

RETHINKING OWNERSHIP

PRODUCER OWNERSHIP MODELS IN A
CIRCULAR ECONOMY

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RETHINKING OWNERSHIP
Producer ownership models in a circular economy

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Foreword

The crises that threaten the future of our planet – climate change, biodiversity loss and the depletion of natural resources – emerge from the way we consume materials and products. The circular economy, which is an economic model in which production and consumption are based on services instead of ownership, offers solutions to the sustainability crisis our world is facing.

Shifting to a circular economy calls for a fundamental change in the way we think and consume. One change concerns ownership. In our current economic model, people own a lot of products with short life spans. In the circular economy, this is reversed: people own considerably fewer products, but their life spans are much longer. Ownership of products more often remains with the service provider, allowing products to be used more efficiently throughout their life cycles.

Examples of successful circular economy businesses, where ownership remains with the service provider, can already be found in Finland and internationally. Nevertheless, the systemic change of businesses adapting their operations to planetary boundaries is still a long way off.

The transition towards a carbon-neutral circular economy can be accelerated through smart decision-making and the right incentives. Impetus for the change can also be provided by investors and funding providers that seek sustainable and climate-friendly investment targets.

The aim of this report is to bring producer ownership to the core of the circular economy and the work towards a sustainable future. Change requires action at the national and EU levels. This is especially topical now, as the European Commission is starting to implement its Green Deal programme and EU states are launching sustainable recovery programmes. The effort also needs the business sector: legislation, funding providers and customers are already looking for new and smarter ways of ownership, and the first-mover advantages are up for grabs now.

Kari Herlevi

Project director, competitive and fair circular economy
The Finnish Innovation Fund Sitra

Summary

The circular economy offers solutions to the sustainability crisis faced by our world. It plays a central role in mitigating climate emissions and the loss of biodiversity as well as in the creation of a sustainable and competitive economy. From the perspective of the economy and the business sector, the circular economy presents new business opportunities as people shift from a disposable culture to new models of consumption and ownership.

Rethinking ownership is a key aspect of circular economy business models. In a circular economy, instead of continuously manufacturing more goods, products are shared, rented, repaired, maintained, upgraded, recycled and reused with the help of various services. Consumption does not end, but it becomes more sustainable.

The ownership of products increasingly remains with their producers or intermediaries, ensuring that products and materials remain in efficient use throughout their life cycle. These business models are referred to as producer ownership models, which fall into four main categories: product-as-a-service, material-as-a-service, performance-as-a-service and function guarantee, such as extended or lifetime warranties and material return and deposit systems. Producer ownership is also supported by sharing platforms and various digital solutions.

The report presents a vision of rethinking ownership, which outlines how, by 2030, companies will have transitioned from simply selling products to renting, maintenance and returns, thereby taking ownership of products throughout their life cycle. Economic steering methods, legislation and the financial markets will have accelerated the shift to new forms of ownership.

Pioneering companies and experts were interviewed for the report to assess the advantages and challenges associated with producer ownership. Rethinking ownership presents new business benefits to companies and supports the transition to a circular economy. Producer ownership models create close relationships with customers and enable continuous cash flow. In the long term, they also reduce the business risks that may be caused by regulatory changes and the availability of financing. Legislation aimed at mitigating climate change and the excessive consumption of natural resources puts pressure on companies – and creates incentives – to engage in sustainable business.

In Finland, the strategic programme to promote a circular economy presents the opportunity to promote the rethinking of ownership through, for example, the creation of service models and sharing platforms. In the European Commission's new Circular Economy Action Plan, sustainable consumption and product policy hold a central role, and producer ownership is one solution for achieving these goals.

The operating environment does not currently support the transition to producer ownership. The report presents action proposals to decision-makers in Finland and at the EU level to promote the transition to producer ownership.

Opportunities may arise from developing legislation on producer responsibility, implementing product and material passports and standardising product-related information. In the area of taxation, the transition would be supported by sustainable development tax reform: potential tax concessions for new forms of ownership and tax increases for linear economy products. Public funding and public tendering processes must support resource-wise products and services. Cross-industry business ecosystems and a circular economy infrastructure need to be developed by supporting a broader co-operation through funding with regard to product life cycles or entire industries. And investments in training and skills

development can improve the circular economy competence of businesses. Companies, for their part, need to understand the change in the operating environment and respond to the challenge by adopting new business models. This calls for investment in competence development, technology and infrastructure.

Making the shift to producer ownership is possible. Pioneering companies are already applying circular economy business models and there are examples of successful circular economy businesses in Finland and internationally. Nevertheless, the major change, in which businesses adapt their operations to the earth's carrying capacity, is still a long way off. The transition towards rethinking ownership can be accelerated through smart decision-making and appropriate incentives.

Introduction

The circular economy has emerged as an important element of economic and environmental policy in the European Union and Finland. The EU's new [Circular Economy Action Plan](#) was published in March 2020 and is one of the cornerstones of the [European Green Deal](#). In early 2020, the Finnish Government started preparing a [strategic programme to promote a circular economy](#) with the aim of making the circular economy the new foundation of the economy and strengthening Finland's role as a circular economy pioneer.

The circular economy is a way of mitigating climate change and preventing the loss of biodiversity and the depletion of natural resources. In a circular economy, our economic system operates within the limits of the earth's carrying capacity and the aim is to decouple economic growth and the growth of well-being from the growth of material consumption. Circular economy business models aim to keep materials and products in circulation for as long as possible, with high rates of usage. This minimises inefficiencies and waste.

One way to extend the circulation of materials and products is to transfer their ownership from customers to companies. This means that ownership remains partly or fully with the party that directly or indirectly manufactured the product. When ownership remains with companies (even partly), product life cycles are extended, usage rates are improved and the circulation of materials becomes more of a closed loop, which has both economic and environmental advantages. This called producer ownership. This affects our consumption habits and lifestyle: what we buy and own, and how we use products and services.

Producer ownership models include product-as-a-service, material-as-a-service and performance-as-a-service. In these models, the ownership of the product or material remains with its producer instead of the end user. The models also include function guarantees, such as lifetime warranties, as well as material return and deposit systems, such as bottle return systems.

Why is rethinking ownership necessary?

The EU has set a target of becoming climate-neutral by 2050, and Finland has set an ambitious corresponding target of 2035. The goal of a climate-neutral Europe calls for significant changes in how we produce and consume. Making the transition to circular economy models is essential for achieving the target of climate neutrality.

Many companies are already preparing for higher prices and shortages of raw materials by starting to use secondary materials, improving material efficiency and shifting from selling products to using other business models based on lower material consumption. The transition to more sustainable models is also supported by changes in the investment markets. Deutsche Bank has estimated that the proportion of the world's assets managed by professional investors that fall under the banner of responsible investing will rise to more than half by 2020 and to 95 per cent by 2030 (Deutsche Bank Research 2018). Responsible investing is expedited by the sustainable finance taxonomy [published by the EU](#), which helps investors, companies, other business-sector participants and EU member states allocate funding to actions that

" Rethinking ownership presents companies with opportunities for new growth."

promote the creation of a low-carbon and resource-efficient society (BIOS 2020).

The EU also has several legislative initiatives under way to support and accelerate this change. One example is sustainable product policy, where the ambitious goal is to promote the durability, reusability, upgradability and repairability of products. More than 80% of the ecological footprint of products is determined in the design stage (European Commission 2014), which means that rethinking ownership is essential for the transition to a circular economy. The changing trends in consumption, including the shift from ownership to using, also create added pressure to adopt new business models.

Rethinking ownership presents companies with opportunities for new growth. The new models create closer, continuous customer relationships and improve resource use. When consumption is based on the use of services rather than ownership, the financial risk borne by the customer is reduced, the use of the product is more flexible and the end user does not need to worry about repairs or maintenance. Having ownership remain with companies opens up opportunities for extending product life cycles, improving rates of usage and facilitating the efficient circulation of materials. There are already companies engaging in profitable business around the change in ownership, and their business

operations promote sustainable consumption. In order for climate change to be mitigated and ambitious climate targets to be achieved, it is essential that these business models become mainstream.

In this report, we discuss changing ownership in a circular economy, the opportunities it presents for business growth and solving environmental issues, and the challenges associated with its widespread adoption. We present pioneering companies that are already taking advantage of the change in ownership and we issue recommendations to decision-makers and companies regarding the transition to these models.

For the purpose of this report, we studied the activities of 60 Finnish companies that are already making use of producer ownership models and interviewed 10 of them. We also conducted five interviews with decision-makers and experts and organised a stakeholder workshop attended by 18 representatives from companies, decision-making bodies and expert groups. The report was produced in parallel to the broader [Project LAUNCH](#) by the SUN Institute, SYSTEMIQ and University College London. The three-year project focuses on barriers to the adoption of the circular economy and producer ownership among companies in the European Union as well as on ways to promote the implementation of the related operating models.

