Planning for a Circular Economy

environmental services association

Foreword

It is vital for the UK's future competitiveness that we move towards a Circular Economy, where manufacturers, retailers, businesses of all kinds, consumers and the waste and recycling industry work together to ensure that products and materials are made and used efficiently and then wherever possible reused or recycled for future use. Where wastes cannot be economically or practically recycled they should be used to maximise low carbon energy generation.

This concept is now beginning to gain momentum, and many traditional business models are being reviewed and aligned with the more innovative approaches to design, manufacturing and service provision espoused by the Circular Economy.

There are potentially huge cost savings to be made by businesses, pushing up their productivity, as we pursue greater resource efficiency. Defra estimates that UK businesses could benefit by up to £23 billion per year from the introduction of quick-win resource efficiency measures.

Of course, the UK's planning system has a key role to play in making this transition. There have recently been positive moves to embed climate change objectives and sustainable economic growth at all levels of the planning system (national policy down to local plans). However, some of the preconceived notions of our industry, often harking back to the days of reliance on landfill disposal, continues to prevail in many planning authorities and needs to be overcome if the planning system is to facilitate the delivery of the infrastructure capable of transitioning to the Circular Economy of the future.

The nature of the Circular Economy will evolve over time as it continues to mature. In the short term, we need the planning system to provide the new treatment facilities the UK critically needs as landfill sites close around the country. In the longer term, flexibility to adapt to new business models, new ways of thinking and meeting the demands of an increasingly environmentally conscious customer base will all take on greater significance. The planning system needs to adapt to these changes too and enable the industry to position itself to optimally manage material flows and source sustainable end markets for materials produced by the wider economy.

Jacob Hayler
Executive Director
Environmental Services Association

Section 1. Introduction

The UK's resource and waste management industry is a real success story. The days of viewing waste as a problem solved only by landfill disposal are long gone and instead the industry is focused on returning as much of society's waste back into the economy as recycled and secondary raw materials. The industry has helped increase the recycling rate to almost 45% while supplying the UK with 11% of its renewable electricity by recovering the energy from those wastes which cannot be readily recycled.

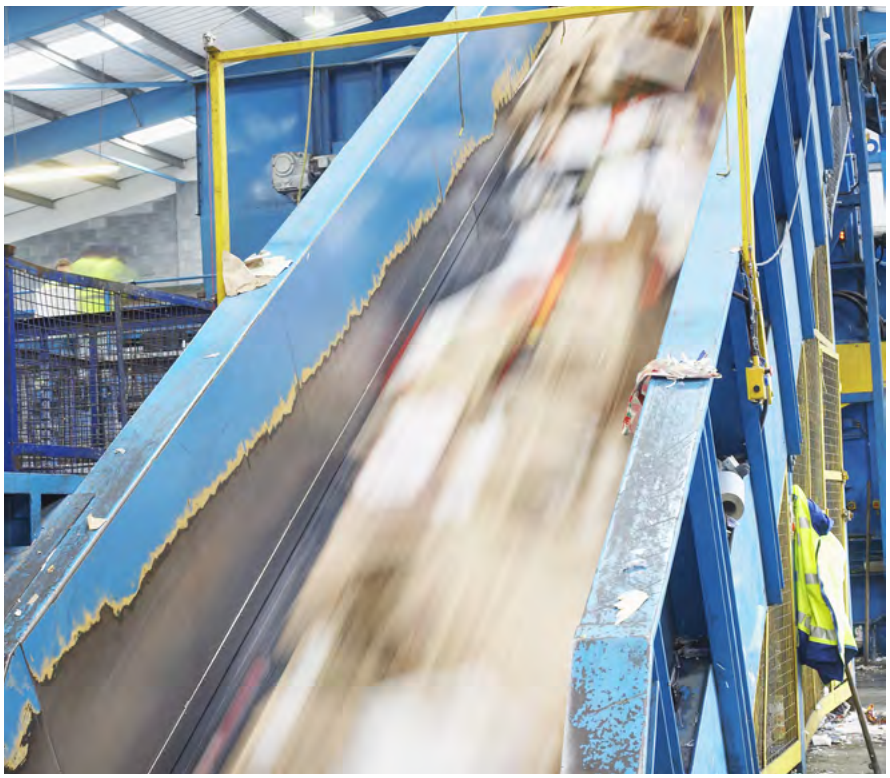
Our transformation to a modern, dynamic industry is already well underway and with plenty of opportunity for further innovation and growth, with the resource and waste management industry uniquely well positioned to play a leading role in delivering the UK's ambitions for a Circular Economy.

ESA fully supports the Circular Economy, a concept in which the value of resources are maximised by ensuring materials remain circulating within the economy for as long as possible. In fact it is a concept which is now beginning to gain political traction, and with a package of measures expected to be shortly adopted by the European Commission.

However, an often overlooked aspect is the pivotal role of the UK's planning system in helping realise our Circular Economy objectives. Progress towards a Circular Economy – in which more of the UK's waste is recovered and used as a resource – not only relies upon a planning system capable of delivering new waste management facilities in time and in the right location, but one which affords the industry with the flexibility to adapt to changing and evolving business environments.

In practice this should allow for greater diversification of the waste industry, where recycling and waste recovery is promoted through the planning system and with polices and strategies designed to enable the movement of materials to areas where they can cost effectively input into the manufacturing process.

