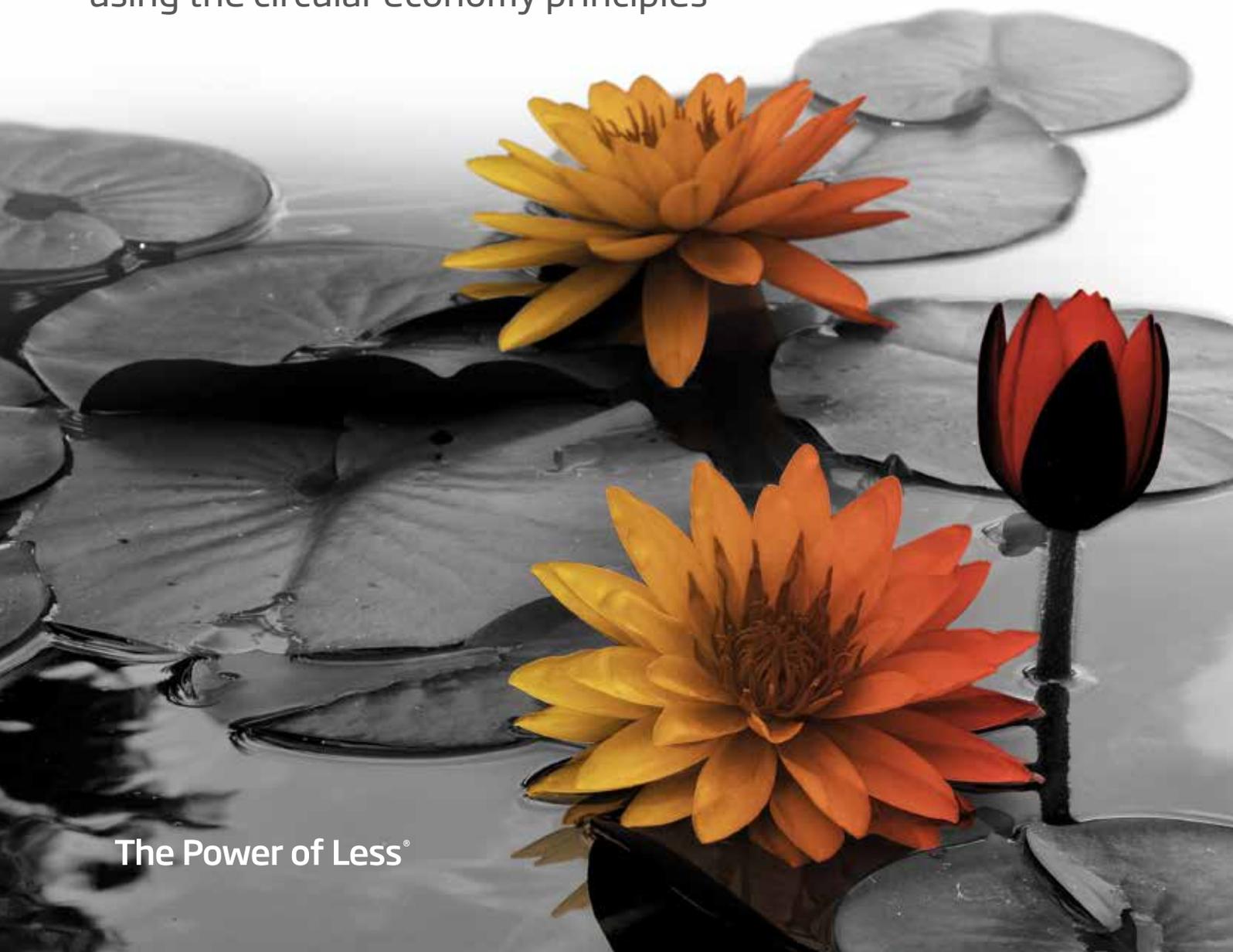




One step away from zero waste

How we can achieve recycling nirvana
using the circular economy principles



The Power of Less®



Introduction

By Mathew Prosser,
European Commercial Director,
DS Smith, Recycling Division

At DS Smith we've long recognised the importance of the circular economy, practising closed loop recycling for over 40 years. The best example of this is with paper and cardboard, which is collected from recycling streams, sent to the company's paper mills for reprocessing, with the product sent to the packaging facilities to be remade back into a cardboard box. The whole process can be completed in as little as 14 days from start to finish.

