

Corporate Sustainability Lessons Learned

Going circular: Our 10 year journey

PwC in the UK

*Fourth edition
September 2017*



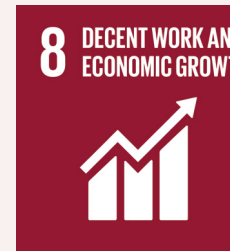
Introduction

Our *Lessons Learned* publications are designed to share our experience of implementing our sustainability strategy, in order to allow others to learn from our successes – and our mistakes. This report, first published in November 2015, is part of a series focusing on our ‘Going Circular’ programme, which seeks to alleviate pressure on materials, water and the climate in support of the **Sustainable Development Goals**, especially Goal 12, Responsible Consumption and Production¹.

Having gone ‘zero to landfill’ in 2012, we’ve been working towards an aspirational goal to reuse or recycle 100% of our waste by 2017, as well as exploring fully ‘circular solutions’, in the longer term.

This document is our fourth edition, updated to reflect new solutions introduced over the past year or so, and better data. It’s accompanied by a series of videos and case studies which bring to life the collaborations at the heart of our programme.

All of these materials can be found on our Going Circular website at www.pwc.co.uk/goingcircular. We hope they’ll provide a useful resource for others looking to take a similar approach.



1. See page 4 of this document for more details.

Chapter 1: What do we mean by the 'circular economy'?

The 'circular economy' (see [Chart 1](#) on [page 2](#)) is a conceptual model used to underpin decision-making for sustainable development. It's intended to replace the existing, linear, 'take-make-dispose', global system of production and consumption, by which we extract resources (by mining or growing them), and then manufacture, transport and use products, before disposing of them. This system has been enabled by a century of declining commodity prices but is no longer viable.

First, the global population is set to rise from seven to almost ten billion by 2050, putting pressure on global stocks of raw materials. Second, the upstream stages of primary extraction and manufacturing often require large quantities of energy and water (known as embodied carbon and water) which could be avoided by using resources more efficiently. Third, traditional methods of waste management are not always well-regulated and can cause pollution, or – at least – lock materials away in landfill, where they are no longer available to the economy.

In contrast, the circular economy is driven by innovation and entrepreneurship. It involves change at each stage of the value chain:

- Improving extraction and production processes for greater efficiency, or switching to the use of alternative, renewable materials;
- Reducing consumption by, for example, encouraging consumers to buy products that are more durable, or moving away from products towards services (i.e. providing customers access to products when needed rather than having to own them): this shift is being enabled through new technology, and there are already established models for peer-to-peer accommodation, car sharing, and clothing rental via 'sharing' platforms¹;
- Moving to systems where products are repaired, refurbished, reused or remanufactured to give them a second-life; and
- Improving waste collection and recycling systems so that materials are recovered in a way that enables them to be put back into the economy as useful inputs.

1. <https://www.pwc.co.uk/issues/megatrends/collisions/sharingeconomy/outlook-for-the-sharing-economy-in-the-uk-2016.html>



Chart 1

'Going circular' explained

The circular economy is often depicted as a series of loops, each representing a different way of managing products that are no longer required by their owners (because they are damaged, defective, or simply unwanted). The loops represent a hierarchy. The closer to the centre the loop is, the less waste and environmental pollution created and the more economic value retained in the product or materials.

1. Recycling

Recovering materials from end-of-life products for use as raw materials in another process, excluding incineration to generate energy. May lead to materials of the same quality, lower quality (down-cycling) or higher quality (upcycling). For organic matter, may refer to composting or anaerobic digestion¹.

2. Remanufacturing

Disassembling products at the component level rather than into separate materials, replacing broken or out-dated parts to make a new product for sale or lease. This avoids a new product having to be manufactured.

3. Reuse

Selling or donating a product in its original form, or with little change, which avoids a new product having to be manufactured. May also include redistribution of unwanted food.

5. Redesign

Developing products that use fewer materials or have a smaller environmental footprint, that are designed to be more durable, or to be offered as a service through a leasing or take-back model. Also includes adaptations to make products easier to maintain, reuse, remanufacture or disassemble and recycle at end-of-life. Aims to tackle the most material impacts, based on lifecycle analysis.

4. Maintenance

Extending the life of a product with its first owner, either via a repair or refurbishment service, or by making it easier for users to repair it themselves. This delays the purchase of a replacement product.

1. Anaerobic digestion is a process whereby waste organic matter, such as food or garden waste, is converted into digestate (which can be used as a fertiliser on farmland) and biogas (which can be used to generate clean energy).



Chapter 2: Why ‘go circular’?

The circular economy requires a change in mindset towards ‘materials stewardship’, focusing on the protection and renewal of resources. It’s a timely concept, as it will not only help nations and businesses to improve their resource resilience, but will foster economic growth, and create new jobs. This is true globally, and also in the UK.

But why would PwC want to ‘go circular’? Well, there are four main reasons:

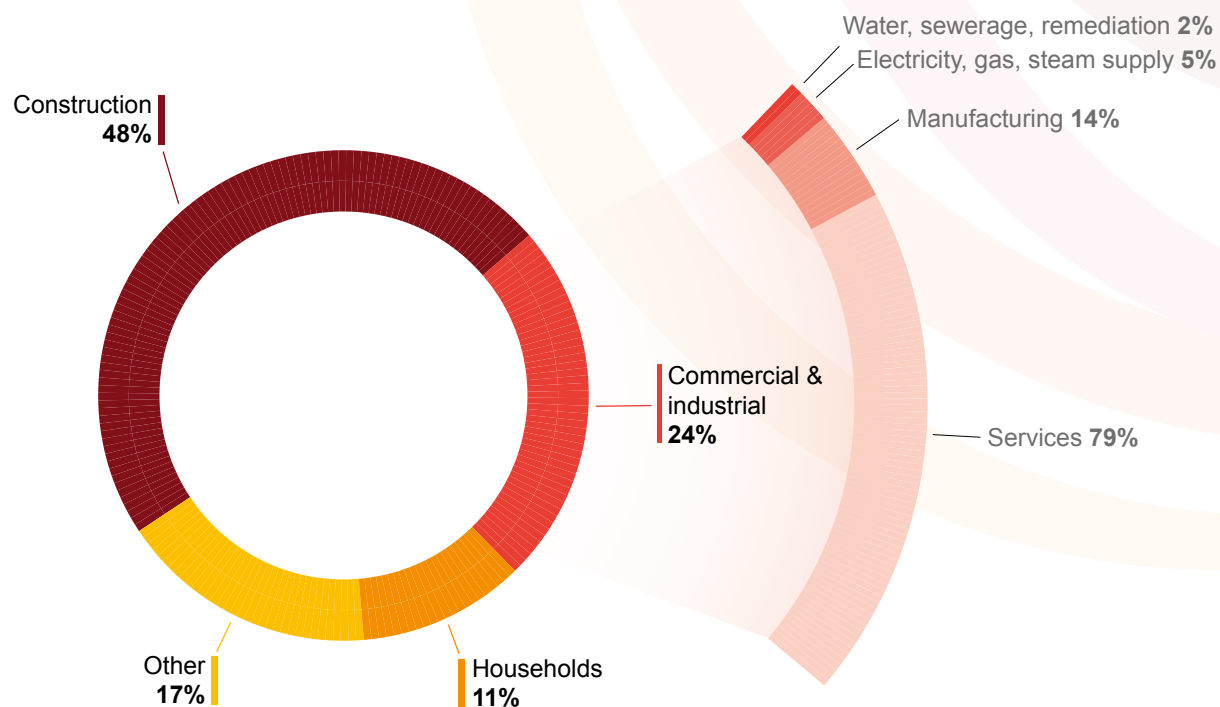
1. Walking the talk

The circular economy is a compelling vision of the future and an area where business can make a big impact. This means that it’s an opportunity for us. Our **Sustainability and Climate Change** practice includes experts who are helping several leading clients to innovate, adopting circular solutions by incorporating them into their business models and operational processes¹. Wherever possible, we try to apply the same best practice advice that we recommend to our clients to ourselves, and circular economy principles are no exception.

2. Delivering on our purpose

PwC’s purpose is ‘to build trust in society and solve important problems’. Carbon emissions, waste and water are important global issues so our 2013-2017 sustainability strategy included actions to reduce our negative impacts, both in our operations (as measured in our **sustainability scorecard**²) and in terms of our **total impact**³. It’s easy to assume that the majority of the UK’s waste emanates from households, when in fact that only represents 11% of the total, with businesses (commercial and industrial) accounting for another 24% and construction (much of which is commissioned by businesses) for 48% (see **Chart 2**). And, even though our sector – professional services – is itself resource-light, we procure products and services from companies with a bigger waste footprint. As a result, we’re able to influence considerable upstream impacts, and feel it’s important to play our part, pioneering new processes and contributing to new markets.

Chart 2
UK waste, by type (with commercial & industrial breakdown)



Source: Eurostat ‘Generation of waste by economic activity and hazardousness (2014)’ dataset

3. Stakeholder expectations

Our business depends on our people and our reputation, so it's important that we meet the expectations of our stakeholders, wherever possible. Our clients expect us to have high standards in relation to resources and waste, and our people, too, have strong views on the topic: waste is a visible and symbolic workplace issue, which they expect their employer to be tackling.

Business is also expected to play its part in achieving government environmental targets, whether at global, EU, UK or city level, while NGOs expect us – as a big business – to be doing our bit, too.

4. Contributing to the delivery of the Sustainable Development Goals

The **Sustainable Development Goals** are a set of 17 global goals, underpinned by 169 specific targets, and which were agreed in 2015 by 193 countries as being necessary, by 2030, if we are to achieve a thriving society in a thriving environment⁴.

Our **Going Circular** programme supports several of the goals, especially 'Responsible Consumption & Production', but also several others:

- **Goal 6:** Clean Water and Sanitation - target 6.4
- **Goal 8:** Decent Work and Economic Growth - target 8.4
- **Goal 11:** Sustainable Cities and Communities - target 11.6
- **Goal 12:** Responsible Consumption & Production - targets 12.2, 12.3, 12.5, 12.7 and 12.8
- **Goal 13:** Climate Action - target 13.3.

There is a growing expectation that business will help to deliver the global goals and, as a responsible business, we feel we should proactively support the transition to a circular economy.

“I want to do my bit for the environment, so it's important that I can recycle at work.”

Adam Blacklay, employee, PwC

“The circular economy has the potential to make a real difference to the delivery of the Sustainable Development Goals. I'd encourage many more companies to consider how they could adopt circular practices.”

Louise Scott, Director and SDG programme leader, PwC

1. www.pwc.com/circularbusiness.

2. www.pwc.co.uk/annualreport/assets/2017/pdf/pwc-uk-sustainability-performance-and-commitments-2017.pdf.

3. 'Total impact' refers to a methodology created by PwC to measure the impact on society, good or bad, by business operations or specific decisions. It includes economic, tax, environmental or social impacts. For more on the

methodology, see www.pwc.com/totalimpact. For PwC's own impacts, see www.pwc.co.uk/who-we-are/corporate-sustainability/valuing-our-total-impact.html.