Such an approach needs to be flexible enough to allow the movement of waste materials across local administrative boundaries. In brief, the planning system should enable the industry to deliver a network of integrated waste management facilities in which collected waste may be bulked or recycled in one location, recyclates processed at another, or residues treated or disposed of elsewhere.



"...a concept in which the value of resources are maximised by ensuring materials remain circulating within the economy for as long as possible"

Section 2. Who we are

The Environmental Services Association (ESA) is the voice of the resource and waste management industry in the UK. Our Members turn waste into valuable resources while protecting the environment. We represent approximately a third of the waste industry —including all the major companies—speaking on their behalf in Britain and in the EU. We help raise industry standards and lobby constructively for a policy framework which enables ESA Members to operate profitably and responsibly for the benefit of the environment.

The sector at a glance:

Total turnover: £11 billion

Direct Employment: 106,000 people
(including waste collection, treatment and materials recovery)

Municipal waste handled each year: 27 million tonnes

Energy generated (across landfill gas, anaerobic digestion and energy from waste) each year: approximately 11,867 GWh, which is 3.5% of the UK's electricity. 9,083 GWh of that was renewable electricity (taking out non-biodegradable portion of EfW) which is 11% of the UK's renewable electricity

Greenhouse gas emissions down by 70% since 1990

The top seven companies account for approximately 40% of turnover. Many hundreds of SME's provide either localised or more specialised services

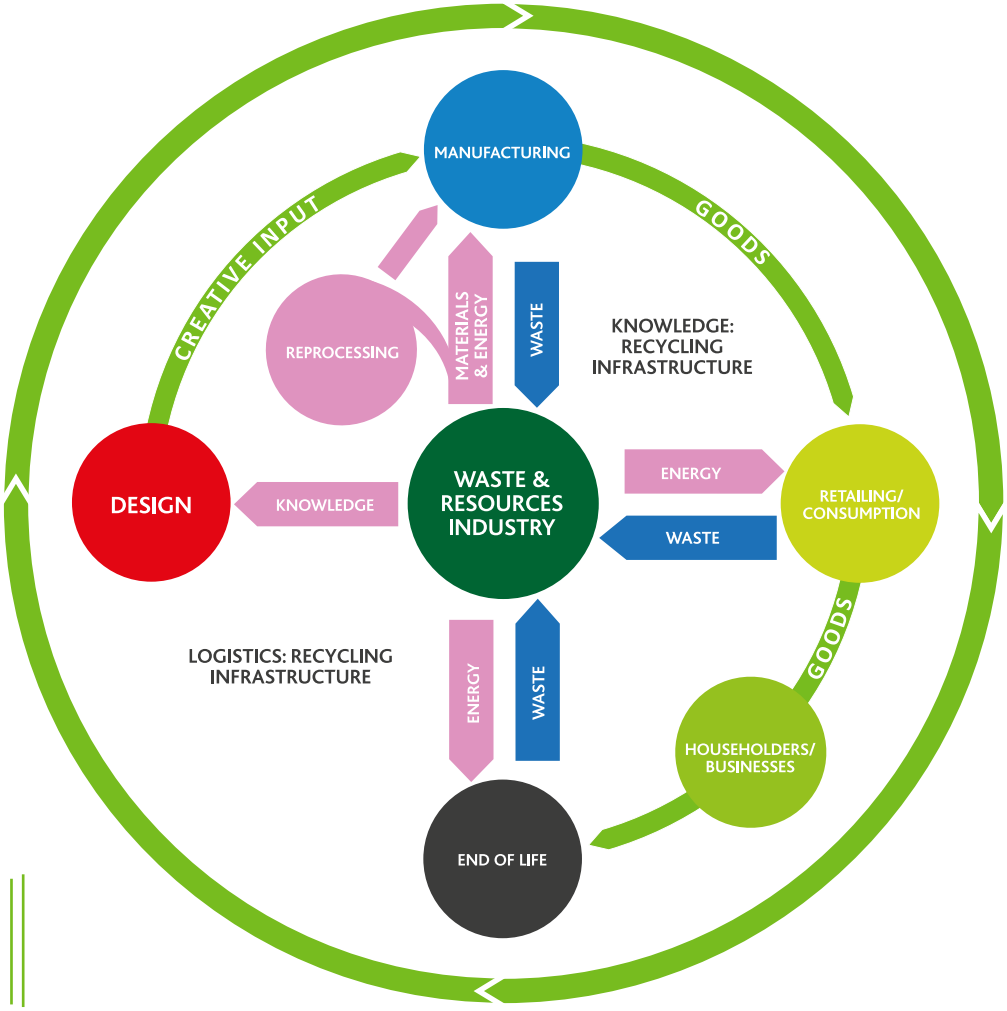
Section 3. The Circular Economy

The Circular Economy is an alternative to the traditional take-make-use-dispose approach which has prevailed in one form or another since the late 19th century. It is based on the premise that materials are not wasted and instead returned to the economy as new products or energy. As waste is pushed up the waste hierarchy it creates greater resource efficiency and security by reducing the need to extract and import new raw materials. This in turn reduces the impact on the environment by avoided emissions from the otherwise energy intensive extraction of raw materials and from the disposal of materials in landfill.