Activities at the bottom of the waste hierarchy including waste to energy and landfill are often replacing recycling and resource reuse as a method of handling waste materials which is completely contrary to a sustainable circular economy environment and mean significant and unnecessary costs are incurred.

Our closed loop management solutions are born from a company-wide commitment to Supply Cycle Thinking. Supply Cycle Thinking supports a circular economy, a system where no materials are lost, where products and business models are designed to ensure continuous recycling of quality resources. By operating at the top of the waste hierarchy, with waste reduction and resource reuse as our top priorities, zero waste can be made a reality. So rather than focusing on supply chains, organisations should address the supply cycle, adopting solutions that ensure materials are used and reused as efficiently as possible - taking in the whole process and not just the sum of its parts.

In simple terms, adopting Supply Cycle Thinking provides a top down waste hierarchy focus that enables us to consider waste before it becomes waste. This is achieved through shedding the constraints of a linear supply chain model and influencing our businesses to procure with waste reduction and resource reuse as a key decision making pillar. This model delivers tangible, and more importantly, sustainable environmental and financial benefits replacing the traditional short term 'cost of purchase' procurement decision making.



Supply Cycle Thinking

Box to box recycling
in 14 days



Executive Summary

Take one step closer to zero waste with circular thinking

The findings of the most recent “Ellen MacArthur Foundation Towards the Circular Economy Report” (volume 3, 2014) were the starting point for our Supply Cycle Think Tank workshop. It suggests that over \$1 trillion in material savings can be achieved per year by 2025 as a result of scaling up the circular economy.

But how can firms contribute to meeting that landmark? They need to start thinking circularly. So instead of treating waste simply as waste, they need to see the value in it. While waste to energy and other recovery treatment facilities have a place in diverting non-recyclables from landfill, these technologies should not be used to replace recycling and resource reuse. Most importantly of all, businesses mustn't allow waste to energy to become the 'new landfill'. Instead of directing waste to waste to energy and landfill sites, industry needs to recognise the cost, environmental and sustainable benefits of turning these materials back into something useful once more. We wanted to identify how businesses can realise these potential benefits, what they need to do and the ways they'll have to change their approach. We recognise there will be challenges to overcome and new ways of working to help them take one step closer to the circular economy.

Collaboration throughout the supply cycle is an essential part of circular economy thinking. By addressing the four building blocks of a circular economy - product design, reverse networks, business models and enabling conditions - our discussions found enablers and blockers which need to be worked upon, by all involved in the supply cycle. Without such collaboration opportunities will be missed.

Our key findings:

1. Enablers and blockers can be interchangeable across all building blocks, allowing you to take either one step backwards, or one step closer to a circular economy.
2. Product Design – the role of procurement can help and hinder change. Incorporating recyclability at the design stage of products is the key to ensuring reuse again and again.
3. Business Models – we need to overcome resistance to change, have buy-in from senior management teams and the infrastructure within a company to implement change.
4. Reverse Networks – the legislative framework needs to encourage growth and not hinder development. We need clear political leadership supporting the ethos of the circular economy.
5. Enabling Conditions – a combination of regulations and fiscal measures is required to shape the circular and shrink the linear model.
6. Collaboration is central to developing a resilient circular economy. Everyone within the supply cycle needs to collaborate to achieve the best potential.

Background

Our Supply Cycle Think Tank workshop was held during the Resource Expo in March. Our panel of experts addressed the four building blocks of a circular economy - Product Design, Business Models, Reverse Networks and Enabling Conditions. We discussed how their role in waste and recycling can contribute to a circular economy.

Following a panel debate, delegates from a range of industry sectors and job functions split into four groups, representing each of the building blocks to discuss the blockers and enablers to making the vision a reality.





“You cannot design in isolation and you cannot think or manage a product without design being part of it.”