4. For details of the goals and targets, and the implications for business, see www.pwc.com/gx/en/sustainability/publications/PwC-sdg-guide.pdf.

Chapter 3: Where we've come from and where we're going

Our work on materials and waste is progressive, and we're evolving our approach over three successive stages as we pilot new solutions and build momentum (See [Chart 3](#)).

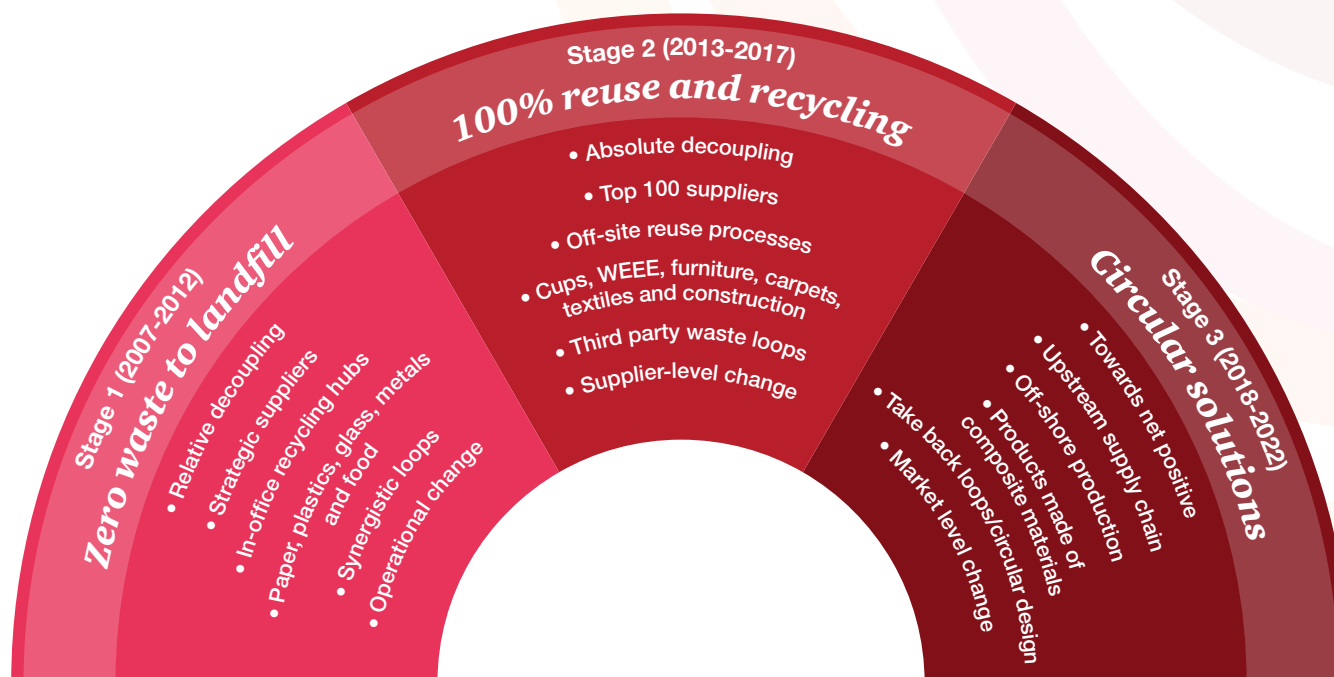
Stage 1 – Zero waste to landfill

2007-2012 was the period in which we first made waste a real focus area in our sustainability programme. We were unsure what was possible, so set targets to reduce our waste and consumption that were relative to our size, and focused on changes to our 'practice floors' – i.e. the main areas of our offices where all our people work, both internal and client-facing. Removing desk-side bins, we implemented recycling hubs with segregated waste streams, which forced our people to separate out paper, plastics, metals, glass and – later – **food waste** (see photo on [page 6](#)). Our primary goal was 'zero waste to landfill'¹ which we achieved in June 2012, having collaborated with our national waste management provider, **Suez**, to source appropriate waste collection and recycling services for all of our c. 30 offices in the UK. We also worked with them to improve our methods for estimating waste volumes and weights, improving our measurement and reporting.

We established a 'waste to energy' solution for materials that couldn't be recycled. We also tested a couple of 'loops', working with suppliers to convert our archive paper into hand-towels for use in our washrooms, and to refine the used cooking oil from our on-site restaurants to **make biofuel** that we can burn in our tri-generators to generate heating, cooling and power for our buildings².

We shared the lessons from this stage, including the cost savings and tips for overcoming the challenges we experienced, in a previous Lessons Learned document, available on our [website](#)³.

Chart 3
Our three-stage approach to the circular economy



Stage 2 – 100% reuse and recycling

In 2012, we reset our ambitions and goals. With the confidence that came from our successes of the first five years we moved to absolute decoupling of our growth and our impacts – setting targets to reduce our material consumption (e.g. paper, water) and our waste generation by 50% versus our 2007 baseline. We also set a new, aspirational goal to achieve 100% recycling of our operational waste⁴ – a target designed to encourage us to think differently about our operations, and set about finding solutions for the outstanding waste streams.

In parallel, we expanded our work on waste with our suppliers, by engaging the top 100 or so as part of our overall supply chain sustainability programme. We're encouraging them to help us find better reuse and recycling solutions: as our 'Going Circular' videos show, this often requires collaboration across multiple parties.

The next chapter of this document sets out what we've achieved in the last five years, and what we've learned as a result.



Segregated waste recycling hub

Stage 3 – Fully circular business

Even before we reached 2017, however, we started looking ahead to the next stage of our resources strategy. We envisage that it will take a further five years to achieve our long-term aspiration to set up fully circular solutions, engaging with suppliers to comprehensively tackle upstream impacts and identify sustainable designs that can complement or supplant our current, end-of-pipe solutions.

But, we've already put the foundations of this in place, identifying the main opportunities for **circular procurement** in our business, in accordance with the PwC **Circular Business Model Transformation methodology**. We spent some time creating a definition of what we mean by a 'circular product' and reviewed our current purchasing to create a baseline. In fact, we were surprised to find more solutions already in place than we originally imagined. But, with a desire to increase the number of circular products deployed in our business, we also included circular economy requirements in relevant supplier evaluation and selection processes, as contracts came round for renewal, to identify and appoint partners who can help create sustainable solutions even if they are not yet available in the market.

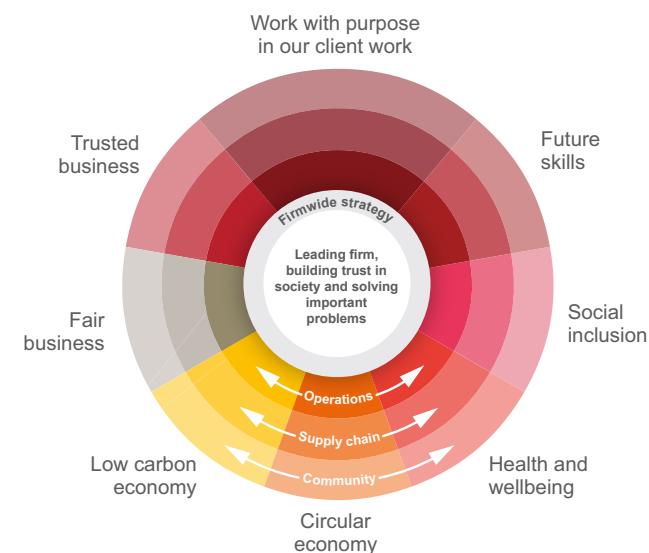
Moreover, as the principles of the circular economy have helped us see our business through a new lens, we realised that we could extend our influence even further, encouraging circularity in other ways. As a result, we're now also encouraging **circular lifestyles** amongst our employees, and **supporting circular start-ups** through our community volunteering. And, with a rolling real estate renewal programme to support the growth of our business, we've been exploring how we can continue to pioneer **circular buildings**.

This new level of ambition is reflected in the fact that we've made the circular economy one of eight priorities for our 2018-2022 **Responsible Business strategy**⁵ (see **Chart 4**, right).

More details about all these areas are provided later in this report (see **Chapter 6**).

Chart 4

Our 2018-2022 Responsible Business Framework



1. Hub waste and waste from on-site catering facilities only.
2. For more on this innovative collaboration, see our video: bit.ly/biofuelGC.
3. Lessons learned - Zero waste to landfill: towards 100% recycling. www.pwc.co.uk/assets/pdf/lessons-learned-zero-waste-to-landfill-2012.pdf.
4. Hub, on site catering, archive paper and IT waste.
5. www.pwc.co.uk/who-we-are/annual-report/annual-report-corporate-impact.html#new-sustainability-strategy.

Chapter 4: Our stage two story – what we achieved

Driving waste down, recycling up

Over the past five years, we've taken further steps to reduce our waste and increase our recycling. We finished the rollout of centralised, multifunctional devices for printing, copying and scanning, to replace desk-side printers. With secure printing and a default, double-sided print setting, this has been one of the major contributors to reducing our paper consumption by 64% since our baseline year of 2007 (exceeding our target of 50%), and avoiding costs of c. £4m.

Overall, we've significantly reduced our waste versus ten years ago. We set a target to halve the waste reported in our [sustainability scorecard](#)² by 2017, and have almost achieved it, with a reduction of 46%.

We've also significantly increased our recycling rate. Because wax cups¹ used for hot drinks by our staff during the day were a large percentage of our non-recycled hub waste, we'd already found a recycling solution for those generated in our largest offices during stage one of our Going Circular programme, sending them off to be used in the making of building materials. More recently, however, we decided to replace all the cups and food packaging issued by our on-site hospitality supplier with compostable alternatives, so that they can be sent for in-vessel composting or [anaerobic digestion](#) wherever we can, along with any waste food. This, together with programmes to reuse old furniture, has helped increase the proportion of our total waste that is reused or recycled. It now stands at 91% (see [Table 1 on page 13](#))³.

But some items remain challenging. There's no mainstream market solution for composite food packaging – from external food retailers and eateries near our offices, for example – yet this now represents a large part of the waste we send to incineration. Meanwhile, stationery items such as staplers and hole punchers, although durable, cannot be easily recycled if they eventually break, because they're made from multiple

materials and cannot easily be disassembled. We're trialling solutions to both, with [Terracycle](#).

Taking stock

Mid-way through stage two, we took stock to check we were on track and interviewed key groups - internal and external - to refresh our understanding of what stakeholders expected.

We conducted research amongst our people to understand their perceptions of PwC's current waste management, and their expectations of the firm, as well as identifying barriers to behaviours that would help us achieve our goals. A couple of lunchtimes stopping people on the way out of the work restaurant and a simple set of survey questions yielded interesting findings that have helped shape an employee campaign (see [Let's talk rubbish on page 8](#)) which has helped us improve segregation of recyclable materials and drive down the volume of items sent to incineration by 76%.

