

# Changing mindsets on aggregate reuse and recycling in the built environment

| The role of digital waste tracking in enhancing  
the future of CD&E waste management.

**Specialist Report** 2023



# Contents

<b>Foreword</b>	3
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Chapter one: <b>The challenge</b>	4
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Chapter two: <b>Progressive change</b>	7
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Chapter three: <b>Rethinking our approach to recovery management</b>	8
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Chapter four: <b>The regulatory framework – maintaining momentum</b>	10
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Chapter five: <b>Resourcing the future – fulfilling your duty</b>	14
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Chapter six: <b>Addressing the issues: Posing questions that matter</b>	16
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Chapter seven: <b>Useful resources</b>	17
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# Foreword

**I was delighted to be asked to write this foreword to introduce Tarmac's short report on the importance of waste management in the construction, demolition and excavation (CD&E) industry.**

CIWM is the leading professional body in the resource and waste management sector, representing over 5,500 members and more than 250 affiliated organisations across the UK, the Republic of Ireland, and beyond. We lead the narrative on key waste-related issues and, together with our members, are facilitating the move away from traditional linear waste management models towards a circular economy of reduce, reuse, and recycle in order to deliver change.

This report recognises that waste and the reuse of resources are hot topics for the CD&E industry but shows that it must strive for improvement on its current performance. With 138 million tonnes of CD&E waste produced each year in the UK, more must be done to see waste as a valuable resource and optimise its use instead of choosing landfill.

With only 28% of aggregates coming from recycled and secondary sources, there is a golden

opportunity for the CD&E industry to make greater strides forward and deliver both an environmental and commercial benefit.

As showcased at our recent Festival of Circular Economy, there is a growing need for all industries to put reuse and recycling at the forefront of their waste strategies and adopt a joined-up approach towards a more circular, net-zero future.

The key to change in construction will be pioneering companies leading the way. I hope that others will read, learn from, and emulate these examples.

I am pleased to see Tarmac taking a lead on the subject of waste management in construction, and trust that it opens up further discussions that result in innovative medium and long-term solutions.

**Together, we can drive change, protect our environment and secure a sustainable future. Together, we can move the world beyond waste.**



**Sarah Poulter**  
Chief Executive  
CIWM



## Chapter one

# The challenge

**The introduction of a mandatory digital waste tracking system in the UK is imminent, which will make it easier to track waste and resources in real time. It is a huge step towards helping businesses and the government achieve a more circular economy as we strive to achieve net zero greenhouse gas emissions by 2050.**

Digital waste tracking will mark a new era for land and waste recovery, presenting new opportunities – and new challenges – for those in the Construction, Demolition and Excavation (CD&E) value chain when handling recovered excavation waste.

It is one of a number of strategies designed to reduce carbon and support a more circular economy, in light of a growing global population which is consuming more, building more and creating more waste than ever before.



