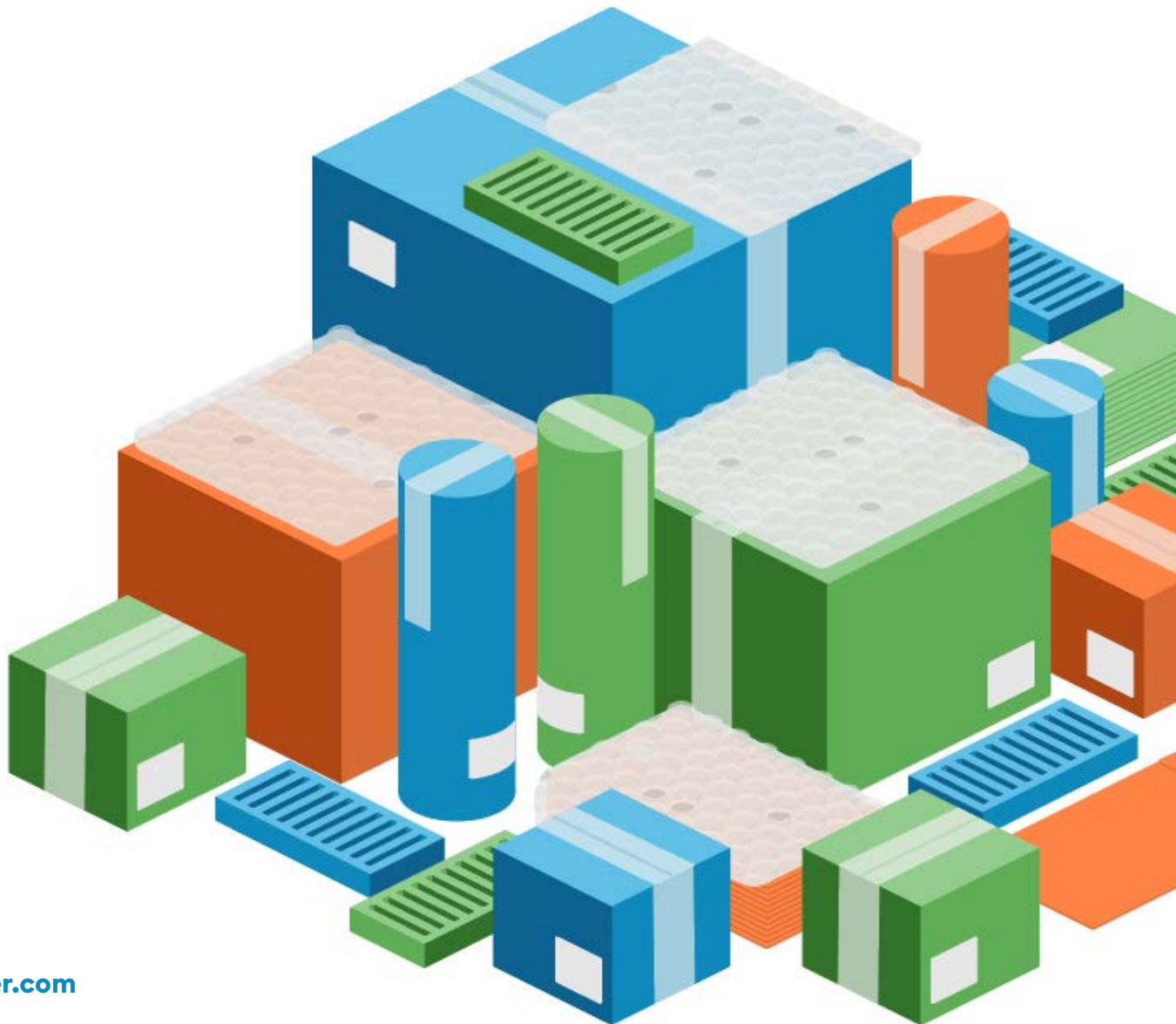