1 Producer ownership plays an important role in the implementation of a circular economy

Circular economy business models create value by keeping products and materials in circulation for as long as possible. They can be shared, rented, repaired, maintained, upgraded, recycled or reused. This ensures long life spans and high usage rates for products. Circular economy business models can be grouped into five different models (Table 1) – product-as-a-service; renewability; sharing platforms; product-life extension; and resource efficiency and recycling (Accenture Strategy, Sitra and Technology Industries of Finland 2018). All five circular economy business models include elements of producer ownership. The models also serve as the framework for the producer ownership models that are discussed in this report.

In the product-as-a-service model, a company provides a service instead of products. In business models based on renewability, renewable and recyclable materials and/or renewable energy is used in product design and manufacturing. Sharing platforms help increase the usage rate of products and resources through renting, selling, sharing and reuse, for example. In business models based on product-life extension, products are used according to their original purpose for as long as possible through means such as maintenance, repair and refurbishment. Business models focused on resource efficiency and recycling include material and energy-efficient solutions as well as the collection and reuse of products

and raw materials that have reached the end of their life cycle.

Producer ownership models

Producer ownership is linked to all of the circular economy business models presented above. The difference between producer ownership and circular economy business models is that producer ownership is related to change in the ownership of materials and products, whereas circular economy business models are more broadly focused on the circulation of materials and products. Producer ownership complements and adds specificity to the circular economy business models.

In producer ownership models, the customer shifts from ownership of the materials or products towards their use, sharing, borrowing and renting. Ownership remains with the manufacturer, such as a company, which remains responsible for the product throughout the life cycle. Offering product-as-a-service is a classic example of this type of producer ownership model, but it is not the only one by any means. Ownership may also take the form of a promise to retake possession of products, repair and resell them, or reuse and recycle the materials they contain. Various repair services and warranties by which the producer guarantees a certain life span for the product are also forms of producer ownership (Domenech et al. 2019).

In Project LAUNCH, the SUN Institute, SYSTEMIQ and UCL use Stahel's (2019) outline to describe the business models of producer ownership (Figure 1). In these models, the role of producer ownership consists of various combinations of production, legal ownership, and operation and maintenance.

Production = the direct or outsourced manufacturing of a product or material

Operation and maintenance = maintenance, repairs and returns of a product or service as well as logistics and other infrastructure

Legal ownership = ownership of, and legal responsibility for, a product or material

The models of producer ownership are product-as-a-service, material-as-a-service, performance-as-a-service and function guarantees. Also included in the business models are support functions, such as sharing platforms and digital solutions (Table 2). A company can engage in one of these, or its business may be a combination of several models. The operations of some companies combine elements of producer ownership and the traditional sale of goods. In all of the aforementioned models, the service provider takes responsibility for the life cycle of the product or materials.

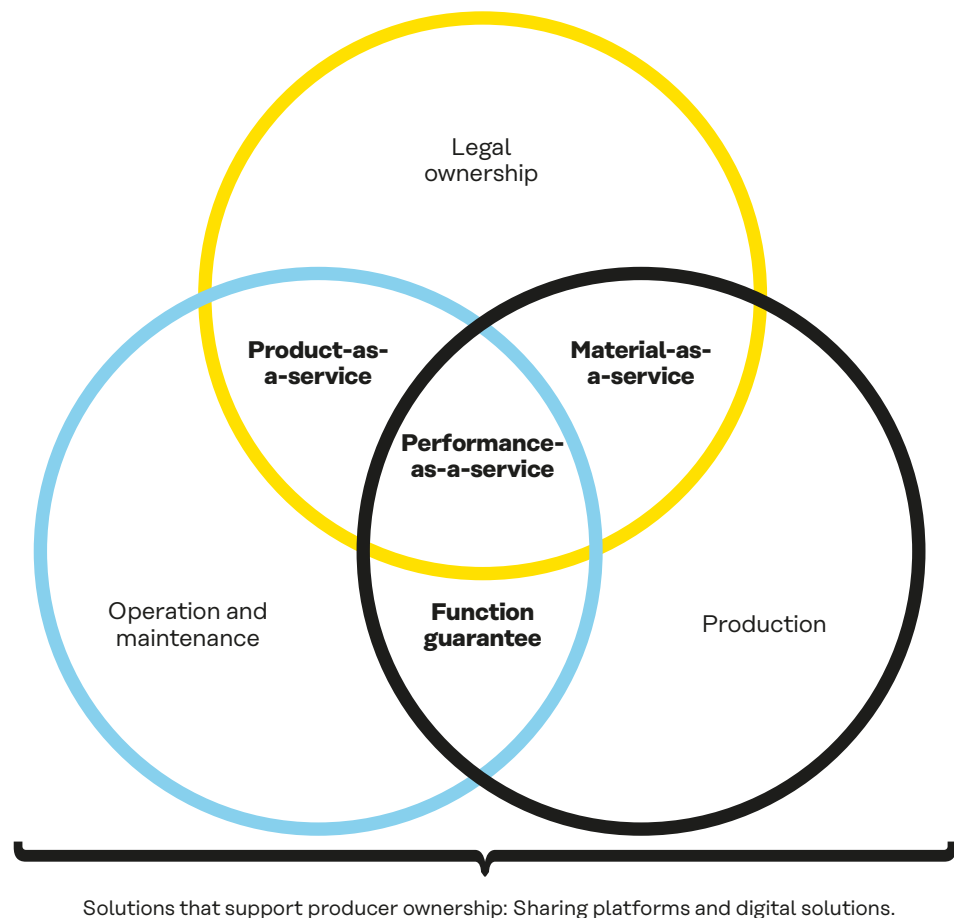


Figure 1. Models of producer ownership

Source: Domenech et al. 2019

Circular economy business model	Business model description
Product-as-a-service	Providing services instead of products.
Renewability	Using renewable and recyclable materials as well as renewable energy in manufacturing.
Sharing platforms	Increasing the usage rate of products and resources and extending their life cycle by using sharing platforms to facilitate renting, selling, sharing and reuse, for example.
Product-life extension	Using products according to their original purpose for as long as possible through means such as maintenance, repair and refurbishment.
Resource efficiency and recycling	Material and energy-efficient solutions as well as the collection and reuse of products and raw materials that have reached the end of their life cycle.

Table 1. The five business models of the circular economy

Source: Accenture Strategy, Sitra and Technology Industries of Finland 2018

Model of producer ownership	Business model description
Product-as-a-service	A service model in which the customer rents or leases the product instead of buying it. The service provider owns the products and is responsible for their maintenance.
Material-as-a-service	A service model in which the manufacturer of the materials produces and owns the materials, but the customer is responsible for their use.
Performance-as-a-service	A service model in which the customer buys a “performance” instead of owning and using a product.
Function guarantee	<ol style="list-style-type: none"> 1) A lifetime warranty for a product, with the producer taking responsibility for the product’s maintenance and longevity. 2) Deposit systems that ensure that products are returned from the customer for subsequent reuse, remanufacture, repair or use as raw material in production.
Solutions that support producer ownership	Description of support functions
Sharing platforms and digital solutions	Digital sharing platforms and solutions that make it possible to increase the usage rate of goods and other resources through renting and sharing, for example. In this model, the platform operator does not directly own the resources that are rented and shared on the platform but nevertheless holds a key role in the effective functioning of the business model.

Table 2. Description of the models of producer ownership

Source: Domenech et al. 2019

Product-as-a-service

In the product-as-a-service model, the customer rents or leases the product instead of buying it. This model suits needs where the customer values the functionality more than the ownership of the product itself. One good example is the Finnish company 3stepIT, which provides its customers with IT device rental services based on managing the entire life cycle of the IT equipment, including maintenance and returns. In the product-as-a-service model, the company usually owns the products and is responsible for their functionality and maintenance. This motivates companies to manufacture high-quality products with long life spans instead of disposable products.

In the product-as-a-service model, pricing is usually based on usage or time. For example, the Finnish children's clothing company Reima offers garments for a monthly subscription fee, allowing customers to simply choose colours and sizes to gain access to all of the outerwear needed by their child for each season. The model is flexible and convenient for the customer and is often more affordable than buying the products outright.

The product-as-a-service model enables closer customer relationships and better customer insight. It opens up new business opportunities through cross-selling and additional sales. It also provides continuous cash flow instead of one-off transactions. Lindström is a good example of how the product-as-a-service model can open up new business opportunities. Over the years, Lindström has transformed itself from a Business-to-Consumer (B2C) laundry services company to a Business-to-Business (B2B) service provider that offers workwear, hotel textiles and carpets as a service to other companies.

The most significant environmental advantages of the product-as-a-service model can be achieved by producing durable, maintainable and high-quality products whose life span and usage rates are as high as possible. This enables a reduction in mass production and the amounts of raw material used. It is also easier for a company to influence the recyclability and reuse of a product than a consumer, whose knowledge of sustainable recycling may be limited.



