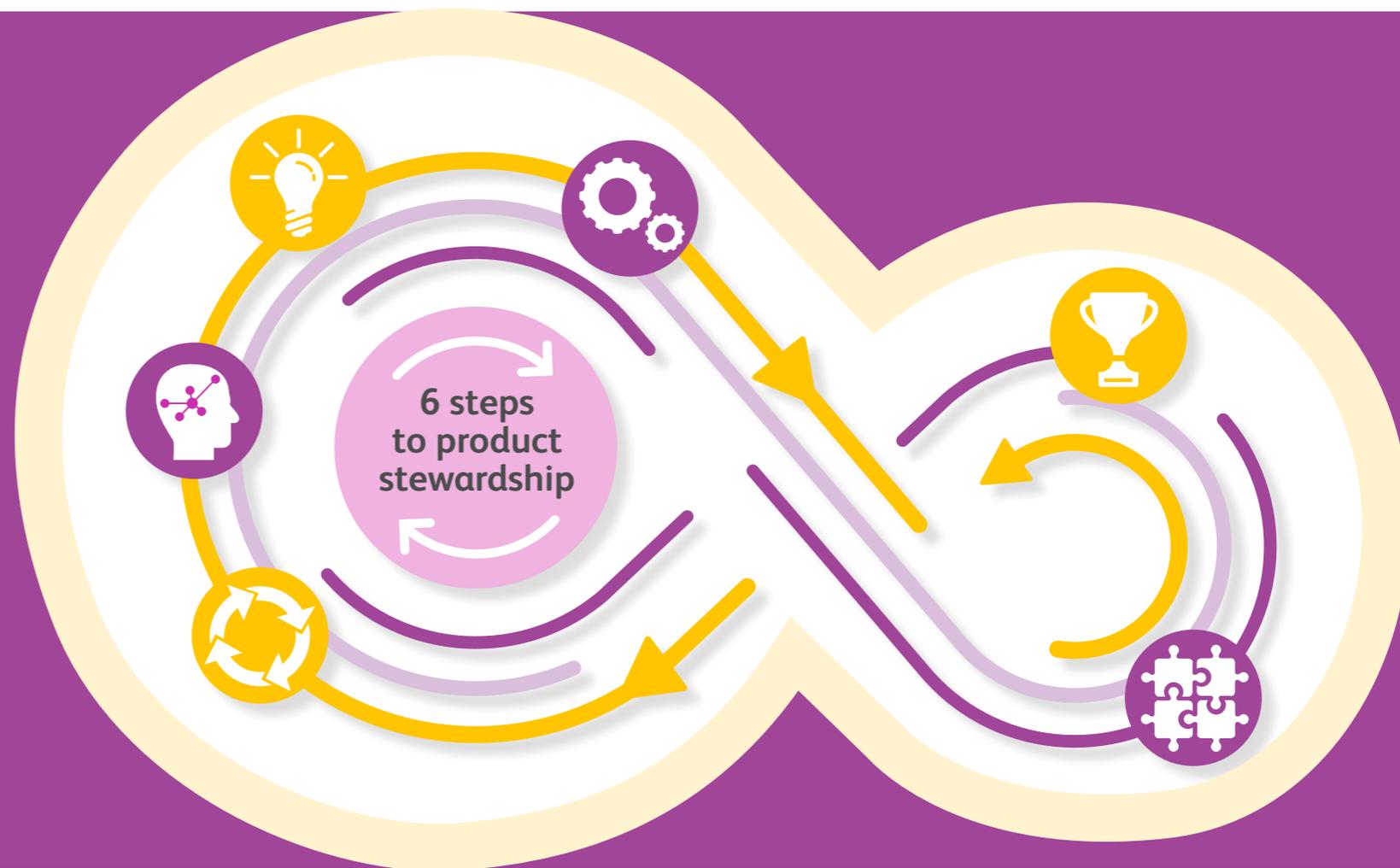


Product Stewardship Roadmap



This Roadmap is ‘open source’ – feel free to use this content to help encourage as many businesses along your value chain as possible to take the first step to a circular economy.

Many thanks to the Ministry for the Environment, accredited Product Stewardship Scheme managers and the Sustainable Business Network (SBN) who have all contributed to this Roadmap.

PRIMARY AUTHORS:

Juhi Shareef & Emma Harding, Fuji Xerox New Zealand

DESIGN:

Fuji Xerox New Zealand Design Team

A roadmap to product stewardship

Product Stewardship: the first step to a circular economy

Product stewardship is simply the responsible management of the environmental impact of a product, at all stages of the product lifecycle.

Everyone plays a part in a product's lifecycle, from design to use, reuse, recycling or disposal. We all need to work together to come up with creative, circular solutions. This Roadmap shares six steps to taking responsibility for the products you sell, manufacture or distribute.

In a throwaway economy which depends on consumption for growth, products often end up in landfill. Globally, this means 7 to 10 billion tonnes of **products** are landfilled annually. New Zealand's disposal to landfill is rising at 5 % per year, locking valuable resources in the ground.

So what can we as individuals and businesses do?

Instead of operating in a **take, make, waste** economy we need to move to a **circular economy** where we keep our valuable resources circulating and prevent pollution of our land, water and air.

In the first economic study of its kind, a recent report* revealed that Auckland alone could unlock up to \$8.8 billion of growth by 2030 if it were to transition to a circular economy.

RESOURCES:

Learn more about product stewardship and the circular economy on the Ministry for the Environment website:

<http://www.mfe.govt.nz/waste/responsible-product-management/government-accredited-product-stewardship-schemes>

www.mfe.govt.nz/waste/circular-economy

*Read the report "The circular economy opportunity for Auckland"

<https://www.circulareconomy.org.nz/aucklands-circular-economy-opportunity>

Get involved with the Circular Economy Accelerator, an initiative of the Sustainable Business Network here:

www.circulareconomy.org.nz

Visit the Ellen MacArthur Foundation, a fantastic resource of international best practice:

www.ellenmacarthurfoundation.org

The New Zealand story

In New Zealand, at the time of writing, there were 15 voluntary product stewardship schemes including ours at Fuji Xerox New Zealand, which have been formally accredited by the Minister for the Environment.