## CD&E waste: Assessing the landscape

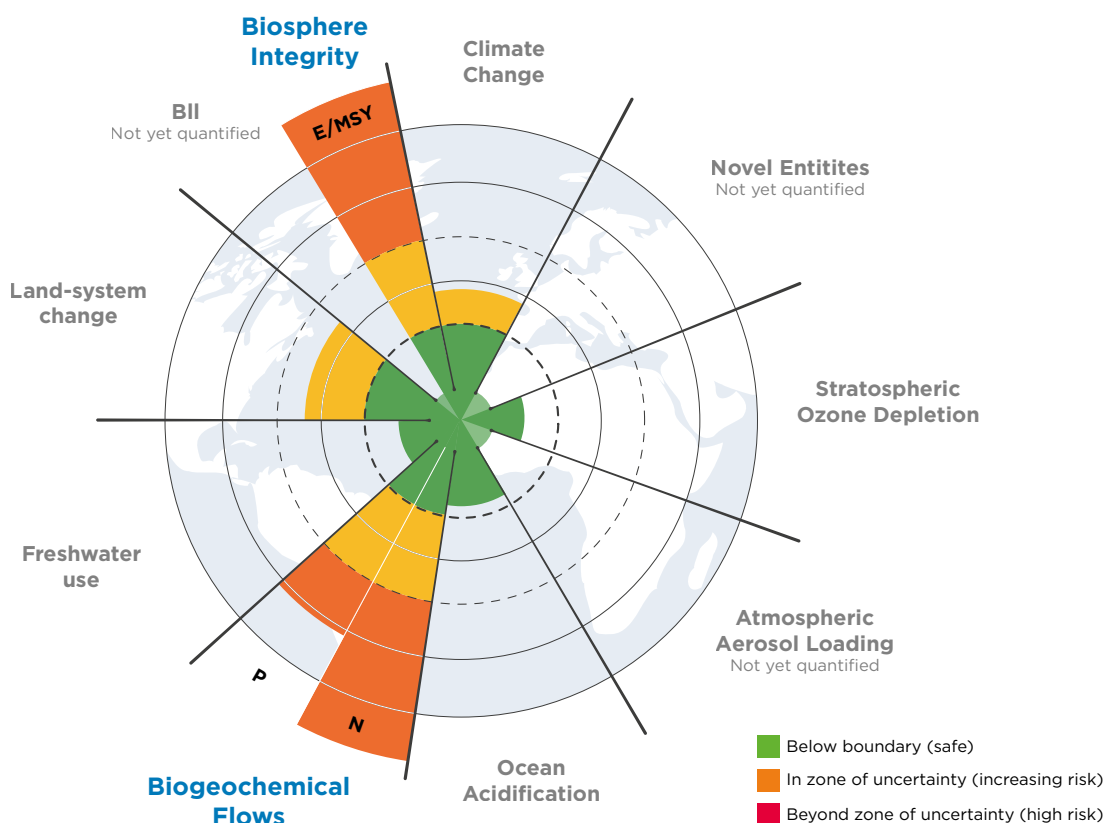
Waste remains a hot topic in our industry. The Construction, Demolition and Excavation (CD&E) sectors generate 62% of all waste in the UK and more than a third of waste in the EU. The most recent figures from Statista show that 138 million tonnes of CD&E waste is generated each year in the UK.

Great strides are already being made to recover and reuse CD&E waste, within the context of wider efforts to reduce landfill use and optimise resource efficiency. But there is room for improvement, both in performance and reporting, and the key now is in maximising reuse of aggregate materials. In the UK, around 28% of aggregates used for construction comes from recycled and secondary sources.

However, these figures don't tell the full story. In fact, the difficulty in collating up-to-date information is telling, with multiple sources giving contradictory information at times. In reality, whilst it is universally recognised that more needs to be done, it is difficult to establish an accurate picture without digital waste tracking.

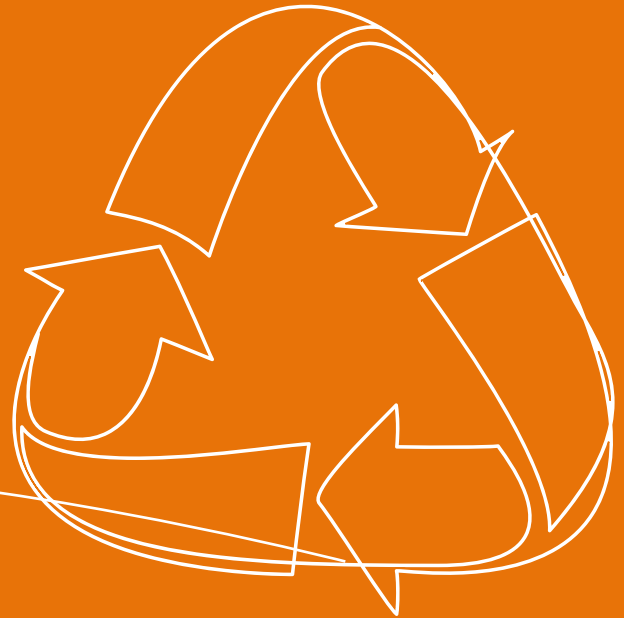
If one thing is certain, it is that we need to build on the foundations of success. The new mandatory digital waste tracking system should help to improve visibility but no individual organisation can drive the change needed to help achieve a circular economy in CD&E waste. However if we, as an integrated construction value chain, can come together to do even more to close the loop on aggregate recovery and reuse, it will deliver tangible benefits for all. With the tools already in place and the imminent introduction of mandatory digital waste tracking – all against the backdrop of a continued climate crisis – there has never been a better time to galvanise the sector.

