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Mainstreaming Circular Economies Through Collaboration and Co-creation (MainCirc)

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Lead organisations: Kemmy Business School, University of Limerick

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Rialtas na hÉireann
Government of Ireland

Environmental Protection Agency

The EPA is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

Regulation: Implementing regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply.

Knowledge: Providing high quality, targeted and timely environmental data, information and assessment to inform decision making.

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The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

1. Office of Environmental Sustainability
2. Office of Environmental Enforcement
3. Office of Evidence and Assessment
4. Office of Radiation Protection and Environmental Monitoring
5. Office of Communications and Corporate Services

The EPA is assisted by advisory committees who meet regularly to discuss issues of concern and provide advice to the Board.

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What did this research aim to address?

The traditional take-make-dispose economy model is highly resource-intensive and contributes significantly to the climate crisis through waste generation and carbon emissions. In contrast, a circular economy promotes resource efficiency by prioritizing reuse, repair, recycling, and sustainable design. The MainCirc project through collaboration with Green IT, an Irish SME specialising in sustainable Information and Communication Technology (ICT), aimed to understand how circularity could be mainstreamed through innovative business models. The electronics and ICT sector, identified as a priority area under both EU and Irish circular economy policies, offers significant potential for circularity (high product obsolescence, , emphasis on product innovation and new products). The project examined value co-creation in ICT circularity, assessed market potential for second-life devices, developed sustainability and climate impact metrics, and influenced policy frameworks. The research is important for European and Irish policy makers who are responsible for defining and meeting circularity targets.

What did this research find?

A central outcome of MainCirc was the design and delivery of a demonstration project that contributed to the mainstreaming of ICT circularity. Remanufacturing ICT, the process of restoring devices to 'like-new' condition, was found to offer higher perceived value and acceptance compared to refurbishment, particularly among organisational buyers. To unlock public sector opportunities, Green IT successfully sought inclusion into Ireland's public procurement framework (PPF), which previously restricted ICT procurement to new devices. In June 2024, Ireland became the first European country to formally include remanufactured ICT in its national PPF through the revised "Buying Greener" strategy. Between August 2024 and March 2025, 2,500 remanufactured laptops were purchased by public sector buyers. The associated GHG emissions savings is approximately 166 tons CO2 equivalent. While this is already substantial, if Green IT can achieve the full potential of 64,000 units of remanufactured laptops over the life of this public procurement contract, this would lead to an average saving of over 1000 tons CO2 equivalent per year for each of 2 the 4 years of the procurement framework.

How can the research findings be used?

This project supported Green IT's strategic shift towards 'servitization', from a product-based to serviced-based business models, emphasising the growing viability of remanufactured ICT in mainstream procurement. Through close buyer engagement and continuous service improvements, it showcases how circular ICT can meet high performance and aesthetic standards, challenging outdated perceptions of non-new devices. One of the most significant impacts of this project is the legitimization of circular ICT products as a viable alternative to new devices. The project's action research design ensures robust evaluation, offering evidence-based insights that support policy developmentimpacts of climate change and EWEs. Based on the outcome of this analysis, it may be possible to identify how these monitoring programmes can be augmented to address the additional information needs.

Project code: 2021-GCE-1071

EPA RESEARCH PROGRAMME 2021–2030

Mainstreaming Circular Economies Through Collaboration and Co-creation (MainCirc)

(2021-GCE-1071)

EPA Research Report

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This report is based on research carried out/data from April 2021 to January 2025. More recent data may have become available since the research was completed.

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Executive Summary

The Mainstreaming Circular Economies Through Collaboration and Co-creation (MainCirc) project is a 4-year academia–industry collaboration between the University of Limerick and GreenIT, a small Irish company specialising in sustainable information and communications technology (ICT). Running from April 2021 to March 2025, the project examined how circularity could be mainstreamed in the ICT sector through action research, co-creation and innovative business models. MainCirc addressed environmental, economic and institutional challenges and offered real-time solutions implemented through a demonstration project.

In contrast to traditional linear economy models, a circular economy approach seeks to minimise waste and extend product life cycles through reuse, refurbishment, remanufacturing and shared ownership, aiming to decouple economic growth from resource consumption. The ICT sector, identified as a priority area under both EU and Irish circular economy policies, offers high potential for circular practices due to its significant environmental footprint and reliance on scarce resources. However, shifting to circular practices is particularly challenging due to consumer perceptions, rapid innovation cycles and entrenched linear business logics.

MainCirc aimed to understand value co-creation in ICT circularity, assess market potential for second-life devices, develop sustainability and climate impact metrics, and influence policy frameworks. GreenIT was selected as a case partner due to its commitment to ICT device refurbishment and sustainability. The project applied an action research methodology, enabling iterative, real-time learning between academic and industry partners. Over the project's duration, the team conducted 32 stakeholder interviews, market analysis and co-creation workshops.

A central outcome of MainCirc was the design and delivery of a demonstration project that contributed to the mainstreaming of ICT circularity. Remanufacturing, the process of restoring devices to "like-new" condition, was perceived to offer higher value and to be more acceptable than refurbishment, particularly among organisational buyers. The public sector was identified as offering important opportunities, given the sectoral targets set out under the Green Public Procurement Strategy and Action Plan 2024–2027.

Thus, to unlock public sector opportunities, GreenIT sought the inclusion of remanufactured devices in Ireland's public procurement framework (PPF), which previously restricted ICT procurement to new devices. Through sustained engagement with policymakers and strategic alignment with Circular Computing (UK), GreenIT successfully advocated for the inclusion of remanufactured ICT devices into the PPF.

In June 2024, Ireland became the first European country to formally include remanufactured ICT devices in its national procurement framework through the revised "Buying Greener" strategy. The demonstration project marks a significant milestone in mainstreaming circular ICT. With sales of over 2500 remanufactured ICT devices to government agencies between July 2024 and March 2025, the project has initiated market change and has impacted policy in Ireland, receiving positive feedback from multiple government agencies regarding product quality, affordability and ease of procurement.

A critical component of the project was developing sustainability metrics. Global warming potential (GWP) was selected as the primary emissions indicator due to its relevance in climate policy. Using a customised life cycle assessment calculator, the emissions savings from remanufacturing versus new device production were estimated at 165.55 tonnes of CO_2 equivalent for the initial 2500 units sold. If scaled to the full contract potential of 64,000 units over 4 years, projected savings could exceed 1000 tonnes of CO_2 annually. To put this in context, 1000 tonnes of CO_2 is roughly equivalent to the annual emissions of 230 petrol-powered passenger vehicles, or the carbon sequestered by approximately 16,500 seedling trees growing for 10 years. These initial figures indicate that securing the opportunity to offer remanufactured ICT devices through the PPF has been significant, not only in terms of the GWP impact but also because it has advanced conversations around remanufacturing and circularity in the public sector and beyond.

Beyond product sales, the project supported GreenIT's strategic shift towards "servitisation", a shift from product- to service-based business models. This included offerings such as end-of-life management, sustainable procurement advisory services and circular data reporting. Service-oriented business models enable deeper value co-creation with clients and reflect a systemic approach and opportunity for circularity.

MainCirc demonstrates that market transformation towards circular ICT is both possible and impactful when driven by collaboration, co-creation and research-led practice. By successfully integrating remanufactured ICT devices into public procurement, the project created policy and market shifts critical for Ireland's circular economy transition. MainCirc sets a precedent for action research-led market transformation and provides a scalable model for circular ICT adoption in other sectors and regions. Key recommendations include improving circular product perceptions; collaboration across market actors; shifting from product-based models to service-oriented solutions; and integrating sustainability metrics into decision-making.

1 Overview of MainCirc Project

1.1 Introduction

Linear business models are characterised by *take, make and dispose* – a straight-line process where natural resources are extracted, used to manufacture products and then discarded as waste after use (Figure 1.1). This approach has dominated global markets since the Industrial Revolution and is reflected in long-established market logics, in which business performance is predicated on new product development, market expansion, continuous growth and planned obsolescence. Within this model, waste has largely been treated as an externality. However, today, global waste generation has reached alarming levels and there is growing recognition that raw materials and other resources are not infinite. Therefore, it is acknowledged that this linear economy model is heavily implicated in the current climate crisis and is, ultimately, unsustainable. In contrast, the realisation of a circular economy is considered critical to fostering sustainable economic growth, which is a contested and multivalent concept (Connelly, 2007; Glavič and Lukman, 2007), by reducing reliance on imported raw materials and ensuring environmental wellbeing.