We wish to acknowledge the fantastic work of these businesses, whose accredited schemes, together with their suppliers have collectively prevented 1.3 million tonnes of product from landfill.

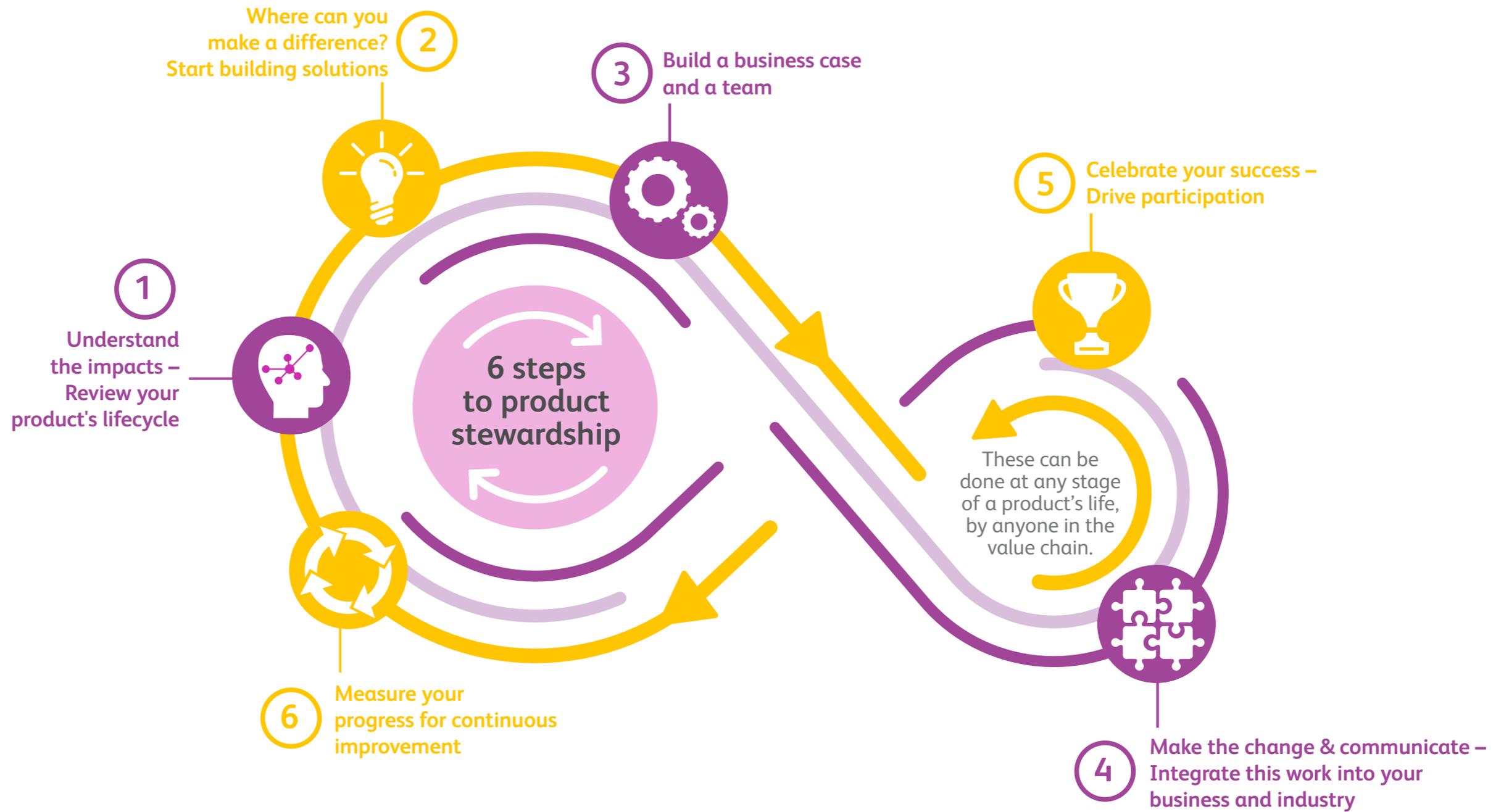
1.3 million tonnes kept from landfill

The managers of these Government accredited schemes, together with the Ministry for the Environment and the Sustainable Business Network, have kindly contributed to this Product Stewardship Roadmap and we at Fuji Xerox New Zealand thank them for their time and contribution.

How to use this Roadmap

The first section of this Roadmap shares six steps to develop your own product stewardship scheme. The second section encourages you to 'dig deeper' into your product lifecycle to see how to make more circular products.

The 6 steps to product stewardship





UNDERSTAND THE IMPACTS REVIEW YOUR PRODUCT'S LIFECYCLE

How can we reduce a product's 'lifecycle' environmental impacts – through design, manufacturing, use and end of life? If you have the resources, a Lifecycle Assessment is very helpful.

Think about how your product is currently:

DESIGNED

- How many components does it have?
- How frequently is the product redesigned?
- What materials are used and where are they sourced?

If you don't design the products you buy or sell, ask your upstream suppliers how they incorporate these considerations into their manufacturing processes.

MANUFACTURED

- What are the processes and materials involved?

USED

- Who are your customers and how do they use your product?
- What are the environmental impacts from using your product e.g. energy or water use?
- What is your business model – do you have a sale or lease model?