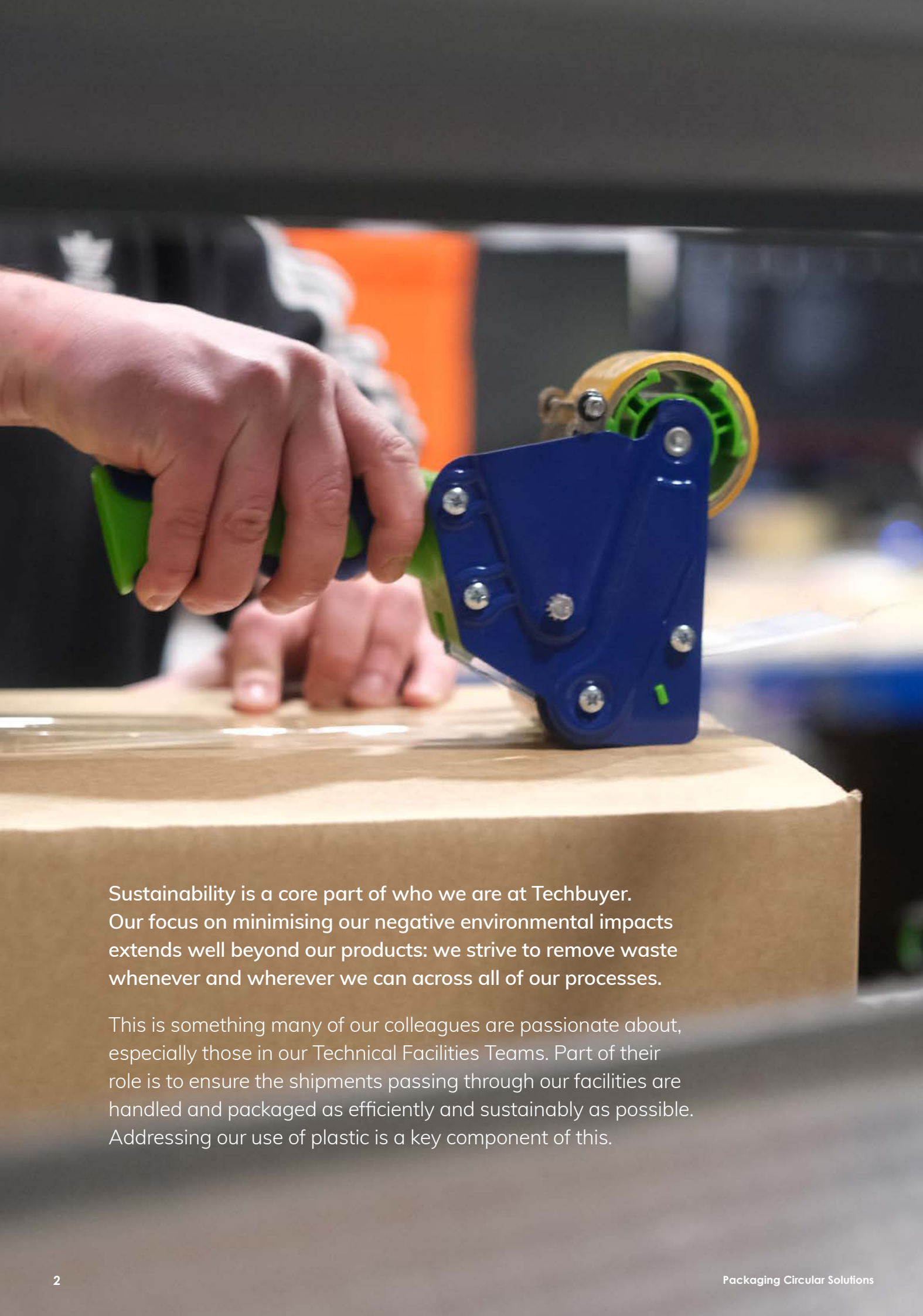