In practice this means more efficient use of materials, creating greater value from customer supply chains and ensuring more material is reused, recycled, and with energy generated from any residual, non-recyclable wastes.

Progress towards the circular economy will likely push the waste management industry beyond its traditional spheres of operations, opening up new opportunities and requiring closer working with a host of new partners and engaging further 'upstream' in material supply chains than perhaps done so in the past. New technologies and new working practices will help break the UK's traditional linear models of production and consumption, transforming the industry's role into that of a resource provider, manufacturing raw materials and products for the wider economy.

A more responsive planning system is essential, one which recognises and supports further diversification, if the UK is to fully grasp the opportunities presented by the Circular Economy.



Waste & Resources Industry at the centre of the Circular Economy

Section 4. Aligning the planning system with the Circular Economy

Investment in new waste and recycling infrastructure depends upon the planning system performing its role in converting high level, national waste management policies and objectives into consents for specific development proposals.

Investment in new waste and recycling facilities brings economic benefit to local communities. More than 100,000 people are directly employed in the waste and recycling industry with many more employed indirectly through the supply chain and in the construction sector.

Diverting waste from landfill helps support more jobs, and it is estimated that 5-10 jobs are created for every 1000 tonnes of material recycled, compared to 0.1 jobs for every thousand tonnes of waste sent to landfill.[1] Furthermore, larger waste management projects can be expected to generate up to 300 jobs during construction.

A Circular Economy, where more of our resources are re-used, recycled and recovered, could help to:

- generate 50,000 new jobs;
- attract £10 billion of investment in new waste management infrastructure, boosting GDP by £3 billion; and
- generate an additional £1.4billion in recyclate revenues for the UK economy if all potentially recyclable material was captured for recycling.

While the export of recyclable material generates over £1b in sales for the UK, increasing domestic waste treatment capacity would result in further economic benefit as the export of refuse derived fuel (RDF) to Europe is estimated to be costing our economy £280m a year[2], with the economic and environmental benefits of recovering this material being realised overseas.

Development of new waste management infrastructure contributes to local authority and national recycling targets while also helping local authorities to avoid disposal costs, and the associated landfill tax.

The challenges presented by the planning system to these investment opportunities have been well documented elsewhere (including ESA's 2011 planning report[3]) with many instances of applications for waste management development bogged down in lengthy delays for planning consent or rejected against officer recommendations. For many waste management facilities, the planning system has been a major element of project risk.

On a more positive note, the situation in recent years has been one of general improvement with ESA research showing that over 70% of planning authorities now have an adopted waste plan in place. Of course, this helps make the process of guiding new waste management development to appropriate locations that more efficient. Consents for new recycling or waste sorting infrastructure have generally been more forthcoming than in the past, particularly for those accommodated within standard, 'mainstream' industrial units, which tend to face less opposition. However, the planning consent process can still remain less certain for larger and more complex waste management development proposals, and particularly for merchant plants designed to treat non-recyclable, residual wastes.

Many planning authorities can take credit for the progress achieved over recent years, particularly within the backdrop of pressing budget constraints (spending on local authority planning services have nearly halved since 2010[4]). However, aligning the planning system with the strategic objectives of the Circular Economy will likely require a further step change. Some of the more traditional perceptions held by many planning authorities of the waste

management industry will need to be challenged if the industry is to fully realise the benefits of the Circular Economy.

The planning system is by its very nature highly politicised and most parliaments have sought to implement planning reform in one form or another. ESA has long maintained that there is nothing inherently wrong with the planning system and that there is little to justify a significant overhaul of the system. Rather, it is the manner in which the rules are interpreted and applied that can prove the main area of contention.

The culture within many planning authorities towards planning for waste management can often be somewhat outdated. As above, the UK's transition from its reliance on landfill for the disposal of waste to more sustainable and innovative solutions for the recycling and recovery of society's waste has been a remarkable success story, more so given how rapid this change has been. However, in many respects the local authority development management regime has lagged behind and with a strict control culture continuing to prevail.

Such an approach undoubtedly has its roots within the "landfill era" where the remit of planners was to regulate the supply of landfill capacity and to control the daily operations of consented sites through detailed and prescriptive conditions.

Of course, modern waste recycling and treatment facilities now tend to resemble "mainstream" industrial processes and should therefore face no greater operational restrictions than those imposed on any other business occupying industrial or employment land. In fact, if anything, planning authorities should take comfort in that the operations of consented waste management facilities are subject to an additional layer of control through the Environment Agency's environmental permitting regime.

Quite simply, the commercial landscape that the waste and recycling industry now operates has changed considerably in recent years, and in many respects the industry now resembles any other logistics enterprise, handling, processing and transporting materials to commodity markets. However, this tends not to be reflected in local waste plans, particularly older ones awaiting review. This unfortunately can generate conflict from the outset with applicants having to justify the need for a development proposal in the first place, as new and innovative approaches to waste management can in many cases constitute a departure from the local plan.

There are significant commercial challenges to investing in new recycling facilities, accentuated further in recent years by depressed global commodity prices. Planning authorities should therefore aim to make planning consents for new waste management facilities as helpful and operationally flexible as possible, in order to help stimulate investment in much needed infrastructure. Flexibility is key: the waste management industry supplies recycling materials to (international) commodity markets, with these materials managed and transported as regulation, customers, and commercial factors dictate. The industry needs to adapt to this evolving and dynamic commercial environment and looks to the planning system to do the same.