Sophie Thomas, RSA /
The Great Recovery Project



Product Design

The design of products and packaging plays an influential role in the circular economy. The decisions that are made at the design stage impact throughout the supply cycle, particularly when it comes to the end of its life.

“80% of the environmental impact of products, minimum, is determined at the design stage. We can use design to reduce the environmental impact across the lifecycle, use design making products more circular.”

Mark Shayler of Ape

Making it easy for the product or packaging to be reused, dismantled or recycled is crucial. The use and type of materials to consider is critical and designers should take into account the quality, scale and reliability of supply of the materials. Increasing resource scarcity will create a dependence on using recycled materials, requiring a consistent supply of high quality output.

For example, when designing packaging for a product, is it enough that all the materials used in the packaging can be recycled? The composition of that piece of packaging may inhibit its ability to be recycled further down the cycle.

Designers today need to think about the process materials will go through in order for them to be reused, recycled or recovered once the first owner has finished with them, creating the minimum impact on energy and water use and producing products that can be used again and again. For this to take place design teams must be aware of the implication of their design choices. Collaboration is essential so we need to find out the composition of the best design teams, including representatives across the entire supply chain. From recovery and recycling facility managers, to logistics, retail and environmental managers, right down to the end user.

“You cannot design in isolation and you cannot think or manage a product without design being part of it. It’s all integrated and interlocked and that is the key to circularity. It’s all about the network and co-creating together. Without having designers who really understand circularity we won’t shift and have that disruptive thinking that needs to happen in our supply chains.”

Sophie Thomas, RSA / The Great Recovery Project

ONE STEP BACKWARD

The risk of failure was identified as a real blocker in product design. It often means that's the end of the conversation – "we won't try this because it might fail".

However, risk is essential to change and we must understand this when considering a move into new territory.

**"The risk of failure is a real blocker."
[outcome from discussions]**

Tied in with this is defining specification. For years products have been made certain ways, with materials tested to specific standards that manufacturers are used to. Even though materials, such as paper and aluminium, have been successfully reused for years there is still inconsistency when using recycled materials. Without specific definitions this will not change. There is a lack of technical knowledge on existing data to fully understand material capabilities. People need proof of quality to have confidence in using it.

Improving requirements in procurement is essential to generate the necessary step change. But it was discussed that there is often reluctance in some quarters to move on or make the changes required and an unwillingness to change existing supply chains which have worked well up to now. This is often tied in with getting the correct decision maker involved in the process, ensuring the right conversations are taking place.

"The role of procurement – it's going beyond just having a defined specification and getting people to think about it. What is the actual end result?"

[outcome from discussions]

ONE STEP FORWARD

But procurement also plays an enabling role in changing direction to a circular economy. Procurement offers up great opportunities, opening up peoples' minds on buying specifications. When taking a different approach it's like starting again with a blank sheet of paper. There is the opportunity to challenge, ask different questions and find the right solution rather than produce something because it's always been done that way.

The collaborative approach to the circular economy sets up a framework to link different sections of industries and supply chains to develop ideas. Collaborative thinking and discussions can take ideas from all sectors of all industries, transferring those examples that are successful and avoiding those that haven't worked. Sharing knowledge and experience is crucial to speed up the process.

"One enabler is linking up different parts of industries and different parts of supply chain. Having conversations with these elements is important to develop the circular economy."

[outcome from discussions]

Corporate responsibility policies play an influential role within product design. If products can be easily recycled or reused, they will be contributing to a circular economy, taking us one step closer to zero waste. When undertaken properly, the accountability for decisions is built in to the business strategy and not carried out by separate entities. This means corporate responsibility programmes must involve all departments within an organisation, as well as those businesses that interact with the company as part of the wider supply cycle. This isn't something that occurs overnight but a journey taken over time.