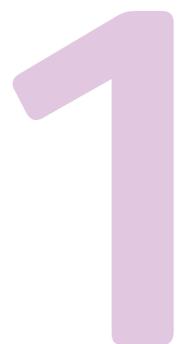
DISPOSED OF AT END OF LIFE

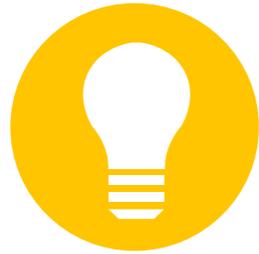
- Where will it end up – in waterways, in the air (e.g. if incinerated) or in landfill?
- Can it be reused / repurposed / disassembled / recycled? If so, where and how?
- Are there existing reuse / recycling programmes that you can partner with?

Understanding the impacts of your product's lifecycle will enable you to see connections between elements in its value chain where changes can be made, allowing the product to adopt more circular principles.

OUTCOME:

A map of your product's impact – see the following **Dig Deeper** section.





WHERE CAN YOU MAKE A DIFFERENCE? START BUILDING SOLUTIONS

2

Now you understand what and where your product's impacts are over its lifecycle, where can you make the biggest difference to reduce negative impacts?

- Are there any quick wins or small changes you can make immediately?
- What is your role in the lifecycle of your product? Where do you have the most influence for change? Define your role.
- Who has the most influence for change at the different stages of the product's lifecycle? Understand the drivers and concerns of a range of people who influence how the product goes through its lifecycle, considering designers, employees, suppliers, transport/logistics firms, retailers, customers, local government, recyclers and interest groups (your stakeholders).

Involve and partner with those who can:

- Help create alternative, sustainable pathways for your product, and
- Provide solutions to problems that you have uncovered, such as how to get your products back in the easiest and most cost-effective way.

OUTCOME:

Solutions to make your product more sustainable.



BUILD A BUSINESS CASE AND A TEAM

3

Do some initial calculations to see which solution is the most viable to become your product stewardship scheme:

Start to build a business case for your chosen scheme, considering:

- Costs and benefits
- What changes will need to be made to your current processes
- Timeline for implementation
- Who will manage the scheme once it is set up

Consider who will be key to make the scheme a success and identify and engage a champion from top management.

Build a team from across your business and your supply chain and include logistics partners, industry experts and partners who can upcycle, disassemble, reuse or recycle the product at the end of its life. Remember to include your customers at key points along the way.

Ask your team to help refine the business case. Who is going to fund the scheme: your business / user / end-user or a combination? Some customers may be willing to contribute to the cost of such a scheme, in which case the benefits of the scheme will need to be presented.

Make sure the scheme addresses the drivers of the stakeholders you considered at Step 2.

OUTCOME:

A business case for a product stewardship scheme.



MAKE THE CHANGE & COMMUNICATE: INTEGRATE THIS WORK INTO YOUR BUSINESS AND INDUSTRY

- Create a plan with clear actions, milestones and timelines to create your product stewardship scheme. Ensure budget is allocated to properly resource the scheme.
- Work with your team to implement the plan. This is not up to one person or department – every function within a business is part of the product lifecycle.
- Communication is key to success. Top management endorsement will ensure buy-in from across your business. Think about the stakeholders who will be impacted by the change. Remember their drivers and create a communications plan to address these. Key stakeholders will include: your customers; people who will be communicating the value of the scheme to your customers and those who will need to change their practices.
- Make it easy for people to change: equip them with information and resources in the format that works best for them and highlight the benefits and incentives of the scheme. This is essential, otherwise despite your hard work, your scheme may not be successful.

4

OUTCOME:

Implementation plan including regular internal and external communications.



CELEBRATE YOUR SUCCESS: DRIVE PARTICIPATION

- Reap the benefits of your product stewardship scheme! By selling a product that is better for the environment and society you are: leading your industry through innovation, reducing risk, potentially staying ahead of regulation and adding value to your business and your customers.
- Get others on board: Products are often part of a complex system. Help your customers, and those along your supply chain, understand their roles and where they can change to improve environmental and social practices.

5

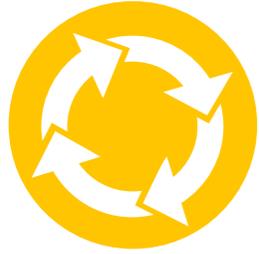
OUTCOME:

A case study to share with your stakeholders. Consider also sharing it with the the Circular Economy Accelerator.

<https://www.circulareconomy.org.nz/>

and the Ministry for the Environment at

www.mfe.govt.nz/waste/product-stewardship/applying-accreditation



MEASURE YOUR PROGRESS FOR CONTINUOUS IMPROVEMENT

Product stewardship is not a one-off project but a commitment to keep improving.

- Establish benchmark data (the amount recycled, reused etc) so you can measure your scheme's success over time.
- Engage with your stakeholders to see where else you can improve.

What would make a truly 'circular' product?

Refer to the **Dig Deeper section** and start at Step One to help further improve your product lifecycle.

For further inspiration, check out some case studies of schemes which are accredited by the Minister for the Environment.

RESOURCES:

Accredited voluntary product stewardship schemes:

<http://www.mfe.govt.nz/waste/responsible-product-management/government-accredited-product-stewardship-schemes>

Check out how Fuji Xerox New Zealand improved its Minister for the Environment-accredited product stewardship scheme:

<https://www.circulareconomy.org.nz/fuji-xerox>

6

OUTCOME:

A vision for a truly circular product.

PRODUCT STEWARDSHIP CASE STUDY:

At Fuji Xerox New Zealand, we believe that product stewardship is the first step to a circular economy. It provides a framework to move us from a 'take, make, waste' linear economy to an economy where valuable resources keep circulating.

We are proud that in 2015, our Product Stewardship Scheme was the first in our industry to be accredited by the Minister for the Environment. We offer all our customers a free take-back service for our machines, used printer cartridges, drums, fusers and developer (a substance used in our 'production' machines) to ensure they are reused and responsibly recycled rather than sent to landfill. Thanks to our Product Stewardship Scheme, we recycle 99.5% of the equipment we get back.