The next section of this report outlines key aspects of the planning system that can often frustrate the development of new waste management infrastructure and would benefit from review to more closely align with Circular Economy objectives.

Section 5. Catchment boundaries

As above, the planning system should promote the recycling and recovery of waste which enables movement of materials to areas where they can cost-effectively input into manufacturing processes. It is therefore entirely reasonable to expect the sub-regional movement of waste and the movement of waste across local administrative boundaries, with waste transported to the nearest appropriate facility.

However, in interpreting net self-sufficiency, some planning authorities have sought to impose mileage limits on the haulage of waste to and from waste and recycling facilities (i.e. imposing catchments) either within local plan policies or through planning conditions on consented development.

Such an approach is not only anti-competitive and difficult to enforce, but fails to acknowledge that some waste facilities could have a highly specialised role requiring a large catchment area extending beyond a planning authority's administrative boundary.

Waste management facilities of course take on an array of different sizes and technologies, but each is designed to treat waste in the most efficient way. Some may therefore require considerably different catchments to make them viable, and with industry investment made on the assumption that minimum waste inputs can be secured over a payback period. Unless the catchment is sufficiently large to facilitate a minimum waste input, investments are unlikely to be forthcoming.

By way of example, given the relatively small tonnages of hazardous waste produced within any one local authority area it is unrealistic to expect each authority to provide relevant capacity within their individual area. One hazardous waste treatment facility might therefore be built to serve a number of authorities (or may even be designed to serve a national need) and would require waste from a number of areas, perhaps even an entire region, to ensure the economic viability of the plant.

Imposing catchments on new waste facilities restricts the market available to that facility while existing facilities (within the local authority area and in adjoining areas) would be able to compete in these restricted areas. It is inevitable that new facilities would be at a competitive disadvantage to those facilities which did not have restricted catchments. Facilities with restricted catchments would be deemed a higher risk for investors which ultimately could prevent the delivery of modern waste infrastructure.

There is a growing body of evidence from Planning Inspectorate casework and elsewhere which confirms that catchment boundary restrictions are neither justified nor supported by national planning policy.[5]

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"A waste or recycling facility which benefited from change of use simply could not operate without an environmental permit from the Environment Agency."

Section 6. Change of use

Many modern industrial units are intentionally designed to be suitable for a wide range of industrial processes and occupiers, and many are therefore suitable for the processing of waste or recyclables with little or no requirement for modification. In most circumstances all that is required is the installation of plant and equipment.

Facilities for the processing of waste materials clearly fall within the definition of an "industrial process" of Article 2 of the use classes order and are therefore B2, and should be able to utilise existing industrial units without the need for planning permission. Where no processing of waste is involved (for example bulking of waste at a transfer station) then B8 (storage and distribution) would be applicable.

Opportunities to use industrial units for relevant waste management development should not be missed simply because of confusion within planning authorities about application of the use classes order. As above, local authorities should be reassured that any waste management facility which would benefit from change of use would still fall within the scope of the environmental permitting regime. A waste or recycling facility which benefited from change of use simply could not operate without an environmental permit from the Environment Agency.

Section 7. Greater flexibility in planning conditions

Recycling and waste treatment facilities require operational flexibility to respond to dynamic customer and market requirements like any other manufacturing and logistics industry and therefore planning authorities should provide for greater flexibility in planning conditions than that currently afforded. To clarify, the industry is by no means calling for de-regulation of the planning regime, but certain aspects of the consenting regime can unnecessarily shoehorn waste and recycling facilities, thereby placing them at a disadvantage to other similar industrial processes.

Waste types/inputs

There is much inconsistency within conditions attached to planning permission on the types of waste that facilities (Material Recovery Facilities, Transfer Stations and the like) are able to accept, with some containing long, prescriptive lists of acceptable waste inputs or those that are excluded. Interpretation of how a particular waste stream fits within the waste definitions used by planning conditions can vary between authorities, impacting upon the efficient operation of the facility. Some planning conditions are cross referenced with the site's environmental permit (issued and regulated by the Environment Agency) which can become out of date following changes agreed with the Agency (or to the site's working plan).

ESA has long maintained that the control of waste inputs (and associated definitions of acceptable waste inputs) is a matter for the Environment Agency in regulating a site's environmental permit. This is perhaps an example of "planning creep", with planning authorities seemingly reluctant to relinquish control of 'pollution control' policies despite such matters best left to and dealt by the environmental regulator.

Consent conditions

Through primary legislation the Government intends to prohibit pre-commencement conditions from being imposed without prior agreement of the applicant. While such measures should be broadly welcomed, this is nonetheless likely to be of more relevance to housing developers. Instead, it is the inappropriate use by planning authorities of operational conditions and non-material amendments that is of greater concern to our industry.

Overlapping interests and requirements within both the planning and permitting (pollution control) regimes leads to duplication of information requests and additional administrative burdens in the form of costs and time for both developers and competent authorities. Planning authorities should therefore refrain from duplicating the work of the Environment Agency by seeking to regulate pollution control issues through planning consent conditions.