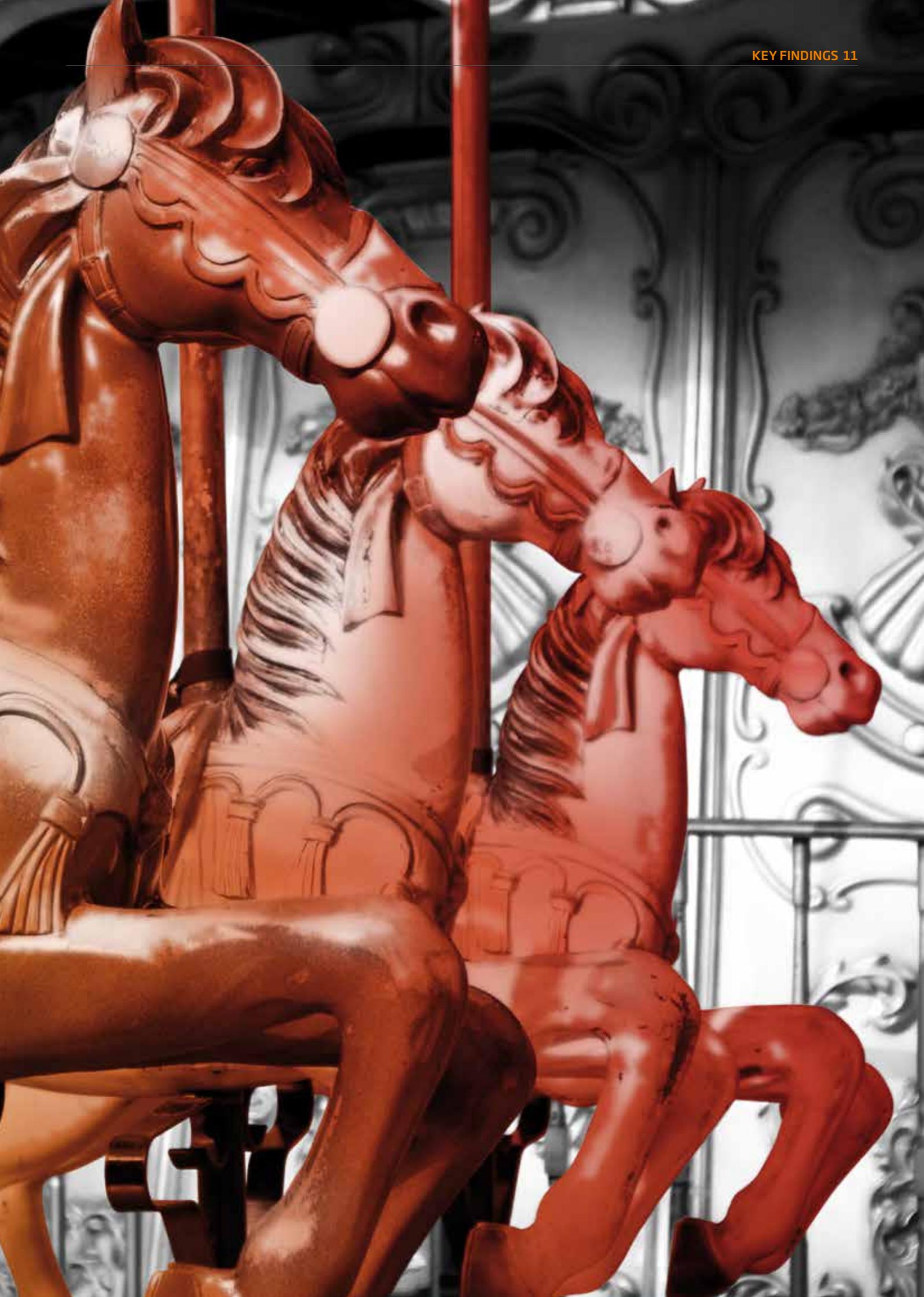
"Where does corporate responsibility fit in with this? When building these elements across an organisation we need to ensure we're building at the right level of corporate governance so we have accountability for decisions throughout the organisation."

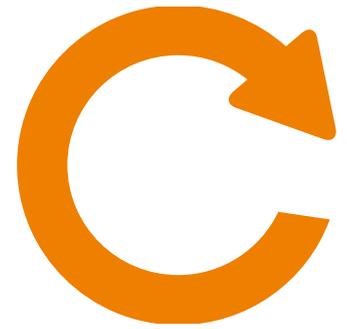
[outcome from discussions]

“[We need] to come up with good policy, good methods and good research that can assist Government to do the right thing.”