Meanwhile, interviews with around a dozen clients, waste experts and NGOs reminded us that our business is associated with items beyond our hub waste. It's why we extended the scope of our programme to cover all our waste categories including our electronic goods such as PCs, laptops, and mobiles, and the furniture and carpets used in our offices (see [Table 1 on page 13](#)). Uniforms worn by suppliers providing services on our sites were also included, in light of the priority being placed on textiles in EU and UK circular economy plans. Our discussions also caused us to expand our horizon to assess the waste impact of our construction projects.

Filling the gaps

Subsequently, we interviewed various managers around our business – in the facilities, real estate and IT teams – to gather more information about this non-hub waste.

We already had good practices established in nearly every area, although data had not always been systematically captured. So, we set about collating figures for all our non-hub waste. Where actual data was not available, we estimated the number of units disposed of and weighed items, to be able to aggregate volumes and establish an approximate annual tonnage (see [Chart 5 on page 12](#)).

We were also able to confirm that, when it comes to treating items at end-of-life, our service owners in the business have well-established processes, ensuring that as many items as possible are reused, and residual items are disassembled to recover all the materials. Sometimes – such as for our [IT waste](#) – specialist organisations had been identified and were providing a reuse and recovery service. In yet other areas – such as our office carpets – we were sending old products to a take-back scheme which cleans and resells as much as it can. In other cases – such as [our furniture](#) – an employee had been given responsibility for distributing items to charities as part of their job, supported by the Community Affairs team which runs a 'furniture exchange' programme, offering items to social enterprises in the PwC Social Entrepreneurs' Club. Indeed, this area of the business has more recently taken bold steps to reduce the amount of new furniture we need in the first place, by working with the provider to refurbish task chairs and extend their life within our business. Or, if we can no longer use them, they are sold back for remanufacturing - to extend their life with other companies (see [Sitting pretty inset on page 11](#)).

One of the few areas where we found we did not have a circular solution in place was the [uniforms](#) worn by suppliers' staff in our offices. Disposal of corporate workwear items was left to the individuals who wore them, via municipal waste collection systems. We've now engaged the suppliers in question to establish a take-back scheme, so that old items are returned when new uniforms are issued, to maximise reuse and value retention (see [Textile take-back inset on page 9](#)).

Finally, we also looked at what happened to waste generated during our large-scale real estate projects such as our completely new office at London Bridge, and the refit of our existing headquarters at Charing Cross. We decided to treat the waste from construction as project-based rather than as 'business as usual' (i.e. ongoing waste), due to the fact that the schedule of building works is ad hoc. Nevertheless we still view it as our responsibility to influence any construction we commission and encourage the highest standards possible (see [Circular buildings inset on page 10](#)).

Let's talk rubbish

Our people have an inherent interest in waste and recycling, and want to do the right thing, but are often confused about how to dispose of particular items. In early 2016, we launched a campaign – 'Let's Talk Rubbish' – to tackle this confusion, by engaging our people in a dialogue about waste, and clarifying the right way to dispose of rubbish in our offices.

For example, our research had shown that, when busy, people sometimes 'bundle' waste items inside one another and then put the whole lot into the 'waste to energy' bin. So, we gave a bag of mixed rubbish a personality, naming it 'Bertie Bundle', to raise awareness of the fact that this behaviour prevents us from recycling the individual items.

In a similar vein, we found that people do not realise that leaving food on packaging contaminates 'dry' recycling, and prevents food being recycled. So, we created a 'Larry Leftovers' character, and asked people to give him a 'new lease of life' by scraping food off their packaging at the end of their meal.

We used the same concept to raise awareness of our new lightweighted, compostable coffee cups and how to dispose of them, by creating a 'Verity Vegware' character. (The cups themselves feature a space for individuals to write their name, so they can use the same cup multiple times a day, further reducing the volume we need).

Tackling waste behaviours in this fun, light-hearted way has been well-received and has helped us progress towards our reuse and recycling goal. This year we reached an all time high of 91% (see [Table 1](#) on [page 13](#)).

Let's talk rubbish



Perplexed by packaging?
Flummoxed by food waste?
Confused by compostable cutlery?

Join the new conversation about our waste.

Search Spark places for 'Let's talk rubbish'.



Say bye-bye to Bertie Bundle

When you're juggling waste on the way to the bins, Bertie Bundle lends a hand to carry your rubbish.

But Bertie needs sorting out. Just a few items in the wrong bin could mean the whole lot can't be recycled. And, putting recyclable packaging in the 'waste to energy' bin sends resources that could have been turned into new products up in smoke.

So, make sure you bid Bertie farewell, and sort your rubbish when you get to the bins.

To find out more, and join the conversation about our waste, search Spark places for 'Let's Talk Rubbish'.

Give Larry Leftovers a new lease of life

Sometimes, there's no way of avoiding Larry Leftovers.

But next time you're left with more than a smear or a smudge, take a few seconds to scrape unwanted food into the food waste bin. That way, it can be recycled into fertiliser, so today's leftovers can help grow tomorrow's lunch.

To find out more, and join the conversation about our waste, search Spark places for 'Let's Talk Rubbish'.



All change for Verity Vegware

Meet Verity Vegware. She's made from compostable materials, so she's got a much smaller carbon footprint than our old, plastic-lined 'wax cups'. Verity's also now thinner, which means she uses fewer resources.

Make sure you pop Verity – and any other Vegware items – into the compostables bin, so they can be recycled into fertiliser.

Non-compostable cups from outside the office should still go in the waste to energy bin, though.

To find out more about Verity, or to join the conversation about our waste, search Spark places for 'Let's Talk Rubbish'.

Our non-hub waste mapping exercise was conducted by a full time individual from the sustainability team, over several months, and allowed us to see the relative size of each **waste stream** and to conclude that we had a good **solution** in place for most of our material items.

Sharing our switching stories

A lot of people asked us about our experience of switching to better end-of-life treatment and it seemed that it was the practical things that mattered. Who do you partner with? Where do you send it? How have you set up the processes?

We decided to create a series of videos that 'follow' our waste and tell the story of what happens to it via the people involved - our suppliers, the people treating it and the people ultimately receiving the recycled materials. We made the videos available to anyone via a dedicated website (www.pwc.co.uk/goingcircular) and we also started working with **Business in the Community** (BitC) to encourage other companies to take action. In fact, the breadth and depth of our Going Circular programme, together with the figures showing the importance of waste arising from the services sector, grew into a major new programme. Called '**Circular Office**', this aims to accelerate the transition to the circular economy by creating circular office champions⁴.

Textile take-back

We have six suppliers that provide services – such as catering, security, hospitality, cleaning, etc. – in our offices. Together, they employ around 675 non-PwC people to work in our buildings, most of whom are issued with uniforms, on our behalf, by their employers. We estimate that this accounts for some 3,300 items of clothing every year, weighing just under one tonne. So, we approached these suppliers to ask them if they would be willing to collaborate on a simple '**take-back system**' so we could gather up old uniforms, and find better, more circular, end-of -life destinations for them.

All were receptive and we've already piloted this new system with three of them, taking back more than 550 items and sending them to a specialist textile recycling company in the Midlands, where they are assessed and categorised according to their condition.

Items in good condition are sent overseas for resale; those that are damaged have cuffs, pockets, etc. removed and are cut into large pieces that can be sold as industrial rags; smaller or damaged pieces of fabric are shredded and become an input to make other products, such as the sound insulation used in the bodies of cars. In addition, buttons and zips are removed and sold for use in clothes manufacturing in Pakistan.

Over the past two years, we've learnt that just over 20% of our items can be reused in their original state. Around 60% can be reused as rags. Approximately 20% have to be shredded. All can be used for some other market, reducing environmental impacts by eliminating the need for virgin materials. Moreover, we assessed all the returned items to glean insight about why they can no longer be worn but what we discovered is that there were no specific product 'failures' and instead the uniforms needed replacing due to general wear

and tear. On the other hand, we realised that integral logos mean uniforms can't be reused. As a next step, therefore, we're working with suppliers to see if we can change to logos that can be easily removed, and aiming to approach the original manufacturers to see if they can adapt their designs to give the items more durability.

The suppliers' employees who were affected by the new scheme were happy to bring their old uniforms back in, feeling that it was the right thing to do for the environment. And, we used the opportunity to provide them with a leaflet on caring for their new uniform, which encouraged them to wash at 30 degrees and to dry on a line (rather than tumble drying), to help reduce the clothes' in-use environmental impacts. It also gave them tips on how to ensure their uniform stays smart for as long as possible.



We reuse or recycle supplier uniforms

1. 'Wax cups' is the generic term used internally to refer to plastic-lined paper cups.
2. www.pwc.co.uk/annualreport/assets/2017/pdf/pwc-uk-sustainability-performance-and-commitments-2017.pdf.
3. This is the percentage reported in our sustainability scorecard (77%), which includes assured data and therefore represents our hub, catering, electronic and paper waste streams only. Our Total Waste includes other materials, as set out on in [Table 1](#) on page 13.
4. environment.bitc.org.uk/smart-resources/what-is-a-circular-office.

Circular buildings

With c. 30 offices across the UK, we have a great opportunity to make a sizeable difference by adopting circular principles in the design of our buildings. It's also important to us because construction waste – albeit intermittent – is one of our largest waste streams. So many years ago, we set ourselves the goal of achieving the highest possible ratings for our buildings as defined by **BREEAM**, a leading sustainability assessment method for buildings. Our approach to material use and waste is a big part of this, alongside other criteria such as minimising energy use, maximising renewables use and improving health and wellbeing.

For new buildings, we look to get involved in the project as early as possible so that we can influence the design, including the building's sustainability features. This approach has enabled us to achieve a string of 'firsts': the UK's first 'outstanding' rating for a new build at 7 More London, the first for a retrofit at our headquarters, Embankment Place and, this year, we helped achieve the first 'outstanding' multi-tenanted office building at Central Square, Leeds (see image, right) which houses one of our main regional practices.

First and foremost we seek to ensure that the buildings will last, as demolition generates huge amounts of waste and construction requires large quantities of materials. So we create our offices in a modular way that allows us to reconfigure floor space easily as our business evolves and grows. We also focus on using materials with low environmental impact during construction, including recycled materials, wherever we can. In our More London office, for example, we adapted the steel structure in the building so we could use over 80% recycled aggregate for the concrete, reducing our use of virgin materials and our carbon footprint.

But beyond the building's shell and core, some of the real progress we've made in adopting circular thinking is during the fit-out phase of our real estate projects. We challenge our contractors and suppliers to consider how they can apply circular thinking to our buildings, such as minimising the materials they use, reducing packaging and waste generated on site, and reusing or recycling materials that are left over.

Prefabrication

Prefabrication helps improve production efficiency and allows waste materials to be reused in the factory. It also means we transport fewer materials and generate less waste on site. Some of our toilet and shower facilities were made in Scotland in this way, with all services incorporated into a pod before shipment. Other suppliers have pre-fabricated or pre-cut less complex materials – such as plasterboard ceilings, audio-visual cables, curtain tracks, raised access floor panels, aluminium studwork and lighting trays and brackets.