We're calling on suppliers, developers, contractors and building owners/operators to raise their own standards. Better recovery and reuse of CD&E waste will cut waste crime, support environmental targets and improve business efficiency. We will be using fewer resources, cutting carbon emissions and driving cost-efficiency in the built environment. Crucially, we can better support climate action, noting the tipping point of the nine planetary boundaries that are so critical to the sustainable future of our planet.



## What constitutes CD&E waste?

Construction, demolition and excavation (CD&E) waste is defined as any waste generated from demolition of structures, from excavation of aggregate materials or from materials wasted during the construction process on site.



**£900m**

Waste and other environmental crimes  
cost the economy an estimated £900 million per year.

**138m**

138 million tonnes of CD&E waste was  
generated in the UK in 2018.

**43%**

A site waste management plan can  
reduce on-site waste by up to 15%,  
which translates to 43% less waste  
heading to landfill.

**28%**

28% of aggregates used for construction in  
the UK comes from recycled and secondary  
sources – 62Mt of a total 221Mt. Of that, 55Mt  
is recycled and 7Mt secondary.

**13%**

13% of all construction waste  
is new, unused material.



## Chapter two

# Progressive change

**If the construction value chain is to really take advantage of the opportunities and drive progressive change, it is important to fully understand the possibilities. And this begins with a change in mindset.**

### **It's not waste, it's a resource.**

Re-use management of waste resources offers immediate opportunities for environmental, operational and commercial benefit.

Recovery management is no longer a box-ticking exercise, it is a means of providing vital resources. Greater awareness and regulatory drivers are increasing the relevance and penetration of recovery measures, which should be factored into every building project from the outset.

With greater regulatory pressure, the introduction of digital mandatory waste tracking and global climate change initiatives, there has never been a better time to embrace the circular economy. Every time CD&E waste is reused, it helps to preserve valuable mineral resources and reduce waste sent to landfill.

Our waste products of today can be the resources of the future. But only if we work together to achieve the common goal.

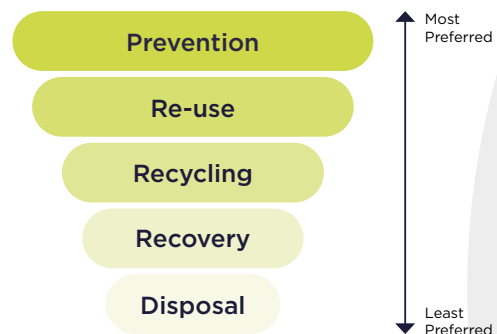


**“Our waste products of today can be the resources of the future”**

## Chapter three

# Rethinking our approach to recovery management

**The Waste Hierarchy was adopted by the UK Government 30 years ago as a tool to help organisations guide and rank their waste management decisions according to what is best for the environment.**



### Prevention

Under the Waste Hierarchy, industries, communities and governments are first encouraged to reduce the amount of waste generated, usually by focusing on the use of materials before they become waste e.g. good storage, packaging design and limiting single-use products or components. In the construction sector, this means preventing demolition and rebuild by repurposing buildings, as in the case of Battersea Power Station.

### Re-use

If waste can't be prevented, it should be prepared for re-use. This covers reclaimed building materials such as bricks, blocks and metals. Re-use usually means putting products, components or structures back into use without any pre-processing – otherwise it will be deemed recycling. One such example is cleaning and replacing railway ballast.

### Recycle

Where recovery operation requires waste materials to be reprocessed into products, materials or substances, it is covered in step 3 of the Waste Hierarchy. Recycling includes closed loop – where the waste materials are recycled back into the same or a similar product (e.g. Recycled Asphalt Planings) – or open loop recycling where the waste material is recycled back into different products (e.g. concrete recycled into aggregate).

This includes concrete buildings and roads recycled into type 1 materials and washed soils to produce recycled sands and gravels.

Co-processing – where energy and mineral content are simultaneously recovered, is another form of recycling found in a handful of industries, like cement production. The use of waste derived-fuels in cement manufacturing ensures that these end-of-life materials find beneficial reuse in higher value, long lived products such as concrete.

### Recover

This stage includes 'backfilling', where CD&E waste can be used for the reclamation of excavated areas or engineering purposes in landscaping. Moving materials from places where they aren't needed to places where they are, such as restoring quarries or building nature reserves set out in restoration plans. In other sectors, it can include recovery of energy from waste through processes such as incineration, anaerobic digestion, gasification or pyrolysis.