Ray Georgeson, Resource Association







Business Models

A circular mindset is essential to achieving zero waste. Adopting different business models is a fundamental part of moving towards a circular economy. This provides opportunities for entrepreneurs to develop new ways of promoting their offering and some of the ideas can even be resurrected from the past. Product rental shops and repair services were a familiar sight on the high street for many years, for example.

Each industry sector will need to think clearly about the type of business model that works best for them – some practices are clearly better in some industries than others. Manufacturers or brands that sell products with a high turnaround using a single source of material have a better chance of creating closed loop models than those selling products with a longer life made out of a complex composite of materials.

“There are two ways to make the circular economy business model more attractive. The first is to think about making the return loops more efficient, [with] better collection, innovation, better processing and simple design for taking apart. This drives a lot of value creation particular on the outer loops like recycling. But the real benefits sit in being more effective in product and component reuse and remanufacturing where ultimately you get a much higher margin, as more of the embedded material, labour and capital costs are preserved.”

Markus Sils, Returnity Partners

Ownership of materials and products will change as everyone within the supply cycle rents said materials for finite periods of time before these materials move on to the next organisation in the cycle, creating a continuous loop. Investment will need to come from new areas – crowd sourcing projects have already shown how to get the necessary finance when traditional funding sources dry up. Again greater industry collaboration on processes and technologies will speed up and lower the cost of adoption.

“It’s to do largely with goods and services being passed on to consumers/users in B2B and B2C, by means of selling. Though after the point of sale there is less access to that material or product. We rely on public utilities and other specialised services to bring that back. One of the fundamental questions the business model needs to address is [whether] you actually ensure ownership of the product for a retailer or manufacturer and move to a service based model, so leasing or rental based, to make it viable?”

Markus Sils, Returnity Partners

ONE STEP BACKWARD



The structure of companies can often be a huge barrier to change. Senior managers can be resistant to change, seeing greater risk than the potential opportunities that introducing a new business model could bring. Creating effective change in any organisation requires buy in from the top, alongside a sufficient structure to enable proper delivery throughout the company. Often there is a disconnect within line management that creates a barrier to change. Institutional inertia was one term used to describe the situation in the workshop groups.

“A consistent theme throughout was that something that can be an enabler in another circumstance can be a blocker, for example the regulatory environment or the structure of management of companies.”

[outcome from discussions]

Data is crucial in making changes, for assessing and measuring how well the changes are being made. But in many instances there is a lack of available data and necessary auditing protocols are required to highlight the areas where change can be beneficial. And crucially, without data, businesses are unable to review the fiscal and environmental benefits delivered back to the organisation in order to facilitate widespread change.

“There’s a big issue on data availability. It’s not just whether data is there but also the mechanisms by which data is arrived at, auditing protocols and so forth. How can you have accountancy for resources and renewable activities within a company in terms of their output like carbon?”

[outcome from discussions]

In some instances the regulatory and legal environment can hinder different processes, though equally it can help to move thinking forward. There are often conflicting interests, for instance between a landlord and tenant, where leasing arrangements do little to help facilitate change in practices. Another example is in short term waste management contracts that don’t allow for investment in long term sustainable solutions that could generate opportunities to move to zero waste and enter the circular economy.



ONE STEP FORWARD

New players, particularly those with entrepreneurial spirit will help to drive a new approach and demonstrate what can be achieved. They will be happy to take the risk and rethink the fundamentals to develop new business models. Different attitudes aligned to companies’ incentive programmes and profit motives can help to drive this forward.

As global populations grow and resource security becomes constrained businesses will have no option but to refocus the mind. Building a resilient organisation will be the only option for survival, led by senior management commitment and perhaps a redefined purpose of the company. Those that take this thinking on board sooner rather than later will reap the benefits and remain competitive against those that delay this process.

“If a business can build itself into a resilient company it will ride the transformation much better. Change is always happening but you have to manage that change and resilience is a fundamental thing in making sure that the circular economy is arrived at.”