Minimising product waste

Pre-planning how materials are handled and used on site helps minimise waste. Both plasterboard and insulation offcuts, for instance, were designed to be used in other specific parts of the building. For some of the more fragile materials used in our buildings, we use a 'just in time' delivery approach to minimise the risk of damage on site. This has been important for kitchens, as well as drywall partitions.

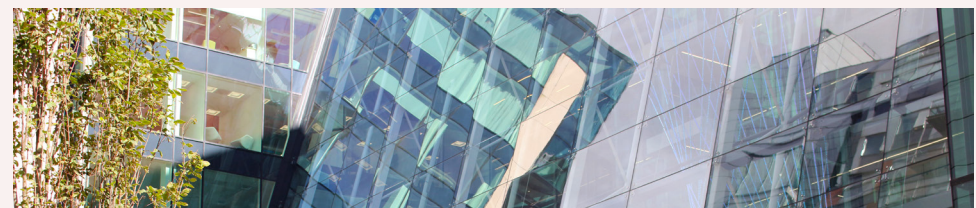
Minimising and reusing packaging

One of the largest sources of fit-out waste can be the packaging which protects the materials arriving on site so we've used a variety of techniques to tackle this. Lighting suppliers greatly reduced their packaging by adopting reusable solutions. Joiners used packaging selectively – more for high value items, and corner-protection only for lower value goods. In both cases, the cardboard was taken back for reuse in future deliveries. Another technique was to choose container sizes which minimised packaging waste e.g. 500mm electrical cable drums instead of the standard 100mm or 200mm ones, or paint in large, 25 litre tins.

Recycling waste

For waste that is generated on site, we encouraged suppliers to recycle their own materials, where possible. Carpet offcuts, for instance, have been taken back to the manufacturer to be recycled. One metal piping supplier sent all its off-cuts to a prefabrication plant in the UK to be used for future projects, and all of its piping shrink wrap to a dedicated recycling facility. And a plasterboard supplier placed dedicated, lockable plasterboard bins on site to prevent contamination of their waste so that it could be correctly recycled. Suppliers also weighed their waste on-site to track their performance.

Many of these initiatives have been quite straightforward, but setting our requirements early in projects allows us to significantly reduce our material use and waste. For our largest two buildings, More London and Embankment Place, for instance, we succeeded in reducing our fit-out waste to nearly half that of leading practice, and diverted virtually all (97%) of our waste from landfill.



Sitting pretty

Musical chairs, anyone?

As a professional services company our people mostly work in office environments. Of course, we want them to be productive so we provide them with effective workspaces and comfortable task chairs. And, with over 19,000 people across the UK, we need a lot of chairs.

One of the ways we minimise this is by 'hotelling', a system in which our people only book a space when they need it. Since they can sit wherever they like, we select chairs which can be easily adjusted to suit all body shapes. We also choose high quality products that are designed to last over a decade, so we don't need to replace them very often.

Orangebox's G64 task chair is one such example, which we've been buying since 2001.

Refurbishment - another ten years' life

Eventually, however, the chairs do get worn or damaged. But when this happened a few years ago, instead of throwing them away, we partnered with Orangebox to refurbish them for reuse in our offices. In 2013, Orangebox audited and refurbished 2,000 of our G64 chairs onsite in our London Hays Galleria office. They replaced cushions, arms and backs, as needed, giving the chairs another ten years' use. Later, in 2014, they refurbished another 700 of our G64 chairs in a similar way, to be redeployed to our Belfast office for a second life.

Now part of our ongoing buildings management, this approach significantly reduces our environmental footprint, as we're buying and disposing of far fewer materials and any old or broken parts are recycled, with none sent to landfill: the cushions, for example, are sent to a UK company which recycles them into reconstituted foam, whilst the plastic backs are sent to a local business which granulates and reuses the material.

Refurbishing our chairs has significant financial benefits, too. Typically it costs a third of the price of a new chair to refurbish one. In fact, many of our chairs were in good condition and didn't need much work, keeping the cost even lower.

Remanufacturing – as good as new

More recently, however, we had around 650 chairs from our Leeds, Southampton and Aberdeen offices that we no longer needed. We worked with Orangebox, who remanufactured them for resale. As with refurbishment, parts were reused where possible and replaced where necessary. The chair mechanisms were fully cleaned and greased, and the chair bases resprayed, restoring the chairs to a tip-top standard where

they couldn't be distinguished from a new one so they could be resold, with a warranty – including Swansea Council for their new offices.

According to FIRA, an independent third party consultancy that specialises in carbon footprinting and life cycle analysis, a remanufactured G64 chair has a carbon footprint that is 61% less than a new one (20 kg CO₂e versus 52 kg CO₂e respectively). And you can save about 40% of the cost of a new G64 by buying a remanufactured one, too.

We're proud of what we've achieved with the G64 chair and, going forward, continue to work with our suppliers, adopting their latest generation of task chairs, as part of our commitment to procure products designed for circularity (see [page 20](#)).

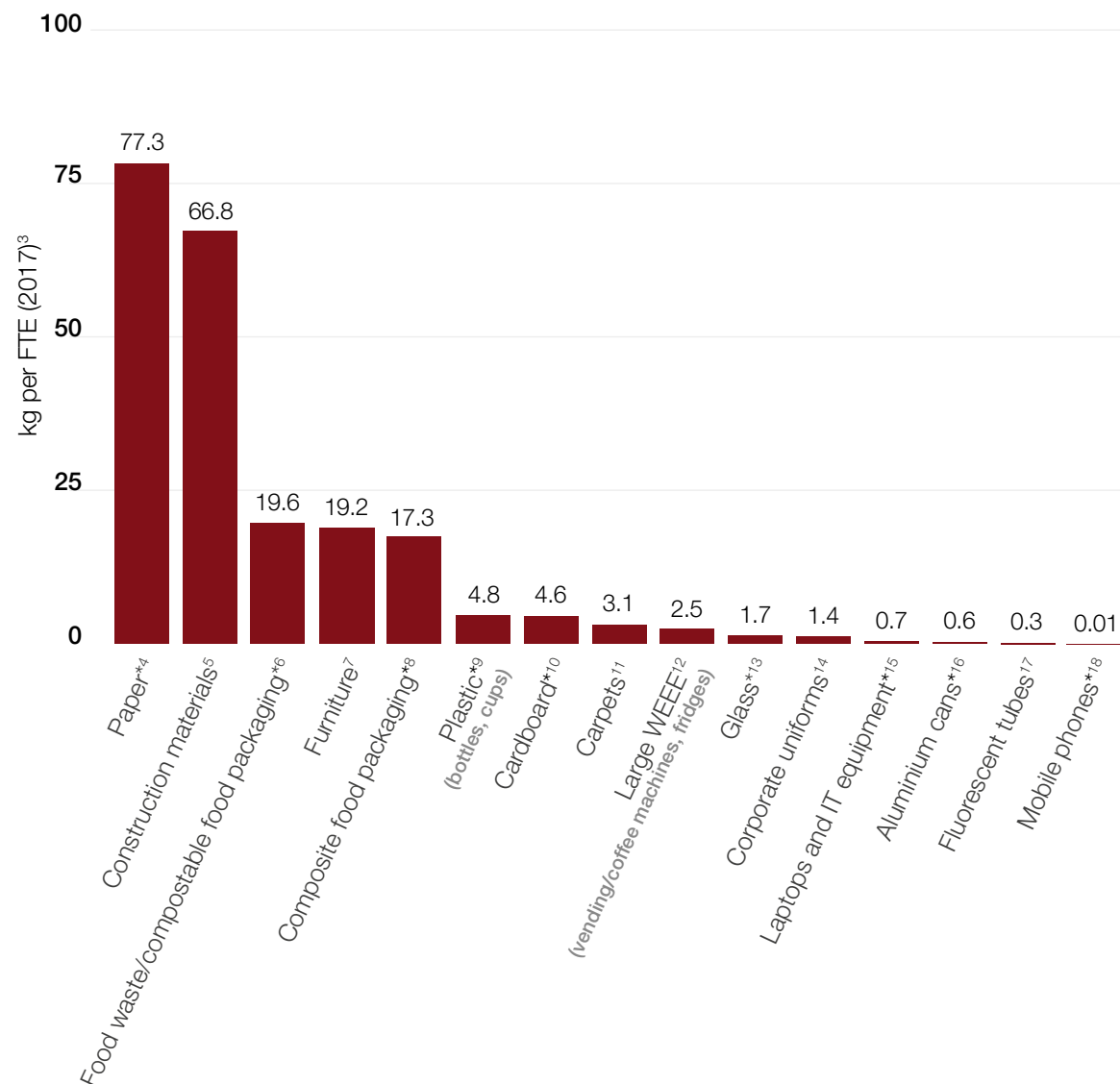
“We're passionate about designing circular thinking into our products & PwC have helped us to make this a reality, leading the way on refurbishing and remanufacturing their old G64 task chairs.”

*Gareth Banks, Senior Designer,
Orangebox*



We use task chairs designed for circularity, helping to save money and the planet

Chart 5
 Kg per full time equivalent (FTE) by waste stream^{1,2}



1. Includes combination of waste measured and assured (indicated with*) as part of our sustainability reporting each year (www.pwc.co.uk/who-we-are/annual-report/annual-report-corporate-impact.html), as well as other waste which is currently estimated only, using the best, most recent data available.
2. FTE relates to PwC employees, except for figures relating to corporate uniforms, for which it relates to the FTE of suppliers' employees working on PwC sites.
3. Annualised estimates used where 2017 data not available or unrepresentative (construction materials, furniture, large WEEE, carpets and corporate uniforms).
4. Includes shredded paper from offices and archive files. Volume has been reduced by move to multifunctional devices. May be higher for organisations who have not put such programmes in place.
5. Includes gypsum, metals, wood, packaging, general waste etc. Multi-year real estate programme underway in period in question. Figure represents annualised quantity as at end year five. May be lower for organisations with no renewals.
6. Includes food waste from onsite restaurants/cafes, and post-consumer food waste from meals purchased offsite and eaten in offices.
7. Includes desks, chairs, cabinets. Driven largely by rolling, multi-year office renewal and rebranding programme. May be lower for organisations where furniture is only being replaced when broken.
8. Items disposed of in our 'waste to energy' bins. In large part comprises composite consumer food packaging from external eateries.
9. Mostly PET bottles, some single-material plastic food packaging, and cups from vending machines.
10. Includes packaging for products used to run our buildings, and post-consumer packaging from e-commerce deliveries to staff at office sites. May be lower if organisation policy does not allow personal deliveries.
11. Some correlation with significant office moves. May be lower for organisations where carpet is only being replaced when worn out or other flooring materials are used.
12. Offices have coffee machines, vending machines and fridges on all floors and data pertain to period of significant asset renewal. May be lower for organisations without this facility within their buildings or for whom the equipment is earlier in its serviceable life.
13. Primarily post in-office hospitality events (e.g. bottled drinks) and packaging from ingredients used in on-site catering facilities.
14. Uniforms for suppliers providing security, welcome, facilities, catering, cleaning and other services on site. Includes footwear, issued to 30% of people with uniforms. Take-back pilots underway.
15. Includes laptops, PCs, and all peripherals as well as servers. Renewals for laptops every 2 - 3 years. Other organisations may find volumes are higher or lower if their replacement programme has different schedule.
16. Drinks purchased on site or at external retailers.
17. We also disposed of 960kg of other hazardous waste in FY17, including used cleaning bottles and aerosols. These were disposed of in line with the best practice available.
18. Programme to issue phones to all members of staff has only recently been initiated, so organisations which already do this may have higher volumes.