### Dispose

When no other options are available, waste must be sent for landfill or incineration without energy recovery. This is the only step that does not contribute towards a circular economy.



# Is the Waste Hierarchy still relevant?

There is a growing consensus that the Waste Hierarchy – in place since 1992 – has ‘outlived its usefulness’ and no longer delivers on the targets for which it was originally designed because it views waste as a problem, not as a resource. For example, previous material classifications defined the recovery of some materials for quarry restoration as disposal – a definition that lowers that value today.

The waste hierarchy also has difficulty dealing with new technologies such as co-processing in cement kilns, and anaerobic digestion, which fall between recycling and recovery.

In September 2022, the Institution of Mechanical Engineers (IMechE) called for the UK Government to replace the Waste Hierarchy with a model that *“genuinely delivers on the prevention of waste”*.

## Chapter four

# The regulatory framework: maintaining momentum

**Environmental regulation is the foundation on which all waste management strategies are built and the importance of good regulation and supportive regulators to meet the challenges ahead cannot be underestimated.**

**Such legislation has been evolving and developing for more than 170 years. Here we include an overview of current and planned regulatory drivers.**

### Environment Act 2021

The Environment Act was described by ministers as ‘the most ambitious environmental programme of any country on earth’ when it was passed into law in November 2021.

It sets the UK’s new framework for environmental protection following Brexit, offering new powers to set UK-specific binding targets, including for air quality, water, biodiversity, and waste reduction.

Section 57 of the Act replaces Section 45A of the Environmental Protection Act 1990 on waste collection, with a number of notable changes to further support reuse, recycling and recovery of waste materials including the separation of recyclable waste from other waste.

It also gives powers to applicable bodies across the UK to make regulations to establish a mandatory digital waste tracking system, which would require those who produce, handle, dispose of or make products from waste, to enter information onto it.

### Resources & Waste Strategy

Waste – and indeed all environmental matters – is a matter where individual nations within the UK have their own legislation, but with an overarching and ambitious strategy across the UK. One example of devolved policy is Defra’s Resources & Waste Strategy, which was the first major waste policy intervention for England for seven years when it was released in 2018.

The strategy, which aims to trigger this transition to a circular economy, is split into eight main chapters and covers a range of topics including innovation, sustainable production, resource recovery, and waste crime. Together they set out Defra’s plan to meet a series of overarching targets including zero avoidable waste by 2050, to double resource efficiency by 2050, zero plastic waste by 2042, and zero food waste to landfill by 2030.

Defra says: “A more circular economy (re-use, remanufacture, repair, recycle) will see us keeping resources in use for as long as possible. It will allow us to extract maximum value from them, then recover and regenerate products and materials at the end of their lifespan.”

## Mandatory digital waste track system

The Environment Act 2021 introduced the notion of a mandatory digital waste tracking system, which will replace the existing paper-based system to record what waste is produced, where it is going and thus help crack down on waste crime by making organisations more accountable.