[outcome from discussions]

Reverse Networks



Reverse networks is about redefining how people think about linear models, or chains, encouraging them to move towards a supply cycle. It's about looking at the touch points and the way materials flow and how they are reused and recycled. Considering the process as a network it incorporates logistics and transportation, collaborating with new and existing companies to ensure all vehicles on the road are fully utilised.

This circular process requires a zero waste mindset ensuring resource efficiency - across materials, energy, water and logistics - is maximised to the best potential. It's about creating savings, as materials are reused, avoiding costly virgin materials, vehicle journeys are utilised and products are remanufactured.

“We need to start thinking about resource efficiency because we get so much material that ends up as waste. Design has got a big part to play but there's a lot about the way we think about waste as consumers and as businesses. By trying to put a zero waste ethos into our mindset we don't want materials to go to landfill and we don't want to just swap waste going to landfill to go to energy from waste or incineration because that's cheating. So what kind of things can we do in our everyday lives and business models to reduce the amount of waste being created?”

Tom Campbell-White MCIWM, DS Smith



“Costco told me the other day that they recently redesigned their peanut container. All they really did was change the way the lid was. By doing that, by making their peanut container more square so it was not domed at the top they managed to take 500 vehicles off the road, every year. So we need to try and think of ways we can do this type of thing.”

Tom Campbell-White MCIWM, DS Smith

ONE STEP BACKWARD

The regulatory framework was found to have both a positive and negative impact within reverse networks.

On the negative side legislation was said to have limiting effects, with some believing it can be too restrictive in places, preferring market forces to drive forward changes. But food waste regulations are helping to drive volumes and build an infrastructure of reprocessing facilities.

There is a lack of political leadership with clear direction, some delegates felt. While not wishing for over subscription enforcement, relevant guidance is useful. Many doubted that we had the positive and powerful leadership required to make the changes across the whole of the economy and for all to benefit from the potential opportunities.

“Do you understand supply networks, do you collaborate with those, is it easy, simple? Have you got your own vehicles that you can return materials to central locations or would you need to collaborate with the people who do your deliveries or collections and can those backhauled journeys be maximised. Do we need to think about companies that are outside the normal logistics? Can we really think outside the box?”

Tom Campbell-White MCIWM, DS Smith

ONE STEP FORWARD

Commercial viability is crucial to ensure success but just as important, an entrepreneurial approach that some organisations are providing combined with research and development gives hope for the possibilities that are out there. With a number of great successful examples, sharing knowledge and experience is vital to speed up the process. It's about sharing what has worked across different industries and seeing how this can be applied elsewhere.

“It has to be commercial viable”

[outcome from discussions]

Continuous and consistent communication is necessary to help raise awareness and boost the exchange of knowledge. Education and information throughout the supply cycle, including consumers will be required. There's still much work to be undertaken on changing peoples' mindset, wherever they are in the cycle, particularly on regarding waste as a resource and a material that can be put to good use once more. It's about considering the language used and tapping into public perception.