* Denotes assured data.

“Our Going Circular programme is all about showing what’s possible – by any business.”

*Bridget Jackson,
 Director of Corporate
 Sustainability, PwC*

Table 1
 Waste quantity (tonnes) and designated treatment¹

Waste category	Total tonnes (annual, estimated) ²	Percentage reused	Percentage recycled	Percentage incinerated	Percentage sent to landfill
Paper*	1,487	-	100%	-	-
Construction materials	1,285	-	97%	-	3%
Food waste/compostable food packaging*	378	-	c. 100% ³	-	-
Furniture	370	95%	5%	<1%	-
Composite food packaging*	333	-	-	100%	-
Plastic (bottles, cups)*	93	-	100%	-	-
Cardboard*	89	-	100%	-	-
Carpets	60	-	98% ⁴	-	2%
Large WEEE (vending machines, coffee machines, fridges)	48	99%	1%	-	-
Glass*	33	-	100%	-	-
Laptops and IT equipment*	14	50% ⁵	50%	-	-
Aluminium cans*	11	-	100%	-	-
Fluorescent tubes	5	-	100%	-	-
Corporate uniforms	1.0	n/a ⁶	n/a	n/a	n/a
Mobile phones*	0.1	37%	63%	-	-
Total	4,208	10%	82%	8%	1%

1. Some rows may not sum to 100% due to rounding.

2. See note 1 to Chart 5 on page 12.

3. Sent for recycling via a mix of composting and anaerobic digestion, depending on local solution availability. Reviewing and optimising facilities used to ensure compostables are treated in the best possible way. Facilities unavailable for two very small offices, resulting in c. 0.5% being sent direct to incineration with energy recovery.

4. Treatment in line with maximising value and minimising environmental impact. Where split across reuse/recycling is currently unknown, recorded as recycled on a conservative basis.

5. Laptops - 80% reused. Other IT equipment - 41% reused.

6. Pilots imply c. 20% reuse of whole items, c. 60% recycled as industrial rags, and c. 20% shredded and downcycled. Figures will be updated once take-back system rolled out to all suppliers and actual, annual figures are available. Figures based on PwC assessment at time of collection, using the same classification as the textiles recycler, as data on actual end destination not available.

* Denotes assured data.

Chapter 5: Triple bottom line benefits

Lots of companies are interested in the circular economy, but are unsure where to start, or how to build a business case for action. Over the past year, therefore, we've revisited our programme to both pull out financial cost-benefit information and to estimate the carbon savings associated with the initiatives we've put in place so far. As a result, we now have a lot more insight on the benefits of 'going circular', which we've set out in the rest of this section.

There are multiple benefits to be had from making changes to material and waste practices in line with circular economy principles. The idea originally came from sustainability groups concerned about a growing global population and the need to reduce the negative environmental impacts associated with increasing levels of consumption. But, as the idea has been further explored, it's become clear that it also maintains goods at a higher value in the economy (enhancing GDP), and can deliver financial benefits to the businesses adopting its principles, through resource efficiency or innovation. Moreover, many circular solutions generate additional social value, by providing incremental jobs - for example in reuse or recycling. The circular economy, then, is a concept that really does have triple bottom line benefits.

Reducing materials consumption, water use and carbon emissions

It's also attractive because the environmental impacts are three-fold: first, the circular economy keeps raw materials in circulation, and maximises their utilisation; second, it reduces the energy required for upstream processes to source raw materials, and manufacture goods, which – in turn – obviates the associated greenhouse gases; and, it reduces the need for water in the same, upstream processes.

Disposal switches – a key transition step

In the long term, the circular economy will require new business models - for example, with more products being leased or shared. But, many benefits can be derived even with simple changes to end-of-life treatments. If the majority of

businesses were to adopt such 'disposal switches', they could, together, make a step-change in material recovery and reuse, and build a better foundation for the more visionary elements of the circular economy. Moreover, their understanding about the challenges relating to better end-of-life treatment could also inform upstream procurement policies, with insight on how products should be designed for reuse, remanufacturing, disassembly, or recovery. Thus, they could have a profound influence over whole supply chains.

No-cost solutions

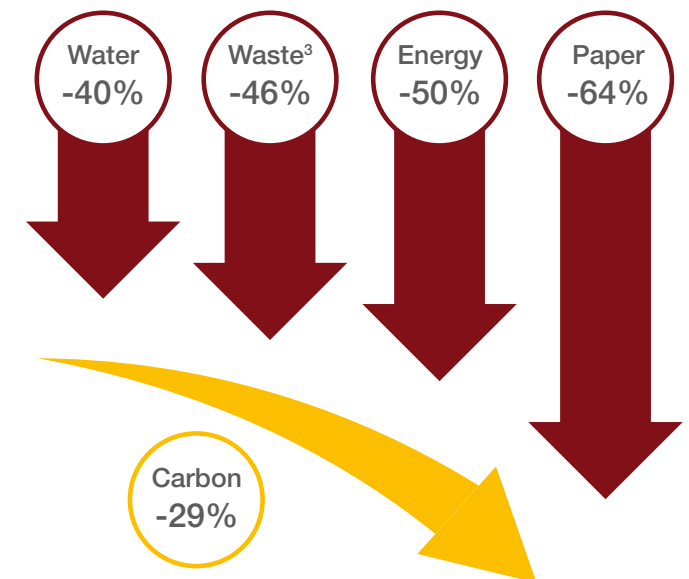
Our experience, at PwC, is that disposal switches can generate revenues and reduce business costs, as well as provide significant environmental benefits.

The most striking of these is the revenue-generating opportunity from refurbishing and reselling old laptops and mobile phones: we use a best-practice, approved treatment facility with strong environmental credentials instead of a basic WEEE-compliant facility, thereby achieving up to 80% reuse. We estimate that we raise between £50-75 per person per year through reuse of our laptops, and between £20-50 for our smartphones (see [Table 2](#) on [page 16](#) for key assumptions).

Whilst other end-of-life materials do not command such high prices, they still offer modest cost savings, or 'no-cost solutions'. By diverting waste that would attract considerable gate fees¹ if sent to landfill (£107 per tonne, including landfill tax²) or incineration (£83 per tonne), reuse and recycling frees up funds that can easily cover any costs to set them up.

For example, donating our unwanted office furniture to other organisations avoided 80% of the associated landfill costs. We try to find a new home for our furniture within 10 miles of our offices. However, even if we had to transport furniture 20-100 miles to get it to its new home, we estimate that we would still make a net cost saving of £1-2 per person per annum (see [Chart 1](#) on [page 2](#) and [Table 2](#) on [page 16](#) for our volumes and treatment ratios). Similarly, sending our food waste to composting (for which gate fees

Chart 6
Our ten year results



are typically £46 per tonne) and anaerobic digestion (AD) (c. £29 per tonne) instead of landfill reduces costs by around 35%, with a positive cash impact of c. £1 per head, per year. Switching from standard, plastic-lined coffee cups to compostable alternatives (provided for beverages our people drink throughout the day) was cost neutral, whilst sending them to composting or AD instead of incineration creates a 40% cost reduction (c. 10-15p per person, per year).

The only material, so far, which has been more expensive to reuse and recycle is corporate uniforms, which we estimate cost us 5-15 pence per head per year, even though the textile recycling service is free. This is due to the costs of transporting the old uniforms to the recycler, and the fact that there is no offset through reduced landfill, as the uniforms were previously disposed of by our suppliers' employees. We feel that this is a small price to pay to know that uniforms carrying our brand are being securely and responsibly disposed of.

Whilst these numbers are only estimates, and will vary from organisation to organisation, we wanted to share our most up-to-date insight into the cost-benefit of such ‘disposal switches’ to help other businesses looking to move towards circular economy principles. More details, including key assumptions in each case are set out in [Table 2 on page 16](#), which we hope will help people to create strong business cases for reuse and recycling of their own waste streams. Overall, we believe our results show cost should not be a barrier to better reuse and recycling.

Environmental benefits for society

We not only wanted to understand the financial implications of better waste management, but we also wanted to get a sense of how much better our ‘disposal switches’ were for the environment, all other things being equal i.e. assuming that no changes are made to the design, manufacture or in-use aspects of any products, at this stage.

We analysed the impact on the greenhouse gases associated with ‘end-of-life waste treatment’, based on Defra’s conversion factors⁴ but – due to the emphasis on material consumption choices in carbon measurement – this only made incremental improvements to our own, operational carbon footprint. That’s not to say that there are no climate benefits from better reuse and recycling. Far from it. Rather, the benefits are made on behalf of society, by obviating the need for new items made of virgin materials, and purchased by another organisation. And on that basis, our analysis shows that the overall carbon savings from ‘disposal switching’ are considerable – ranging between 20% and 110%⁵ (see [Table 2 on page 16](#)). Reuse of laptops and smartphones, for example, can reduce associated carbon emissions by more than 90%, whilst recycling of food waste is net positive. Reusing office furniture can cut emissions by 60%, whilst a switch to eco-friendly coffee cups delivers 50% saving, and even recycling old uniforms can cut carbon by nearly 20%.

Given that it costs next to nothing to make such changes, or can even generate a positive cash flow, we feel that these simple, end-of-life improvements are well worth the effort to set up.

Social benefits

In addition to the financial and environmental benefits of ‘going circular’, we found that many of our solutions create social value, too, providing valuable resources to charities that might otherwise not be able to afford them, in a period when government funding is being cut. One such example is shared in our ‘[Old furniture, new home](#)’ video story, which shows how our office desks were remanufactured for use in the Meningitis Research Foundation’s new offices⁶.

Or, circular solutions can provide employment to disadvantaged or hard-to-reach groups. For example, our IT waste refurbishment provides work experience to offenders, with training that leads to an NVQ, helping them get back on their feet and reducing reoffending rates once they leave prison (see our video story, ‘[Restart, refresh, reuse](#)’ for more details⁷).

With such a broad range of benefits, businesses should consider all three categories when shaping their waste management strategies, as it may be possible to collaborate across different departments, drawing on different budgets to get a holistic programme in place.

1. Average from Wrap Gate Fees report 2017. May vary. Cost benefit analysis based on PwC actuals.
2. £86.10 from April 1st 2017.
3. Refers to operational waste.
4. We’ve focussed on the carbon savings arising from each of the switches we’ve made, for simplicity and as a first step, although in some cases the main benefits may relate to reduced pollution, protection of scarce materials or minimising the demand for scarce water reserves.
5. Our analysis is based on Defra conversion factors for end-of-life waste treatment and material consumption. It assumes that a switch from waste treatments that lock away materials (landfill and incineration) to treatments that reuse the goods or recycle the materials will benefit society by obviating the need for an item made of virgin materials i.e. it enables a switch from material consumption using virgin materials to consumption of a product with reused/recycled content.
6. bit.ly/furnitureGC.
7. bit.ly/ITwasteGC.

