

The Circular Economy at Kingspan





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1.0 Introduction



Redesigning an approach to materials and products, where what was once considered waste can be regarded as a resource

Today, the construction industry consumes 42.4bn tonnes of materials each year and accounts for 50% of global material use.¹ At Kingspan, we believe that shifting to a circular economy is an opportunity to make the step change needed to address these issues, decoupling resource depletion, natural capital degradation and waste from economic growth.

There are a number of definitions of a circular economy but, at its core, it is an economic system which seeks to move away from our traditional linear economy (take, make, waste), and aims to maintain value in materials through redesigning products and services, and making sure that those materials can be recirculated at the highest level for the longest time period. This concept of value retention is one which is repeated throughout the theory.

The Ellen MacArthur Foundation, a charity dedicated to promoting the global transition to the circular economy, has defined three principles of a circular economy:

1. Designing out waste and pollution;
2. Keeping products and materials in use; and
3. Regenerating material systems.²




The circular economy enables us to address multiple issues under one umbrella, limiting siloed initiatives and the potential to solve one problem only to create another. This is most evident in seeking to address two of the most significant issues facing the construction industry - resource depletion and waste generation. Redesigning an approach to materials and products, where what was once considered waste can be regarded as a resource, presents the opportunity to significantly limit the negative impact the construction industry is having on our environment.

Circularity is therefore key to delivering a more resilient and sustainable future. What this means for Kingspan is that the products, components and materials we produce are held at their highest value, and that our actions as a business are restorative and regenerative. Addressing the circular economy has now become a major factor in how we develop our products and drive operations. Furthermore, it influences the fundamental way in which we do business, incorporating our supply chain, customers and third-party collaborations.

2.0 Planet Passionate



The circular economy is embedded in Kingspan's ambitious global sustainability programme, Planet Passionate. Circularity is highlighted as one of three worldwide issues to be addressed through the programme and is one of four key areas of commitment, setting three strategic targets for the company to meet by 2030:

 Zero company waste to landfill by 2030	 1billion PET bottles recycled into our manufacturing processes by 2025	 All Quadcore™ insulation to utilise upcycled PET by 2025
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Kingspan's approach to the Circular Economy details the way in which these targets will be met, identifying the broad strategic work that will be required to truly embed circularity within the organisation. Through the Planet Passionate initiative, Kingspan will be able to play a part in addressing this global issue, helping to reduce waste, optimise resources and support circularity.

Kingspan's approach complements our work to address climate change and the protection of our natural environment. While these issues are intrinsically related, the actions taken to address them and the means by which progress can be measured, are often different. It is therefore of critical importance that we consider these issues separately, but in parallel, so that we can make the most informed decisions at any given time as we work towards ultimately achieving a low-carbon, restorative and regenerative circular economy.

For example, a product with high recycled content may not itself be recyclable at the end of life, and could incur a higher carbon footprint, whilst a material of low embodied carbon within a building may need to be replaced regularly, thereby using more resources over the lifetime of the building.

¹World Green Building Council Strategy 2020-22
²www.ellenmacarthurfoundation.org/circular-economy/what-is-the-circular-economy