CASE

3stepIT

Producer ownership model: Product-as-a-service

3stepIT is an IT company established in 1997 that provides solutions to help customers acquire IT devices, optimise their use and recycle them. The company's turnover in 2019 amounted to EUR 357 million and its customer service operations currently cover approximately two million devices.

Service description: 3stepIT provides its customers with a life-cycle management model for IT devices. In practice, 3stepIT helps customers acquire IT devices, such as computers, as a service. It arranges financing, assists with the optimal use and maintenance of the devices and subsequently takes the devices back and securely erases all data on the devices when the contract expires. As many as 98% of the returned devices are subsequently reused, which promotes a sustainable circular economy.

The advantages and challenges of the business model: Customers can upgrade their devices frequently enough to suit their needs. The model provides flexibility for customers. For 3stepIT, it offers predictable cash flow and long-term customer relationships. Optimising the use of IT devices also extends their useful life and reduces the customers' carbon footprint. The service model represents a more sustainable alternative for customers and can reduce their IT expenses by as much as 30%. The challenges 3stepIT faces with the business model include maintaining a high level of customer service and the competence of its employees. Keeping up to date with the rapid rate of digitisation is also of critical importance for the company.



Material-as-a-service

In the material-as-a-service model, the customer pays for flexible access to materials as needed. The difference between this model and the traditional approach to material purchasing is that the customer does not need to buy large wholesale quantities at a time. Instead, they only have the necessary quantity of materials in use. The producer of the materials also commits to accepting returns of unused or unsold materials, which minimises the amount of wasted material.

For this model to function, the materials must be identifiable and traceable. The company must know where the materials are located, how much of them have been used and what products they have gone into. Real-time monitoring is enabled by, for example, accurate supply chain management, tracing technologies and the Internet of Things (VTT Technical Research Centre of Finland 2019).

The benefits that companies gain from the material-as-a-service model are largely the same as with the product-as-a-service model: close customer relationships, continuous cash flow and opportunities for additional sales. For example, Suomen Kemikaalitukku began to offer a monthly chemicals-as-a-service model at the beginning of 2020. The service enables customers to acquire chemicals as needed and return unused or unsold chemicals.

From the circular economy perspective, the advantage of the material-as-a-service model is that the owner of the materials is also their producer. The circular economy is usually a key aspect of the design and recycling of materials throughout their life cycle, unlike in the product-as-a-service model, for example, where the service provider is not always the product manufacturer, and therefore may not be able to influence the full life cycle of the product.



CASE

Suomen Kemikaalitukku

Producer ownership model: Material-as-a-service

Suomen Kemikaalitukku (SKT) was established in 2019 to challenge the traditional chemicals industry by focusing on online sales and the Chemicals-as-a-Service (CaaS) business model. SKT specialises in car chemicals, cleaning products, waxes and industrial maintenance products. The company aims to achieve annual growth of 10 per cent.

Service description: The CaaS business model started from customers expressing a wish to pay for the chemicals they actually use instead of buying large wholesale quantities. The service is offered to retailers as well as companies that use chemicals. CaaS enables customers to sign a retainer under which chemicals are acquired as needed instead of having to buy a year's worth of inventory at a time. SKT also commits to taking unused or unsold chemicals back from its customers.

The advantages and challenges of the business model: For SKT, the most significant advantage of the business model is a close customer relationship, which gives the company a better opportunity to train its customers. By training, SKT refers to advising customers on making optimal choices when choosing and using chemicals. The service model is also better than the traditional product sales model with regard to customisation. This creates economic and environmental benefits, for example, by making it possible to minimise waste and the use of chemicals that are harmful to the environment. Customers do not need to recognise the chemicals on their balance sheet, as the chemicals are delivered under a service agreement and either used quickly or returned to SKT.



Performance-as-a-service

In the performance-as-a-service model, the customer buys performance from a company instead of buying a product or service. For example, the Finnish company Valtavalo sells LED lighting as a service instead of selling lighting equipment. And Tamturbo, established in 2010, produces compressed air for industrial customers as a service. The compressed air service involves the company providing the customer with an air compressor and looking after its functionality and maintenance throughout its life cycle. Companies that sell performance produce, maintain, operate and own the products involved. The key aspects of the performance-as-a-service model are convenience, operational reliability and the elimination of risk. Especially in the B2B context, it enables customers to focus on their core business.

In the performance-as-a-service model, the outcome is more important than the product. This can be illustrated by comparing this model with the product-as-a-service model, in which the customer pays for having access to the best possible workwear, for example. In this scenario, what the workwear is like is important, but the customer is responsible for how the workwear is used. In the performance-as-a-service model, on the other hand, the customer pays for having the best possible lighting in its workspace, for example. In this context, the important factors include how the lighting is designed, how it

adapts to needs and how it supports the work. The customer does not need to be concerned with the use of the product, as in the case of workwear, for example. Instead, that is included in the service package.

In the performance-as-a-service model, quality levels and certain outcomes are usually predefined. Pricing may be based on time or utility, or it may be linked to the cost savings achieved, for example. The Finnish company Fluid Intelligence uses an oil-as-a-service business model that includes comprehensive monitoring of oil performance and the control and maintenance of critical machinery. The service is based on monthly pricing according to the service level agreed on with the customer.

As with the previously discussed service models, the advantages of the performance-as-a-service model for the companies that use it include more comprehensive customer relationships and continuous and predictable cash flow.

From the circular economy perspective, the most significant environmental advantages of the performance-as-a-service model arise from the fact that products are designed to be durable, maintainable and reliable. As with the material-as-a-service model, one advantage is that the service producer retains ownership of the products throughout their life cycle. Moreover, use is planned according to need, which reduces waste.



CASE

Tamturbo

Producer ownership model: Performance-as-a-service

Established in 2010, Tamturbo produces air compressors and supplies compressed air for industrial customers as a service. The development of the underlying technology was completed in 2017, which is when the sales of the first devices began. Last year, the company's turnover was EUR 2.1 million.

Service description: Tamturbo sells compressed air as a service to industrial services, much in the way that other operators sell electricity, heat and water. The compressed air service involves the company providing the customer with an air compressor and looking after its functionality and maintenance throughout its life cycle. Tamturbo's technology solves the key challenges and problems of traditional technology by providing an entirely oil-free and energy-efficient solution for industry. Tamturbo's compressed air equipment requires 90% less maintenance. The service model currently accounts for about 25% of Tamturbo's sales.

The advantages and challenges of the business model: In this service model, Tamturbo owns the compressor, which eliminates the need for the customer to buy it as a balance sheet asset. Tamturbo also handles the servicing and maintenance of the air compressor and helps the customer make optimal use of it. As the compressors are remotely controlled, it is not necessary to visit the facility in person to optimise their operation. Another advantage of the service model is that the customer and Tamturbo both have an incentive to maximise the life span of the compressor. The service model results in lower life-cycle operating costs for the customer, and the model is also profitable for Tamturbo. The challenge faced by Tamturbo is the traditionality of the industry, which means that getting a new business started can take a long time. Finding a suitable financing model has also proved to be a challenge.



Function guarantee

The function guarantee model includes lifetime warranties and deposit systems. In the function guarantee model, a company offers a lifetime warranty for a product, which includes taking responsibility for its maintenance and longevity. This means that the provider takes on part of the risks of ownership. A lifetime warranty can be either included in the price of the product or offered as a separate add-on service. The Finnish high-growth company Swappie repairs and resells used smartphones. It offers a 12-month warranty free of charge for all of its phones. For an additional fee, the warranty can be extended to three years, which is considerably longer than the warranty that manufacturers offer for their products. The particular advantages of the function guarantee model for service providers is the demonstrability of customer value for consumers and corporate customers, which helps attract the interest of new customers.

Deposit systems ensure that products are returned from the customer for subsequent reuse, remanufacture, repair or use as raw material in production. In deposit systems, the company takes on the responsibility for keeping a product in circulation for as long as possible thanks to its quality or reusability. For products that reach the end of their life cycle, the company ensures that the raw materials they contain are appropriately utilised. Products in a deposit system usually come with a paid deposit, which is refunded to the customer when the product is returned to the

manufacturer. Palpa, or Suomen Palautuspakkaus Oy, is a leading example of a comprehensive national product return system. It uses deposits to ensure that aluminium cans, PET bottles and glass bottles remain in circulation for as long as possible by reusing the materials.

The current benefits of introducing a deposit system for a company come from the first-mover advantage. There is a demand for deposits for products and packaging in many industries, but the supply is limited. One company that aims to respond to this demand is the Finnish company RePack, which offers reusable postal parcels made from recycled materials for use by online retailers as an alternative to disposable parcels. When someone returns one of these parcels, they receive a discount code that they can use in an online store offering RePack as a delivery option.