“At PwC, you’re light years ahead.”

*Charlie Devine,
Zero Waste
Scotland*

“I am impressed by the work that PwC is doing in terms of the corporate uniform take back programme.”

Sarah Clayton, WRAP

“I am proud to work for a firm which... cares about the environment.”

PwC employee, annual people survey response

Table 2
Financial and environmental benefits of disposal switches

Material	Disposal switch made	Financial impact to business (£, per individual, per annum) ¹		Societal CO ₂ e benefit (per individual, per annum)		Key assumptions ^{2,3}	
Laptops	Shredding to reuse ⁴	£50 to £75		0.3kg (>90% reduction)		Material	Laptops on 24-36 month contract.
						Financial benefits	Revenue dependent on condition of items.
						Baseline	Meeting minimum WEEE requirements of 70% recycled, 10% recovered with the rest going to landfill ⁵ .
Smartphones	Shredding to reuse ⁴	£20 to £50		0.04kg (>90% reduction)		Material	Smartphones on 24 month contract.
						Financial benefits	Revenue dependent on condition of items – considerably higher for newest models in best condition.
						Baseline	Meeting minimum WEEE requirements of 70% recycled, 10% recovered with the rest going to landfill ⁵ .
Furniture	Landfill to reuse	£1 to £2 (c. 80% reduction)		13kg (c. 60% reduction)		Material	One desk, chair and cabinet per employee. Sharing other furniture e.g. storage, meeting rooms etc.
						Financial benefits	50% of 'reuse' displaces production of new furniture ⁶ .
						Baseline	14% office furniture reused, rest going to landfill ⁷ .
Food	Landfill to composting/ anaerobic digestion	c. £1 (c. 35% reduction)		7kg (113% reduction – net positive)		Material	Per employee, we dispose of roughly 16kg of food waste per year into dedicated food waste bins.
						Financial benefits	Food waste goes to anaerobic digestion where facilities exist (c.80%) with the rest going to composting ⁸ . Based on anaerobic digestion obviating need for grid electricity.
						Baseline	Disposal into general waste bins, with c.70% disposed in landfill, c.30% incinerated ⁹ .

[Continued on next page]

Material	Disposal switch made	Financial impact to business (£, per individual, per annum) ¹	Societal CO ₂ e benefit (per individual, per annum)	Key assumptions ^{2,3}	
Compostables	Wax cups and landfill/ incineration to ecofriendly cups and composting/AD	£0.10 to £0.15 (c. 40% reduction)	1.8kg (c. 50% reduction)	Material	One cup per working day per employee.
				Environmental benefits	Directed to anaerobic digestion where feasible, remainder to composting ⁸ .
				Financial costs/ benefits	Eco-friendly, corn-derived, poly-lactic acid (PLA) lined cup cost comparable with wax/plastic-lined cup ⁸ .
				Baseline	Wax cups c.70% disposed in landfill c.30% incinerated as per mixed, ordinary waste ⁹ .
Corporate clothing	Introduction of textile take-back scheme for reuse/ recycling	£-0.05 to £-0.15	5kg (c. 20% reduction)	Material	Corporatewear worn by supplier employees on site with average of 5 items per employee and mix of logo types (tax tabs, embroidered or no logos). Costs may be lower if fewer items issued.
				Environmental benefits	85% of reuse displaces production of new clothes ¹⁰ .
				Financial costs	Dependent on distance to recycling facility. Assumes use of pre-existing in-house logistics for first leg, and additional payment for final leg, between 20-100 miles.
				Baseline	90% to landfill or incineration ¹¹ .

1. Based on full time equivalents throughout, for consistency, except for corporate clothing, which is based on suppliers' employees.

2. See [Table 1](#) on [page 13](#) for post-switch reuse and recycling rates.

3. Material consumption and disposal CO₂e from Defra 2017 (www.gov.uk/government/collections/government-conversion-factors-for-company-reporting).

4. Dispose using a best-practice, approved treatment facility with strong environmental credentials instead of a basic, WEEE compliant facility.

5. Source: UK Government.

6. In line with assumptions in www.wrap.org.uk/sites/files/wrap/Office%20Furniture_final.pdf, Wrap 2011. Production CO₂e based on FIRA Source: "Benchmarking carbon footprints of furniture products", FIRA, 2011.

7. Source: www.wrap.org.uk/sites/files/wrap/Office%20Furniture_final.pdf, Wrap 2011.

8. Source: PwC data.

9. Source: Eurostat 2014 UK treatment data for mixed ordinary waste.

10. Source: "Environmental benefits from reusing clothes", The International Journal of Life Cycle Assessment 15(7):726-736, August 2010.

11. Source: "A review of corporatewear arisings and opportunities", Wrap 2012.

Chapter 6: Stage three – towards a fully circular business

As mentioned in Chapter 3, stage three of our Going Circular journey will be about extending our reach, maturing our programme and moving towards being a fully circular business. This includes exploring options to buy products and services that are designed for circularity, and can replace our existing ones to achieve even better sustainability.

We share our process for embedding circularity in our procurement on [page 19](#), and our thinking on what constitutes a ‘circular product’ on [page 20](#), together with early examples. Stage three will also entail seeking to use all our spheres of influence to accelerate the transition to a circular economy: our employee engagement, for example, can encourage sustainability mind-sets and more circular lifestyles, so we share what we’ve done so far on [page 21](#); and our community programmes can help start-ups that are making a contribution to the circular economy, as we show on [pages 22-23](#).

Indeed, the breadth and positive impact of the circular economy is so far-reaching that we’ve made it one of eight priorities for our responsible business agenda for the next five years (see [Chart 4](#), on [page 6](#)), alongside actions to help the transition to a low carbon economy, and other social ambitions. Our new strategy aims to better integrate our actions across our entire value chain - including our client work, our core operations, our supply chain management and our community engagement - in order to amplify our positive impact and contribute as effectively as possible to society – in line with the [Sustainable Development Goals](#)¹. We’ll continue to report on our progress and share what we learn with others, as before.

1. www.pwc.co.uk/sdg.

What to ask your suppliers

Request for information question²:

- How will you collaborate with us to make a step change to our sustainability performance in the period of the contract, especially in areas relating to: greenhouse gases; material consumption and waste (circular solutions); water; procuring from social enterprises (Buy Social); and human rights & modern slavery in our/your operations and your supply chain.
- We’re keen to agree sustainability KPIs and/or terms that incentivise this step change. How willing would you be to work to such an arrangement? Please suggest ways we might do this and list at least two sustainability KPIs that you might think may be appropriate for this contract.

Request for proposal questions²:

General:

- We’re looking to move towards more circular solutions in our business, minimising the materials required, reusing or recycling them at end-of-life, and reducing their overall environmental impacts. How could you help us ‘close the loop’ on more of our products?

Catering specific:

- Food packaging is one of our largest waste streams and a priority issue for us. How could you help us reduce the environmental impacts of our food packaging? Please provide any relevant examples from your other clients.

Document production & distribution³ specific:

- Certain stationery items are difficult to manage at end-of-life such as lever arch files, jiffy bags, hole-punchers and staplers. How do you propose to work with our stationery provider to find sustainable alternatives?
- Packaging is a priority issue for us. How do you propose to help us reduce the impacts of the packaging associated with the products we use? Please provide any relevant examples from your other clients.

Corporate merchandise specific:

- What are your policies for sustainable product development?
- Please explain your approach to sourcing sustainable products and provide examples of sustainable alternatives to items we have traditionally procured.
- What percentage of your sales, in terms of value, can be attributed to sustainable products?

2. For illustrative purposes only, based on questions used in PwC tender process. Should be adapted as required.

3. Supplier of this service manages stationery provision for PwC.

Chapter 7: Circular procurement

Embedding circularity into our procurement processes

Over the past ten years, our suppliers have played a major role in helping us improve our environmental performance, and we know they will continue to do so in the next phase of our sustainability journey, from 2018-2022. Moreover, in the run-up to 2017, we conducted an extensive tender process for the supply of all the core services in our business – facilities management, hospitality and security, catering and cleaning etc. It was important for us to ensure we had partners that understood and shared our values for social and environmental leadership, and that were able to bring innovation to our partnership.

It's with that in mind that circular economy principles form part of our **responsible procurement policy**, and that we embedded circular economy thinking into all four stages in our procurement process: 1) setting out our requirements; 2) selecting and evaluating suppliers; 3) agreeing commercial arrangements; and 4) ongoing supplier management.

Setting out our requirements

For each of the sustainability areas we've prioritised for supplier collaboration (e.g. Going Circular, Buy Social, carbon reduction, human rights and modern slavery etc.) we define a roadmap. This not only sets out the minimum requirements that we expect to have in place at the start of any contract, but also articulates our ambition for the next three to five years - which we expect suppliers to support us on. Our 'Going Circular' roadmap (see **Chart 7**, right) includes a desire to deliver fully circular solutions within our business in the period of the contract, as well as stipulating that suppliers focus on waste and recycling in their own operations.

Where needed, we use additional roadmaps for some categories of service provision, such as catering, where there are specific requirements less relevant to other suppliers e.g. maintaining our best practice approaches to food waste and continuous improvement to help tackle food packaging.

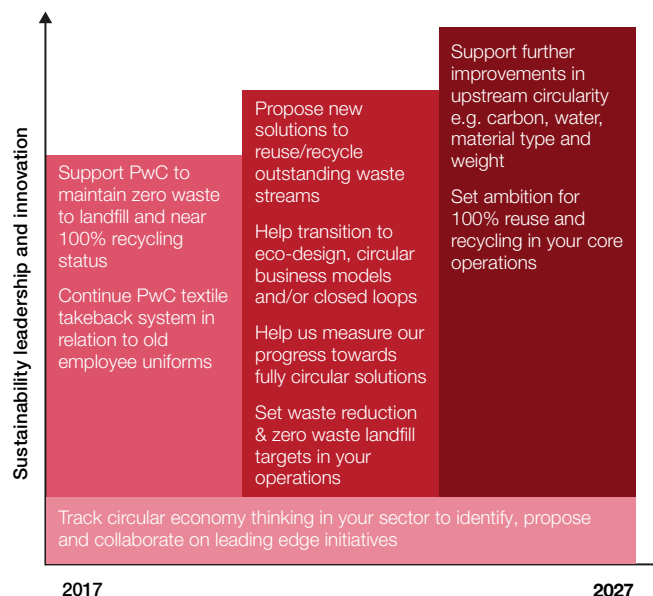
Selecting and evaluating service partners

When selecting suppliers, we invite them to demonstrate how they will meet our minimum requirements and to put forward innovative circular economy solutions as part of their proposals. This happens at both at the Request for Information (RFI) and the Request for Proposal (RFP) stages.