3.0 Kingspan's Circular Economy Approach

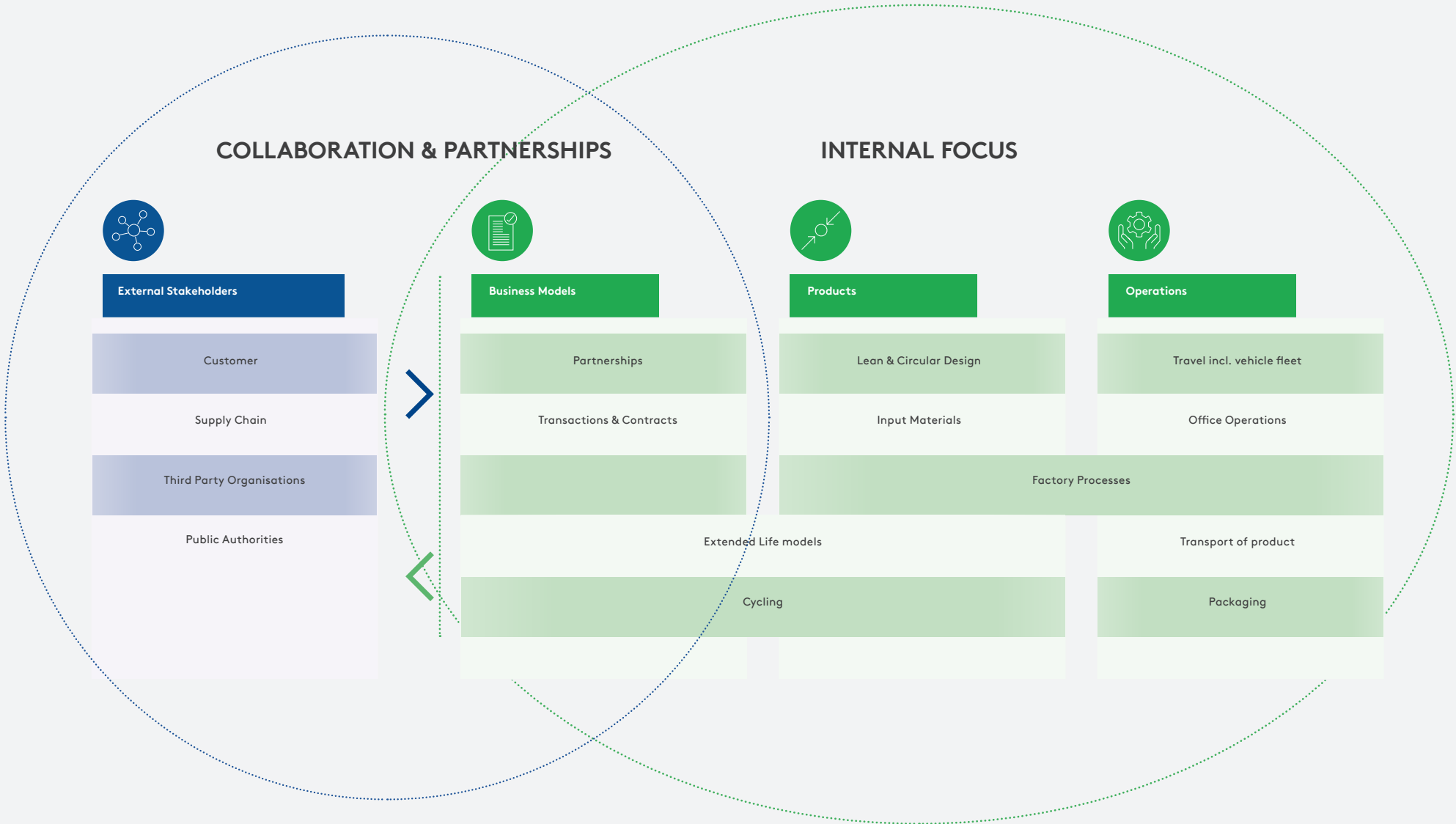
The circular economy is an emerging and complex concept. There is a temptation to over-simplify the issue to make it easier to address and present market facing initiatives - quick fixes that sound good but ultimately fail to deliver what is needed. To make sure that the company enacts real change and delivers long-term value, Kingspan has developed an overarching approach to address themes of circularity across the multiple scales of its business and value chain.

This method enables a nuanced and long-term view, facilitating continual re-evaluation as the concept is adopted and advanced across the construction industry, and addressing circularity on a broad scale. Kingspan's circular economy approach is based on three key elements:

Collaboration and Partnerships: Circularity is a collaborative process at every level, be it across our own business, through partnering with innovative third-party organisations, or new business models across our value chain. Collaboration and Partnerships is an integral part of our strategy, which links to supply chain sustainability and customer focus.