According to the Whole of Government Circular Economy Strategy 2022–2023, a circular economy is "an alternative to this linear model, one in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of life" (DECC, 2021). The circular economy operates at multiple levels – the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond). The ambition of circularity is to simultaneously create "environmental quality, economic prosperity and social equity, to the benefit of current and future generations" (Kircherr *et al.*, 2017: 224–225). Achieving a circular economy would decouple economic growth from resource consumption by encouraging the continual use of raw materials, reducing waste and supporting sustainability (Figure 1.2). This will require augmenting (and eventually replacing) the conventional take–make–dispose supply chain model through refurbishment, remanufacturing, dismantling, reuse and recycling. These processes not only challenge the identity and stability of products but also create a need for "new forms of valuation and exchange" (Spring and Araju, 2017: 127). The shift from a linear to a circular economy will be as challenging as it is necessary and will require transformations in market logics, institutional contexts and business practices.

At a macro institutional level, the EU is a global leader in promoting the potential of circularity to foster sustainable economies, create jobs and reduce environmental impacts. One of the driving factors behind this transition is the EU's aim to enhance its strategic autonomy by decreasing dependence on imported raw materials. Indeed, it is estimated that achieving a more robust circular economy could reduce Europe's overall material use by up to 11% within a decade, effectively decoupling economic growth from raw material consumption (World Bank, 2022). The EU has identified the following seven key

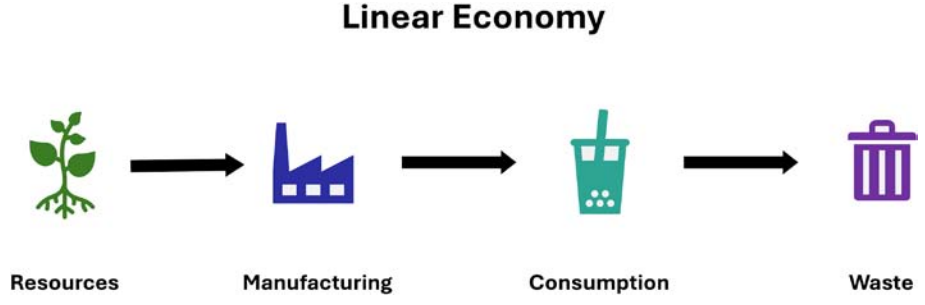

Figure 1.1. Linear economy.

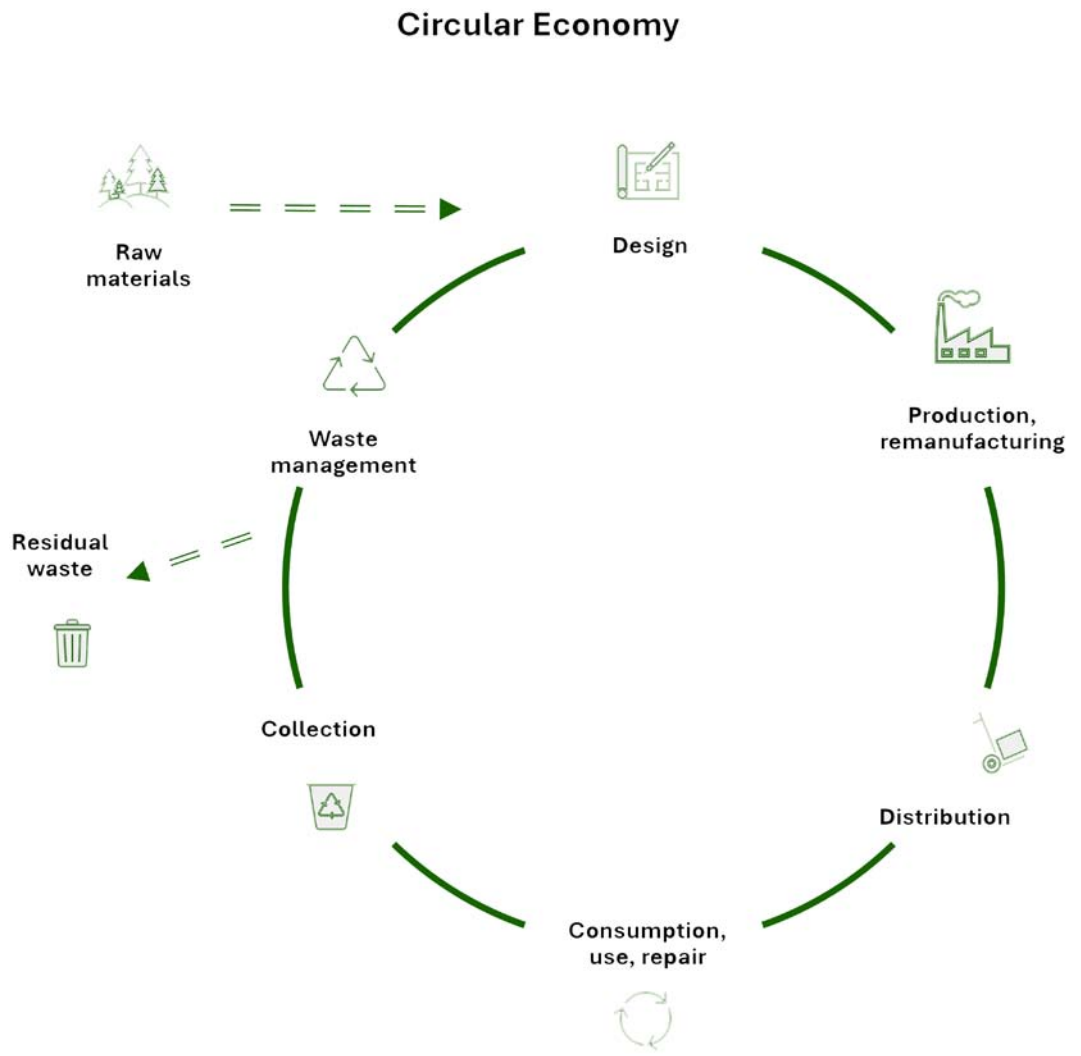

Figure 1.2. Circular economy.

sectors to prioritise in relation to circular economy efforts:

1. electronics and information and communications technology (ICT);
2. batteries and vehicles;
3. packaging;
4. plastics;
5. textiles;
6. construction and buildings;
7. food.

The collaboration of industry stakeholders, policymakers and other relevant actors will be necessary to ensure that circularity is achieved within these sectors (WBCSD, 2020). Led by the EPA, Ireland's Circular Economy Programme (2021 to 2027) is the driving force for our move to a circular economy. Focusing on the reuse of materials, the programme aims to overcome barriers to the take-up of pre-owned/ refurbished goods and to promote a national reuse and repair culture. However, progress is slow, with Ireland's circular material use rate being only 2% in 2020, well below the EU average of 12.8% (OECD, 2022).

1.2 Rationale for a Focus on the ICT Sector

Both Ireland's Circular Economy and Miscellaneous Provisions Act 2022 (Government of Ireland, 2022) and the EU's Circular Economy Action Plan (EC, 2020) identify ICT as a priority sector because of its impact on environmental degradation. The electronics and ICT industries have a significant environmental impact,

particularly at the manufacturing and disposition phases. Value is embedded in the product at the manufacturing stage, is accessed through purchase and use, and is disposed of when it becomes waste. The sector has a very high negative environmental impact not only because of the materials used (semiconductors, batteries, reliance on energy-intensive and critical raw materials) but also because it is deeply embedded within a business logic that is predicated on market growth through high levels of product obsolescence and truncated product life cycles, and an emphasis on product innovation and new products. Consequently, product lifetimes are often much shorter than their potential lifespans, adding to electronic waste (e-waste), which is already the fastest growing waste stream in the world and has been since the early 2000s (Dalrymple *et al.*, 2007). Moreover, most critical raw materials are not recovered due to technical or socio-economic reasons and remain hazardous to the environment. Extending the lifetime of devices can offset unnecessary production costs, increase efficiencies in resource use and reduce negative environmental impacts from e-waste. Therefore, achieving greater circularity within this sector holds potential to reduce net negative environmental impacts and reduce virgin material extraction and consumption.

This project responds to the growing environmental and economic challenges posed by the linear consumption model in the ICT sector. Although the ICT sector offers significant potential for circularity, it remains hugely challenging to achieve, as contemporary business models are limited in accommodating the connected and creative thinking necessary for market actors to pursue new sources of value creation (Fehre and Wieland, 2021). In particular, value co-creation is the joint creation of value by a firm and its customers, where the customer actively participates in the creation process, and the value is determined in use through interactions and activities (Vargo and Lusch, 2004). In order to mainstream circularity in ICT, the aims of this project were to investigate how market actors understand and experience value; identify opportunities and processes that support value co-creation for circularity; and develop quantitative targets and metrics to measure the environmental impacts of circularity and their resource and climate outcomes.