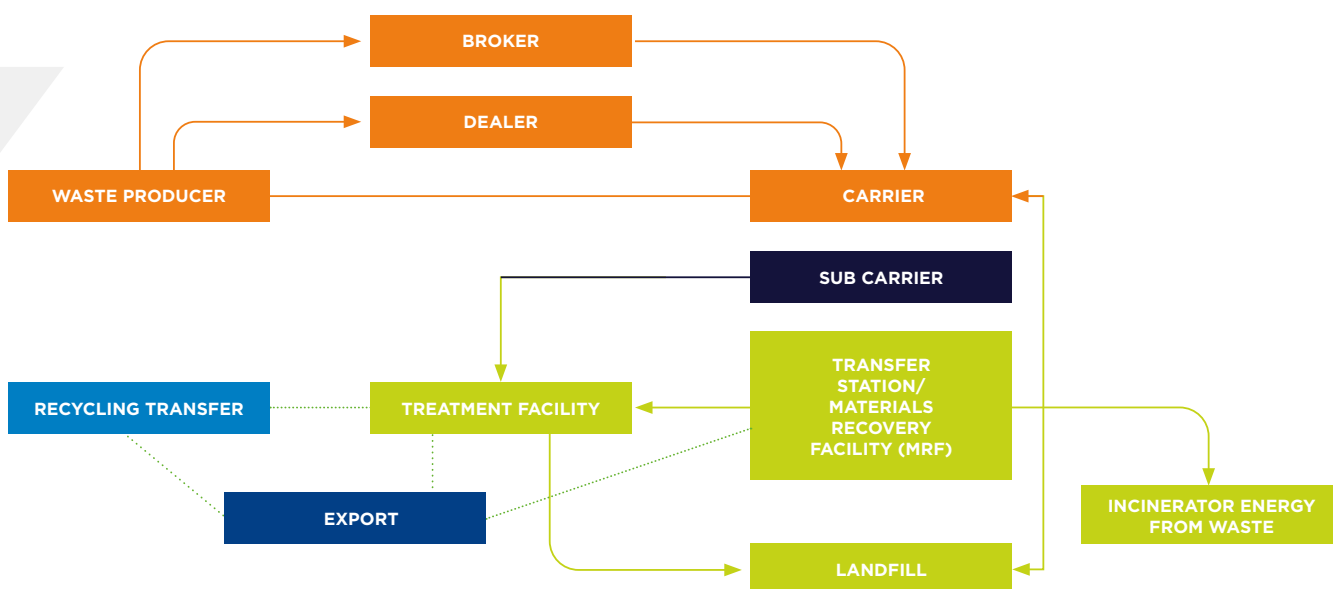
Under the mandate, all waste management will be digitised, although we don't yet know how the system will be set up in each of the UK nations' individual regulatory bodies (the Environment Agency, Scottish Environment Protection Agency, Natural Resources Wales and the Northern Ireland Environment Agency).

The aim is to digitally track every part of the waste chain, from waste producer to recycling or disposal point, for the original waste and for subparts of the waste stream, without enforcement officers having to check the fragmented paper based system, as they currently do.

This will be a big change for everybody involved in waste management including the CD&E industry, but will likely lead to operational efficiencies and environmental benefits. In addition to supporting duty of care, regulation and circular economy, once we can see what wastes are produced, we can look to maximise the value of those wastes as resources. It will also make it a more level playing field for those companies doing the right thing.

**The target is for a system to be in place by the end of 2023.**

## The waste chain





## 25 Year Environmental Plan

The Resources & Waste Strategy gives longer term policy direction in line with 'A Green Future: Our 25 Year Plan to Improve the Environment', which sets out what Defra will do to improve the environment within a generation.

It sets goals to improve England's air and water quality and protect threatened plants, trees and wildlife species. The steps include minimising waste, reusing materials as much as we can and managing materials at the end of their life to minimise the impact on the environment.

## Upcoming changes

A look at new and upcoming guidelines, protocols and legislation.

## Quality Protocols

The Environment Agency is reviewing the 13 Quality Protocols that cover a range of waste-derived materials to establish whether they meet current technical standards and include latest best practice. The goal is to drive continuous improvement across the Quality Protocols, which determine the process needed for a waste within that waste stream to be considered as 'recycled' so that it is now a product and not a waste.

At the time of writing six reviews have been completed – and all six of those Quality Protocols were deemed to need revision. That process is now underway as the remaining reviews continue. It is important to note that the current Quality Protocol remains in place until the review is complete.

## Waste carriers and brokers consultation

The government has also consulted on a reform of the waste carrier, broker and dealer system in England. At the time of writing, the responses are yet to be published.

The intention is to move from a registration to a permit-based system, with enhanced background checks and a technical competence requirement to raise industry standards. It will be more rigid, with more restrictions. Ultimately, the government wants to make it easier for regulators to clamp down on non-compliant operators to reduce waste crime.





## **Think!**

If you are responsible for CD&E waste, you need to prepare for the introduction for mandatory digital waste tracking.

### **Why wait?**

Get your systems in place and start driving efficiencies now.

# Chapter five

## Resourcing the future

### – fulfilling your duty

**Remember, it is your company's legal obligation and duty of care under Section 34 of the Environment Protection Act to ensure that waste is dealt with correctly. The responsibility for what happens to it or where it goes, is on every organisation in the value chain, regardless of whether services are contracted out.**

On a development site, for example, with a mixture of inert, hazardous and non-hazardous soils, ultimate responsibility lies with the waste producers to ensure their waste is handled, transported and received by correctly licensed facilities. However, everyone in the chain is liable if there is a prosecution for non-compliance, including the developer, contractor, any sub-contractors and muck shifters.