From the circular economy perspective, the advantages of warranty and deposit systems are obvious. In the function guarantee model, the products are designed to be durable and easy to repair. This makes it possible to reduce waste and maximise the usage rate of products. In deposit systems, the company takes on the responsibility for keeping a product in circulation for as long as possible by ensuring its quality or reusability, which maximises the recyclability and life span of products and materials. Deposits create a motivation to return products and maximise the extent to which materials remain in circulation.



CASE

Palpa

Producer ownership model: Function guarantee

Palpa, or Suomen Palautuspakkaus Oy, was established in 1996 to manage the return system for aluminium cans. Today, Palpa also manages the return systems for glass and plastic bottles. Palpa is a non-profit company owned by the central retail franchising groups and major beverage companies in Finland. Its annual turnover is approximately EUR 80 million and about EUR 340 million worth of deposit fees run through it each year.

Service description: Palpa administers three different return systems intended for different packaging types: there are return systems for aluminium cans, PET plastic bottles and glass bottles recycled as materials. When consumers return bottles and cans to return machines in exchange for deposit fees, the ownership of the returned materials passes to Palpa. The returned cans and bottles then go to material recycling plants and subsequently to packaging manufacturers as recycled materials. Palpa pays the deposit fees received by consumers back to the retail operators.

The advantages and challenges of the business model: The objective of Palpa's return system is to achieve a closed loop to the greatest possible extent. The advantages are the efficient use of resources and minimising the use of virgin materials. According to Palpa, the biggest advantage of the model is the synergies involved: when the return system is highly centralised, it can operate efficiently. The challenge with the model is that it calls for co-operation between various parties – in Palpa's case, retailers and the beverage industry. Organising this type of co-operation is not always easy due to different interests, for example. This kind of model also calls for the training of personnel as well as consumers but, over the years, this has led to a genuine change in culture when it comes to the recycling of cans and bottles.



Sharing platforms and other digital solutions support producer ownership

Sharing platforms and digital solutions make it possible to increase the usage rate of goods and other resources through renting and sharing. From the environmental perspective, this reduces the need to use virgin raw material. Sharing platform operators usually do not own

the resources that are rented and shared via their platform. Instead, by facilitating the renting and sharing, they support the other models of producer ownership. Sharing platforms and digital solutions support producer ownership models and they have significant opportunities for growth. To reach profitability, they need a large volume of users.

CASE

Skipperi

Sharing platforms and digital solutions

Skipperi is a website and sharing platform established in 2017 to facilitate the rental and shared use of boats. In 2019, the company's turnover was approximately EUR 280,000.

Service description: Skipperi provides two services: a sharing platform for boats and a city boat service. The users of the sharing platform can put their boats up for rent and rent boats from other users. The city boat service is a subscription-based service that gives consumers access to Skipperi's boats for the entire boating season for a one-time fee. Skipperi's sharing platform is based on the traditional revenue model, whereby the company earns a commission each time a boat is rented through the service. The city boat service gives the users access to 350 boats at 30 marinas around the Baltic Sea. The city boat service also has three different service levels to suit different needs.

The advantages and challenges of the business model: In Skipperi's experience, its business faces the same challenge as sharing platforms generally do: the need to have high volumes. Furthermore, starting the business takes time and the city boat service, in particular, requires large initial investments. Environmental benefits are a core element of the business model: boats owned by consumers are often not efficiently used, and the infrequent use leads to the deterioration of their condition. Skipperi's platform offers consumers the opportunity to make resource-efficient use of their boats and earn additional income.



Business model	The opportunities the model presents for companies	The challenges of the model for companies
Product, material or performance-as-a service	<ul style="list-style-type: none"> + Eliminates the hassle of ownership for customers, being risk-free, flexible, free of maintenance and reliable + A closer customer relationship compared to one-off sales + Opportunities for service customisation + Improved customer insight + Opportunities for cross-selling and additional sales + Continuous and predictable cash flow + Environmental advantages, such as a smaller material footprint, a smaller carbon footprint and waste minimisation 	<ul style="list-style-type: none"> - Customers' prevailing ideas of the convenience and necessity of product ownership - Educating customers (e.g. acquisition and use) - Maintaining a high level of customer service and the competence of employees - Investments in technology and infrastructure - For devices that have a short life cycle and require a lot of maintenance, manufacturing may be more profitable for the time being
Function guarantees	<ul style="list-style-type: none"> + The benefits are easily demonstrable to the customer in the form of product-life extension, for example + In many industries, there is demand but no supply – first-movers are in a good position + Centralised return and deposit systems create significant synergies + Environmental benefits, such as the minimisation of waste 	<ul style="list-style-type: none"> - Composite materials complicate opportunities for reuse - Investments in technology and infrastructure - Customer training (product returns) - Requires co-operation between several parties and a centralised system (e.g. bottle return system)
Support functions: Sharing platforms and digital solutions	<ul style="list-style-type: none"> + Good business scalability and growth potential + Higher usage rate for shared resources 	<ul style="list-style-type: none"> - Requires a large number of users and high volumes to function - Generally, employment legislation pertaining to the platform economy requires further specification, as it may create unfair situations towards employees in its current form

Table 3. The opportunities and challenges presented to companies by the different models of producer ownership

2 A vision of rethinking ownership in 2030

The EU's Circular Economy Action Plan underlines the importance of incentivising business models where producers keep the ownership of the product or the responsibility for its performance throughout its life cycle. This primarily calls for decision-makers at the Finnish and EU levels to accelerate the adoption of such models, but it also requires

changes in companies' business models and the luring of new customers.

Based on the interviews and workshop conducted for this report, a vision statement was created to illustrate what the use of producer ownership aims to achieve and what the operating environment should look like in 2030.

Vision 2030:

Companies have transitioned from simply selling products to offering services, maintenance and returns, thereby taking ownership of products throughout their life cycle. Regulation, legislation and the financial markets have accelerated the shift to new forms of ownership.



Fulfilling this vision would mean that the circular economy will have emerged as a core element of business strategy and companies will have built their operations around business models that minimise the use of natural resources. This will have become the most profitable way to engage in business. Regulation at the national and EU levels will support and incentivise the offering of services, maintenance and return of products. The EU Circular Economy Action Plan proposal on a new Sustainable Product Policy Framework will have been implemented. Products placed on the EU's internal market will have been designed to be durable, easy to reuse, repair and recycle, and they will contain a high content of recycled material. Functional markets for various recycled materials will have begun to form in the EU.

Regulation at the national and EU levels will require companies to take responsibility for the products and services they produce. It will cover the full life cycle of products and materials by specifying requirements concerning the repairability, returnability and maintainability of products. Maximising the usage rate of existing products will be more profitable than selling new products, as products will have been designed and manufactured to be durable and repairable. Sharing platforms and various digital solutions will enable a high usage rate for products. Recycled materials will be used as

much as possible, as the use of virgin raw materials will have been rendered expensive through taxation, among other things. The majority of produced materials will be returned through ecosystems for use as raw materials in production.

The vision would see consumers and corporate customers buying sustainable circular economy products and services as their supply and markets grow and become more affordable for customers. Customers would not feel the same need for ownership as they used to, as ownership would no longer have the same value through status or the element of security compared to the services that have come to replace ownership. The new services will be flexible, easy to use and reliable and they will reduce the risks of ownership. These services will have become widely available and various business models that replace ownership will have become mainstream. Finnish companies will be among the pioneers and leaders in this development.

The shift to producer ownership will have benefited the planet, companies and consumers. The use of primary resources will have been reduced, products will be more durable and the new business models profitable. Decision-making will not have created obstacles to a good quality of life – instead, regulation will have supported the transition to a sustainable circular economy and society.

3 Rethinking ownership presents new business opportunities and creates a positive environmental impact

The producer ownership models create profitable business

One of the key advantages of producer ownership models is the opportunity to establish closer customer relationships. This arises mainly from a company providing user-centred services and taking ownership of materials or products even when they are used by a customer. Furthermore, the development and innovation of business models is enhanced when companies receive continuous feedback from customers regarding the needs and effectiveness of the service model.

Close customer relationships create opportunities for additional sales and continuous cash flow

A close customer relationship requires companies to improve their presence and customer service, which presents opportunities for cross-selling and additional sales. Because producer ownership models are, above all, service models, companies have the opportunity to enter into long-term service and co-operation agreements with customers instead of one-off transactions. The customer pays only for what they use and does not have to worry about extra cost. The advantage of these service models is that the monthly savings are easy to demonstrate to customers by comparing the monthly price of the service to a large one-time investment. The service models also provide customers with flexibility, which is vital in a

rapidly changing business environment. In the product-as-a-service model, for example, customers can be offered products that are easy to exchange when situations and needs change. From the service provider's perspective, this type of model creates upcycling opportunities. This means, for example, that devices that are not suitable for one operator can be sold to the next client instead of having them end up recycled or in a waste container.