1.3 The Project

The Mainstreaming Circular Economies Through Collaboration and Co-creation (MainCirc) project was a collaboration between a multidisciplinary research team at the University of Limerick (Trisk.ie) and GreenIT (Greenit.ie), a small Irish company. GreenIT was chosen as the exemplar case for MainCirc because it had an existing relationship with members of the research team and was already engaging with circularity through the sale of refurbished ICT devices. The University of Limerick Trisk team draws from a number of disciplines, including environmental science, ICT, consumer research, value co-creation and entrepreneurship, providing input from the fields of science, engineering and business to gain an understanding of critical areas such as resource recovery, refurbishment, remanufacturing, and value co-creation and servitisation. Through collaboration and reflexive action research, the underpinning processes to mainstream circular ICT were identified and developed and these are documented in this report.

1.3.1 Methodology

MainCirc is a collaboration between the multidisciplinary research team and their industry partner (GreenIT) and involves action research. Action research is defined as a "systemic inquiry that is collective, collaborative, self-reflective, critical and undertaken by participants in the inquiry" (McCutcheon and Jung, 1990: 148). Action research was chosen because researchers do not only observe an activity, but, significantly, it allows them to impact practice in real time, enabling the practitioner to adapt strategy based on academic research and insights. Consequently, action research is ideal when the goal is to contribute to both business practice and academic enquiry (Shani and Coghlan, 2021). Consequently, evaluating action research is more complex and involves assessing the effectiveness and impact of the focal project as well as the contribution to knowledge more broadly (Piggot-Irvine and Bartlett, 2008). In this report, we offer insights based on data collected over the course of the project, reflect on the decisions made and assess the overall contribution of the project.

Specifically:

- A critical literature review was undertaken on circular business models (CBMs), critical

raw materials and sustainability metrics as an academic underpinning for the project.

- At the outset of the project, several meetings were conducted between the University of Limerick team and GreenIT senior management team. These meetings were supplemented by interviews with GreenIT technical and sales staff and a tour of their warehouse facilities. Following these initial meetings, the team began to scope and discuss market development options.
- Thirty-two in-depth qualitative interviews were conducted with key stakeholders, including suppliers and existing and potential customers of GreenIT. Following analysis, the interviews generated insights into the main factors shaping the market and an appreciation of GreenIT's strategy within this.
- Feedback from the market informed decision-making in an iterative fashion. Some initial decisions were made and ideas were workshopped within an industry group. Following this, the team identified the product/market opportunities and articulated the parameters of the demonstration project (remanufactured ICT devices/public sector).
- After the successful launch of remanufactured ICT devices on the public procurement framework (PPF), a further round of interviews was held with customers and a life cycle analysis was performed of the remanufactured computers. This life cycle analysis was used to calculate the environmental impact of the demonstration project.

2 Circular Business Models

“Circular modes of production, and the business models that underpin them, represent the key activities that could realise a transition to a more resource efficient and circular economy” (OECD, 2019: 20). While approaches may vary, the defining element of a CBM is the intention to optimise resource use. Some progress has been made in delineating appropriate business models for ICT circularity. These can be categorised as follows:

- *Circular supply models*. These models replace virgin materials with bio-based, renewable or recycled alternatives in ICT manufacturing. Companies adopting this approach reduce dependency on newly mined resources, ensuring compliance with environmental regulations while supporting material recovery. Remanufactured components in electronic devices exemplify this strategy.
- *Resource recovery models*. This model focuses on extracting valuable materials from e-waste, such as metals, plastics and rare earth elements, for reuse in new products. Closed-loop recycling systems allow materials from old devices to be reintegrated into production, minimising environmental footprints. However, logistical constraints, regulatory inconsistencies and concerns about the quality of secondary materials remain barriers to large-scale implementation.
- *Product life extension models*. Extending the lifespan of ICT products through repair, refurbishment and remanufacturing reduces e-waste while providing cost-effective alternatives to new devices. Many ICT device manufacturers and refurbishers are implementing take-back schemes, extended warranties and repair-friendly designs to encourage longevity and resale.
- *Sharing models*. Digitalisation has enabled shared ownership and leasing of ICT equipment, reducing e-waste and overall consumption. Device-as-a-service and cloud computing solutions allow consumers and businesses to access high-performance computing resources without requiring personal ownership of physical devices.
- *Product–service system models*. These models shift the focus from product ownership to service-based approaches, such as leasing or subscription services. Enterprises increasingly rely on software-as-a-service and hardware rental models, which extend the life cycle of devices and optimise resource efficiency.

Despite the advantages of CBMs, several barriers remain that hinder widespread adoption in the ICT sector. The fast pace of technological innovation fuels high rates of product obsolescence, making product life extension strategies challenging. Markets are complex systems that evolve through time and can be resistant to change (Baker *et al*., 2019). Consequently, businesses need to not only innovate but also re-shape the market in order to advance circularity in ICT. In order to develop the demonstration project and inform appropriate strategy development, the team developed an understanding of the market for second-life ICT devices and identified barriers to and opportunities for developing that market.

3 Demonstration Project

3.1 Background

GreenIT was established in 2014 and is dedicated to reducing e-waste through extending the life of ICT devices through a product life extension model. The company is recognised for providing sustainable IT solutions. In its early years, GreenIT refurbished and sold ICT equipment rather than allowing it to be prematurely recycled or inappropriately disposed of. GreenIT has since developed significant competencies in the charity and education sectors, where affordability and access are particularly important. The company differentiates itself from others through proactive equipment sourcing, stringent quality standards and a customer-centric approach. GreenIT is considered the ideal research partner for this project given its focus on sustainable practices within the ICT industry (Figure 3.1).

As indicated in an interview with its Managing Director, GreenIT had anticipated significant market growth in refurbished ICT equipment because of the EU drive to reduce waste, particularly waste electronic and electrical equipment, together with Ireland's Circular Economy Programme (2021 to 2027):

> From a European perspective, there is a target to reuse 5% of all electrical items that come onto the market. That's only happening in 3 out of the 27 Member States. That's not happening in Ireland. Our first target is to comply with the European directives and reuse 5% of all electrical items … So that's where we want to get to. We want to follow the European guidance up to potentially the 20% mark … Whether or not that's achievable … I don't know, but that's where we want to be. We want to be on that track, with the European legislation taking us from zero to 5% reuse and then all the way up to potentially 20% reuse. Ireland will have to do it at some stage in its future. And we want to be prepared for that.
>
> Managing Director, GreenIT, April 2022

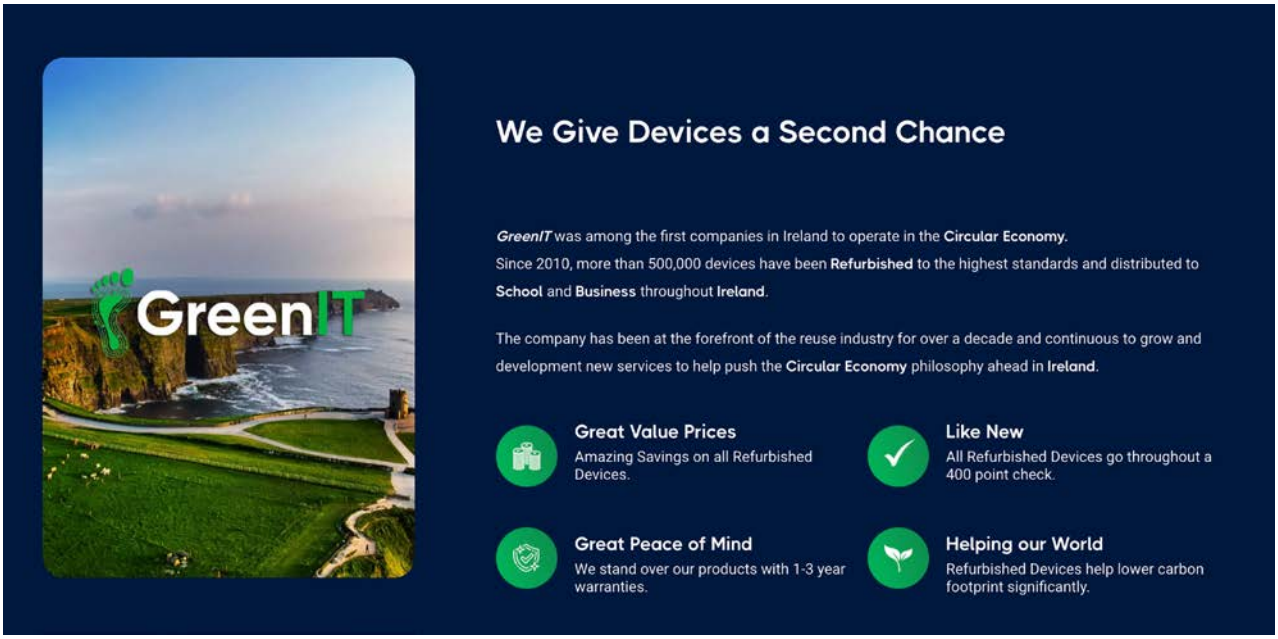

Figure 3.1. GreenIT value proposition 2022. Reproduced from GreenIT (2025) with permission from the copyright holder, Phoenix RM Ltd.