Our RFI includes a couple of introductory questions to test the supplier's appetite for change and capacity for innovation (see **What to ask your suppliers** inset).

Our RFP poses more specific questions and asks that they submit their answers in the tender document, as well as inviting them to attend a dedicated sustainability workshop, to discuss how we might collaborate and innovate.

Chart 7
Our 'Going Circular' supplier roadmap



Of course, suppliers must be able to deliver the functional and quality standards required by the firm, at prices that are acceptable to us. But the social and environmental aspects are key aspects of the evaluation, and the final decision is made by the PwC Service Owner in conjunction with stakeholders from across the business including the Corporate Sustainability team.

Agreeing commercial arrangements

We work in a collaborative manner with our service partners but also find it valuable to include appropriate sustainability clauses, both generic and circularity-related, in the contracts or service schedules. At this stage, we also introduce the concept of formal sustainability reviews as part of the governance arrangements, to help us maintain focus and momentum.

Ongoing management

We work closely with our suppliers to develop action plans and deliver our intended outcomes. We usually hold a contract kick-off meeting with our service partner to review our objectives, discuss ideas and agree work schedules. We also agree how we'll work together and what approach we'll take to performance management and reporting. For key suppliers, such as our waste management and catering providers, we invest in an in-house account manager, who can sit alongside our operational and sustainability teams and work seamlessly to deliver improvement projects.

Each of these steps is important to successfully adopt circular practices and transition towards a fully circular business. In addition, the corporate sustainability team has played a central role in creating excitement in the business, working closely with the procurement function to share knowledge about the concept and provide hands-on experience of the challenges associated with the current, 'linear' economy. Together, team members visited a materials recycling facility, for example, and participated in a 'tear-down' workshop to find out how hard it is to take apart everyday products used in the business.

Chapter 8: Substituting with circular products

Defining 'circular products'

Our ultimate goal is to ensure we're procuring the inputs we need for our business in a form which is the most sustainable it can be. As we started to define what 'circular procurement' might look like, we realised that the characteristics of 'circular products' seem to fall into two groups – 'material sustainability' and 'in-use sustainability'.

In terms of 'material sustainability', the easiest way to 'go circular' is to look for items that have minimised the amount of materials used. But it may also mean substituting items with alternatives that are made of renewable materials or which incorporate recycled materials or parts – to alleviate pressure on virgin materials and reduce the carbon and water footprint of the products. Or, it may mean seeking out goods that are designed for disassembly and easy recycling at end-of-life.

In terms of 'in-use sustainability', this may mean choosing designs that are durable, or where thought has been given to how they can be maintained, refurbished or remanufactured to extend their lifespan. (In turn, this may lead to procuring the functionality we want as a service, rather than as a product – on the assumption that the provider is better placed to steward all the materials needed to deliver that functionality at scale, and to create closed loops more effectively than we can as a single organisation.) It may also entail encouraging sharing models, and moving towards what is known as 'collaborative consumption', allowing many people to access what they need in a way that reduces the overall number of products used in the first place.

Circular products in our business

We consulted colleagues to see if this made sense and to identify opportunities for such circular procurement. In fact, we found that several departments had already sourced circular products, especially in the areas of office furniture, electronic equipment and consumables.

For example, Orangebox provides us with task chairs that have many circular characteristics: not only durable (a typical high quality task chair will last more than ten years), these chairs have been adapted to minimise material use, and use recycled content, as well as to allow easy refurbishment, remanufacturing or recycling, as described in our [Sitting pretty](#) case study on [page 11](#)). Our workstations are also sturdy but are built in a way that allows us to replace the surfaces, but keep the base and legs as our business grows and our needs change – something we are doing in an upcoming 'restack' of our main buildings. They're also designed so that employees can share: anyone can sit down to work at any desk by simply plugging in to a flexible telephony system and standardised power plugs. Lockers where our employees store personal effects are modular, allowing us to reconfigure them both in terms of how they are stacked in the office, but also by replacing doors and fittings to allow them to be used in new ways, over time. And, we select high quality, durable carpets that have up to 60% recycled material, including a mix of pre-consumer and post-consumer content, and with up to 100% recycled yarn.

Our laptops have been light-weighted to reduce material use, include recycled content and are durable to give them a long life. Our multi-functional printer-copier-scanner devices are leased from a company that maintains them, replacing parts as needed, and they've been made available to our people on a sharing basis since the removal of personal desk side printers, some years ago. Even our laptop bags include recycled content and they're designed to last, allowing us to collect them in and reuse them with new employees, if anyone leaves the firm.

Meanwhile, we've substituted a lot of our consumables with circular options: standard [coffee cups](#) have been replaced with compostable alternatives (see inset [page 8](#)), our energy is produced using a [biofuel](#) made from the used cooking oil from our in-house restaurants, the hand towels in our client washrooms are produced from our old archive files, and our printer paper is sourced in a 'closed loop' by a state-of-the-art paper mill, Steinbeis, that takes our office paper waste and makes new, office-grade paper which we buy back in. This allows it to be recycled around 20 times, instead of

the industry average of seven, making it significantly more circular, at no extra cost.

We've even replaced the clothing items we use for community volunteering with more sustainable solutions, and you can read more about it in our ['Circularity - down to a T'](#) case study on the [Going Circular website](#)¹.

In the coming years, we'll look for new opportunities to procure circular products and we'll report on our progress in due course.



We buy office paper made from our own 100% post-consumer recycled paper - using 100% less timber, 83% less water, 72% less energy, and with 53% less carbon emissions

1. bit.ly/TshirtGC.

Chapter 9: Encouraging circular lifestyles

'I will, if you will'

In 2006, the UK Sustainable Development Commission wrote a report about behaviour change for better social and environmental outcomes. Entitled 'I will, if you will', it pointed to the way consumers typically look to others to change before they will, be it another country, the government, or some other third party such as their employer. As we pulled together our ten year story about Going Circular, we felt it could act as a strong platform to engage our people towards better, more circular lifestyles – making a link between the actions we had taken as a business and a parallel behaviour that they could personally adopt to help the transition to the circular economy.

Leveraging our existing infrastructure

We also started to think about whether we could use the waste collection and treatment infrastructure and processes we'd set up for PwC, for employees. This would extend the environmental benefit by amplifying our reach and scale.



We use our IT disposal infrastructure to make it easy for employees to recycle personal laptops and mobile phones

We decided on three campaigns – each tackling an issue with a high carbon and water impact, and to be promoted at the same time as the video stories about the circular approaches we've taken to waste from our business:

- **IT Amnesty:** a two week, UK-wide campaign to encourage our people to bring in old laptops and phones for remanufacturing or recycling¹ - off the back of our 'Refresh, restart, reuse' video²
- **Suit Donation Day:** collection points in our main offices enabling our people to donate their old workwear to charities³ helping people in need to get ready for job interviews – following on from our 'Cut from the same cloth' video⁴
- **Grounds to ground:** a programme, offering people spent coffee grounds from our restaurants to use as compost at home, on an ongoing basis, in collaboration with our catering provider, **BaxterStorey** – off the back of our 'Out of the frying pan into the fire' video⁵

Employee enthusiasm

We were delighted that hundreds of our people chose to participate. Just under 120 individuals donated over 270 laptops, mobile phones and other IT items. Over 180 of our people (both men and women) donated more than 1,340 clothing items, and over 50 people have, so far, taken coffee as compost.

We believe that our success can be ascribed to the effort we put into making the process as easy as possible for our people, and highlighting the personal benefit to individuals in our communications, as well as making sure that we promoted the events well in the days preceding them – allowing people time to dig out their unwanted items at home before the collection period.

In addition to the social and environmental benefits of diverting this waste, we also unleashed a huge amount of energy and enthusiasm amongst our people, many of whom proactively wrote to us to thank us and praise the initiatives, showing that sustainability really does engage employees.



We collected over 1,340 workwear items for people in need

“This is a fantastic idea. I have three defunct laptops sitting in a drawer at home and didn't know what to do with them. Such a win-win initiative”

Ben Combes, Consulting, PwC UK

1. Partnering with Tier 1 Asset Management Ltd.

2. bit.ly/ITwasteGC.

3. Smart Works & Suited for Success.

4. bit.ly/textilesGC.

5. bit.ly/foodwasteGC.

Chapter 10: Supporting circular start-ups

Encouraging innovation in the market

Although we've been able to identify and implement better ways to treat our waste, many of the specialist providers were sub-scale. And, it's been a lot harder to find circular products or services designed for circularity that are mature enough to be implemented in our business. Yet, in order to reach its full potential, the circular economy requires lots of new solutions and – in some cases - new business models. This means that entrepreneurship is a fundamental foundation for a fully circular economy in the long-term. That's why PwC has been supporting circular start-ups, helping them by sharing our skills, knowledge and resources, alongside other social enterprises, as part of the [PwC Social Entrepreneurs' Club](#)¹.

Why do we do it? Well, not only does it fit with our purpose – to build trust in society and solve important problems – but it also offers fantastic development opportunities for our people, who are excited to collaborate with such passionate, visionary and creative entrepreneurs.

Sharing our skills and resources

We offer members of the Club a wide portfolio of support which can help increase their chances of success, but are low cost for us. At its heart is mentoring by employees, who typically bring strong financial and business know-how. We also organise regular masterclasses on a range of topics that are relevant for start-ups such as investment readiness, or impact measurement. And we offer networking events, coaching, and an annual awards system that provides financial grants to those who best demonstrate impact or innovation.

To date, just under 30 circular start-ups have joined the PwC Social Entrepreneurs' Club, from all over the UK. As might be expected, the majority are from high population areas, such as London and the South East, as well as the

Midlands and Scotland, which has a strong social enterprise sector and entrepreneurial culture.

Making a difference

We seek feedback from the organisations we work with in our community programmes on a regular basis, to ensure we are supporting them in a way that is helpful, and a survey amongst the circular start-ups earlier this year highlighted the positive impact we've had, even in a short period of time².

- 85% reported that their enterprise has developed faster because of our support
- 77% reported an increase in personal development 76% said that the PwC Social Entrepreneurs Club has had a beneficial impact on their enterprise
- 46% reported an increase in social or environmental impact

“Being a member of the PwC Social Entrepreneurs Club is a fantastic opportunity to learn from peers and advisors who've seen it before and have expertise to share.”

Martin Gamester, Founder, Total Reuse

TotalReuse

Total Reuse is a social enterprise based in the North West of England offering a range of services and projects aimed at diverting reusable items from landfill - making them available to low or no income families, charities, community groups and good causes. When this isn't possible they're remanufactured into something completely different.

Their services include the Green Team (an alternative to skip hire), Total Clearance (a commercial and domestic clearance service) and an Artisan Range (bespoke furniture manufactured from reclaimed and salvaged materials).

Creating economic, environmental and social value, their combined activities now employ over 20 people. They operate two retail outlets where over 11,000 low income families a year are able to access good quality new and used furniture at affordable prices and when you add it all together it diverts in excess of 1,000 tonnes of reusable items from the waste stream and landfill annually.