The service perspective also opens up other opportunities that accelerate revenue growth. Especially in the B2B context, where large listed companies are concerned, optimising the balance sheet and minimising unnecessary costs is important for maintaining profitability. This is why large listed companies are increasingly buying equipment and machinery as services instead of making expensive investments in equipment. Producer ownership models allow customers to focus on their core business.

Long-term service and co-operation agreements ensure continuous and predictable cash flow for companies, unlike the "sell and forget" approach to product sales. Close stakeholder relations, which includes customer relationships, have been shown to increase operational flexibility and thereby reduce the risk levels of companies' cash flows, which creates value for shareholders (Zhang, 2005; Chen et al., 2011). High customer loyalty has also been found to reduce a company's susceptibility to risk (Albuquerque et al., 2019).

Producer ownership models create incentives for coupling environmental objectives and financial benefits

Both B2C and B2B companies are now actively seeking solutions for reducing their carbon footprint. This provides circular economy business models with an excellent customer segment in which companies are open to all solutions that reduce their carbon footprint. Companies that offer these types of solutions increase their carbon handprint and establish a positive position in the fight against climate change.

A key element of producer ownership models is resource wisdom, which refers to the ability to make carefully considered and sustainable use of resources. For example, the product-as-a-service model and the function guarantee model have built-in incentives for designing durable and resource-efficient products and ensuring that their life span is as long as possible. Companies are also motivated to design products with a long life cycle if they can offer them to another customer after their first use. This also leads to potential positive environmental impacts by keeping products in use for as long as possible and increasing their use during the life cycle. Similarly, deposit and recycling solutions have built-in incentives for looking after materials or products as they approach the end of their life cycle. Nevertheless, it should be noted that recycling is not automatically always the best alternative from the environmental perspective. Sharing platforms that support producer ownership need a large number of users and volumes to reach financial

profitability. This gives companies a financial incentive to encourage their users to be active in sharing, which further increases the usage rate of products.

What all of these business models have in common is that they enable simultaneous economic and environmental benefits. In addition to the incentives built into the models, there is nevertheless a need for broader producer responsibility to increase resource-wise business operations.

Fewer risks to business by transitioning towards the circular economy

From the perspective of companies, the advantages of switching to circular economy business models is not only a question of the opportunities presented by demand but also a risk-management procedure. Climate change is the greatest threat to our entire civilisation and presents a tremendous risk for companies, in both the short and long term. In addition to the threat to the availability of raw materials, climate change and biodiversity loss can also lead to changes in the political atmosphere and in the regulatory system, and to fluctuating demand, leading to greater risks to companies.

In Europe, as a result of the actions taken by the EU and its member states, the political climate and regulatory environment are moving firmly in a direction that favours circular economy business models. The circular economy has been on the EU's agenda since 2015 and it is one of the focus areas of the European Green Deal (European Commission 2020). EU-level initiatives, such as the [Circular Economy Action Plan](#), will shape the regulatory operating environment in the future.

"Companies are motivated to design with a long life cycle if they can offer them to another customer after their first use."

In Finland, the government has been advancing the circular economy since 2015, and the Sanna Marin government has launched several assessments during its term with the aim of improving the operating conditions of the circular economy in Finland. One example is the national strategic programme to promote a circular economy, which started in 2020 (Finnish Government, 2019). It is also highly likely that future public procurement and tendering processes in Finland will place increasing emphasis on sustainability and the circular economy; responding to this development will be important to every company whose customers include public-sector organisations.

In general, the future will favour business models that demonstrate resource wisdom and environmentally sound ethics. Proceeding with linear operating models will be a significant business risk for companies in the long run. Many companies that rely on a linear model will be later forced to revise their strategy to incorporate circular economy business models.

In particular, the risks of a linear business model will also increase in the future for companies whose business is reliant on natural resources. There are already signs of challenges related to the adequate availability of raw materials. In the long run, we may see taxation on virgin raw materials. Environmental policies are very likely to be used to take action to minimise emissions from mining operations, for example. These types of policy measures would increase the price of many raw materials and reduce their availability. Accordingly, business operations that rely on using such primary materials in large quantities will encounter considerable risks

in the medium term. Producer ownership models provide a solution to this challenge, as their logic is based on minimising the use of raw materials while maintaining economic value.

Changes in the operating environment needed for producer ownership to proceed

Based on their experience, the pioneering companies interviewed for this report recognised the need to improve their operating environments to make the shift to producer ownership more profitable. Even though circular economy business models help companies achieve sustainable growth, the current economic system was not built to support business based on the circular economy. For example, in taxation, legislation, financing models and the education and training of professionals in various fields there are structures that favour the traditional operating methods. The current challenges discussed below need to be addressed by political decision-making at the national and EU levels to accelerate the transition to producer ownership.

Taking producer ownership models into account in taxation

The biggest taxation-related challenge perceived by the companies interviewed was that the tax authorities have varying interpretations of the taxation of producer ownership business models. In as-a-service models, for example, having the business activities taxed as a service instead of a product would be favourable. This should be addressed in the sustainable development tax reform that is currently under way.

"80% of the ecological footprint of a product is determined at the design stage."

Securing funding through public and private circular economy funding models

With regard to funding, the biggest problem perceived by the companies was the availability of funding. Funding-related issues often involve the problem that the business is seen as too uncertain and risky to attract private investment, and public funding usually needs to be supported by private financing. The companies interviewed felt that private investors may find it difficult to finance business models based on producer ownership. New solutions promoting producer ownership have not been viewed as attractive investments by traditional funding sources, which tend to be more favourable towards leasing-type financing, for example.

Another challenge related to obtaining funding has been that investors lack tools that facilitate comparisons to assess the investment potential of circular economy companies. However, the new EU sustainable finance taxonomy will provide some relief in this respect (Kivisaari, 2019).

The interviewed companies requested decision-makers to introduce new public and private funding solutions if there is a genuine commitment to support the transition towards producer ownership. One suggestion was to secure funding through state-run risk bearers that could either fund a company's operations directly, establish a fund or provide guarantees to other funding providers. This does not mean that unprofitable business models would be given financial support. Instead, it means that the breakthrough of profitable models would be accelerated.

Greater responsibility for a product's life cycle and longevity remains with the

producer when transforming to producer ownership models. This transforms the financing needs, since small and medium-sized companies in particular face a challenge to keep the products on their balance sheet. Long-term funding can support producer ownership models by investing in machinery and equipment. This enables stable and long-term profit for the fund and enables the company's service model.

Legislative reforms to support producer ownership models

The companies interviewed recognised that current legislation does not provide a framework that sufficiently guides companies to engage in producer ownership models, sustainable product design and material consumption. Traditionally the challenges with circular economy solutions have included the difficulty of using recycled materials, as well as their limited availability and high costs. At the same time, the market economy has driven the prices of many consumer products – such as clothing, phones and printers – to such a low level that buying a new product is cheaper than repairing an old one.

Using virgin raw materials is usually much cheaper than using recycled materials, which leads to 90% of the materials and energy being lost after only one round of usage (Domenech et al., 2019). Furthermore, products are often designed in such a way that their manufacturing is dependent on the use of virgin raw materials. When an estimated 80% of the ecological footprint of a product is determined at the design stage, it is clear that we need new product policies to guide product design in a resource-wise direction (European Commission 2014). There are already EU-level initiatives under way to tackle this challenge, such as the framework for a sustainable product policy. These initiatives need to be implemented promptly at the national level in Finland to accelerate the shift to producer ownership.

The legal challenges of ownership were also seen to be problematic regarding the transition to new models. For example, determining the legal responsibility is not necessarily entirely straightforward in product-as-a-service solutions targeted at consumers, and a product that breaks down can easily lead to a dispute. This can create a lack of trust on both the buyer's and the seller's side, which may need to be addressed by long contracts, obligatory insurance policies or other similar measures. These types of transaction costs create friction for these business models, which inevitably leads to a reduction in consumer interest. The legal challenges of ownership will hopefully be tackled in the reform of the EU's consumer legislation. When this legislation is complete, Finland should among the first to implement it.

Taking producer ownership better into account in public procurement

Companies that participate in public tendering processes felt that producer ownership models are not yet addressed in the criteria used in public procurement. In Finland, public procurement processes are evaluated in a manner that puts the most weight on the price. This usually gives the traditional business models an advantage over circular economy and service solutions. Public procurement would be an excellent way in which to accelerate the broader adoption of producer ownership if the criteria were changed at the government level, the public agency level and the municipal level.

Increasing customer awareness and change in consumer behaviour

As the earlier examples indicated, many pioneering companies have successfully created profitable business models based on producer ownership. Marketing is a crucial factor behind many of the successful cases.

Both companies and experts believe that raising awareness among consumers and corporate customers to influence current consumer behaviour is a key business need in the transition to the new models. In people's daily life, changing from a familiar approach to a new service happens slowly. There is a need for significant investment in marketing and making testing new service models easier by, for example, offering trial periods.