PACKAGING

CIRCULAR SOLUTIONS





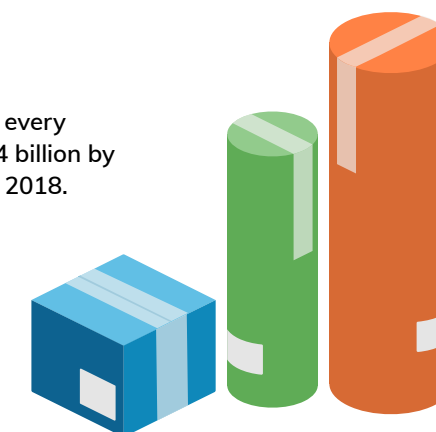
Sustainability is a core part of who we are at Techbuyer. Our focus on minimising our negative environmental impacts extends well beyond our products: we strive to remove waste whenever and wherever we can across all of our processes.

This is something many of our colleagues are passionate about, especially those in our Technical Facilities Teams. Part of their role is to ensure the shipments passing through our facilities are handled and packaged as efficiently and sustainably as possible. Addressing our use of plastic is a key component of this.

Background: Our Waste Woes

According to the World Bank, the UK generates over 2 billion tonnes of solid waste every year – averaging at 0.74 kg per person per day – and this is expected to grow to 3.4 billion by 2050. The UK is a major contributor to this, producing 222.2 million tonnes alone in 2018.

Disposing of this waste is often far from easy. For example, of the 222.2 million tonnes of waste produced in the UK in 2018, only 48.7% was recycled or recovered. The rest was put into landfill, released into bodies of water, or incinerated. As a result, waste management accounts for around 4% of UK emissions (~16.2 million tonnes CO₂e).



The Plastic Problem

Plastic is one of the main concerns when it comes to waste. The production of plastic is damaging for many reasons. Not only does it rely on finite oil supplies, but it is also highly polluting, especially to waterways. This is unfortunately just the tip of the iceberg; the use and misuse of plastic is where the real issues lie. According to Statista, the UK places around 4.9 million tonnes of plastic on the market each year – around 60% of which is single use and 75% ultimately becomes waste.

Recycling is often touted as the solution, but an [academic study](#) revealed that 9% of plastic waste has been recycled and, according to Statista, the UK's recycling rate stands at only 44%. There are many reasons for this, including demand that outstrips recycling capacity, along with the frequent use of compound or commonly unrecyclable plastics such as bubble wrap, tape, and low-density polyethylene (LDPE) packaging foam. A more fundamental challenge is that making a plastic recyclable does not mean it will be recycled: educating consumers and making the process as easy as possible are both crucial.

Paper vs Plastic

A common belief is that switching from plastic to paper or card could solve these issues. The reality is a little more complicated.

Paper-based solutions do bring several benefits: they are often made with more recycled content, and they are easier to recycle, compost, and biodegrade. That being said, they are not always recycled (26% of total landfill waste is paper), and they release methane (a potent greenhouse gas) when they decompose in landfill.

The production process is also water and energy intensive. Manufacturing one sheet of paper, for instance, requires up to 13 litres of water (a scarce resource in many countries), and producing a paper bag emits 3x more emissions than a single-use plastic one. On top of that, 42% of global wood harvesting is used to make paper. From an operational perspective, meanwhile, paper packaging is usually bulkier and heavier than plastic, which will increase transport emissions.



Plastic Packaging Tax

In response to some of these issues, recent legislation has been brought in to stimulate the recycling industry, making it easier to source recycled content in the future. The UK Plastic Packaging Tax, for instance, means companies that manufacture or import 10+ tonnes of plastic packaging a year will be charged £200 per tonne of plastic that does not contain at least 30% recycled material.