At the outset of the project, GreenIT's markets included both organisational and individual consumers, with the latter serviced primarily through its e-commerce platform. GreenIT sought to shift consumer perceptions regarding refurbished technology by emphasising its high-quality products, cost-effectiveness and environmental benefits (Figure 3.1). The organisational market included businesses and charities, with a heavy reliance on primary schools, each requiring a limited number of refurbished devices. Our analysis indicated that this approach was heavily resource-intensive, necessitating a significant human capital investment to maintain client relationships and provide ongoing support. Furthermore, serving numerous small accounts resulted in a fragmented market approach, dispersing efforts and impeding the development of specialised solutions tailored to specific industry needs. This collectively accounted for 60% of its business at the start of the project. The company's long-term objective was to expand into large enterprises and public sector contracts.

The research team collaborated with GreenIT through action research. Working with GreenIT offered the opportunity to engage with the company as it navigated and shaped the market for circular ICT solutions and at the same time evaluate the environmental impact of this initiative.

3.2 Objectives

The primary goal in collaborating with GreenIT and the overarching aim of the project was to develop and assess an experimental CBM in the ICT sector. Specifically, this involved:

- identifying the challenges and opportunities involved in developing a circular ICT market in Ireland;
- developing a set of sustainability, resource and climate indicators to evaluate CBM outcomes in Ireland;
- evaluating the environmental impact of the demonstration project;
- identifying opportunities for value co-creation that enhance circularity in the Irish marketplace.

3.3 The Decision-making Phase

The project team used the Business Model Canvas to interrogate GreenIT's competencies and value propositions. GreenIT had two major decisions to make in determining its value proposition. The first related to the product offering and the second to the market opportunity that would be developed.

Additionally, project researchers conducted 32 in-depth interviews (from July 2022 to January 2025) with market actors, including individual and organisational customers, suppliers, competitors and industry experts. Initial insights were supplemented through a circular value co-creation workshop with industry representatives in October 2023, led by Professor O'Malley. Given the nature of action research, the relationship between research and practice was dynamic and iterative. For example, GreenIT used the research insights to inform strategic decisions relating to its choice of product offerings and the market opportunity to be developed.

Refurbished computers are essentially pre-owned devices that have undergone thorough inspection, repair and restoration, to ensure that they are in proper working order (Coughlan *et al*., 2018). While the refurbishment process aims to rectify any defects or issues, it might not entail a complete overhaul. Refurbished devices are commonly subjected to rigorous testing to guarantee that they adhere to specific standards before being reintroduced to the market. Despite this, our interviews with market actors at the value co-creation workshop revealed concerns regarding the quality, reliability and look of refurbished devices. According to the market actors, the language surrounding refurbished devices did not appeal to consumers of ICT equipment. However, they appeared to be more open to the terminology surrounding remanufactured devices. Remanufactured computers represent electronic devices that have undergone extensive restoration. This process entails disassembling the device, repairing or replacing any worn-out components, and subjecting the product to stringent quality control measures to restore it to its original specifications. The objective of remanufacturing is to prolong a product's lifespan while also minimising environmental impact. Consequently, remanufacturing is "an industrial process during which worn-out products are restored to a like-new condition" (Ardente *et al*., 2018: 1545). A "like-new" condition can also be described as a "same-as-when-new" or a "better-than-when-new" condition. As such, remanufactured ICT devices offer a better alternative to refurbished devices and a viable alternative to

new devices, particularly for larger organisations. Therefore, from a market readiness perspective, our analysis indicated that remanufactured devices have more potential than refurbished devices. More importantly, remanufactured devices offer greater levels of the scalability that is required to mainstream circularity in ICT. Consequently, GreenIT made the decision to focus on developing its market for remanufactured devices.

In exploring opportunities for market development, the project researchers in collaboration with GreenIT considered various potential market segments, including finance, health care and education. However, following its decision to focus on remanufactured devices in late 2023, GreenIT needed to expand its market to include large organisations, to justify the level of investment required for remanufacturing. The public sector represented a hugely significant market in terms of both sales potential and reputational development. However, at that time, there was no possibility of selling to public sector organisations, as only new ICT products were listed in the PPF.[1] Furthermore, public organisations can buy from approved suppliers only, and GreenIT was not an approved supplier. GreenIT did not see this as an insurmountable hurdle; rather, it recognised a strategic market-shaping opportunity and sought to engage with the PPF.

With this in mind, the demonstration project aimed to bring about changes to the PPF, namely the inclusion of remanufactured devices; to track the resulting sales; and to and measure the environmental impact. It was further anticipated that success within the public sector would legitimise remanufactured ICT devices with large corporations and other organisations.

3.4 Shaping Public Procurement to Include Remanufacturing

GreenIT invested resources in building relationships with key policymakers and actively participated in industry consultations to advocate for the benefits of using remanufactured IT equipment. The company set out to (i) make remanufactured ICT devices available as a purchase option through public procurement and (ii) become listed as an approved supplier for public procurement. Engaging with relevant stakeholders on both issues took considerable time and resources and resulted in delays to the MainCirc project. GreenIT formed a strategic partnership with Circular Computing[2] in order to meet anticipated levels of demand. Circular Computing is a UK-based organisation that specialises in remanufacturing and has a large number of corporate clients. Significantly, Circular Computing has the only factory in the world that remanufactures ICT devices that have the British Standards Institute (BSI) Kitemark.

In April 2024, the Minister of State with responsibility for public procurement and circular economy announced the publication of *Buying Greener: Green Public Procurement Strategy and Action Plan 2024–2027* (DCEE, 2024). The Buying Greener initiative is significant and intended to accelerate circularity, fairness and sustainability in the ICT sector, making Ireland the first country in Europe to offer remanufactured ICT devices through its PPF.

GreenIT successfully navigated the government procurement process to secure a contract for the supply of remanufactured computers. Initially, GreenIT familiarised itself with Irish government procurement policies, particularly the emphasis on sustainable and green procurement. To ensure compliance with procurement requirements, GreenIT:

- reviewed guidelines set by the Office of Government Procurement (OGP) and aligned its operations with EU Green Public Procurement criteria;
- partnered with Circular Computing to ensure the provision of remanufactured computers that met the technical specifications and quality standards required in the tender;
- secured ISO 14001 (Environmental Management System) certification and other necessary accreditations;
- addressed data security, software licensing and product warranty requirements, to assure the government of product reliability.

1 *Green Tenders: An Action Plan on Green Public Procurement* (DPER, 2021) focused on improving the environmental credentials of new ICT products and ensuring the appropriate disposal of end-of-life products, with no provision for the purchase of second-life devices.

2 https://circularcomputing.com/ (accessed 1 August 2025).

In its bid, GreenIT highlighted the reduction in carbon footprint achieved through remanufacturing compared with producing new computer procurement. It also provided a life cycle cost analysis, demonstrating long-term cost savings for the government. Testimonials and case studies were submitted showcasing the reliability, efficiency and sustainability of remanufactured products and services. Finally, the price of remanufactured ICT devices was shown to be competitive, at 30–40% below the cost of new computers. This was attractive given government budget constraints and was supplemented by value-added services such as extended warranties and on-site support.

On securing the contract, GreenIT assumed responsibility for the timely delivery of remanufactured computers, adhering to service-level agreements and, where required, reporting on sustainability metrics, including energy savings and waste reduction. Feedback from customers was very positive, as shown by the examples in Box 3.1.

Thus, preliminary feedback suggests that there was some hesitancy among potential customers, as evidenced by the initial small number of units ordered. Furthermore, these orders may have been primarily motivated by price. However, the findings suggest that customers were pleasantly surprised by the aesthetic and functional qualities of remanufactured devices and the level of service. A further unanticipated benefit was that customers were offered a wider range of choice than was previously available under the PPF. Between July 2024 and the end of March 2025, 2500 remanufactured devices were bought under the PPF. While these sales are significant in themselves, the availability of remanufactured ICT devices on the PPF legitimises this offering to other large firms.