Internal focus: We will embed circular principles across our business to enable a systemic change mindset. This covers a range of activities, from how we run our production facilities and offices, to logistics, packaging and transport and the delivery of our new LIFEcycle Product Circularity Framework. (outlined in more detail on page 10)

Measuring and reporting performance: Development of a clear and robust framework will allow us to better understand the interrelating nature of the circular economy across these themes, and provide the information needed to unlock and start measuring circular outcomes across our product, operation and business functions.



4.0 Collaboration and Partnerships

A circular economy cannot be achieved in isolation, it requires collaboration at multiple scales to deliver effectively and efficiently. Collaboration and Partnerships is therefore an integral part of Kingspan's circular economy strategy, linking to supply chain, sustainability strategy and customer focus.

We cannot manufacture circular products without input materials which enable us to do so. Accessing these materials is a collaborative exercise, as some of the inputs we require, or suitable alternatives, might not exist yet or not at the scale we require. Showing suppliers that we are committed to a long-term sustainable vision, gives them the encouragement and market demand certainty to invest in their own research and development.

We are actively engaging with long term customers from the design and construction world, to develop market ready solutions for our products. Actively engaging with customers, and the wider construction industry, gives us the opportunity to make sure our products are delivering on their in-use potential and are dealt with appropriately at end-of-life to enable resource recovery.

We are also engaging with public authorities to highlight opportunities and barriers to circular economy in the construction industry, to help enable well-functioning policy frameworks. Partnering with third parties allows for pre-competitive collaboration and the transfer of knowledge to tackle issues endemic to the industry, and to begin to make construction more circular. We have partnered with leadership groups, such as the Ellen MacArthur Foundation, to develop and offer increasingly circular opportunities to market.



A showcase of lean design and circular thinking
UpCycle Office, USA

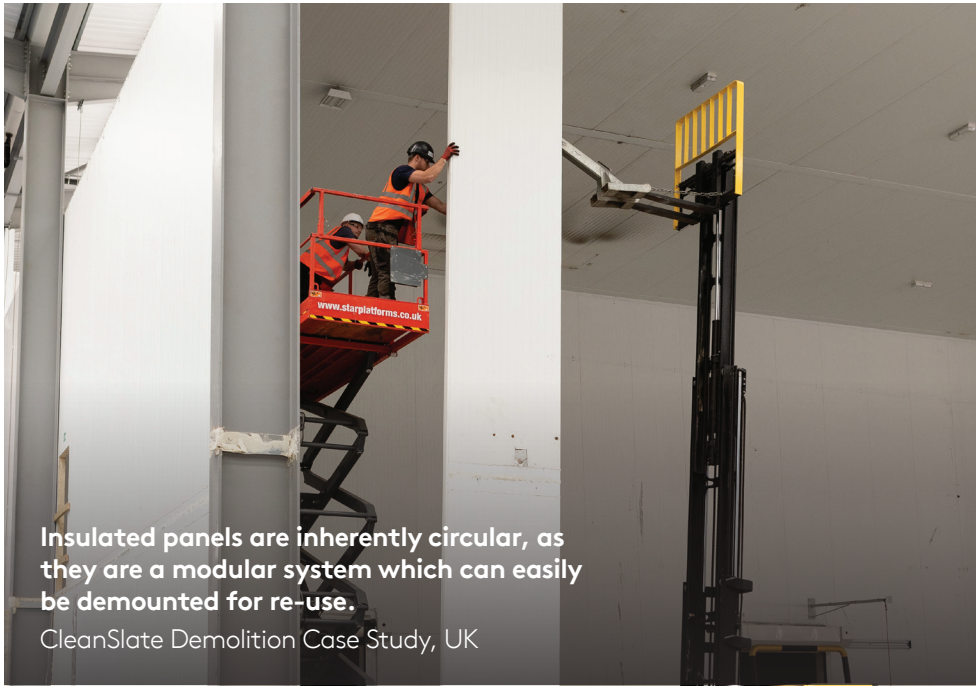
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5.0 Internal Focus

5.1 Business Models

We can never truly call a product we manufacture 'circular' unless we engage with how it is used once it leaves our facility; we could only enable a circular outcome. Active collaboration and investigating new business models, where we can directly influence or manage how our product is used, re-used, and treated at end-of-life, is an integral part of our approach to the circular economy.