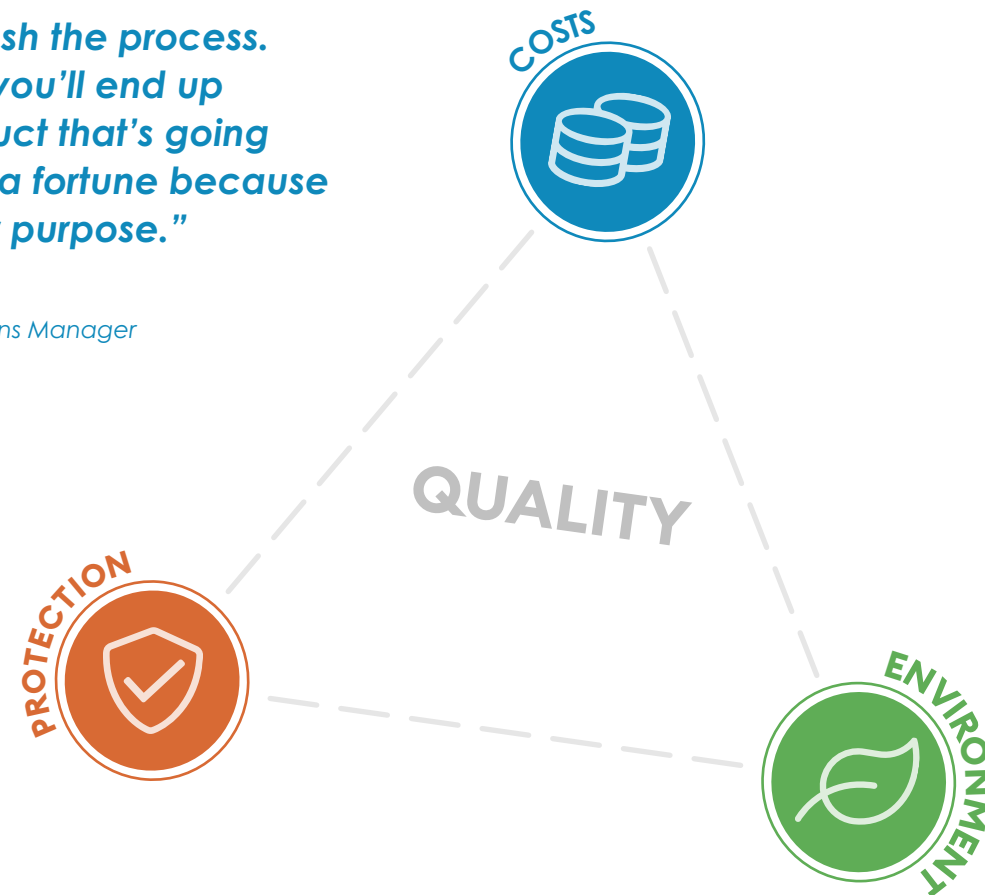
Our Approach

To find the sweet spot between environmental and operational concerns, we consider all knock-on effects of every option.

For instance, let's say we found a new foam packaging solution that is 100% recycled and recyclable. At first glance, this sounds perfect, but if it is lower quality and offers limited protection, we are likely to have more damaged products. This means it will be less sustainable on the whole due to additional waste (and it will cost us more in returns). Similarly, moving to a packaging system that significantly increases costs, storage requirements, or processing time may make the solution economically unviable. Finding the right solution often takes patience.

“You can’t rush the process. Otherwise, you’ll end up with a product that’s going to cost you a fortune because it’s not fit for purpose.”

Lee Moss
Assistant Operations Manager



Our Headline Achievements So Far...



21,732 m² of single-use plastic avoided per year – almost 2x the size of Trafalgar Square

Via 100% recyclable alternatives including envelope wallets and anti-static bags



99% reduction in transport distance for CPU and memory boxes

Down to ~78 km vs ~9,600 km (as the crow flies)



15,590 kg of unrecyclable packaging foam replaced per year – the same as about 20 cows!

Replaced with a 70% recycled and 100% recyclable newly developed solution

Our Five-Step Process

1. Identify focus areas

Key considerations here include items that are unrecyclable or made from virgin (i.e., non-recycled) materials. Aside from what products are made from, it is also worth looking at where they come from. If the manufacturer is located on the other side of the world, there are often opportunities to cut down shipping emissions by finding a local alternative.

Speaking to suppliers has also proved fruitful for us in the past; more often than not, they have areas they want to improve themselves, so there can be opportunities to collaborate. Asking experts can also be effective. This can be hiring sustainability consultants to review processes, using free online resources, or working with universities and research institutions (see our resources section for some useful links).