When negotiating the interface between the planning and permitting regimes, planning authorities should seek to consent development in accordance with development plan policies and should work on the assumption that the relevant pollution and control regime will be properly applied and enforced.

Whilst potential environmental impacts may be deemed to be a material consideration, the weight applied by planning authorities to potential impacts should be reduced in so far as they are addressed and mitigated by the Environment Agency in fulfilling its statutory duties.

Operating times

The industry would welcome greater flexibility on planning conditions which specify consented site opening (and operational) hours. The standard, '9-5, 5-day a week' format is somewhat dated and perhaps a legacy from the regulation of landfill activities. The demands of our customer base is changing: some operate 24 hours a day, while contracts may stipulate that waste or recycling collections are conducted outwith standard office hours to avoid the busiest and more congested periods of the day. The collection of waste from schools, for example, before the start of the school day should not be curtailed simply because the local waste facility is not consented to open until later in the day.

Most waste management facilities are of course sited within enclosed buildings on industrial estates where noise is less of a concern than it might otherwise have been in the past. Other industrial activities are not restricted so on operating hours and such habitual restrictions placed on waste operators through planning conditions makes it more challenging for the industry to invest and meet the needs of its customers.

Section 8. Greenbelt

Few aspects of the planning system ignite more interest than the green belt and in recent years there has been a noticeable public and political backlash against large scale housing development on greenbelt sites, particularly since the publication of the National Planning Policy Framework (NPPF). Unfortunately our industry has been left to face the consequences as, in the face of such opposition, the Government opted for a tougher stance on greenbelt development in a revision of the national waste planning policy.

While there is no general push to develop waste management facilities on the greenbelt the revised national waste planning policy has nonetheless adopted a more negative stance than contained in previous waste planning policy (PPS10). There are of course some local authorities for which much of their administrative area is greenbelt. Therefore in recognising the strategic nature of sustainable waste infrastructure it is important that local planning authorities should take account of the specific benefits arising from modern waste management development and apply added weight when considering the very special circumstances for proposals located within the greenbelt. Some waste development has unique locational needs: anaerobic digestion (for the treatment of food and organic waste streams) for example, is generally more suited to (semi) rural rather than urban environments.

As landfills reach the end of their operational life (in some cases earlier than planned as legislative and economic drivers divert more waste away from landfill for recycling) this presents an ideal opportunity to "re-think" the future uses of such sites and consider how, upon restoration, they might usefully help meet Government policy objectives for sustainable development. The siting of landfill development is of course dictated by the location of previous quarrying activities (often on the urban fringe) and which means that greenbelt policy is often a factor when considering potential after-uses of such sites. While closed landfill sites have tended to be returned to low grade agricultural use, Appendix 1 sets out a fresh approach and includes examples of innovative diversification of closed (and also some operational) sites that could help bring land back into productive use.

While there are undoubtedly a number of technical and economic factors to consider in converting closed landfill sites into solar parks or energy storage schemes, from a planning perspective, the greenbelt policy often proves the biggest constraint in realising sustainable development opportunities.

In allowing greater flexibility on after-use of previously worked mineral and waste sites within the greenbelt (and rural areas), we suggest that local authorities adopt a sequential test, in which greater weight is applied to development on previously used land over greenfield sites. Improved provision within local plan policies in support of renewable and alternative energy projects, particularly those able to make continued use of an existing connection to the national grid would also go some way towards meeting wider Circular Economy and sustainable development goals.

Section 9. Residential encroachment

While local authorities of course have targets to increase housing supply, meeting housing demand should not be at the expense of other vital components of the economy.

Over recent years residential areas (or sites allocated for residential development) have been encroaching on existing waste management facilities (or land designated in plans as sites suitable for waste management development) with land re-zoned to accommodate housing demand. The proximity of housing (or similarly sensitive receptors) can place additional operational constraints on existing or new waste management development, and thus prove potentially detrimental to its economic role.

This appears somewhat counter intuitive: householders rely on local waste management facilities to sort and recycle their waste, encroachment onto which would likely affect their ability to operate efficiently. While modern waste management facilities strive to be good neighbours and can of course co-exist with other types of development, more sensitive development (such as housing) should be prevented from encroaching within 200 metres of existing waste management facilities or allocated waste sites.

In addition to the statutory consultation undertaken with the Environment Agency and other statutory consultees, we recommend that an operator of a waste management facility should be consulted if a new development is proposed within 250 metres of a waste site boundary.

"The proximity of housing (or similarly sensitive receptors) can place additional operational constraints on existing or new waste management development, and thus prove potentially detrimental to its economic role."

Existing and allocated sites for waste management development should be safeguarded from encroachment by sensitive landuses to avoid situations where sites, operating in full compliance with consent (and environmental permit) conditions, incur complaints from surrounding residential properties. In situations where there is little option but to consent sensitive development in such locations, planning conditions attached to the design of new housing could also help reduce potential for nuisance (e.g. position of balconies etc).

Furthermore, the safeguarding of sites allocated for waste management development should not be undermined by local authorities imposing time-limits on the retention of protection afforded to such sites. Despite the general improvements in planning authority performance noted above, the planning system remains a major element of project risk, and it can take years of work to firstly identify a suitable site, gather data and perform relevant assessments even before a planning application is submitted to the local authority.

