17	26
2016	22,770	44.2	12,381	48.8 (20.8)	2	17	27
2017	22,437	44.4	11,784	48.2 (19.6)	2	17	26

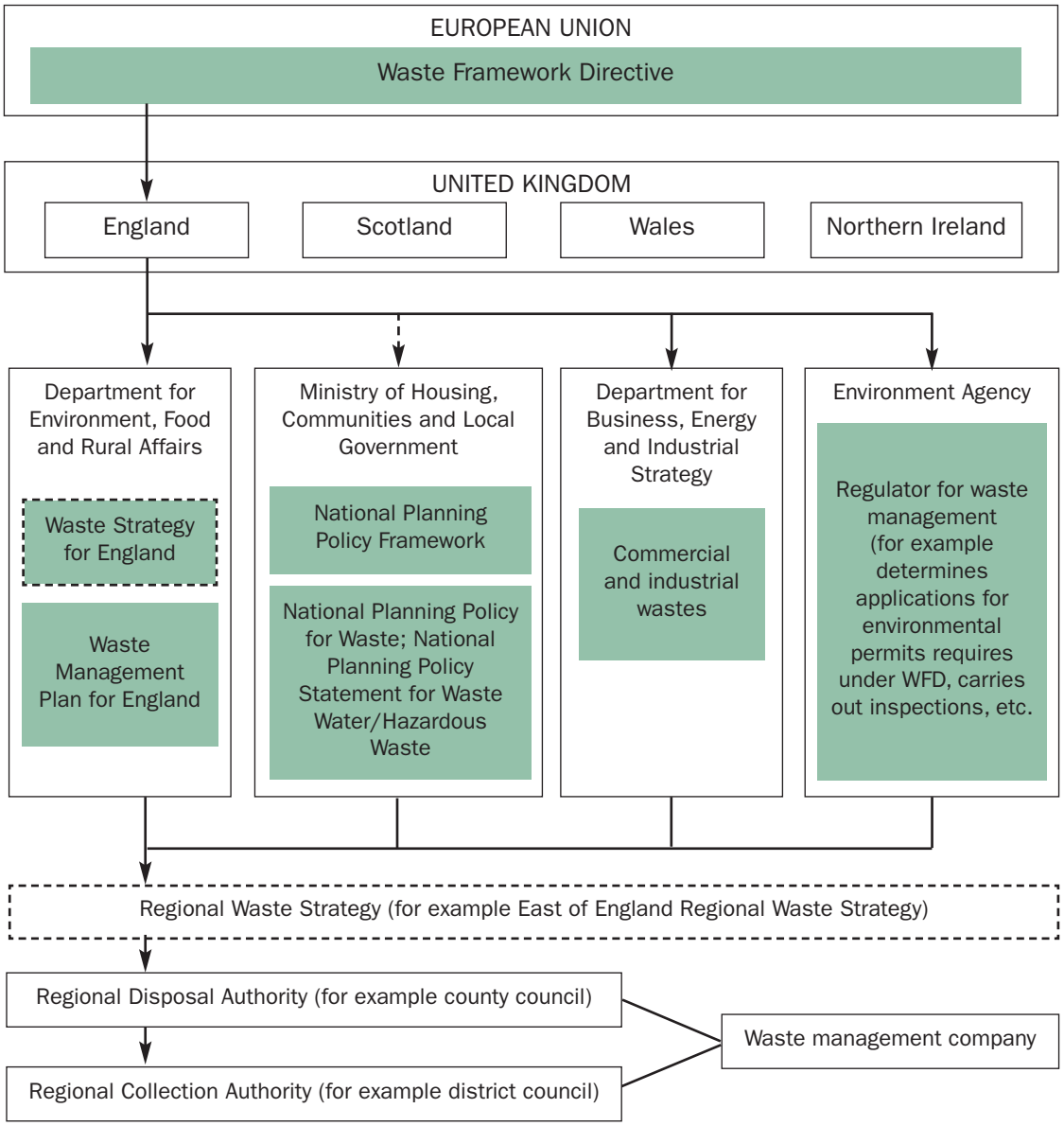

Figure 2: *The hierarchy of waste management in England – roles and responsibilities.*

Other published strategies that influence waste management practices in England are shown in Figure 3.

Although the first waste strategy for England, *Waste Not, Want Not* (Strategy Unit, 2002), considered the involvement of 'individuals, businesses and other stakeholders', the responsibility for waste management has primarily been within the purview of government (see Figure 2). In fact, central government sets the overall waste management policy (with the Environment Agency acting as the 'waste regulator'), while local authorities act as waste collection (district councils) and disposal (county councils) bodies (Sustainability Exchange, 2019). Following the contracting out of municipal services – including waste collection and disposal – waste management companies have become important stakeholders in providing these services (see Hall, 2006).