Kingspan is exploring many avenues in order to enhance the circular potential of our product offering.



Insulated panels are inherently circular, as they are a modular system which can easily be demounted for re-use.
CleanSlate Demolition Case Study, UK



PET bottle collection initiative at our zero waste to landfill Insulated Panels site in the UK
Holywell, UK

5.2 Products

The definition of a circular product for Kingspan was key to developing our approach. We drew on core principles from across industry, such as the 9R Framework and the Ellen MacArthur Foundation's Circular Design Guide, to develop a robust and realistic framework to deliver on the ambition of Kingspan's approach.

A set of priorities covering the full product lifecycle was identified to define what a circular product should be, which requires broad evaluation and lifecycle thinking, but also enables key targets and metrics to be developed for each individual area. In turn, this allows initiatives at multiple scales to be undertaken to improve product circularity, as the framework (see page 10) requires both individual and collective assessment.

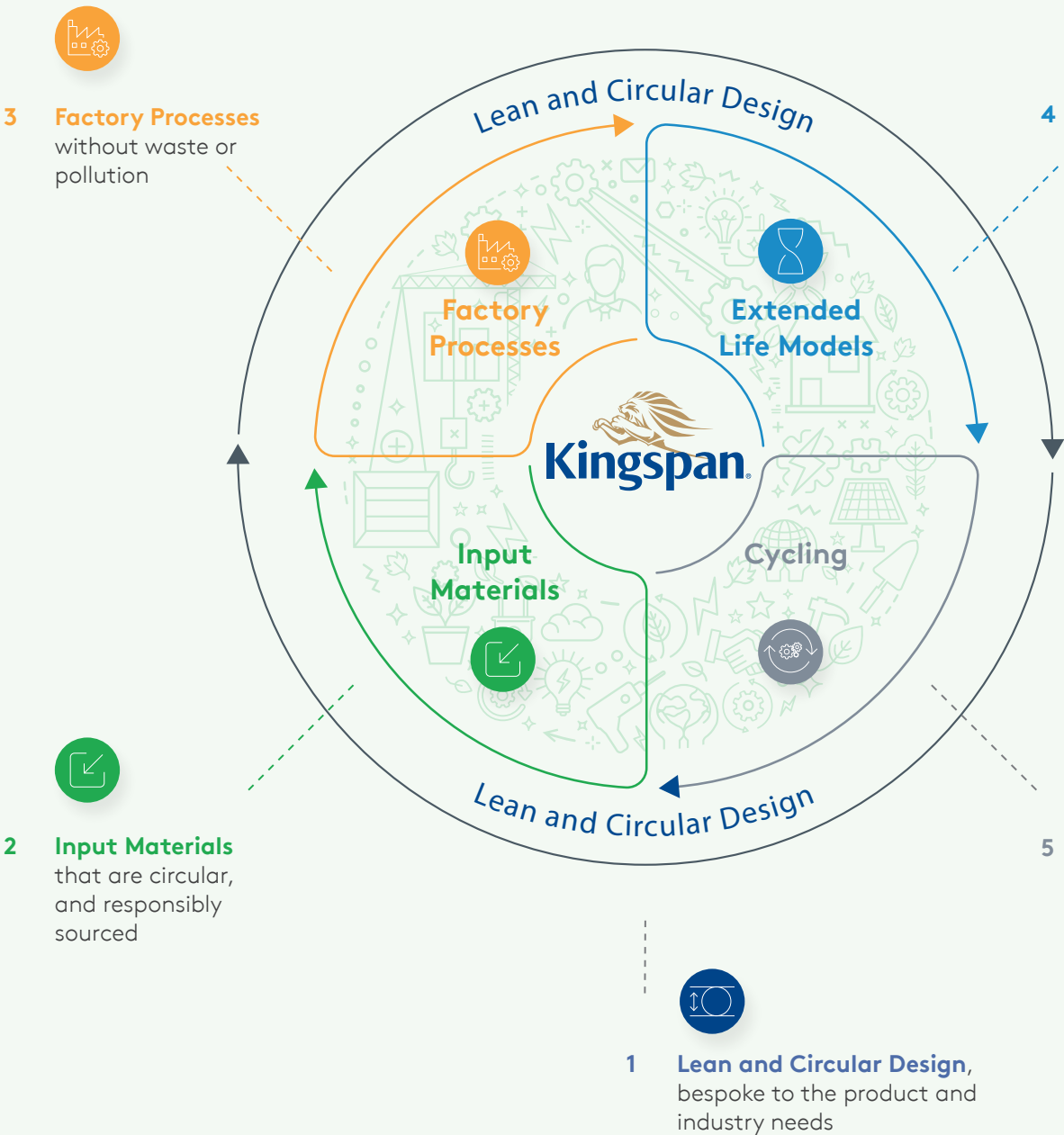
5.3 Operations

Introducing circular principles in our operations across the organisation is required in order to embed the mindset needed for systemic change. This covers how we run our production facilities and associated offices, to the logistics of product, packaging and transport.

6.0 Kingspan's LIFEcycle Product Circularity Framework

We have defined a circular product using our LIFEcycle Product Circularity Framework as one which addresses the following areas:

- 1. **Lean and Circular Design**, bespoke to the product and industry need;
- 2. **Input Materials** that are circular, and responsibly sourced;
- 3. **Factory Processes** without waste or pollution;
- 4. **Extended Life Models**, including potential reuse and/or repurposing where appropriate; and
- 5. **Cycling Technologies**: can be broken down all the way back to its basic material level, thereby allowing those materials to be remade into new products.



A clear framework allows us to take meaningful steps forward in our circularity journey, providing a structured approach, facilitating the setting of clear and measurable targets and timelines for implementation.