Given such complexities it would be entirely inappropriate to set time-limit thresholds for site retention. During periods of depressed commodity values or market downturns, new waste management facilities are unlikely to be forthcoming on allocated sites, only for demand for such sites to increase again when market conditions improve. Time-limited policies would be entirely unresponsive to the cyclical nature of global commodity markets thus potentially constraining growth and development.

Planning authorities often allocate industrial/ employment land within local plans as suitable sites for waste management development, rather than making specific land allocations (or adopting criteria) for such development. Consequently, proponents of waste management development are required to compete with 'mainstream' industrial development for available sites.

Planning policies to liberalise the conversion of industrial premises to dwelling houses further compounds the pressure on waste management development.

The ability to convert an industrial premises into residential would likely increase the value of that property, effectively pricing-out proponents of waste management development, and other industrial users, in seeking to develop that site.

Policies to encourage the conversion of industrial buildings to dwelling houses not only reduces the availability of potential land for waste management development, but could also render surrounding land around a residential conversion (as a sensitive receptor) potentially unsuitable for waste management development.

Section 10. Energy from waste

The transition towards a Circular Economy is as much about reducing our reliance on fossil fuel power generation as it is on closing the resource loop on materials. Energy from waste (EfW) therefore has a key role to play by supplying low carbon energy to homes and businesses.

EfW is supported by the waste hierarchy as a means of recovering the value of the energy embedded in residual waste, those waste fractions remaining after all practicable efforts to extract materials for reuse and recycling. EfW is entirely compatible with efforts to further increase rates of recycling, as even the sustainable material flows espoused by the Circular Economy model will produce a residual waste stream.

EfW is a broad term which is applied to a range of different waste management technologies, which between them offer the potential to produce electricity, heat, gas (to the National Grid) and fuel for transport. The deployment of Combined Heat and Power (CHP), in which both electricity and heat is produced at the same time from the same fuel source, significantly increases the efficiency in which energy is recovered from wastes. However, while an EfW plant operating in "electricity only" mode can be connected to the National Grid with relative ease, maximising the heat off-take from EfW-CHP involves more sophisticated technology and is reliant upon additional off-site infrastructure, such as a local heat pipe network and connections within heat-customer premises.

If such technical barriers can be overcome, EfW-CHP not only helps improve security of supply but also decarbonises the UK's power generation. However, opportunities for incorporating CHP into EfW remain constrained by un-coordinated public (planning) policy and as such most EfW, while "CHP ready", nonetheless operate in electricity-only mode. It is worth nothing that while EfW-CHP operates under the strict terms of an Environment Agency permit, it is the role of the planning system to both encourage and facilitate CHP and ensure such is integrated into the built environment.

To deliver the additional environmental and socio-economic benefits offered by CHP, EfW operators require a reliable, continuous demand for the heat produced. While there are many issues to consider when seeking to match heat supply with heat customers (pipeline investment, heat contracts etc) at the most fundamental level this process is reliant upon a planning system which ensures that end-users (e.g. industry and local communities) are located in the right place to benefit from the heat offtake.

Unfortunately, examples of such are rare in the UK: in response to public perceptions EfW schemes are often situated well away from those communities and centres of populations that would benefit from the heat. Until a more strategic approach is adopted, one which better aligns waste and energy policy, the planning system will likely remain a barrier to realising the full benefits of CHP.

Local authorities could help in this regard by adopting more robust sustainability criteria within local plans, including renewable energy targets to help promote development of low carbon and alternative energy provision. Heat mapping should be a considered alongside other workstreams (such as predicted waste arisings, population forecasts and housing needs) in developing the evidence base for the local plan process. Such mapping exercises would help improve local authorities' strategic understanding of the requirements of both CHP providers and heat users. All too often, CHP is considered by planners as a "bolt on" and something to consider *after* EfW has secured planning consent.

Use of available heat from local EfW-CHP schemes, or a requirement to meet an agreed CO_2 reduction target could form a condition of planning consent for new housing and industrial development. The Community Infrastructure Levy (CIL) or Planning Obligations (s106) could be used to contribute towards the cost of district heating infrastructure.

Delays in planning consents for EfW schemes undermine potential heat customers' confidence: as without consent in place it is difficult to enter into formal contractual arrangements for the heat off-take.

The upfront (pipeline) installation costs may also pose a barrier to the uptake of many potential heat customers. However, by incorporating heat networks into large development projects the heat output from an existing EfW-CHP scheme becomes more cost effective to other, smaller heat customers than might otherwise have been the case, allowing scope for further roll out of the scheme to more heat users within the vicinity.

Section 11. Landfill provision

The Circular Economy rightly places an emphasis on shifting the management of waste further up the waste hierarchy. But this is not to suggest that waste management options towards the bottom of the waste hierarchy have no role to play in the UK's Circular Economy, rather each stage of the waste hierarchy should be considered as dealing with a certain waste stream in a particular way. Planning authorities should therefore make provision for waste management capacity across all levels of the waste hierarchy.

The emphasis on moving towards higher rates of recycling does not mean that there will be no need for a continuing supply of landfill capacity. In fact landfills have a key, strategic role to play in the UK's Circular Economy for the disposal of residues from those recycling and waste treatment processes further up the hierarchy. The flexibility offered by landfills not only provides a useful contingency measure, but also offers the safest and most viable option for the handling of an array of different waste streams.