A particular challenge associated with increasing awareness among corporate customers is that not all companies understand which functions they should perform themselves and which functions should be bought as a service. Attracting consumers to use new solutions is slowed down not only by pricing but also the prevailing views about the inevitability and convenience of ownership. Change in consumer behaviour is made more difficult by the proven human tendency of cognitive bias. For example, "status quo bias" increases people's irrational preference for the current state of affairs, and the "endowment effect" may make it more difficult to achieve the circulation and efficient allocation of materials, as people have a tendency to want a higher price for something they own compared to what they would be willing to pay for it themselves (Kahneman et al., 1991).

Building shared business ecosystems and infrastructure

The companies interviewed believed that shared industry ecosystems and a shared infrastructure are essential for a large-scale shift to producer ownership in Finland and across the EU. Creating these business ecosystems requires public-sector incentives, such as funding models that are conditional on partnership.

Transitioning to producer ownership also requires shared industry infrastructure, such as product return systems. It does not make sense for each company to create their own

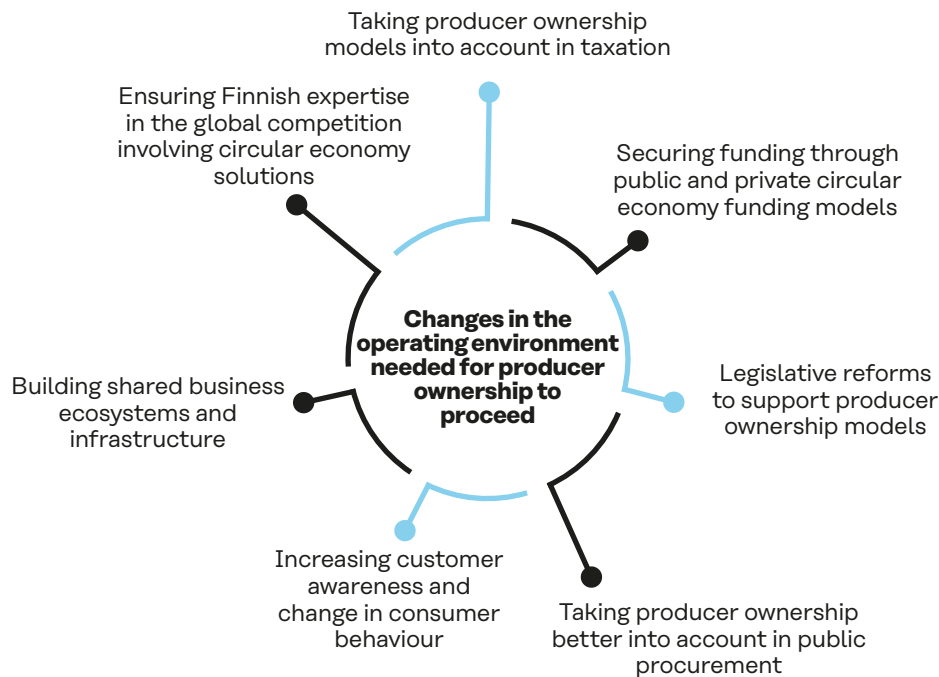


Figure 2. Requirements for the operating environment of companies to facilitate the transition to producer ownership

system. Instead, nationwide logistics and circulation systems, such as Palpa has established for return bottles, are also necessary in other industries. In product-as-a-service models, small players may not have the ability to establish a comprehensive nationwide service network, and they would benefit from the opportunity to use the networks of larger players, such as supermarket chains.

Ensuring Finnish expertise in the global competition involving circular economy solutions

Sooner or later, the shift to circular economy business models will change nearly every industry. People's competences play a key role in this transition in two ways. First, the transition requires employees to adapt and learn new skills. Second, the transition requires the development of the education system to ensure that it fully supports the development of the skills needed in the new economic model. Focusing on competence is of central importance to the EU as a whole

and Finland in particular because maintaining competitiveness through lower taxation or wages, for example, is not a sustainable solution. The countries that will prosper in the global circular economy will be countries of high competence, where there is the capability to implement even the most challenging circular economy business models in an optimal manner.

Because of the need to improve overall competence, preparation for a comprehensive transformation of the economy must be made at all levels of education. This transformation will be manifested in the increasing use of rental and maintenance services, a growing need for repair competence and the declining sales of traditional disposable goods. According to a survey conducted as part of the Climate Competence project by the Finnish National Agency for Education, climate competence, creativity and innovation are currently not focused on enough in the Finnish education system. The practical measures that are needed include

"Product life cycles need to be technically extended by improving recyclability, traceability and maintainability."

incorporating the circular economy into the education system, starting from early childhood education, and making cross-disciplinary innovation activities by universities a degree requirement in higher education (Finnish National Agency for Education, 2020). The international literature on this subject emphasises the significance of cognitive skills and interpersonal skills in the transition towards the "green jobs" that the circular economy business models will create (Consoli et al., 2016).

What is required of companies in the transition to producer ownership models?

In addition to a favourable operating environment, companies themselves need to take particular types of action before the transition to producer ownership is possible. For example, there is a need for a greater understanding of the changes in the operating environment, a profitable business idea, funding and investments, as well as a need for new competences, technology and infrastructure.

Understanding of the changes in the operating environment and new business models

For companies to start to develop producer ownership models on a broader front, they need to be convinced that the operating environment will become more favourable to the circular economy. No company makes business decisions purely based on environmental benefits. Instead, decisions need to be supported by genuine business reasons. Companies need a broader

understanding of the advantages of the new operating models compared to the old models, and they need to be aware of the barriers that make the creation of new markets and business models more difficult. Consequently, companies need to increasingly focus on scenarios in developing their strategies to ensure that understanding the changes in the operating environment provides a foundation for operational business plans and decisions. Changing the business model is a major strategic decision that needs to have the commitment and support of the management and board of directors.

A profitable business idea based on ownership and carefully defined customer value added

Transitioning to a producer ownership model naturally requires a profitable business idea. A company can introduce an ownership-based business model alongside its existing business model or in its place. For both options – but especially in the latter case – it is essential to carefully assess the business benefits and potential for added value. The implementation of a new model is expedited by customer demand, which is why added customer value, such as the price, quality, convenience or risk-free nature of the service, needs to be carefully defined. Market surveys and various pilot projects and trials can support this, for example.

According to an analysis of the interviews, producer ownership creates added value particularly through a closer customer relationship and better customer insight. They not only create a successful service experience for the customer but also make it faster and easier to develop the service. It is also important to carefully define the environmental added value that is offered to the customer. Many companies have taken an active role in reducing the carbon footprint of their entire value chain.

These companies see circular economy solutions representing demonstrable environmental benefits as particularly attractive.

Technology and infrastructure that enable change in ownership

New business models require investments in technology and infrastructure. Product life cycles need to be technically extended by improving recyclability, traceability and maintainability. It is important for companies to identify which emerging technologies – such as artificial intelligence or machine learning – could enable the implementation of new circular economy business models. Sitra's Circular Economy Playbook addresses these technologies and indicates which types of business models they are relevant for. The publication also provides a tool for assessing the technology capabilities of a company in the context of circular economy business (Accenture Strategy, Sitra and Technology Industries of Finland 2018). Companies' internal investment needs are focused on changes in production, new logistics chains and developing new digital platforms. In addition, the need for capital or funding increases when a company does not sell the products and the profit takes longer to arrive.

For example, in the textile industry, the recycling and reuse of materials is challenging because textiles tend to be composite materials. The challenges are further increased by the fact that the cleaning of textiles involves hygiene issues, and recycling currently requires so much manual labour that implementing it with the current technology in a country with high labour costs, such as Finland, is not economically feasible. Nevertheless, technology that is suitable for the recycling of textile composites is currently in development, and there is a pilot project under way in Finland that seeks to find solutions to this challenge.

In addition to technology, the physical and digital infrastructure of companies

needs to be updated to correspond to the needs of the new business model with regard to the traceability, return and maintenance of products and materials. The development processes are typically long and require a long-term commitment to the new business model. Value chains change, which entails changes in subcontracting chains in areas such as sourcing, logistics and partnerships. Furthermore, changes in revenue models, for their part, create a need for action in companies' sales functions, marketing, customer service and financial management, for example.

Circular economy competences in the planning and implementation of business models

The development of new business models calls for many kinds of competences. From the practical perspective of companies, there is a significant need for new competences related to, for instance, product and service design and sales and marketing, to enable a genuine breakthrough for circular economy solutions.

Product and service design competences are required for the successful service design of circular economy solutions and the combination of customisability and cost efficiency, as customers often want a service that is tailored to their needs, which is a labour-intensive and therefore expensive undertaking. Customisability also creates friction and delays in sales processes and consequently in the progress of creating service models.