Box 3.1. Customer feedback

ICT and information management manager, charity:

> We started with a small order to test the waters, but once we saw the quality and service GreenIT provided, it became a no-brainer. The devices look and perform like new, the customer service is excellent, and the procurement process is much smoother than with traditional suppliers. We've now fully switched to remanufactured laptops, placing a large order of 60 devices, and we have no plans to go back. GreenIT gives us better value, reliable equipment, and a more sustainable way to meet our IT needs.

ICT manager, independent statutory organisation:

> The green credentials of the initiative are clear, but it works at many other levels too. Use of this OGP framework just works from a business case perspective. We have found that the quality of devices delivered by GreenIT as part of the OGP framework has been excellent. Lower device costs and good hardware warranty terms made the decision to sign up a lot easier. As a public service organisation, having some choice of hardware manufacturers, makes, models and hardware configurations to suit our business needs is also huge for us.

Information technology infrastructure manager, state body:

> We dipped our toe in the water and bought 10 laptops. I was very impressed – what came out of the box looked and felt like new. The quality of the remanufactured devices is outstanding, and the process of procurement was seamless. We've now bought 80, and by the end of the year, I expect to have replaced all our infrastructure with GreenIT devices. It's an easy win for any organisation looking for high-quality, sustainable IT solutions.

4 Quantification of Sustainability, Resources and Climate Impact

4.1 Framework for Circular Strategy Evaluation

The Organisation for Economic Co-operation and Development (OECD) in its 2020 assessment of the circular economy recommended indicators that relate to direct impacts on the ecosystem (OECD, 2020). As shown in Figure 4.1, these environmental indicators have been categorised into subgroups, largely based on classifications used by the European Commission (EC, 2018) and the European Environment Agency (EEA, 2016).

The subgroups can be broken down as follows:

- *Emissions indicators* focus on tracking the production of greenhouse gases (GHGs), particularly CO_2 emissions, from various activities. Some of these indicators are broad, like measuring CO_2 emissions per capita, while others are tied to specific activities, such as emissions related to material consumption or CO_2 savings resulting from procurement practices or waste generation activities.
- *Production indicators* measure the resources and materials used within the economy, particularly in waste generation across various sectors, such as construction, food production, industry and municipal services. Additionally, resource consumption, such as energy, domestic material, virgin material and water consumption, is part of this subgroup.
- *Efficiency-related indicators* measure the maximum output from a given level of resources used to carry out an activity. These indicators mostly focus on the energy sector (e.g. energy efficiency, energy intensity).
- *Savings indicators* refer to the prevention and conservation of resources. These indicators

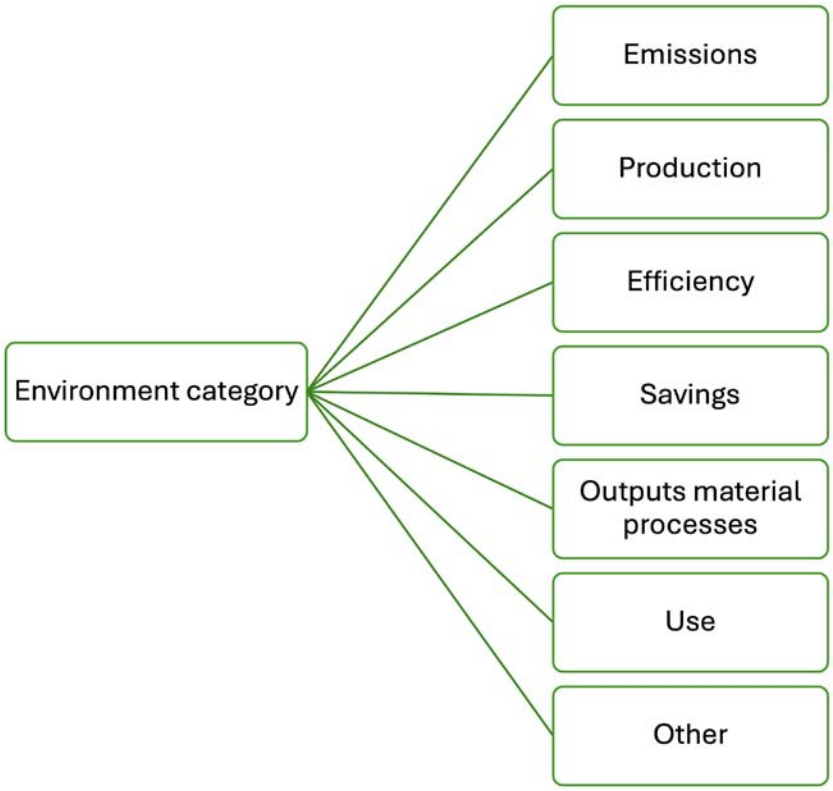

Figure 4.1. Environmental indicators of a circular economy.

measure the avoidance of energy, food, raw materials and clothing consumption. Examples include avoided food waste through circular consumption practices and energy saved through efficiency programmes.

- *Output material process indicators* focus on measuring the waste produced and materials consumed at different stages of a process that can be reused and turned into resources. Examples include tracking of materials collected for reuse in construction, plastics recycling, items recovered at reuse centres and waste materials that have been repurposed.
- *Use indicators* pertain to the use and reuse of resources. These indicators track factors like resources put back into the system, direct resource and land use, and different use rates like the rate of circular material use and the reuse of packaging waste.
- *Other indicators* include environmental indicators that do not fit within the main sub-categories, such as cross-cutting, context-specific or emerging measures.

Following a thorough investigation of these indicators, global warming potential (GWP), an emissions indicator that measures CO_2 production, was selected as an appropriate indicator. Mass-based indicators, that is, indicators that rely on measuring the mass of materials, often fall short in directly assessing environmental impact. While they provide a quantifiable measure of resource use or waste generation, they do not capture the full scope of potential environmental consequences. This aspect is particularly relevant in the ICT sector where the mass of materials and environmental impact are not directly proportional, as even materials in small quantities can amount to significant emission levels.

GWP is calculated as the ratio of the radiative forcing of 1 kg of a GHG emitted to the atmosphere to that from 1 kg of CO_2 over a period of time (e.g. 100 years) (IPCC, 2019). It is highly market and policy relevant because governments, industries and organisations often use GWP data to set climate-related targets, create carbon-pricing mechanisms and meet regulatory standards for reducing emissions. This metric is a crucial consideration in decision-making processes aimed at addressing climate change. There is a growing body of data relating to the GWP of manufacturing processes for ICT device components as more Tier II and Tier III assessments are made as set out by the Intergovernmental Panel on Climate Change. This includes data on the emissions generated during the production of materials like semiconductors, printed circuit boards and other electronic components, where gases and solvents with the highest GWP are known to be involved. As the demand for ICT products increases globally, having access to reliable GWP data that are verified and collected through national contact points helps manufacturers and policymakers to address the environmental impacts of this growing industry by adopting more sustainable production practices.

4.2 Circularity and Sustainability Metrics Dashboard and Calculator

From the primary data collected by GreenIT regarding the specification of remanufactured laptops, the associated impact of GHG emissions was calculated. GWP was analysed using a life cycle assessment of laptops performed by Sphera (2023). Table 4.1 shows the GWP associated with each of the components of the laptop calibrated to the specifications of GreenIT.

Table 4.1 shows the components that have the most impact, indicated by colour (red = high GWP). The highest GWPs are associated with the main board, display and storage. In addition, the upgrade of random access memory (RAM) and storage will lead to more significant impacts. The table also shows the components that have the least impact. These include components such as packaging, logo and LED.

Based on these metrics, our team developed a bespoke Microsoft Excel calculator. The calculator is user-friendly and requires data regarding the RAM and storage specifications. On input of these data, the associated GWP impact is automatically updated, and then the user must input the number of laptops respective to the specifications. This will generate a total GWP impact for the laptops, including all the other components whose impacts have already been fed into the calculator. The results obtained from using this calculator show the importance of scaling up the use of remanufactured laptops. The smaller the number of remanufactured laptops replacing new laptops, the lower the emissions saving calculated. But, as the scale of usage of remanufactured laptops

Table 4.1. Graded GWPs associated with laptop components

Serial no.	Component	Upgrade options	Global warming potential (kg CO_2 eq)
1	Main board		23.32
2	CPU		5.24
3	GPU		0
4	Wifi		0.22
5	SSD	256	9.04
6	RAM (GB)	8	3.95
7	Display		13.77
8	Display PCBA		1.73
9	Display camera		0.47
10	Battery		5.15
11	Mechanical enclosure		3.06
12	Keyboard module		2.86
13	Thermal solution		1.55
14	Speaker		0.61
15	Sub-board		0
16	Logo		0
17	LED sprites		0

Red indicates the components with the highest GWP and therefore the highest environmental impact, and green indicates the components with the lowest GWP and lowest environmental impact.