The Department for Environment, Food and Rural Affairs (Defra) is responsible for formulating waste strategy in England. As a mandatory requirement of Article 28 of the EU Waste Framework Directive (EC, 2008), the Department has to produce a 'waste management plan'. This plan must provide a detailed account of the current state of affairs in waste management practices in England (e.g. the type, quantity and source of waste generated, existing waste collection mechanisms), but a 'waste strategy' is not mandatory (see Defra, 2007; 2018c).

The UK Ministry of Housing, Communities and Local Government is responsible for formulating the National Planning Policy Framework alongside a National Planning Policy for Waste (Department for Communities and Local Government (DCLG), 2014) and National Policy Statements (NPSs) relevant to waste. This suite of policies (e.g. the Waste Water

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and the Hazardous Waste NPSs) offer guidance to unitary authorities (including National Park authorities) and county councils in non-unitary areas on assessing the suitability of sites for waste development within the Local Plan area and in determining related planning applications.

Then there are key principles that underpin how the various stakeholders carry out their roles and responsibilities within the waste management process. First, there is the 'waste hierarchy', which, initially, (see Strategy Unit, 2002) was set out in six levels: landfill (least sustainable); landfill with energy recovery; energy recovery with heat and power; recycling and composting; re-use; and waste reduction. This was later amended (in line with Article 4 of EC, 2008) with an emphasis placed on ranking the levels in order of environmental impact, i.e. prevention; preparing for re-use; recycling; other recovery (such as energy recovery), and disposal (Defra, 2012).

Secondly, the 'polluter pays' principle (set out in Article 14 of EC, 2008), by allocating costs to the polluter, works either as a deterrent to prevent pollution in the first place, or to determine liability procedures following the occurrence of pollution (de Sadeleer, 2002).

Thirdly, the 'self-sufficiency' principle emphasises the importance of 'scale' in waste management practices. EU law requires all member states to adopt this principle at national, regional and sub-regional levels (The Planning Service, 2002). However, in England a focus on arrangements at a regional scale has fluctuated over the decades, thus current regional waste strategy is indicated as dashed lines in Figure 2 because it is not mandatory.

Finally, the 'proximity principle' sets out the need for waste to be managed within the geographical area in which it is produced, as long as there are no significant effects on society (The Planning Service, 2002).

The evolution of waste policy in England

Waste is currently a devolved responsibility, thus, although the Waste Framework Directive (EC, 2008) applies to the whole of the UK, in England and Wales its obligations are transposed through the Waste (England and Wales) Regulations 2011 (TSO, 2011). Some aspects of waste management policy are addressed at the UK level – such as meeting the EU target of recycling a minimum of 50% (by weight) of UK household waste by 2020 (TSO, 2011). Figure 3 sets out some of the key milestones leading up to the current waste strategy in England.

In the 1990s there was broad consensus that waste management was about 'the reduction of waste at source, by understanding and changing processes to reduce and prevent waste' (Environment Agency, 1997). However, there was lack of clarity on how this definition would translate into the commercial, industrial and domestic sectors (Phillips *et al*., 1998). The 1995 *Making Waste Work White Paper* (Department of the Environment/Welsh Office (DoE/WO), 1995) in particular, began to consider the role of various stakeholders in waste management, including central government, local authorities and industry partners. For instance, industry partners were expected to meet targets and adopt waste minimisation as central within their working practices. At national level, central government ran the Environmental Technology Best Practice Programme (ETBPP) to provide guidance and waste audit mechanisms for various industries. At sub-national level, the Environment Agency prepared five-year *Local Environmental Agency Plans* to help manage the implementation of waste policy. This involved setting up regional waste minimisation clubs, and, in some regions, advisory groups were set up to provide free advice on waste and environmental matters. For instance, the Department of Trade and Industry and the DoE jointly funded the establishment of the East Midlands Advisory Group on the Environment (Phillips *et al*., 1998).