Giving an equal weighting to each step, forces us to consider the lowest impact, highest value solution at each stage, reducing the tendency to lean towards easy-win solutions. A focus on recycling can give a get-out clause for dealing with surplus material, as it can lead to a de-prioritisation of other, potentially better, avenues. For example, there might be much more to be gained, such as energy and material saving, from reuse, minimal repair, or repurposing. In alignment with industry and thought leaders, we want to make sure that recycling is seen as the last step and that our products are utilised to their full potential first.

We are currently using the LIFEcycle Product Circularity Framework to evaluate our existing product portfolio, by baselining performance and identifying opportunities and actions to improve. In addition to our existing portfolio, through our culture of innovation, we are committed to developing the high-performance products of the future which are lower in environmental impact and circular by design.

7.0 Delivering Circularity

Setting a clear structure gives Kingspan the platform to plan for progression. Our vision for delivering on circularity is set out below:

- **Product:** fully embed our LIFECycle Product Circularity Framework in all existing and new products;
- **Operations:** achieve circular processes within our operations and business models; and
- **Industry:** support and encourage the wider ecosystem of the construction industry to become more circular, building on existing initiatives (design for disassembly etc.) and partnerships.

Quantifying and reporting on our progress on circularity is crucial as we move forward with our parallel sustainability workstreams. Increasing the circularity of products doesn't always result in lower embodied carbon, as we are often considering innovative solutions which don't have the benefit of years of efficiency exercises that have streamlined their process. However, the broader environmental benefit is apparent, in reduced virgin material extraction and reduced waste. As these solutions become more standardised, their carbon intensity will drop as we appropriately scale and streamline our actions. Measuring and reporting this alongside our work with climate change mitigation and carbon accounting is a priority for transparency on our sustainability journey.

A broad and robust circular economy structure as part of our Planet Passionate vision provides Kingspan with the platform to deliver on true circularity. Our approach isn't just focused on closing our own loop, it is equally about the wider ecosystem of the construction industry, aligning our efforts towards achieving resource efficiency at scale and delivering on a net zero future and low carbon circular economy.



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