We recycle **99.5%** of the equipment we get back

We are now the first to improve our Scheme, by ensuring our waste toner has a second life in TonerPave™. TonerPave is a low carbon asphalt that is more durable and helps to reduce the carbon footprint of a road by up to 23% over its lifecycle.

Thanks to our Product Stewardship Scheme, we have diverted an average of

700 tonnes from landfill every year

As one of the first foundation partners of the new Circular Economy Accelerator, an SBN initiative, we are delighted to help champion the shift to a circular economy. Collectively all MfE accredited schemes to date have kept approximately 1.3 million tonnes from landfill, which is a win for the environment, for our communities and for our economy.

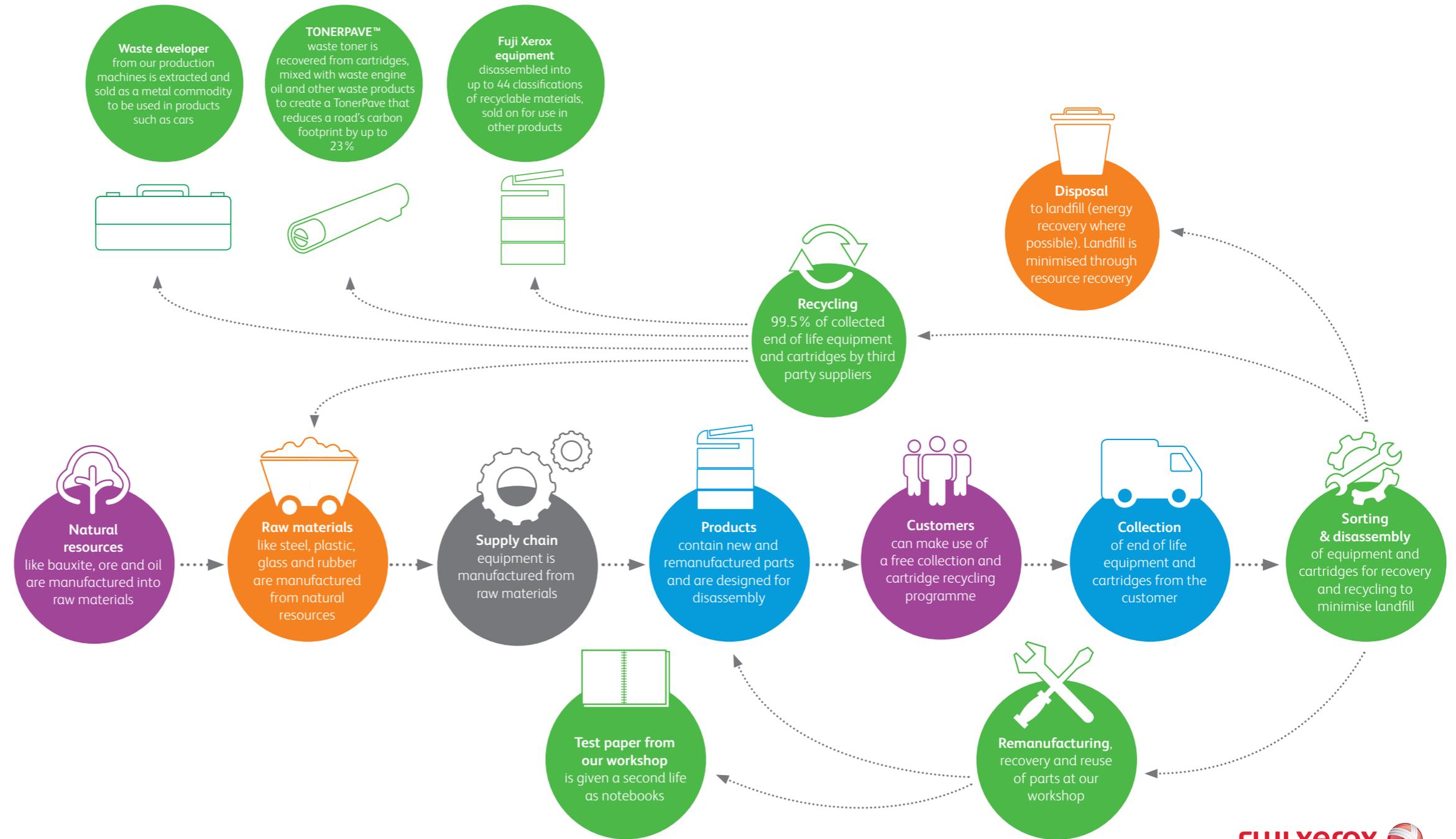
If more businesses practiced product stewardship, it would help New Zealand become perhaps the world's first circular economy. Let's make it happen!