A member of the PwC Social Entrepreneurs Club since 2016, they've benefitted from one-to-one mentoring, business skills masterclasses and networking. In November 2016, Total Reuse won the PwC Social Entrepreneurs Club Environmental Impact Award along with a £5,000 prize, allowing them to expand their service and amplify their environmental and social impact, by purchasing a machine that shreds foam from unwanted mattresses to turn into cushion stuffing.

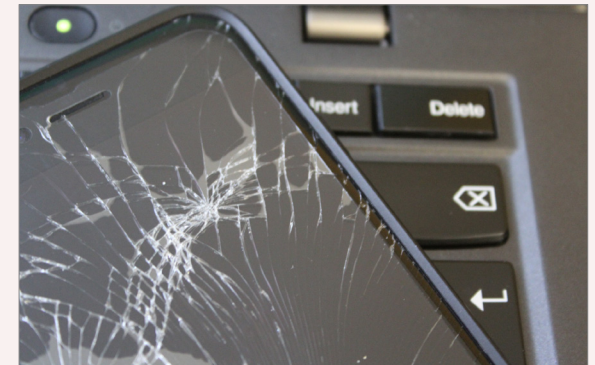
To watch a video of their story, see bit.ly/circstartupsTR.



Recycling / Upcycling: Goldfinger Factory
 Creates bespoke, designer furniture and interiors from waste materials. Based in London.
www.goldfingerfactory.com



Reuse: Glasgow Bike Station
 Refurbishes old bikes for resale at affordable prices, and runs bike repair workshops. Based in Glasgow.
www.thebikestation.org.uk/glasgow



Maintenance: Cracked It Limited
 Repair cracked smartphone screens. Operates in London.
www.crackedit.org



Redesign: Green Revolutions C.I.C
 Run a car sharing club. Based in Birmingham.
www.carclubbrum.org.uk



Other: Hubbub
 Experimenting in innovative ways to achieve 'circular behaviours'. Operates UK wide.
www.hubbub.org.uk

1. www.pwc.co.uk/who-we-are/social-enterprise/social-entrepreneurs-club.html.
2. 65% of circular start-ups have been members of the PwC Club for less than 2 years, 23% for 2-4 years and 12% for 4 or more years.

We also work with the following social enterprises through our PwC Social Entrepreneurs Club:

- **Recycling/Upcycling:** Accumul8, Elvis & Kresse, Global Seesaw, Toast Ale, Worn Reborn CIC.
- **Reuse:** Bicycle Links CIC, Bike Works CIC, Cyrenian Enterprises CIC, Grassmarket Community Project, Jerry Bottle, Julian House Bike Workshop, Second Pedals, Snact Ltd, Strip The Willow Ltd., The Bike Project, The Recycled Assets Company Ltd (TRACO), Total Reuse CIC.
- **Redesign:** Belu Water Limited, Cup Club, The Cup Effect, Tasty Waste C.I.C., Tribe Party C.I.C., No More Taboo.

Chapter 11: What we've learned

As we reach our 10 year milestone, we've reviewed our Going Circular programme as a whole. We've combined our experience of stage two with that from our first five years, to glean insights that can inform our next five, and that may be helpful to others who are also seeking to apply the principles of the circular economy to their business.

There are some interesting reflections, set out below, as well as a summary of key lessons in [Table 3](#) on [page 25](#):

- As discussed earlier, some waste streams are surprisingly big – construction, food and furniture, for example – and consequently merit attention.
- Some waste streams can generate significant financial value from reuse and recycling, notably electronic goods, such as laptops and phones.
- It's not as hard as you might imagine to find ways to reuse many waste items, if you're willing to go beyond the traditional solutions, and create a portfolio of providers.
- Like us, other organisations may find that there is good practice underway, but not being measured.
- We also learned that there are no easy, existing, cost-effective market solutions for some hub waste, especially composite materials that are not standardised and are of low value (e.g. food packaging, stationery, and corporate merchandise). Tackling these will probably require market level change and take some time.
- Existing carbon factors for waste do not incentivise recycling or reuse, but measurement is still valuable, to garner insight for better management of materials in your business and to inform the future design of products.
- It takes time to gear up for circular procurement, because there are numerous internal stakeholders, so start engaging early if this is an area of focus.
- Many 'circular solutions' are early stage and not yet proven. It's therefore important to find innovators, both in-house and amongst your suppliers, whose passion is to keep trying new ideas and won't be deterred if things don't work out, first time.

Next steps

Of course, we'll continue to work on better solutions for the small number of outstanding waste streams which we cannot yet recycle or reuse. We'll trial new options, as they become available in the marketplace, and will share our findings, especially relating to any barriers - in the hope that they can be addressed more quickly as a result.

And, as part of our new [Responsible Business strategy](#) for 2018-2022, we've renewed and increased our targets for reductions in material consumption, such as energy, water, and paper, as well as increasing our target for waste generated to 75% less than in 2007. This will ensure we continue to decouple the environmental impacts of our business from our financial and economic growth.

But our main focus will be on using our influence with a broader set of stakeholders - including our suppliers, our employees and our communities - to help accelerate the transition to a circular economy. Central to this will be identifying and implementing circular products and solutions, building on our current baseline. We'll share our progress in due course.

Our client-facing teams continue to advise and support businesses in manufacturing, retail and other sectors to pioneer circular solutions, which we hope we will – at some point – be able to make use of ourselves, such as the use of natural capital accounting to ensure new circular solutions really are better for the environment.

The circular economy is a concept whose time has come, and every business should be actively seeking to implement better practices to safeguard resources, water and energy, and to mitigate climate change.

We hope that this document will help many wondering where to get started to do precisely that.

Want more details?

Why not visit our dedicated microsite, www.pwc.co.uk/goingcircular. This includes additional materials that bring our story to life, and shows how the principles of the circular economy can be put into practice.

Going Circular video series:

- **Going circular:** How we're applying the principles of the circular economy to our business. bit.ly/overviewGC
- **Restart, refresh, reuse:** How we're generating money by refurbishing and reselling our old laptops and phones. bit.ly/ITwasteGC
- **From fork to farm:** How we're recycling our food waste and food packaging. bit.ly/foodwasteGC
- **Old furniture, new home:** How remanufacturing our old furniture gives it a new lease of life in the offices of charities. bit.ly/furnitureGC
- **Cut from the same cloth:** How we're reusing and recycling the uniforms used by suppliers working in our offices. bit.ly/textilesGC
- **Out of the frying pan, into the fire:** How we're making biofuel from used cooking oil to power our buildings. bit.ly/biofuelGC

Going Circular case studies:

- **Circularity - down to a T:** How we've redesigned our volunteer clothing for longevity and reuse. bit.ly/TshirtGC
- **Total Reuse:** How one PwC Social Entrepreneurs' Club member is diverting materials from landfill to reuse. bit.ly/circstartupsTR

For more on our circular economy work for clients, please visit www.pwc.com/circularbusiness. For more information on our overall corporate sustainability agenda, visit www.pwc.co.uk/corporatesustainability.

We welcome input from interested parties, so feel free to get in touch with our Director of Corporate Sustainability at Bridget.H.Jackson@pwc.com. You can also keep up with our programme on Twitter by following [@BridgetHJ](https://twitter.com/BridgetHJ) or searching for [#GoingCircular](https://twitter.com/GoingCircular).

Table 3
Lessons learned

Take baby steps	Although the circular economy is a simple concept, its breadth can be overwhelming, making it hard to know where to start, especially when there are so many views about the right thing to do. Businesses should feel comfortable to 'start small', and take pride in each tangible achievement in their journey towards a more circular business.
Estimate the 'material materials' and check what stakeholders think you should focus on	Organisations should focus on their material impacts, of course. But since lifecycle analyses are not easily and cheaply available for all products and services, it's pragmatic to start with waste streams that are likely to be biggest for you. Chart 5 on page 12 sets out figures for the weight of each waste material generated by our business, per full time equivalent, which other non-manufacturing organisations may find useful to get a first, rough estimate of how much waste they have – just by identifying the materials they know they throw away and multiplying the number of their staff by the per capita weight provided (adjusted, if necessary, for the notes accompanying the chart). In addition, asking stakeholders about their expectations can be quick, and ensure you're covering all bases.
Create a business case by combining waste streams	Whilst reductions in consumption of, or increased recycling and reuse of, any items in a business has an environmental benefit, and can generate a positive social impact, not all have a financial value strong enough to merit attention in isolation. By including several waste streams in the same programme, the financial returns of one waste stream can offset the costs of others. That said, many end-of-life recycling and reuse solutions have a cost benefit, and are easy to implement, if you have the will.
Set targets to create momentum	Targets help to focus teams on action and empower individuals to find solutions. Set modest goals for the short term, whilst you test what is possible, and increase the number of targets, or the level of ambition expressed by them, once you gain confidence in what's achievable.
Make circularity part of your contracts	Including service level agreements in key supplier contracts sets an agenda for collaboration, but takes time. Start with the most strategic suppliers, and extend coverage to new categories, progressively. Sustainability teams can have a valuable role helping procurement and facilities with guidance on circular economy concepts and solutions. For even greater impact, encourage tier one suppliers to take action to reduce waste and landfill, too.
'Choice edit' first	It's far easier, and quicker, to make changes for the whole business than to engage employees in behaviour change. Wherever possible, make central 'choices' such as removing unnecessary items to reduce consumption/waste, or substituting others to enable recycling. Focus employee campaigns on the outstanding problems once you've gone as far as you can with these changes.
Test, then do	Setting up a part of the business as a test environment, where you can assess employee reactions to changes (such as new waste hub configurations, product substitutions etc.) before roll-out minimises resistance when you introduce new initiatives at scale. A test environment also allows you to get basic measurement in place and identify approximate volumes for problem items, which will help in discussions with new, circular solution providers as you seek to set up reuse and recycling arrangements.
Spot synergies	Sometimes the solution just requires connections to unusual parts of the organisation e.g. linking the facilities department to your community team can accelerate reuse by leveraging existing charity relationships.
Tell the story to build momentum and maximise the business benefits	Employees care about waste: it's a tangible item they deal with every day. Telling them about any recycling achievements builds engagement and pride – delivering business benefits. An umbrella concept (cf. our 'Going Circular' theme) can make the campaign more memorable and show that the whole is bigger than the sum of the parts.
Watch out for interdependencies	Once you start looking at circular procurement and working with upstream suppliers, you may find that you need to engage the same companies as those you wish to approach about human rights and modern slavery, or other sustainability issues. Coordinating and phasing your requests in a holistic way will pay dividends.

About PwC

At PwC, our purpose is to build trust in society and solve important problems. PwC is a network of firms in 158 countries with more than 235,000 people who are committed to delivering quality in assurance, advisory and tax services. Find out more and tell us what matters to you by visiting us at www.pwc.co.uk.

About this publication

This content is for general information purposes only, and should not be used as a substitute for consultation with professional advisors.

© 2017 PricewaterhouseCoopers LLP.

All rights reserved. In this document, “PwC” refers to the UK member firm, and may sometimes refer to the PwC network. Each member firm is a separate legal entity.