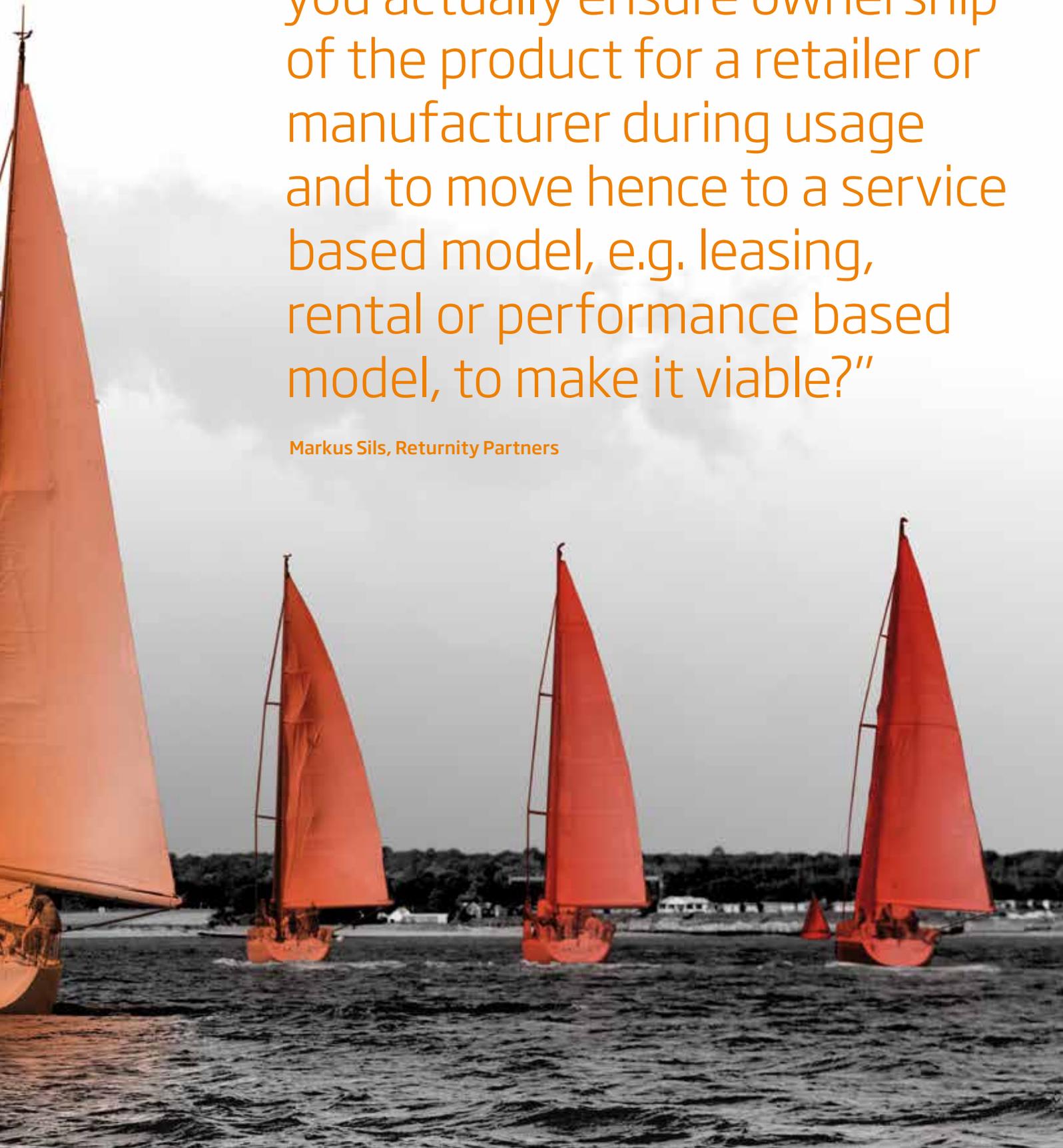
“An enabler was for a more entrepreneurial approach to research [with] educational institutions or private companies coming together and carrying out research and development.”

[outcome from discussions]



“One of the fundamental questions the business model needs to address is [whether] you actually ensure ownership of the product for a retailer or manufacturer during usage and to move hence to a service based model, e.g. leasing, rental or performance based model, to make it viable?”

Markus Sils, Returnity Partners





Enabling Conditions

A clear policy framework with relevant and specific Government support will be required to make such a huge step change toward a circular economy. We need a stronger framework than currently exists, there is a danger in simply leaving the market to work it out for itself.

Markets work best with intelligent regulations so ideally a combination of regulation and fiscal measures is required to shape the circular and shrink the linear model. Because only with a circular way of thinking can we take another step closer to zero waste. Legislative and fiscal measures should adopt a 'carrot and stick' approach. Positive encouragement of sustainable practices is just as, if not more, important than negative persuasion.

"We need a stronger [framework] than we presently have. Markets in my view have often worked better where intelligent regulations worked with markets. I liken it to the way governments shape other policy areas, such as health or defence spending."

Ray Georgeson, Resource Association

Fiscal measures such as the landfill tax, opposed by many when first introduced, have been effective, creating a huge shift in the way materials have moved away from landfill to recovery. People are looking for the cheapest way to manage waste and by taxing landfill, people are more likely to look to recycling and reuse as the more cost-effective solutions. Increasing landfill tax and introducing an incineration tax would do much to highlight the true value of resources as well as considering tax rebates on goods made from recycled content. What's more, avoiding landfill and incineration can significantly enhance environmental and social responsibility credentials.