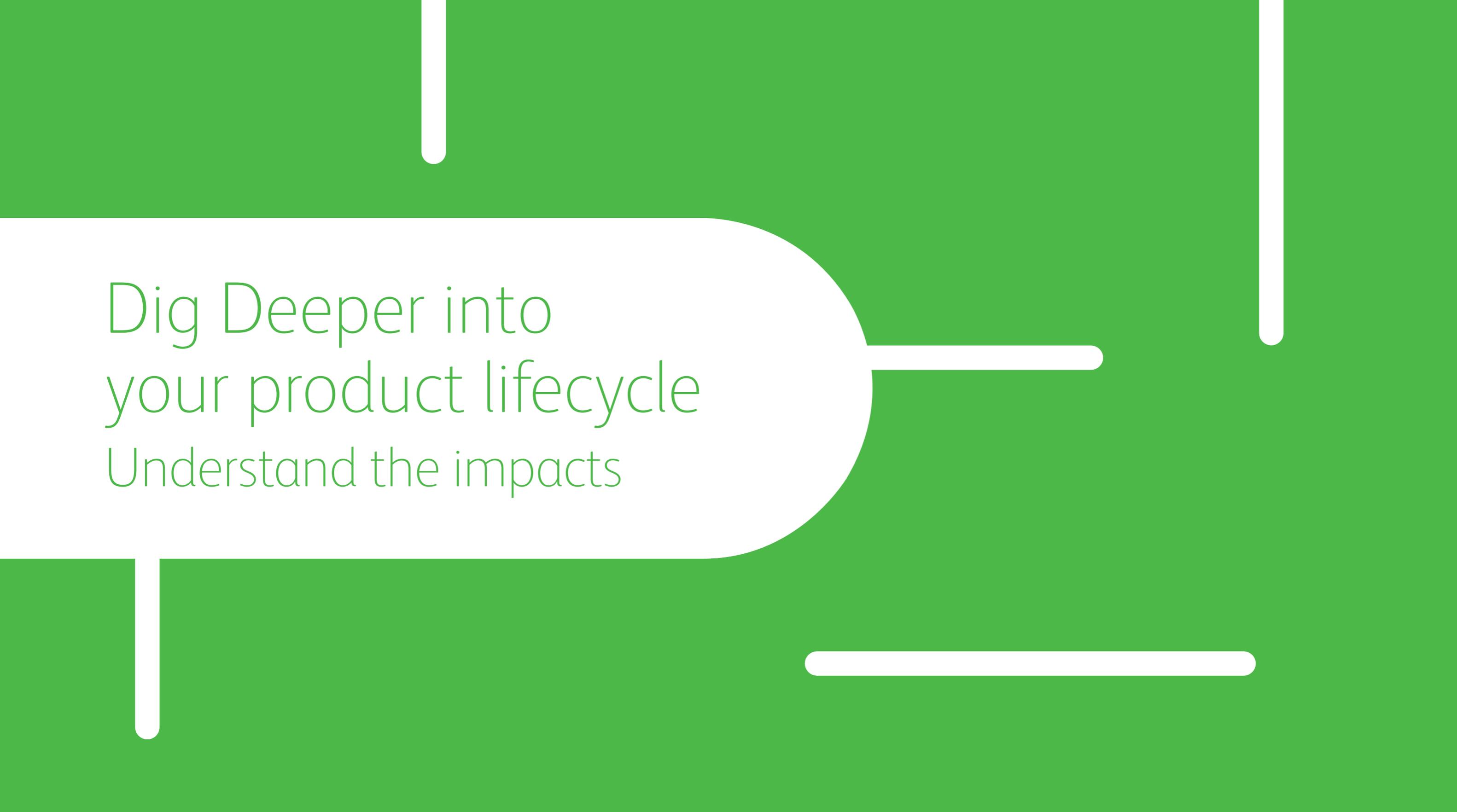
– The Fuji Xerox New Zealand Sustainability Team

For a full case study, please visit the Fuji Xerox website:

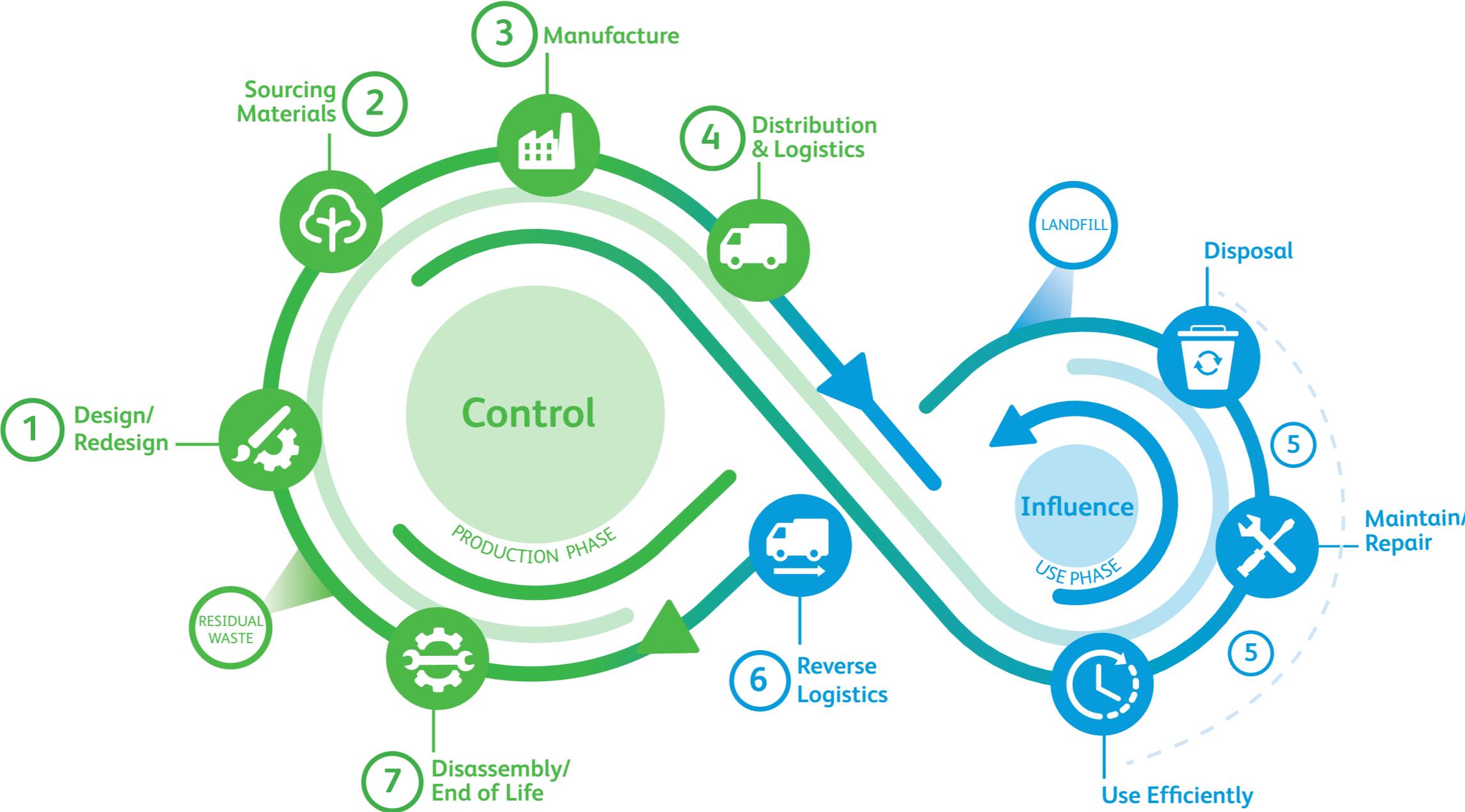
<https://www.fujixerox.co.nz/en/Sustainability/MFE-Product-Stewardship-Scheme>