However, with all the publicity and attention focused on recycling and moving waste management options up the waste hierarchy, planning for continued landfill provision has somewhat fallen from grace and, for all intents and purposes, largely ground to a halt. This is a mistake: landfill is the only waste management option which is consumed as it is used and therefore some degree of replacement capacity is going to be required. Current landfill capacity (20 million tonnes, 2015) is set to halve by 2020 before dropping to 6 million tonnes in 2025 and 4 million tonnes by 2030. Planning for replacement capacity is not simply negated by the projected reduction in landfilling rates and there remains significant volumes of waste (recycling and treatment residues; specialist, niche waste streams; and non-combustible residual wastes) for which there is no viable alternative to landfill.

The overall trend is of course one of reduced reliance on landfill as the industry aligns itself towards even greater rates of recycling and energy recovery. Many landfill sites are set to close or be mothballed, with only those sites optimally located to handle reduced volumes and those niche, residual waste streams referred to above likely to remain viable. In turn, those remaining, operational landfill sites will likely take on even greater significance and strategic value as further demands are placed on this remaining capacity, as they receive more wastes from further afield. The importance of a strategic approach to waste planning therefore takes on greater significance, and the future provision of landfill capacity should form a key element in local authorities' duty to co-operate.

Given the pressures on remaining landfill capacity, flexibility is crucial to "future proofing" this waste management option, with planning conditions on end dates and restoration schemes of many consents likely to need amending to reflect a reduction in residual waste arisings. During this extended period of operation, landfills will continue to provide a disposal option for waste which cannot be treated higher up the waste hierarchy, thereby serving the wider, integrated network of waste management facilities while continuing to produce renewable energy through the utilisation of landfill gas. It is therefore vital that these assets are offered relevant planning safeguards to help them operate at maximum efficiency and to prevent encroachment by housing and from other sensitive receptors.

Section 12: the way forward

The Circular Economy presents a number of innovative opportunities to improve UK resource efficiency, with the waste and recycling industry playing a key role in new and more sustainable material supply chains. While we are not advocating a complete overhaul of the system, clearly a more responsive planning system is needed to ensure that the economic and environmental benefits of the new Circular Economy are not missed. The following recommendations would help:

- a more integrated approach to waste and energy policy. Local plans should include robust policies to support the UK's transition to a largely decarbonised heat sector. In practice, this should allow for sufficient provision (or sites) for energy from waste (EfW) within local plans which maximise the potential for use of heat through combined heat and power. Doing so will maximise heat offtake and therefore improve the environmental benefits of EfW;

- planning authorities should seek to engage developers on draft conditions attached to planning consent prior to submission to planning committee. This would help to firstly identify and then address those conditions which might unreasonably impact on the operational use or commercial viability of waste management development;

- waste management facilities process recyclable material to produce secondary resources for national and global commodity markets. Materials may flow through a number of different facilities across a broad geographical area in order to achieve the desired market specification. Local authorities should therefore desist from seeking to impose catchment boundaries on waste treatment facilities. It is unrealistic to limit material flows to within any given administrative boundary: not only are such conditions unenforceable but such a practice places local recycling facilities at a commercial disadvantage;

- a shift in planning culture should aim to help planners shrug off the strict "control regime" of the "landfill era" and instead recognise the transition in the waste and recycling industry. Modern recycling facilities now tend to resemble "mainstream" industrial and logistics operations and should not face any additional operational restrictions through planning consent than other, similar industries;

- while every effort should be made to push waste up the waste hierarchy, energy from waste and landfill both have a role to play in realising our Circular Economy objectives and provision should be made accordingly within local plans. Both are compatible with higher rates of recycling as they are simply designed to treat a different part of the waste stream (non-recyclable wastes or residues from recycling processes) while providing a source of low carbon energy;

- sensible development proposals on closed landfill sites which meet wider sustainability and climate change objectives should be supported by local planning authorities;

- policies designed to encourage housing supply should be sympathetic to the requirements of operational waste management development, and sites allocated for waste development.

Appendix 1
Realising value from closed landfill sites

Landfills continue to provide value even upon cessation of activities, with closed sites a source of low carbon energy generation. The restoration of landfill sites to their original landuse (or some other productive use) is of course a stipulation of planning consent and restoration schemes have tended to focus on converting former landfill sites to nature reserves, outdoor recreation or low grade agriculture. However, there is scope to adopt a more innovative approach to development opportunities on closed sites, which not only ensures that such continue to provide a positive legacy long after cessation of landfilling activities but also enables local authorities to fully realise wider sustainable development and Circular Economy goals.

Some relevant examples are provided below, and which have the added benefit of prioritising previously developed land over development of greenfield sites.

» 1.1 Solar parks

Closed landfill sites offer significant potential for solar generation, with the ability to utilise on-site electricity generation assets and grid connection from the existing landfill gas engines, thereby reducing project costs. By way of example, a 10 hectare solar park is capable of generating 3.5MWhr. As landfill gas capture rates diminish following cessation of landfilling activity (methane production peaks at 10-15 years) output from solar generation could potentially help make up the shortfall.