CPU, central processing unit; GB, gigabyte; GPU, graphics processing unit; PCBA, printed circuit board assembly; RAM, random access memory; SSD, solid state drive.

increases, so does the emissions saving calculated. This is currently tailored for the specifications of the laptops provided by GreenIT, but it could also be modified to provide detailed calculations for equipment offered by other companies.

As can be seen in Figure 4.2, the GHG emissions savings associated with selling 2500 remanufactured rather than newly manufactured laptops is 165,557 kg CO_2 equivalent.[3] While this has resulted in a significant GHG emissions saving, if GreenIT can achieve the full potential of 64,000 units of remanufactured laptops (16,000 units per year for 4 years) over the life of this public procurement contract, this would lead to an average saving of approximately 1000 tonnes of CO_2 equivalent per year for each of the 4 years of the procurement framework.

These initial figures indicate that securing the opportunity to offer remanufactured ICT devices through the PPF has been significant, not only in terms of the GWP impact, but also because it has advanced conversations around remanufacturing and circularity in the public sector and beyond. In particular, recognising that remanufactured devices are produced to "a like new state both functionally and aesthetically" (PPF) and that these devices might even be "better than new" legitimises remanufactured ICT devices as viable alternatives to new devices. The availability of remanufactured ICT devices though the PPF has removed a lot of the perceived risk associated with not buying new. In this regard, numerous opportunities beyond the public sector are already emerging. GreenIT has also enhanced its already strong customer service, and close engagement with potential buyers has created further opportunities to develop the offering. In particular, it is moving from being "product focused", that is, materials based, to more service based, as can be seen in Figure 4.3. This is a key shift in dematerialisation, narrowing, slowing and closing material loops.

This shift in business offering from the value propositions surrounding products shown in Figure 3.1 (around price, warranties and certification) to a focus on sustainable life cycle solutions, as shown in Figure 4.3, is an example of a process called

3 111 tonnes of CO_2 is equivalent to 5550 trees growing for 1 year or to driving a petrol car for approximately 500,000 miles.

WELCOME TO THE CALCULATOR								
S.No.	Ram Size (GB)	RAM Impact (kg CO_2)	SSD Size (GB)	SSD impact (kg CO_2 eq)	Number of Laptops	Total GWP impact (kg CO_2 eq)	Numer of Remanufactured Laptops	Net Savings (kg CO_2 eq)
1	8	3.95	256	9.04	532	37756.04	532	32505.2
2	16	10.03	256	9.04	1892	145778.6	1892	127104.56
3	16	10.03	512	14.46	61	5030.67	61	4428.6
4	16	10.03	1024	28.49	2	193	2	173.26
5	32	25.46	1024	28.49	12	1343.16	12	1224.72
6	64	63.67	256	9.04	1	130.69	1	120.82
					2500	190232.16	2500	
TOTAL EMISSIONS SAVED BY USING 1693 REMANUFACTURED LAPTOPS =								165557.16 Kg CO_2 eq

Figure 4.2. An Excel-based calculator accounting for emissions saved by using 1693 remanufactured laptops. kg CO_2 eq, kg of carbon dioxide equivalent; S.No., serial number; SSD, solid state drive.

Figure 4.3. A screenshot taken from the GreenIT website (March 2025), indicating renewed business approaches and sustainable life cycle solutions. Reproduced from GreenIT (2025) with permission from the copyright holder, Phoenix RM Ltd.

"servitisation". This involves a firm engaging with innovation and organisational change to compete through business outcomes for customers. In the above example, we can see this shift from selling products (remanufactured ICT devices) to providing solutions (sustainable IT management, end-of-life solutions and second-life solutions). Of course, a product is still part of the offering, but in this new business model the product is only one mechanism through which value is offered. GreenIT's experience in sustainable IT management, its ability to source material, its market knowledge and its competencies regarding ICT, remanufacturing, sustainability, public engagement and market shaping are become increasingly important and provide new opportunities for value co-creation.

5 Conclusions and Recommendations

Consistent with an action research approach, the aim of this project was to examine market dynamics, customer perceptions and the regulatory challenges and opportunities associated with developing circular business propositions and co-creating value in the ICT sector. Specifically, the objectives were to provide a critical review of CBMs and their applicability to the Irish context; design a functioning demonstration project implemented through collaboration with GreenIT; and offer suitable environmental, resource and climate metrics to support ICT circularity.

The project found that, similar to many markets, the linear models of take, make and dispose are heavily ingrained in ICT consumer and organisational buyer behaviour in Ireland. However, the short ICT product life cycle and the related environmental impact of this make the ICT value chain a priority for circularity. New products are associated with performance and reliability, and refurbished ICT equipment was not considered to meet these required standards. However, market research revealed a greater appreciation for remanufactured ICT devices, which are acknowledged as being “as good as new” while being positioned at a lower price point than new products.

Despite the potential opportunities identified for selling remanufactured ICT devices, a significant challenge was also identified, namely that Irish public institutions could not purchase second-life products because these were not available through the PPF. GreenIT proactively engaged with government in order to (i) make remanufactured ICT products available for purchase through the PPF and (ii) become an approved supplier of the same products.

GreenIT contributes to the circular economy through extending the life of ICT devices by remanufacturing and refurbishing them. Getting to this stage has involved developing market-shaping strategies, including partnering with Circular Computing; changing attitudes towards remanufactured ICT equipment in Ireland; and supporting the inclusion of remanufactured ICT devices in the PPF.

The demonstration project’s integration into the government procurement framework marks a significant milestone in the mainstreaming of circular ICT. With sales of over 2500 remanufactured ICT devices to government agencies between July 2024 and March 2025, the project has initiated market change and has impacted policy in Ireland. The MainCirc project has demonstrated how a small company can impact policy, engage in market development and make the significant transition from selling refurbished ICT devices to offering sustainable ICT services. Consequently, the market for remanufactured ICT devices is now much more significant, which also creates opportunities for other suppliers to enter the market. Additionally, the project has contributed to advancing conversations around remanufacturing and circularity in the public sector and beyond.

In the 2020 OECD assessment of the circular economy, emissions, production, efficiency, savings, output materials, process and use were identified as key sustainability indicators (OECD, 2020). After thoroughly investigating these indicators, the team selected GWP, which measures CO_2 production, as an appropriate indicator. Using an environmental impact calculator, the team estimate that the demonstration project achieved a reduction in GHG emissions equivalent to 165,557 kg of CO_2.

The demonstration project has provided valuable insights into the viability of remanufactured ICT products within public sector procurement. GreenIT’s successful navigation of the procurement process underscores the potential for broader adoption of circular economy practices within ICT asset management. Moving forward, continued engagement with policymakers, further refinement of procurement strategies and ongoing advocacy for sustainable ICT solutions will be critical to scaling up the impact of this initiative.

Several contemporary discussions acknowledge the significance of “service” within new business models (Vargo and Lusch, 2004), expressed in the move towards servitisation (Smith *et al*., 2014), collaboration

and value co-creation (Alves *et al.* 2016). As we demonstrate below, in the context of ICT, there is a synergistic relationship between these concepts and *circularity*. All are holistic and systems oriented, and the creation and/or retention of value are central. Circularity aims to retain the value of materials and goods in society for as long as possible. At the same time, servitisation aims to create new value through the application of knowledge and skills. Thus, while opportunities exist for extending life via all kinds of reuse, including the refurbishment of ICT devices, moving from a product-focused approach to a service-oriented and collaborative approach significantly augments the potential for circular value (co-)creation. The recommendations presented in this section are intended to support the mainstreaming of circularity in ICT and are direct outcomes of the project.