THE FUJI XEROX
NEW ZEALAND
PRODUCT
STEWARDSHIP
SCHEME:





Dig Deeper into
your product lifecycle
Understand the impacts





Determine who can answer these questions to understand how the product is made and where in the lifecycle the biggest environmental impacts are.

This will help you:

- Identify quick wins and understand where you have the most control / influence (if you have a leasing business model, you will have greater control).
- Improve the design and production of a product to extend its life – design can impact every stage in the product lifecycle.
- Determine where you can potentially cut costs but also understand where a cost-cutting decision could lead to a poor quality outcome.
- Understand how you can offer more value to your customers by meeting their drivers and offering a more sustainable product.
- Understand what to do with the product and how to get value back from it at the end of its life.



DESIGN / REDESIGN

- Is your product designed for easy reuse, repair and finally, recycling? If not, how can this be addressed? Considering the end of the product's life from the design stage can ultimately contribute to your bottom line.
- Which materials are currently used in your product? It may be helpful to create a 'bill of materials' to better understand the environmental impacts the product may cause. Talk to product designers and find out what alternative materials can be used and how these materials can be remanufactured at end of life. Product designers can help you choose more sustainable, non-toxic components, and materials that can be easily reused, recycled or composted. No one wants their product to end up as toxic gloop.
- Is your product reliant on other products to work? How can you work with these partners to improve shared sustainability performance?
- What packaging does your product require, how can you design the packaging out? (This can help reduce logistics costs). What are the sustainable alternatives?
- Is your product single use: can it instead be reused or have its life extended through maintenance and repair?
- How can the product be improved to reduce its environmental impact during use by the customer? e.g. by minimising water for washing or designing for energy efficiency.
- Design your product to reduce waste over its lifecycle as 80% of waste is determined in the design phase*.

BEST PRACTICE: CIRCULAR DESIGN

A key 'circular' principle is to design for easy disassembly with components and materials that can be reused, repurposed, or used in creating a new product. Remember, reuse maintains a material's quality while recycling doesn't.

Products should be easily disassembled into 'technical' or 'biological' loops, see these worksheets for more information: https://www.ellenmacarthurfoundation.org/assets/design/Circular_Flows_Final.pdf

Instead of 'less bad', aim for your product to do 'more good' i.e. can the product be redesigned to enhance our natural environment?

RESOURCES:

*Source: www.wrap.org.uk. Also see WRAP Topic Guide: Embedding environmental sustainability in product design.

A key resource for the design stage is the Ellen MacArthur Foundation Circular Design Guide:

<https://www.circulardesignguide.com/>

To learn more about circular design, read the book:

'[Cradle to Cradle, Remaking the Way We Make Things](#)' by William McDonough and Michael Braungart.



FUJI XEROX CASE STUDY

PRODUCT DESIGN:

We at Fuji Xerox ensure that sustainable practices are maintained across our supply chain and throughout the provision of any services to our customers. Our customers can be confident when choosing from our range of Multi-Function Devices (MFDs) that they are designed with sustainability in mind.

The design stage of product development enable Fuji Xerox and our customers to meet environmental targets by incorporating technologies that:

- Eliminate the need to use hazardous materials
- Enable low energy consumption during use of the machines – all our office products exceed the ENERGY STAR® requirements
- Utilise innovative and energy-efficient toner and ink specifications