2. Scope Out the Options

See what exists already. This could be searching to see if anyone else has found solutions to this problem before – the expert sources in our resources section are ideal starting points for this – but we often start by asking current suppliers if they have anything suitable. The benefit of this is the existing relationship: we prefer to stick with suppliers that we know we can rely on and effectively collaborate with.

Alternatively, explore support opportunities for research projects. Funding schemes like the [ReBiz programme](#) are often available, and universities may be able to offer insights or collaborate on research projects, too. We have also engaged with some suppliers to trial new-to-market products, which gives us access to the latest solutions and supports their development.

3. Prototyping

Once we have got a long list of options, we contact viable suppliers to ask for prototypes. After assessing them to see if they are likely to work, we make a shortlist of the best options and ask for a few samples for testing.

4. Testing

We will then use the samples to package up an old product – usually an electrical item with an intact chassis but broken internal components – and stress test it. If there is damage, we will work with the supplier to improve the solution. This was a really useful process during the development of the replacement protective foam, Eco Strata, as we were able to collaboratively fix any weak spots.

Live trials come next. We will select specific orders – making sure to incorporate varying sizes and distances – to get some real-world testing over a few weeks or months.

One of the clearest ways of assessing the performance during trials is to track return rates. So far, once we have reached this stage, we have only ever had one solution that presented issues (foam caps that were too soft to protect the ends of servers), and we decided not to proceed with this project.

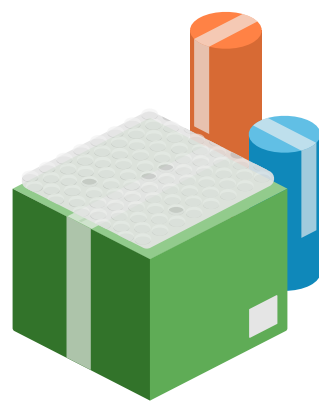
5. Phase In

The replacement is then phased into orders, which gives us a chance to continue to road test the solution on a larger scale to identify any potential hidden issues.

The key thing here is to do this in a controlled way, starting small and scaling up. We also keep a supply of the old solution as a failsafe in case any unforeseen issues arise.

Our Focus Areas

These processes enabled us to identify the improvement areas in the table below. Some – such as the protective foam – came through collaborative discussions with suppliers, but the majority were taken on following internal reviews.



Packaging Item	Use Case	Annual Usage	Sustainability Issues
Protective foam	To provide strong protection for delicate hardware like servers during shipment.	74,250 boxes (15,590 kg)	Made from LDPE, which is not widely recycled due to the complex process it requires.
Bubble wrap	To fill void space, preventing damage from hardware moving around during shipment.	780 rolls (129,900 m ²)	Not widely recycled as it is made from LDPE, and it can clog standard recycling machines.
Tape	To seal boxes before shipment.	9,000 rolls (64,800 m ²)	Regularly made from recyclable PVC, but tape is too thin to be processed on its own.
CPU boxes and clamshells	To store CPUs during warehousing and shipment.	35,500	The boxes are made from non-recycled brittle plastic (making reuse unviable). Also often coated in anti-static polyurethane foam, which is difficult to recycle. The clamshells are an improvement as they are recyclable, but they are only available for certain CPU sizes. Both are shipped from China.
Memory boxes	To store RAM memory DIMMS during warehousing and shipment.	58,200	As above, these are also made from non-recycled brittle plastic. They are also shipped from China.
Envelope wallets	Used for shipping notes and internal labelling.	162,000	Made from non-recycled and unrecyclable plastic.
Anti-static bags	To store devices and protect them from cosmetic damage during storage and shipment.	62,500	Made from non-recycled and non-recyclable plastic.
Incoming packaging	To protect products delivered to our warehouses.	N/A	Often include unrecyclable items like polystyrene peanuts and LDPE foam.



“We’re continuously looking at how we can reduce our environmental impact. Developing innovative packaging solutions plays a vital role in our sustainability strategy.”