Not much has changed in terms of the organisational structure for waste management in England. *Our Waste, Our Resources* (Defra, 2018c) adopts a similar approach to previous strategies: it presents the benefits of sustainable waste management, draws on the 'waste hierarchy' as the core approach, identifies key targets and lists

Year	Legislation/policy (published by)	Significance and targets (if any)
1975	*Waste Framework Directive (75/442/EEC, 15 July, on waste)* (European Economic Community)	Regarded as the first key EC legislation on waste management
1988	Local Government Act 1988	Compulsory competitive tendering for waste collection to be implemented by local authorities
1990	*This Common Inheritance: Britain's environmental strategy* (DoE) Environmental Protection Act 1990	UK's first waste strategy Target: to recycle 25% of household waste by 2000 Designated district and borough councils waste collection authorities (section 45) and county councils waste disposal authorities (section 51). Led to contracting out of waste disposal services
1995	*Making Waste Work: A strategy for sustainable waste in England and Wales* (DoE/WO) Environment Act 1995	Targets: as 1990, plus to compost 1 million tonnes of waste per year by 2001; to recover 40% of municipal waste by 2005 Shifted waste regulation powers to the (newly created) Environment Agency
1996	Landfill Tax introduced	Intended to divert waste going into landfill into other sustainable options
1998	Waste Minimisation Act 1998	Empowered relevant authorities:'to [minimise] the quantities of controlled waste… of any description, generated in its area' (section 1)
1999	*Landfill Directive (1999/31/EC, 26 April on the landfill of waste)* (EC)	Target: to reduce BMW to landfill to 35% of 1995 baseline (21%) by 2020
2000	*Waste Strategy 2000: England and Wales* (DETR) *Guidance on Municipal Waste Management Strategies* (DETR)	Targets: to recycle 25% by 2005/30% by 2010/33% by 2015; to recover 40% of municipal waste by 2005/45% by 2010/67% by 2015; to reduce BMW to landfill to 75% of 1995 level by 2010/50% by 2013/35% by 2020 Each local authority to set targets to recycle and compost waste for 2005–06 based on 1998–99 rates
2002	*Waste Not, Want Not: A strategy for tackling the waste problem in England* (Strategy Unit)	First waste strategy for England
2003	Household Waste Recycling Act 2003	Required all local authorities to:'[collect] at least two types of recyclable waste… separated from the rest of the household waste' (section 1) by 2010
2006	*Waste Framework Directive (2006/12/EC of 5 April, on waste)* (EC)	Revised EU Waste Framework Directive
2007	*Waste Strategy for England 2007* (Defra)	Second waste strategy for England
2008	*Waste Framework Directive (2008/98/ EC, 19 November on waste)* (EC)	The most recent EU Waste Framework Directive
2011	*Planning Policy Statement 10* (DCLG) *Environmental Protection, England and Wales: The waste (England and Wales) regulations 2011* (TSO)	Planning for sustainable waste management in England Target: to recycle 50% of household waste by 2020
2012	*National Planning Policy Framework* (NPPF) (DCLG)	England's first NPPF
2013	*Waste Management Plan for England* (Defra)	Most recent waste management plan for England
2014	*National Planning Policy for Waste* (DCLG) *Statistics on Waste Managed by Local Authorities in England in 2013–14* (Defra)	England's second NPPF Introduced a 'waste from households' calculation. Target: to create consistency in reporting on recycling rates by local authorities
2015	*Transforming Our World: The 2030 agenda for sustainable development* (UN) *Closing the Loop: An EU action plan for the circular economy* (EC)	UN SDGs 12 and 14 link to waste management worldwide by 2030 Targets: to recycle 65% of municipal waste; to reduce waste to landfill to 10% or less of total municipal waste by 2035
2016	*A Framework for Greater Consistency in Household Recycling in England* (WRAP)	Calls for consistent kerbside collection practices
2017	*Agenda 2030: The UK government's approach to delivering the global goals for sustainable development – at home and around the world* (DfID) *The Clean Growth Strategy: Leading the way to a low carbon future* (HM Government) *Our Waste, Our Resources: A strategy for England* (Defra)	UN SDGs 12 and 14 linked to waste management in the UK Target: to achieve zero avoidable waste by 2050 Third waste strategy for England (see text for proposals)
2018	*National Planning Policy Framework* (MHCLG) *A Green Future: A 25 year plan for waste in England* (Defra)	England's fourth NPPF (further revised in 2019) Targets: reiterates 2017, plus zero avoidable plastic waste by end 2042

Figure 3: *The evolution of waste policy in England, 1975–2019. Note: For brevity, only documents referred to in the text appear in the References.*

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important criteria against which to monitor progress. Key proposals relevant to the household waste sector include:

- replace the current 'postcode recycling lottery' system (i.e. the variation in terms of what materials local authorities' recycle) with a unified system across England
- require waste collection authorities to offer separate collections for food waste, and
- introduce a 'deposit return scheme' to encourage recycling of cans and plastic bottles and reuse of glass bottles (Harrabin, 2018).