The company interviews also indicated that, especially for companies that sell expensive investment services, one challenge is the difficulty for the buyer to compare the advantages and disadvantages of the service model with one-off investments. This is especially the case if the service model is only offered by one or a few companies in the market. In the consumer business, influencing the understanding and consumer

behaviour of the customers is a priority. This underscores the significance of sales and marketing competences in promoting the breakthrough of new business models. Producer ownership models also create a need for vocational talent, such as repair and maintenance staff.

Securing funding for producer ownership models

New mission-driven funding models, such as models that emphasise environmental benefits, can accelerate the transition to producer ownership models. However, assessing the sustainability and environmental impacts of business can be difficult initially. Companies must generate comparable data on their operations to make it easy for funding providers to assess their risk exposure and future cash flows as well as verify the sustainability and positive climate impact of their operations. One key tool in this respect will be the EU's sustainable finance taxonomy. In the future, all investment activities that advertise themselves as supporting sustainable development will need to be in line with the criteria of the taxonomy, which will make the criteria crucial for obtaining funding (BIOS, 2020).

Smaller companies may also gain access to funding from large corporations that want to invest in emerging technologies. Known as corporate venturing, this type of investment is being used by a growing number of companies, also in Finland, as a business development tool. However, companies will need to change their perspective on how long it takes for investments to turn a profit. In the context of producer ownership models, this usually takes longer to realise.

Effective internal and external change management

A change in the business model usually affects the way the entire company operates and thinks about its business. There needs to be an emphasis on internal communication to ensure that the entire company understands what is being done and why. Transitioning to new business models may, for example, create concerns about the future of jobs, if the resources for business development are taken from other business functions. It is essential to engage employees from different teams in the planning of the new business model approach right from the start, as this leads to higher commitment and support. Committed employees are usually satisfied employees, and many studies have demonstrated a link between employee satisfaction and business success (Edmans, 2011; Edmans et al., 2014).

According to a recent Kantar survey, 77% of Finns think that companies need to consider broader social responsibility in their operations instead of merely seeking profits (Demokraatti, 2020). This shows that new sustainable and responsible operating methods should be highlighted in a company's brand both internally and externally. New types of operating models require a lot of marketing, and the change should be managed not only in co-operation with employees but also with external stakeholders. It is particularly important to keep shareholders and other funding providers engaged when communicating a change, as not all parties view the transition to circular economy operating models as an entirely positive move from their financial perspective. For example, if shareholders believe that a company uses its resources on circular economy operating models in a way

that diminishes shareholder value, the company's financing costs will rise. This could, in theory, have a negative impact on the amount of funds the company has available in the future to develop its circular economy business model. This is why investor relations and stakeholder communications are crucial in managing the change.

Participation in circular economy business ecosystems and networks

In addition to the company's internal networks, participation in broader business networks and ecosystems is necessary for success. Business ecosystems facilitate the sharing of information and best practices between pioneering companies. Large companies can serve as testbeds for smaller companies in business accelerator activities, for instance. Various partnership models, in turn, can help make use of the competences and service networks of other companies. However, there can be many kinds of

ecosystems and networks, and it is important for companies to recognise what their purpose is.

In circular economy ecosystems, companies operate in a value chain where each company plays a role in enabling circulation and earns revenue from it. These types of ecosystems are vital for organising the profitable circulation of materials. Another business-critical example is a data ecosystem, where the data collected by different companies is shared through interfaces to create profitable business opportunities. Effective data ecosystems require absolute trust between the participants and an open interface for accessing the data. It is important for companies to keep two things in mind: there are different kinds of networks and ecosystems and they can be used in many ways. In the transition to circular economy business models, it is vital to create both industry-specific and cross-sectoral ecosystems.

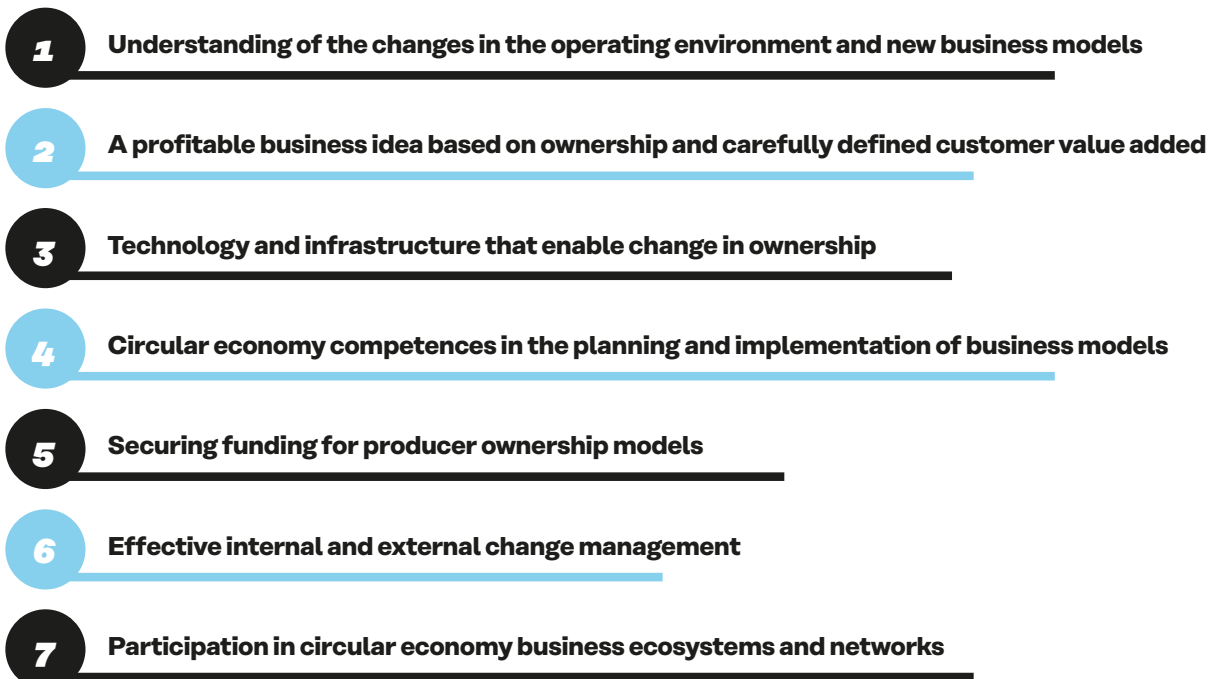


Figure 3. Actions required of companies to facilitate the transition to producer ownership.

4 Transitioning to producer ownership models requires changes in policy

The transition to new business models often requires companies to set a new direction and adopt a new strategy for their business. Since the transition to producer ownership models is important for society, this also needs to be taken into account in decision-making. To accelerate the transition, it is particularly important that the political steering environment is developed broadly with respect to legislation, economic steering instruments and communication, as well as education and competence building.

Current initiatives support producer ownership

From the perspective of producer ownership, the key elements of the [EU Circular Economy Action Plan](#) are the Sustainable Product Policy Framework, the strengthening of the role of consumers and the objectives for waste and recycling. There are already several legislative initiatives under way that will accelerate the transition to producer ownership.

The objective of the Sustainable Product Policy Framework is that all products in the EU's internal market are designed to be durable and easy to reuse, repair and recycle, and they contain a high content of recycled materials instead of virgin raw materials. The framework restricts single-use products, counters premature obsolescence and bans the destruction of unsold durable goods.

The Sustainable Product Policy Framework includes various legislative initiatives that support the change in ownership described in this report. The legislative initiative aimed at expanding the [EU Ecodesign Directive](#) is geared towards

making products in the EU internal market more sustainable through, for example, reusability, repairability, recyclability and energy efficiency. The Ecodesign Directive currently in force sets out ecological requirements concerning the design and development of energy-using products. The new initiative proposes that the Ecodesign Directive be expanded to cover electronics and subsequently other product groups, such as ICT, textiles, furniture and, in process industry, the production of steel, cement and chemicals. Additional product groups will be identified based on their environmental impact and circularity potential.

With regard to strengthening the role of consumers, the process of introducing stricter consumer protection legislation is under way, a key part of which is the Right to Repair. This legislative initiative obliges producers to provide consumers with information on such things as product durability, repairability and the availability of spare parts. The initiative may also lead to longer product warranty periods, which would see the responsibility for products remain with the seller for longer and further strengthen consumer protection.

With respect to waste and recycling objectives, there is an [EU Review of Waste Policy and Legislation](#) under way. The key goals include reducing waste and increasing reuse and recycling. The regulatory package will harmonise producer responsibility systems and set out clearer policies concerning end-of-waste.

In addition to the legislative initiatives under way at the EU level, the Marin government in Finland is committed to environmental tax reform, which aims to shift the focus of taxation towards the taxation of

emissions and natural resources in a way that sustains budgetary balance. This will be achieved by increasing taxes on emissions and natural resources and compensating the tax increases to individuals and companies by simultaneously lowering income taxes, employer social security contributions and/or corporate taxation, for example (Tamminen et al. 2019). When implemented, the tax reform for sustainable development will also support the transition to producer ownership models.