Achievements So Far

Over the last year, we've made a lot of progress on several projects. There are lots of factors we've considered while doing so. For instance, while there are new, more sustainable materials under development, most are still at early small-scale stages, so options are limited without increased risks and costs. In these cases, the best option is often to limit the negative impacts of current solutions by reducing waste, weight, and travel miles, while also exploring options for increasing the amount of recycled content used. Reusable packaging is another viable avenue, but it comes with its own risks, most notably that the added robustness of reusable packaging often comes with a higher carbon and materials footprint that is wasted if they are not sufficiently reused.

Protective Foam Packaging

We collaborated with our supplier, Direct Foam and Packaging, to develop [Eco Strata™](#), a brand-new material with similar characteristics to the LDPE foams we had previously been using but made from recyclable high-density polyethylene (HDPE).

It is produced using 70% recycled plastic waste (10-times more than in average foam and enough to avoid the Plastic Packaging Tax) and is 100% recyclable. Eco Strata has now been rolled out across our UK operations, and we are exploring how we can scale it globally. We have used it to displace over 15 tonnes of HDPE from our operations per year.

Envelope Wallets

We have rolled out a paper-based biodegradable alternative to the plastic wallets we use across our warehouse. These wallets are A5, which means each paper wallet is saving 621 cm² of plastic, equating to a total annual saving of 10,070 m².

CPU and Memory Boxes / Clamshells

After exploring and ruling out cardboard options (due to limited protection and additional weight), we have switched to a UK-based supplier that offers the same product we previously shipped in from China, cutting transport emissions considerably. As the crow flies, our new supplier is based around 78 km from our main office, compared to the previous supplier, which is roughly 9,600 km away.

An additional benefit is the new solutions are made with 70% recycled content (vs 30% via the previous supplier), so we are also reducing our demand for virgin plastics and supporting the development of the secondary plastics market.

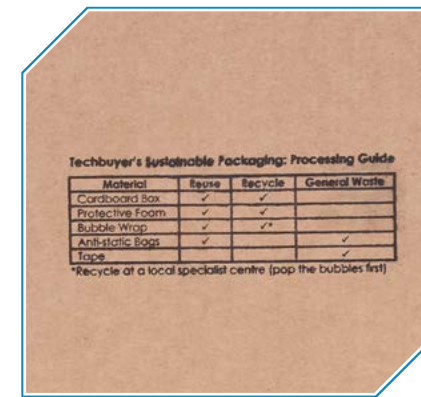
We are currently working with the supplier to prototype clamshells for memory and some additional CPU sizes, which would mean we can roll the solution out to more of our product range, reducing our packaging materials and weight.





What's Next? Pathways to future success

Another key achievement from our work so far was gaining a clear overview of other products that will help us achieve our goals. We have still got some of our focus areas to address. To do this, we have been exploring ideas via an external consultancy project with Leeds-based consultancy Green Gain through the ReBiz funding scheme.



Behaviour Change

As we mentioned previously, ensuring that something is recyclable does not mean it will be recycled. One area we are looking into at the moment is whether we can improve education about the appropriate disposal methods for the packaging we send to customers. We have been trialling custom stamps that would provide this information on the outside of boxes, as we wanted to avoid additional waste from leaflets.

Reusable Packaging

A fully reusable packaging system could create huge environmental benefits by drastically cutting waste and emissions. There are several crucial things required for this to happen:

1. The packaging must be robust enough to provide adequate protection after several uses.
2. It must be recyclable or biodegradable to avoid additional waste.
3. Customers need access to an easy returns system.
4. Operational impacts – e.g additional costs and assembly time – need to be minimal.

With these requirements in mind, we are starting a live customer trial of a reusable solution, with the hope of rolling a system out in the future if it proves to be successful.



Tape

We have had a few samples of paper tape, but we have seen mixed results in testing so far. Often, they are too weak, so we would end up using much more of it. Green Gain highlighted some alternatives, including a plastic option made from 80% recycled content, which we are currently testing.

Bubble Wrap and Void Fill

We have trialled various options here, including a paper version and a recycled plastic alternative, none of which have yet met our high standards for protection. Green Gain suggested several interesting future options here, including recycled plastic bubble wrap and an industrial-starch-based foam solution.