In seeking circular value co-creation propositions in ICT, we can see a number of different options, including (i) extending the life of a device through refurbishment and (ii) extending the life of a device through remanufacturing (both of which are product focused), and (iii) offering sustainable ICT as a service (servitisation). All three options offer different value co-creation propositions:

- Refurbished products provide cost-effective, sustainable alternatives to new products. There is some residual value in the product and the reduced price reflects that diminished value. This value proposition may be appealing to some market segments, and a company can service that market on its own to some extent. However, refurbished products may not be as desirable as new products due to performance and aesthetic concerns. Consequently, a business proposition based entirely on refurbished products does extend the life of the product but only by a limited amount.
- Remanufacturing enhances the value of circular products by offering "good as new" alternatives, both in terms of performance and aesthetics. The term "remanufacturing" refers to the industrial process by which an item is returned to a like-new condition from both a quality and performance perspective. A like-new condition can also be described as a "same-as-when-new" or "better-than-new" condition. Here, the business proposition requires more collaboration to offer a sustainable supply of high-quality products to the market. Moreover, the value proposition has shifted from being embedded in the product to the whole offering, which incorporates price, variety of brands, configurations, software, levels of service and environmental impact. This offers greater value co-creation opportunities.
- A step further is the move towards ICT management solutions. This demands even closer interaction, transforming the provision of sustainable ICT into a customisable service. The term "service" here is not confined to the traditional definition of services as intangible goods but refers to the application of specialised competencies (knowledge and skills) through deeds, processes and performance for the benefit of another entity or the entity itself (Vargo and Lusch, 2014). This evidences a significant shift from simply selling products to providing a compelling and comprehensive solution that requires expertise in the responsible management of ICT, as depicted in Figure 5.1. For example, the extended life solutions offered by GreenIT incorporate refurbishment or remanufacturing, end-of-life solutions and environmental impact management solutions. In fact, there are multiple opportunities to co-create value as market actors learn and evolve, some of which we might not even be able to imagine right now.

The shift to providing a service is significant because sustainable ICT management allows not only for selling both refurbished and remanufactured ICT devices but also for providing other services that might have value for clients, such as lifetime management, donation and disposal. Thus, there are potential opportunities to further develop expertise in the area of environmental impact management (see also Zolkiewski *et al*., 2017). Thus, through the MainCirc project we can see how the shift from a linear to a circular model in the ICT sector has been mainstreamed through engagement with the PPF (Figure 5.2).

While this project has focused on the ICT sector, there are lessons to be learned for other sectors in terms of the kinds of questions to be asked in developing the appropriate circular business and market propositions. Figure 5.3 offers a decision support rubric in this regard.

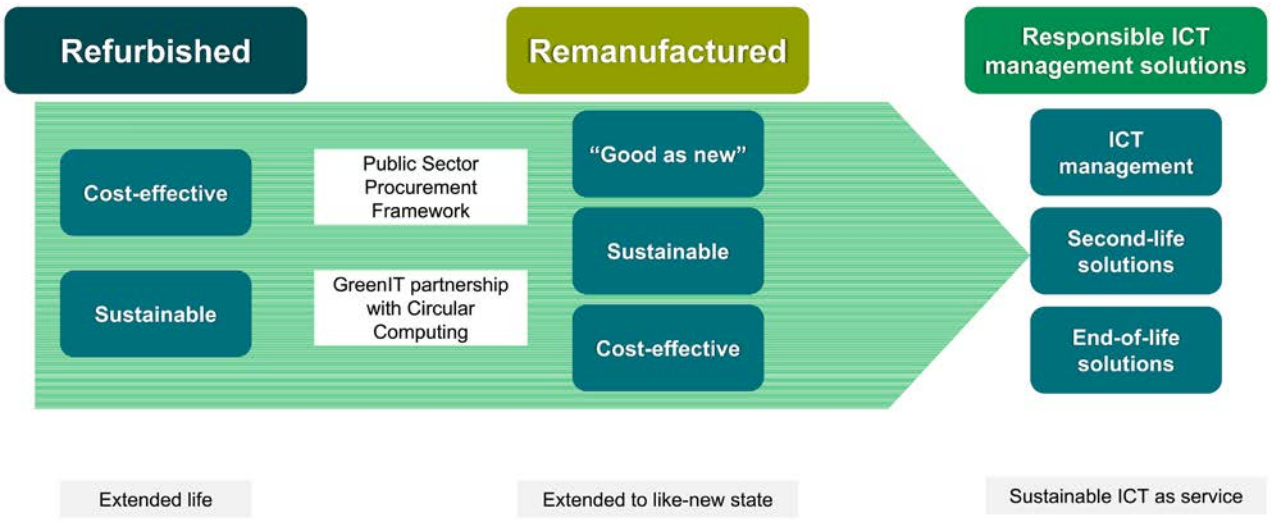

Figure 5.1. Circular value co-creation propositions.

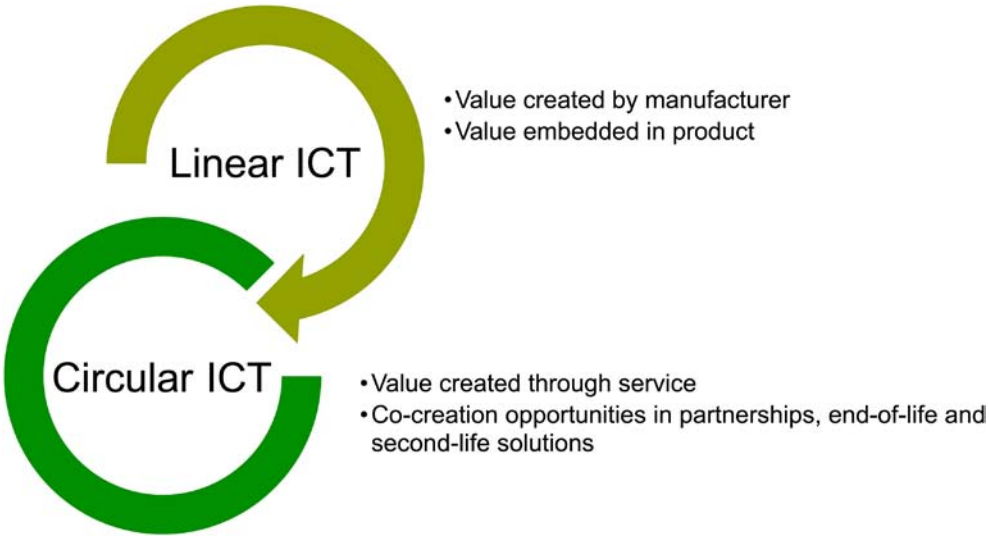

Figure 5.2. Depiction of the shift from a linear to a circular model in the ICT sector.

Different companies will respond differently depending on the nature of the existing and potential market, opportunities for reducing environmental impact, their own resources and capabilities, and their ability to understand and shape value co-creation strategies. On this basis, we propose the following recommendations for exploring circular value co-creation:

- *Enhance the value and desirability of circular products* by improving the functionality and aesthetics of refurbished and remanufactured products. Providing quality guarantees and sustainability certifications can reassure buyers about product reliability and environmental impact.
- *Explore new opportunities and meanings of value for different market actors.* For example, for policy makers, value emerges in meeting sustainability targets and in the mainstreaming of circularity; for suppliers, value might be realised in market and network development, as well as in reputation management; and, for buyers, value is likely to be reflected in the cost, performance, opportunities for customisation, and environmental credentials.
- *Consider opportunities for customisation and collaboration with other actors in the market ecosystem*, to innovate, secure market access and develop specialised competencies and transferable skills.
- *Transition towards service models to increase value co-creation opportunities*. This will require a shift from selling refurbished/remanufactured

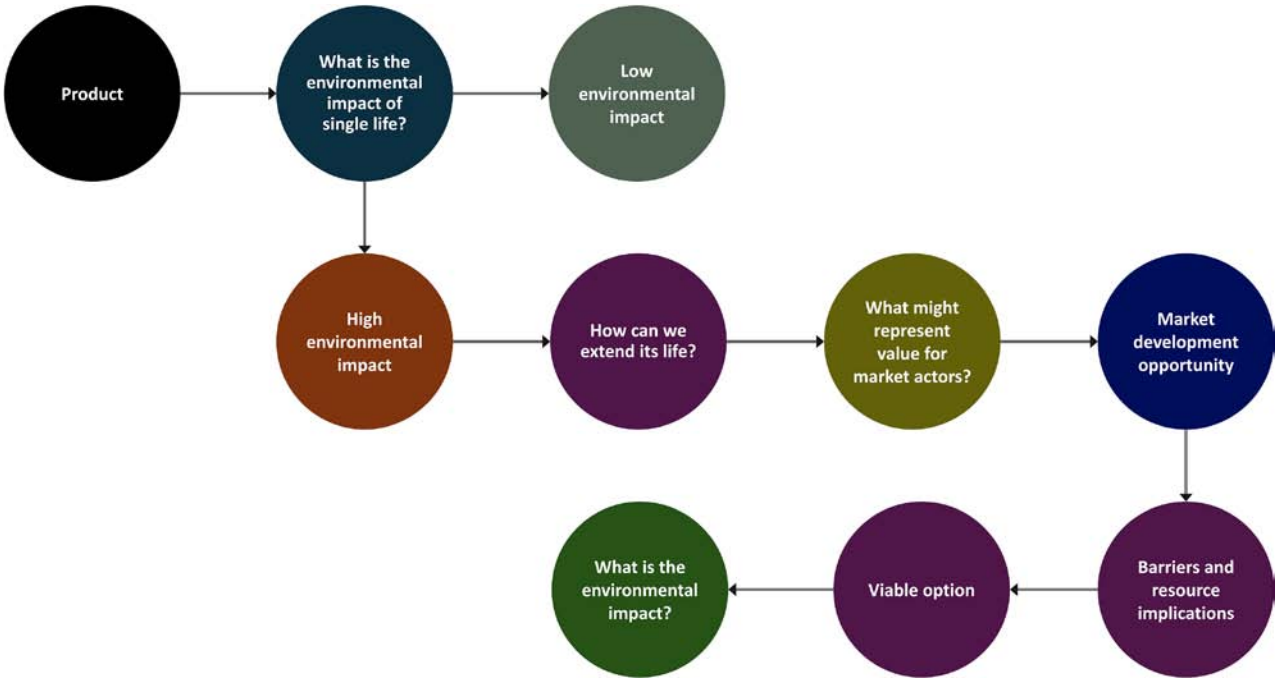

Figure 5.3. Circular value co-creation rubric.

products to reimagining the total offering. This could include access- rather than ownership-based models. Such opportunities should be actively considered, as refurbished, remanufactured and rental devices all contribute positively to the environment.