Situated at ground level rather than requiring deep foundations, installation of ground mounted solar panels (arrays) is relatively un-intrusive and so unlikely to affect the landfill cap layer or associated infrastructure. Favourable slope gradients over a relatively large, open area further improves the commercial viability of such projects.

Further advantages offered by landfill sites include the utilisation of previously developed land over agricultural or greenfield land (which would meet national planning objectives); remote sites tend to be located away from sensitive receptors (or with a sufficient buffer); and such sites are predominately non-sensitive habitats.

However, ground settlement and stability will likely limit development opportunities to those landfills (or areas within landfills) where landfilling activities have long ceased (at least 10 years).

Financial viability is a key consideration since the reduction in Government support for renewable energy projects.

Consented development includes:

- Broadpath Landfill (Viridor), Devon – 5MW
- Westbury Landfill (Viridor), Wiltshire – 3.5MW
- Ockendon Landfill (Veolia), Essex – 38MW

A further 8 non-ESA Member landfill sites, totalling an additional 64MW of installed solar capacity have also been consented.

» 1.2 Energy Crops

Closed (and operational) landfill sites offer potential to grow energy crops, which when harvested can be used as a source of biomass for the generation of low carbon electricity.

FCC Environment grows energy crops at 13 of its landfill sites, covering 350 hectares in total. By way of example, 30 hectares are capable of yielding 350 tonnes of biomass annually.

In addition to providing fuel for low carbon energy generation, the crops provide further benefit in helping the landfill restoration process and in returning the site to agricultural use.

Proximity of landfill sites to (biomass) power generators is likely to be a key consideration, as is the removal of ROC support for energy crops uplift in standard co-firing.

» 1.3 Wind farms

Wind turbines on closed landfills require particular consideration, as excavation of turbine foundations would likely preclude extensive areas of landfilling activities from development. As such, turbines on landfill sites are likely to be quite small scale, limited to just a few turbines, and also limited to the fringes (i.e. non-landfilling areas) of the site. Availability of suitable land is therefore a constraining factor. Despite being relatively small-scale, projects have nonetheless tended to face similar planning challenges as any other wind farm development (landscape; visual impact; cumulative impact; and ecology etc).

Consented development includes:

- Greengairs landfill (FCC), Lanarkshire (9 turbines, 27MW)
- Gallymoor landfill (FCC), Yorkshire (2 turbines, 1.8MW)
- Lawrence landfill, Dyfed (2 turbines, 1.6MW)

A further 5 applications have been refused or withdrawn.

» 1.4 Heat recovery

Existing ground source heat technology could potentially be applied to closed landfills to extract the heat generated within, with the heat off-take used in the on-site leachate treatment process. However, there is currently no known practical application of such.

Ground source heat pumps have, however, been deployed at a landfill site in Cork, allowing the heat to be captured for use in the site's administration buildings (space heating and hot water).

» 1.5 Energy Storage

Existing connections to the National Grid make closed (and operational) landfill sites a potentially attractive prospect for energy storage. Short Term Operating Reserve (STOR) allows for better management of energy supply and demand and can take many forms, including batteries, gas and oil engines or cryogenics. A pilot project was awarded Government funding at Viridor's Pilsworth landfill site, Bury.

» 1.6 Landfill mining

Mining closed or historic landfill sites offers a number of potential benefits: the recovery of valuable materials and the reclamation of high-value land for re-development. Land value would likely have a more significant bearing on the economic viability of any such project and would therefore limit opportunities for such to areas of the country where land is at a premium.

While economic viability (land value), rather than planning or permitting constraints is likely to limit opportunities for landfill mining, a 2013 report commissioned by Zero Waste Scotland nonetheless noted that the following situations offered greatest potential for landfill mining:

- on-site energy recovery (following stabilisation of mined waste)
- excavation, shredding and screening of mined waste for the recovery (and sale) of ferrous metals and recovered soils used for daily cover. Remaining waste compacted and replaced within excavated area (or used in the construction of a development platform)
- off-site energy recovery where wastes were intended to be excavated anyway (site engineering or to mitigate pollution) and the alternative was to incur landfill disposal costs.

Examples of landfill mining include:

- Sandford farm, Reading: mining and remediation of a 20ha site in which 240,000m^3 of landfilled waste was excavated. Remediated site re-developed for housing.
- Remo Milieubeheer, Flanders: project due to commence in 2017 to mine a 1.6mt closed landfill site with the aim of recycling 55% of the recovered waste, and with the rest transformed into heat, power and fuels.

Appendix 2
Partly completed or mothballed sites

Legislative measures and economic drivers to further divert waste from disposal in landfill continue to exert pressure on landfill sites resulting in site closures, or winding down of operations. While some sites may be mothballed - safeguarded for future, strategic value – there are alternative development opportunities for those partially completed landfill sites in which remaining void capacity is unlikely to have any future value as landfill.

While opportunities will vary depending on local circumstances, examples include the foregoing of consented landfilling in favour of the disposal of much smaller volumes of inert materials to create suitable development platforms for recycling infrastructure, or employment parks etc.

While such would have the advantage of realising the cessation of landfilling activities earlier than planned and return the land to a more productive, economic use, such development would nonetheless most likely constitute a departure from both the local plan and from the previously approved scheme for restoration (contours) and end-use.

Consented development includes:

- Houghton landfill employment park (Biffa)

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April 2017