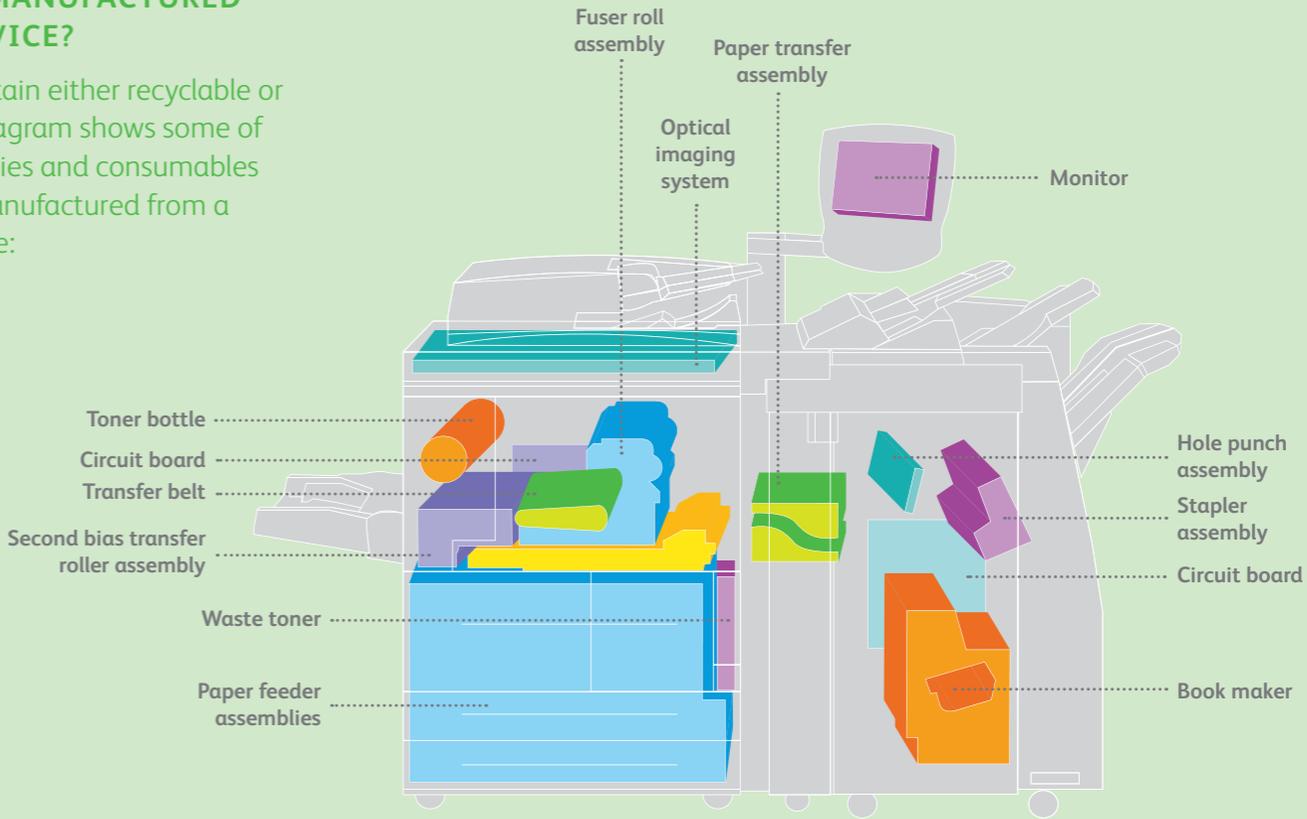
Emulsion aggregation (EA) toner is used in Fuji Xerox devices and was developed after eight years of research. The toner is manufactured from liquids using 35 % less power to produce than conventional toner and is engineered to generate over 50 % less waste when used.

EA toner also displays image-fixing capabilities at low temperatures, requiring even less energy for printing. Besides saving energy and reducing waste, the EA toner offers high-quality printing, producing sharper images regardless of the smoothness of the paper’s surface.

Fuji Xerox adopts design standards that later facilitate the remanufacture and recycling of used machines and parts, as outlined to the right.

WHAT CAN BE REMANUFACTURED IN AN OFFICE DEVICE?

Fuji Xerox devices contain either recyclable or reusable parts. This diagram shows some of the parts, sub-assemblies and consumables that are typically remanufactured from a Fuji Xerox Office device:





Standardisation
We have various components that are common to existing and future models so they can be reused.



Strength
We continuously increase the use of high-rigidity materials to reduce damage during transport, handling and use of equipment.



Durability
We build components designed for longer life to facilitate reuse.



Disassembly
We design products for easier separation and disassembly of short-life components.



Recyclability
We select materials that can be recycled easily. All plastic components are marked to signify their composition, therefore making them easier to recycle/remanufacture.



SOURCING MATERIALS WHERE AND HOW ARE THE MATERIALS SOURCED:

- Dig deep into your product supply chain – where are your materials sourced from? What are better, more sustainable alternatives?
 - Are the materials made of recycled content (preferred) or are they virgin materials?
 - Can they be sourced locally to minimise your carbon footprint?
 - Are they certified? E.g. is the paper or wood you are using sourced from a forest certified as sustainably managed? Robust certifications can help ensure your materials are from sustainable sources.
 - Consider social impact: are the materials sourced ethically (e.g. avoiding forced or child labour and poor labour conditions for workers / sub-contractors, conflict areas etc)
- Can your materials supply chain be improved and simplified?

2



MANUFACTURE / REMANUFACTURE HOW AND WHERE HAS THE PRODUCT BEEN PRODUCED:

Now you understand what materials are used in your product, think about how your product is made.

- Who manufactures the product?
Assess the manufacturer(s) for their commitment to environmental and social improvement. This is key to managing reputational risk.
- Where is the manufacturing facility?
In New Zealand many products are now produced fully or partially offshore. Products made in New Zealand support local employment and minimise a product's travel carbon footprint.
- How can you reduce the environmental impact of manufacturing your product?
 - Does the factory or production facility minimise their water consumption and energy use / carbon footprint?
 - Do they use renewable energy and recycle their waste?
 - Are all the chemicals non-toxic?
- Consider the social impact as with materials sourcing.
- There are international standards manufacturers might have such as ISO 14001:2015 for environmental management or local certifications like Environmental Choice New Zealand. At a minimum, ask to see policies and certificates or do a site visit to check conditions of the facilities.

3



DISTRIBUTION & LOGISTICS HOW HAS THE PRODUCT BEEN STORED, TRANSPORTED AND SOLD?

- Does your product sit in a warehouse or distribution centre? Does it require special conditions such as a cool environment? There are often cost savings to be found when looking into how your product is stored and distributed.
- Is your packaging space-efficient for storage, transport and retail display or can it be improved?
- How can you minimise your product's transport carbon footprint? Work with a logistics company who can measure your carbon footprint and finally, help you to offset. Even better, work with a provider who is keen to innovate e.g. with an electric fleet.
- Is there potential to 'share' unused truck space with other companies?

4



USE PHASE EXTENDING YOUR PRODUCT'S LIFE

Often a product's biggest impacts are in the 'use' phase. Many products use electricity, water etc.