A circular economy can do much to generate wealth, creating new opportunities based around markets that extract more value from each unit of resource. There's the opportunity to create a wide range of jobs, from semi-skilled to engineering roles across a variety of industry sectors, helping to regenerate ailing parts of the economy. Developing a circular economy can not only help to reduce environmental impact, but build a resilient economy too.

"Businesses that engage in the circular economy have the opportunity to make a positive impact on their bottom line."

[outcome from discussions]

ONE STEP BACKWARD

The existing legislative framework in the UK and in Europe is causing barriers to progress. This includes anti-competitive legislation which makes it difficult for companies to talk across different sectors on a European scale and manufacturers looking to share more information across the supply chain. Competition law is hampering industry collaboration which could build on improving the circular economy.

“With anti-competitive legislation, companies find it difficult to get together across different sectors to share specifications. Manufacturers want to share information across sectors and find it difficult to do so.”

[outcome from discussions]

Measures to help with financial processes are also causing problems, with some companies falling foul of leasing arrangements as set under the Financial Conduct Authority regulations. This all needs to be compatible and not hinder future growth. Financial regulations will need to keep abreast as new business models, particularly on the leasing and rental side, develop. The perception of a circular economy and what benefits it can bring to a business is still under discussion. Talk to people from different industries and it will mean different things to each one of them. There needs to be clear understanding of how companies in different industry sectors can benefit from the circular economy and which the best model is to implement.

“The perception is that the circular economy is very difficult but years ago recycling was perceived to be very difficult but now is seen as common place. The perception is that it is a lot harder than it needs to be. I’m not saying it’s easy and can be done overnight but there are barriers to every aspect of changing your business model. It’s just about doing business in a slightly different way and sharing experiences so we can learn how best practice can practically be achieved.”

[outcome from discussions]

ONE STEP FORWARD

The collaborative opportunities are great, particularly if different partners are brought together by an impartial host. Neutral facilitators can help overcome concern and build up trust between sectors within the supply cycle, especially those that have not worked together before. Having BIS (Department for Business, Innovation and Skills) as the main government department could act as a positive role here.

“Sitting on different project groups, bringing together different partners and using an impartial host to share information can be very useful in terms of approaching legislative problems from a commercial standpoint. Going it on your own is a lot harder.”

[outcome from discussions]

While there is a weakness in the understanding of how a circular economy can work and the potential benefits there are plenty of successful ventures already. We should make the most of sharing the systems and processes that work and highlighting those that haven’t succeeded is equally important. Getting in the habit of regularly sharing stories, sharing experience and knowledge is central to how the circular economy will function.

“[We need] to come up with good policy, good methods and good research that can assist Government to do the right things. Nowadays we can’t leave it to them. We have to work out the best policies for ourselves and share with others.”

Ray Georgeson, Resource Association

“Targets aren’t fashionable nowadays but they have had their place in the past and they will in the future. The key of course is involving all the relevant stakeholders, intelligent application of legislation and regulations by government, working with the industries to shape the ambition we are willing to have.”

Ray Georgeson, Resource Association

Continue the debate

www.dssmith.com/zerowaste

Please visit www.supplycyclegauge.com to take part in DS Smith's poll around the four building blocks of a circular economy.

To achieve zero waste, we must adopt a circular mindset, where used materials aren't considered waste, but valuable resources that can be recycled or reused. Zero waste means avoiding landfill at all costs and not simply relying on waste to energy as a solution for all waste. Designing waste out of the supply cycle and turning 100% of discarded materials back into something useful once is the only true way to achieve zero waste. Not only will this approach help you build a responsible reputation, it will take you one step closer to achieving waste and toward a resilient circular economy.

Thanks

We'd like to thank all delegates who participated in the workshop and our panellists: Sophie Thomas, RSA/The Great Recovery Project; Mark Shayler, Ape; Markus Zils, Returnity Partners; Tom Campbell-White MCIWM, DS Smith; Ray Georgeson, Resource Association; and Robin Latchem, MRW for facilitating the session.



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