- *Integrate circularity metrics into business models* to track environmental impact and improve decision-making. Life cycle assessment tools and circularity indicators measure product longevity, resource efficiency and carbon footprint reduction. Implement circularity performance indicators to assess the effectiveness of remanufacturing and service-based models. Use data insights to optimise remanufacturing processes and enhance sustainability across ICT services.

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Abbreviations

CBM	Circular business model
e-waste	Electronic waste
GHG	Greenhouse gas
GWP	Global warming potential
ICT	Information and communications technology
MainCirc	Mainstreaming Circular Economies Through Collaboration and Co-creation
OECD	Organisation for Economic Co-operation and Development
OGP	Office of Government Procurement
PPF	Public procurement framework
RAM	Random access memory

An Ghníomhaireacht Um Chaomhnú Comhshaoil

Tá an GCC freagrach as an gcomhshaol a chosaint agus a fheabhsú, mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ar thionchar díobhálach na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialáil: Rialáil agus córais chomhlíonta comhshaoil éifeachtacha a chur i bhfeidhm, chun dea-thorthaí comhshaoil a bhaint amach agus díriú orthu siúd nach mbíonn ag cloí leo.

Eolas: Sonraí, eolas agus measúnú ardchaighdeáin, spriocdhírithe agus tráthúil a chur ar fáil i leith an chomhshaoil chun bonn eolais a chur faoin gcinnteoireacht.

Abhcóideacht: Ag obair le daoine eile ar son timpeallachta glaine, táirgiúla agus dea-chosanta agus ar son cleachtas inbhuanaithe i dtaobh an chomhshaoil.

I measc ár gcuid freagrachtaí tá:

Ceadúnú

- Gníomhaíochtaí tionscail, dramhaíola agus stórála peitril ar scála mór;
- Sceitheadh fuíolluisce uirbigh;
- Úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe;
- Foinsí radaíochta ianúcháin;
- Astaíochtaí gás ceaptha teasa ó thionscal agus ón eitlíocht trí Scéim an AE um Thrádáil Astaíochtaí.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Iniúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- Cur i bhfeidhm an dea-chleachtais a stiúradh i ngníomhaíochtaí agus i saoráidí rialáilte;
- Maoirseacht a dhéanamh ar fhreagrachtaí an údaráis áitiúil as cosaint an chomhshaoil;
- Caighdeán an uisce óil phoiblí a rialáil agus údaruithe um sceitheadh fuíolluisce uirbigh a fhorfheidhmiú
- Caighdeán an uisce óil phoiblí agus phríobháidigh a mheasúnú agus tuairisciú air;
- Comhordú a dhéanamh ar líonra d'eagraíochtaí seirbhíse poiblí chun tacú le gníomhú i gcoinne coireachta comhshaoil;
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Dramhaíola agus Ceimiceáin sa Chomhshaol

- Rialacháin dramhaíola a chur i bhfeidhm agus a fhorfheidhmiú lena n-áirítear saincheisteanna forfheidhmithe náisiúnta;
- Staitisticí dramhaíola náisiúnta a ullmhú agus a fhoilsiú chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Guaisí;
- An Clár Náisiúnta um Chosc Dramhaíola a fhorbairt agus a chur i bhfeidhm;
- Reachtaíocht ar rialú ceimiceán sa timpeallacht a chur i bhfeidhm agus tuairisciú ar an reachtaíocht sin.

Bainistíocht Uisce

- Plé le struchtúir náisiúnta agus réigiúnacha rialachais agus oibriúcháin chun an Chreat-treoir Uisce a chur i bhfeidhm;
- Monatóireacht, measúnú agus tuairisciú a dhéanamh ar chaighdeán aibhneacha, lochanna, uiscí idirchreasa agus cósta, uiscí snámha agus screamhuisce chomh maith le tomhas ar leibhéil uisce agus sreabhadh abhann.

Eolaíocht Aeráide & Athrú Aeráide

- Fardail agus réamh-mheastacháin a fhoilsiú um astaíochtaí gás ceaptha teasa na hÉireann;
- Rúnaíocht a chur ar fáil don Chomhairle Chomhairleach ar Athrú Aeráide agus tacaíocht a thabhairt don Idirphlé Náisiúnta ar Ghníomhú ar son na hAeráide;
- Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

Monatóireacht & Measúnú ar an gComhshaol

- Córais náisiúnta um monatóireacht an chomhshaoil a cheapadh agus a chur i bhfeidhm: teicneolaíocht, bainistíocht sonraí, anailís agus réamhaisnéisiú;
- Tuairiscí ar Staid Thimpeallacht na hÉireann agus ar Tháscairí a chur ar fáil;
- Monatóireacht a dhéanamh ar chaighdeán an aeir agus Treoir an AE i leith Aeir Ghlain don Eoraip a chur i bhfeidhm chomh maith leis an gCoinbhinsiún ar Aerthruailliú Fadraoin Trasteorann, agus an Treoir i leith na Teorann Náisiúnta Astaíochtaí;
- Maoirseacht a dhéanamh ar chur i bhfeidhm na Treorach i leith Torainn Timpeallachta;
- Measúnú a dhéanamh ar thionchar pleananna agus clár beartaithe ar chomhshaol na hÉireann.

Taighde agus Forbairt Comhshaoil

- Comhordú a dhéanamh ar ghníomhaíochtaí taighde comhshaoil agus iad a mhaoiniú chun brú a aithint, bonn eolais a chur faoin mbeartas agus réitigh a chur ar fáil;
- Comhoibriú le gníomhaíocht náisiúnta agus AE um thaighde comhshaoil.

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta agus nochtadh an phobail do radaíocht ianúcháin agus do réimsí leictreamaighnéadacha a mheas;
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha;
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta;
- Sainseirbhísí um chosaint ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Ardú Feasachta agus Faisnéis Inrochtana

- Tuairisciú, comhairle agus treoir neamhspleách, fianaise-bhunaithe a chur ar fáil don Rialtas, don tionscal agus don phobal ar ábhair maidir le cosaint comhshaoil agus raideolaíoch;
- An nasc idir sláinte agus folláine, an geilleagar agus timpeallacht ghlan a chur chun cinn;
- Feasacht comhshaoil a chur chun cinn lena n-áirítear tacú le hiompraíocht um éifeachtúlacht acmhainní agus aistriú aeráide;
- Tástáil radóin a chur chun cinn i dtithe agus in ionaid oibre agus feabhsúchán a mholadh áit is gá.

Comhpháirtíocht agus Líonrú

- Oibriú le gníomhaireachtaí idirnáisiúnta agus náisiúnta, údaráis réigiúnacha agus áitiúla, eagraíochtaí neamhrialtais, comhlachtaí ionadaíocha agus ranna rialtais chun cosaint chomhshaoil agus raideolaíoch a chur ar fáil, chomh maith le taighde, comhordú agus cinnteoireacht bunaithe ar an eolaíocht.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an GCC á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóir. Déantar an obair ar fud cúig cinn d'Oifigí:

1. An Oifig um Inbhunaitheacht i leith Cúrsaí Comhshaoil
2. An Oifig Forfheidhmithe i leith Cúrsaí Comhshaoil
3. An Oifig um Fhianaise agus Measúnú
4. An Oifig um Chosaint ar Radaíocht agus Monatóireacht Comhshaoil
5. An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tugann coistí comhairleacha cabhair don Ghníomhaireacht agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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