In addition, there is an interesting reference to developing a new 'food surplus and waste hierarchy' (Grundon, 2019). The current version (outlined by Defra, 2018d), has the following levels:

- Prevent surplus and waste in your business.
- Redistribute surplus food.
- Make animal feed from former food.
- Recycle your food waste – anaerobic digestion.
- Recycle your food waste – composting.
- Recycle your food waste – landspreading.
- Incinerate to generate energy.
- Incinerate without generating energy.
- Send to landfill or sewer.

In relation to embedding a 'circular economy' model, Defra's (2019b) latest waste strategy suggests that businesses 'design out' waste – through, for instance, an extended producer responsibility system in which the costs of packaging waste are met by businesses.

Discussion – closing the loop

The foregoing suggests that, since their introduction, waste management practices in England have gone from strength to strength.

Currently, however, we are at an important crossroads and how we navigate waste management practices will have an effect in the decades to come. In 2015, the EU launched an action plan for the circular economy, *Closing the Loop* (EC, 2015). Although it mentions recycling targets for 2035 (see Figure 3), more importantly the action plan points to reframing of waste as an 'end-user' problem. *Closing the Loop* brings to the fore the notion of the 'circular economy' in which waste need not exist: it is 'designed out' (Ellen MacArthur Foundation, 2013). In other words, products are designed with a view to how they would be taken apart after their functional life and the components re-used. An example would be to establish leases for household products in a way that would benefit both the manufacturer and the consumer. With washing machines, for instance, manufacturers could profit from having many of the working parts returned to them at the end of the lease, and the consumer could save money per wash during the period of lease.

An emphasis on the 'circular economy' could shift the focus from 'sustainable consumption' to 'sustainable production'. This may result in a re-scaling of waste management roles and responsibilities from individuals and local authorities to local and international businesses. This has implications for the future role of local authorities as waste collection and waste disposal authorities. Currently, local authorities have a central role in implementing sustainable development, including the UN's Sustainable Development Goals (SDGs), including by setting out targets for recycling, separating household collections into compostable and recyclable materials and raising awareness of and promoting recycling in their area (WRAP, 2007; Cole *et al*., 2014). Interventions such as adopting 'better waste management practices' are seen as necessary to link up effectively with global level efforts to achieve 'sustainable development' (see World Commission on Environment and Development, 1987). When viewed together, the 'self-sufficiency' and 'proximity' principles above pose a complex dilemma for waste management practices, especially for the commercial and industrial sector, because it is difficult to draw 'rigid' boundaries around the flow of waste materials within a country. The impact of the circular economy on the definition of waste also has important implications for the household waste sector, as follows:

- In 'designing out' waste when do we deem a substance or object as 'waste'?
- Taking into account the range of recovery options available to convert 'waste' to 'non-

waste', when or how does a substance or object cease to be 'waste'?

In theory, in a circular economy, household waste (excluding food and other organic waste) should cease to exist, because waste will be 'designed out' of the system. In practice, this will affect our current waste collection and disposal mechanisms. It may lead to two types of relationships. The first between households and businesses – in which at the end of a product's useful life the 'producer collects' principle applies. The second relationship between households and local authorities, would concern the disposal of organic/food wastes from households. In addition, in the long term there is likely to be a shift in the use of targets from local authorities to commercial businesses. That is, of course, if, and when, the circular economy fully dominates waste management practices.

Conclusion

This article provides a reminder that any future waste policy in England will need to strike a better balance between 'sustainable production' (e.g. by referring to phrases such as 'sustainable and efficient use of natural resources') and 'sustainable consumption' (e.g. by 'minimising waste') (Defra, 2018a). However, we need to put more thought into the potential shift to a 'circular economy' model and how it is likely to shape waste practices. It is not clear how or whether the notion of the circular economy will challenge the dominant discourse of the 'waste hierarchy', which has been the basis for sustainable waste and resource management practices in the UK and EU for the last two decades. The redirection of responsibilities and targets from local authorities to local, national, or international businesses seems likely if, and when the 'circular economy' becomes embedded in waste practices.

In conclusion, it is important to note that – despite being a decade in the making – key elements of 2018 waste strategy in England effectively build on waste policy since the 1990s and we are clearly heading in the right direction.

Notes

1. Many of these questions have been raised in past articles in *Town and Country Planning,* see e.g. Cooper, 1995; Fournier and Lloyd, 1995; Davoudi, 1999; Stott, 2008; Tunesi and Rydin, 2010.
2. Cowell *et al*. (2017) discuss a post-Brexit scenario for the waste sector.
3. This discussion excludes wastes from consumer goods (e.g. packaging, vehicle parts, electrical and electronic equipment) and specific sectors (e.g. construction, demolition and extractive industries, agriculture, ship-generated, radioactive and hazardous materials).

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