One success story already has been the inflatable void-fill bags we are now using for certain items like laptops.





Anti-Static Bags

Finding more sustainable anti-static bags has been challenging, but we have had some successes by changing our processes. For products that do not need static protection, we have switched to 100% recyclable layflat tubing instead – we estimate this will save around 17,500 anti-static bags per year. Because it is the larger items that do not need the static protection, this means that we are saving a huge amount of plastic. We can cut our annual usage of anti-static bags (64,462 m² of plastic) by 18% through this new solution, which avoids the use of 11,662 m² of single-use plastic.

Green Gain's findings may help us take this further. The project identified a layflat tubing alternative made from 100% renewable and recyclable sugar-cane-based plastic. We have confirmed that this material can be recycled with standard plastic, so we are currently trialling it as a replacement.

Additional Resources

Use Case	Specialisms	Resources
WRAP	Consultancy and technical support on how to improve the circularity of plastic packaging, including through behaviour-change campaigns.	<ol style="list-style-type: none"> Campaign assets and materials. Reports, guides, case studies, and tools.
British Plastics Federation	Industry-led insights into the sourcing, use, and disposal of plastics.	<ol style="list-style-type: none"> 'Plastipedia' of information on plastics applications, recycling, etc.
Ellen MacArthur Foundation	Circular economy consultancy, advocacy, and education.	<ol style="list-style-type: none"> Education on circular economy thinking. Case studies and best practices on circular economy.

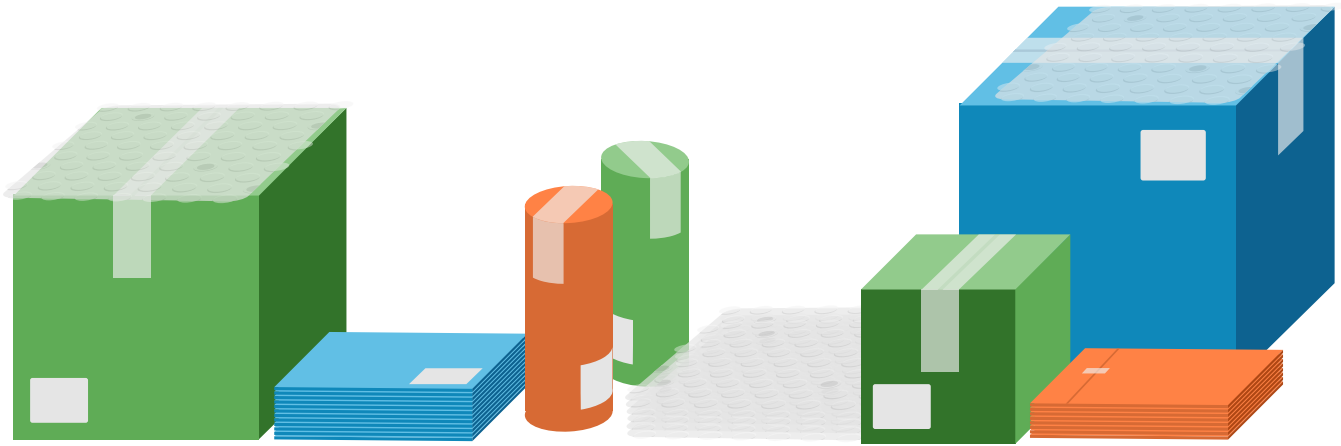
Incoming Packaging

We receive deliveries from many different organisations, so we are not always able to eliminate unrecyclable items from our incoming packaging. Rather than send them into general waste, we donate materials to local charities and organisations to use as arts and crafts supplies. Green Gain helped us identify custom recycling solutions for these items, and we are currently exploring whether we can collaborate with other local businesses to pool our waste.



CPU and Memory Boxes

While our clamshell solution works well – and Green Gain confirm it is the best option on the market for our needs – we are still not happy with the use of plastic. We are keeping an eye out for alternative materials and solutions to address this.



We're a social bunch. Why not follow
us on our social channels in 2023?