- How can energy and resource use be minimised?
- What instructions do your customers need to reduce impacts and extend the product's life? Repair is a potential revenue stream. At end of life, if a take-back service is not offered, how can the customer responsibly dispose of the product to avoid landfill? How can these instructions be better communicated?
- Ensure the product can be reused: single-use products, particularly plastic products are extremely harmful to the environment. If they absolutely need to be single-use, ensure they are **biodegradable** or can be recycled
- How can the product be easily repaired? Customers are becoming increasingly cynical about 'planned obsolescence'. Find a way to further engage with your customers and offer tips on how they can get the most out of your product.

RESOURCES:

Check out some good practice case studies here:
www.circulareconomy.org.nz/case-studies-2

5



REVERSE LOGISTICS GETTING YOUR RESOURCES BACK THROUGH RETURN OR COLLECTION

For a successful product stewardship scheme, 'reverse logistics' is key – create a take-back service for your products.

This can be one of the hardest steps and you need to consider all options:

- Who is responsible for returning the product: you, your customer, a retailer, recycling partner, etc.?
- Are you creating collection hubs?
- Or, will you use a logistics provider to return the product? If so, work with your logistics partner to see if you can negotiate a lower rate as the product will be end of life so may need less care in handling. As with distribution, you may be able to 'share' unused truck space.
- There are many examples of take-back schemes apart from ours at Fuji Xerox New Zealand (e.g. Resene Paintwise or Nespresso) who demonstrate different reverse logistic models.

RESOURCES:

Check out some good practice case studies here:

www.circulareconomy.org.nz/case-studies-2

Resene Paintwise: www.resene.co.nz/paintwise

Nespresso: www.nespresso.com/nz/en/how-to-recycle-coffee-capsules

6

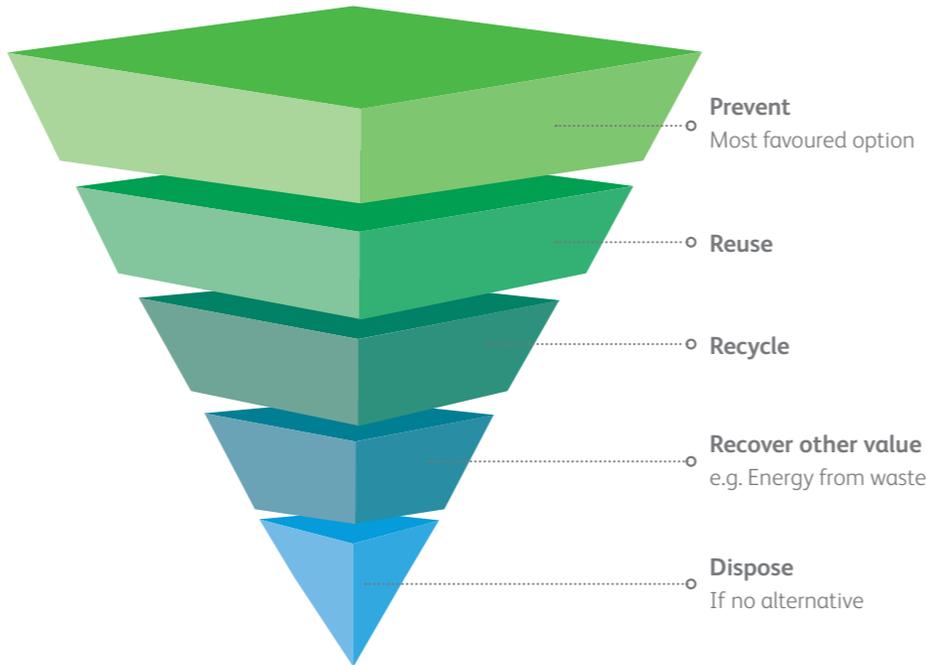


DISASSEMBLY / END OF LIFE
HOW ARE YOUR PRODUCT
MATERIALS REUSED,
RECYCLED AND DISPOSED OF:

Once you have explored all the above options, how can the product components or materials be:

- Disassembled
- Reused
- Recycled – do the materials need to be separated for recycling?

Remember the ‘waste hierarchy’:



Consider:

- Where will the product end up: in waterways, in the air (e.g. if incinerated) or in landfill? Recent research predicts that by 2050, there will be more plastic by weight in the sea than fish.
- Are there existing recycling programmes that you can partner with? Fuji Xerox New Zealand has partnered with Close the Loop to ensure waste toner has a second life in low carbon road surface: TonerPave™.
- Can you collaborate with other businesses or social enterprises on innovative projects or campaigns to find a solution to shared waste streams?

For example, the waste test paper from Fuji Xerox workshops is collected and given a second life as a notebook. Doing this eliminates the paper production process which has equated to over 3 million litres of water saved since the first collection was made in 2015.

RESOURCES

More plastic than fish:
<https://www.weforum.org/agenda/2017/01/more-plastic-in-sea-than-fish-3-strategies/>

Fuji Xerox Product Stewardship Scheme:
www.fujixerox.co.nz/en/Sustainability/MFE-Product-Stewardship-Scheme

The Akina Foundation and social enterprise resource:
www.akina.org.nz

The CleanSeas campaign: www.cleanseas.org

The Sustainable Business Network is at concept phase of an Institute for Innovation in Remanufacture & Reuse, learn more at:
www.circulareconomy.org.nz

There is a great resource of Product Stewardship Schemes accredited by the Minister for the Environment at:
<http://www.mfe.govt.nz/waste/responsible-product-management/government-accredited-product-stewardship-schemes>



We wish you all the best on your journey to a circular future.

Please contact Emma Harding, Risk & Compliance Manager – Sustainability & Circular Economy
at emma.harding@nzl.fujixerox.com with any questions or feedback.