Crucially, the responsibility doesn't end when an individual organisation transfers the waste. Mandatory digital waste tracking will therefore make it more important than ever to check that your waste is being managed responsibly once you transfer it to a licensed waste carriers. With digital waste tracking, any failure in duty of care along the waste chain will be more transparent.

#### What is waste?

Any substance or object the holder discards, intends to discard or is required to discard.

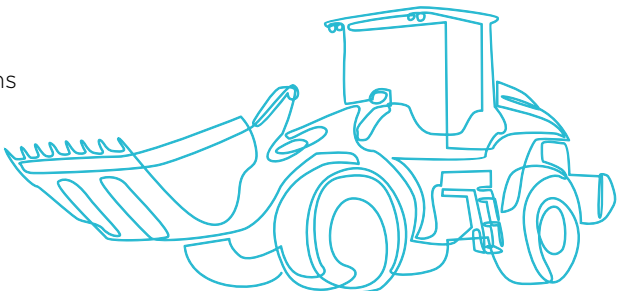
#### Who has the responsibility for defining and categorising it?

The person or company that produces it.

#### Who has responsibility for where it goes?

The person or company that produces it.

Whilst it is important to know your legal and regulatory obligations, this should not be the only reason that organisations and governments are taking action. With increased scrutiny of environmental and social governance by investors, local communities, NGOs and the public, there are commercial and reputational benefits to maximising resource recovery.



A truly sustainable business will achieve its objectives around **people**, **planet** and **profit**:



With climate action a priority, there is a responsibility outside of regulatory drivers on every organisation within the construction supply chain – suppliers, developers, contractors and those responsible for managing and operating properties, including housing associations – to change their thinking on waste.

To help reframe waste as a resource, moving away from the traditional, linear 'take-make-dispose' model towards a circular economy. And, in the built environment in particular, to share their own data on recovery rates to ensure we have the transparency needed to drive effective change.

The recovery and re-use of waste offers immediate opportunities. The tools and the solutions are available to use today, but we lack industry-wide motivation and transparency to maximise those opportunities.

## Think!

Waste crime costs the economy in England **an estimated £1 billion per year**, up 50% since 2015, and 18% of all waste is estimated to be illegally managed. Average fines are increasing. Don't be part of the problem.

Source: National Waste Crime Survey 2021

## Chapter six

# Addressing the issues: Posing questions that matter

By Hannah Haeffner, National Recovery, Landfill & Recycling Manager, Tarmac.

**The evidence put forward in this report highlights both the progress already made in reuse and recycling in the built environment, and the opportunity for further improvement. However, it also raises a number of questions that must be addressed before we can make the tangible improvements needed to close the loop.**

### **How can we improve this and will the digital waste tracking help to do this?**

*"We can't manage what we can't measure. My hope is that digital waste tracking will provide more accurate, more reliable and more up-to-date information from which to build more informed waste strategies at national level."*

### **How do we collaborate more and share some of the best practice in CDE waste management?**

*"This is a huge opportunity for the industry to be a real leader in waste recycling but it will only be possible if we come together to share best practice. Full visibility is required."*

### **Where is the shortfall in construction materials going to come from in the next 10 - 15 years?**

*"Can we increase recovery and recycling rates to provide resources for the future? Will the construction industry need to consider wastes from other sectors to scale up to the quantities needed?"*

### **Are we ambitious enough with innovation compared to other sectors?**

*"We have seen other sectors, including energy, drive real innovation in waste recovery and recycling. I believe the construction sector can still do more. We must embrace innovative technologies and approaches to maximise resource recovery."*

### **How do we encourage the innovation that's needed?**

*"The next five years are going to be critical and will separate winners from losers. Only the most innovative will survive."*



## Chapter seven

# Useful resources

**We want this specialist report to ignite action across the construction and demolition industries. Many suppliers, contractors, developers and others working in the built environment are already taking great strides to recover and reuse waste. But we can all do more.**

The resources below provide guidance, support and inspiration to help raise



Defra



Natural Resources Wales



Chartered Institution of  
Wastes Management



Scottish Environment  
Protection Agency



International Solid Waste Association



Northern Ireland Environment Agency



Environmental Services Association



Materials Recycling World



Ellen MacArthur Foundation



ENDS Report















Environment Agency



Letsrecycle

## Appendix

# Sources

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