Action recommendations for decision-makers to accelerate the transition

The implementation of the [EU Green Deal](#) and the [EU Circular Economy Action Plan](#) under it is a critical part of the transition towards a circular economy. As a leader in circularity, Finland has an excellent opportunity to be among the first to implement the initiatives proposed by the EU and to pilot and present operating models and solutions for putting these initiatives into practice. The following section includes recommendations for Finnish decision-makers to accelerate the transition to sustainable product policy and producer ownership models.

Action plan and indicators for the transition to producer ownership models

Making the transition to sustainable product policy and producer ownership models calls for wide-ranging changes in the operating environment of companies. With this in mind, there is a need for a national action plan to bring about this transition. In the action plan, the objectives for creating a framework for the operating environment of companies must be defined in such a way that they motivate the shifting of ownership from customers and consumers to companies and producers. The producer ownership models must always be more profitable for companies than the old linear

operating models and they must also be more attractive to customers. Creating the framework for the operating environment calls for a close dialogue between the business sector and decision-makers. The national action plan could be created as part of the implementation of [the strategic programme to promote a circular economy](#).

To provide a foundation for the action plan, it is necessary to validate the environmental benefits of producer ownership models, for example as part of the government's research activities. It is also necessary to carry out a legislative review of the laws and decrees governing sustainable product policy and producer ownership as well as the related legislative initiatives. As a significant proportion of the regulation takes place at the EU level, a plan for exercising influence at the EU and international levels must also be prepared as part of the action plan. Finland must work at the EU level towards accelerating a transition to a circular economy and, in particular, enhancing the regulatory environment pertaining to new business models. It must also focus on the circular economy in foreign policy and its efforts to influence trade policy (FIIA 2020).

Finland can act as a legislative pilot platform for new initiatives and, for example, test the effects of regulation on certain producer ownership models. Pilots, best practices and national legislation will also enable Finland to exercise influence at the EU level. This can serve as the basis for creating a broader action plan for the transition to producer ownership as part of the EU Circular Economy Action Plan.

Implementing producer ownership models and monitoring their success requires shared industry-specific objectives and indicators both at the national and EU level. The policies and indicators included in the action plan should first be piloted in selected industries, such as the textile industry and electronics, where measures to promote circularity have already been experimented with. For example, the

machine sorting of textiles and solutions for the use of discarded textiles have been developed in Finland, but the industry does not yet have shared objectives for circularity.

Immediate measures to be taken in

Finland:

- Assess the environmental benefits of producer ownership models through, for example, the government's research activities.
- Carry out a legislative review of the laws and decrees pertaining to producer ownership as well as the related legislative initiatives. A review could be conducted by the Ministry of Economic Affairs and Employment and the Ministry of the Environment.
- Develop a national action plan for the transition to sustainable product policy and producer ownership as part of the implementation of the strategic programme to promote a circular economy.
- Pilot regulations for producer ownership models together with companies. Pilots could be initiated and operated by Motiva.
- Finland should develop a plan for exercising influence within the EU and on an international level and propose that an action plan for producer ownership be created as part of the broader EU Circular Economy Action Plan.
- Assess the actions necessary to measure change in ownership together with Statistics Finland and pilot them in selected industries.

The role of environmental tax reform in accelerating the transition

The broad success of change in ownership requires various incentives for companies. Taxation is an effective solution for creating incentives for consumers and companies by increasing the prices of products of

companies that create negative externalities (e.g. Baumol, 1972). In theory, Pigouvian taxes, or taxes on negative externalities, could be used to impose higher taxes on products manufactured from virgin raw materials or a natural resource tax could be introduced that would make the manufacturing of new products more expensive than repairing old products, from a taxation perspective. Other tax incentives could include tax concessions for new forms of ownership and reviewing the tax rates on product-as-a-service models so that they would be taxed as services rather than products. Tax reforms can be implemented in a budget-neutral manner without increasing the overall tax rate. For example, the changes in taxes concerning the consumption of materials could be compensated for through income taxation. Other possibilities include compensating for the higher taxes by reducing employers' social security contributions and/or corporate taxation (Tamminen et al. 2019).

Tax reforms need to be complemented by various funding instruments, such as RDI subsidies, investment subsidies and investment loans, which should be easily accessible for private companies as well as entire industries and ecosystems. Building industry-wide ecosystems has been identified as a significant factor in creating a successful circular economy. To this end, there is a need for funding instruments contingent on partnership models and a need to support the transformation of the industry as a whole with regard to value chains and product chains as well as the creation of a circular economy infrastructure and support for digital solutions. Small and medium-sized enterprises face a challenge to keep their products on their balance sheet and for this reason there is a need for long-term funding instruments. In addition, funds should also be allocated to marketing investments, especially in business models that require a change in consumer behaviour. Broader sustainable development funding programmes that promote a circular economy are also needed.

Immediate measures to be taken:

- As part of environmental tax reform, Finland should assess the opportunities for tax concessions for producer ownership models and tax increases for linear economy products.
- The RDI subsidies and investment subsidies granted by Business Finland and the Centres for Economic Development, Transport and the Environment should be directed towards the circular economy and particularly to accelerating the transition to producer ownership models, both at the company-specific level and the industry level.
- Public and private long-term funds to support producer ownership models by directing investments to machinery and equipment.
- The development of a circular economy infrastructure and support for digital solutions should be accelerated through the use of funding instruments that are contingent on partnership models, and this should be paired with binding legislation.
- The possibility of using public subsidies for marketing should also be studied.

Legislative initiatives for producer ownership models

For the transition to producer ownership models to occur, the legislative initiatives that support the [EU Circular Economy Action Plan](#), such as the aforementioned expansion of the [Ecodesign Directive](#), the Right to Repair and the EU waste legislation package, need to be implemented.

Of the initiatives that are currently under way, the Extended Producer Responsibility defined in the EU waste legislation package, in particular, should be further expanded. Under Extended Producer Responsibility, manufacturers could, for example, be obliged to manufacture durable and repairable products instead of merely requiring them to

organise waste management (Domenech et al. 2019).

In the long term, various digital material and product passports should be made mandatory for all relevant companies. The material and product passports would display information on all of the materials used in products, their origin, safety, repairability and recyclability. The EU BAMB ([Buildings as Material Banks](#)) project that is currently under way has already started the move in this direction with regard to materials in the built environment. As a leader in circularity, Finland has the opportunity to be a trailblazer in the implementation of material and product passports. In the short term, their development and use could be piloted in certain manufacturing industries, such as the production of machinery. In the long term, material and product passports should be implemented in all applicable industries in Finland and elsewhere in Europe. The broader adoption of material and product passports could be achieved as part of the implementation of the Right to Repair legislative initiative. For example, product passports could be used as a way to provide consumers with the required information on the right to repair.

Finland can also exercise active influence at the EU level on the development of information standardisation, which supports circularity. The objective of information standardisation is to create common standardised ways of presenting information to make it easier to maintain, reuse or recycle products and packaging. It also makes it easier for consumers to compare the environmental impacts of different products and services based on reliable information.

Immediate measures to be taken:

- Finland should prepare to promptly implement the legislative initiatives that support the EU Circular Economy Action Plan, such as stricter consumer protection legislation, the revised

Ecodesign Directive and the waste legislation package. Ministry of Economic Affairs and Employment and Ministry of the Environment could play a key role.

- Finland should take a pioneering role in the implementation of Extended Producer Responsibility and the piloting of material and product passports. Piloting of material and product passports could be advanced within Business Finland programmes by companies and research institutions.
- Finland should actively exercise influence at the EU level on the development of information standardisation to support circularity.

Public procurement and private consumption to accelerate the transition to producer ownership

As public procurement accounts for 15% of the Finnish GDP, influencing procurement processes can lead to significant changes. The European Commission is currently preparing EU-wide criteria for green public procurement and mandatory reporting to monitor the implementation of green public procurement as part of the Sustainable Product Policy Framework.

The transition to producer ownership can be significantly accelerated through public procurement. Producer ownership models must be better taken into consideration in public tendering processes and they need to be incorporated into the criteria used in public procurement. For example, procurement criteria need to address the life-cycle sustainability and environmental impacts of products. This will change the nature of public procurement, as it may become more justifiable to procure services or performance instead of products and materials. While the public sector has some history of renting and leasing equipment, a broader emphasis on service models in procurement is still yet to come. Those in charge of public procurement must have the

ability to compare costs between purchasing products and purchasing a service. To this end, procurement competence must be increased in the national administration, public agencies and municipalities.

In private consumption, the change in purchasing patterns can be accelerated through policy means by, for example, including repair and rental services within the scope of tax credit for household expenses. Public-sector services, such as libraries, can also serve as a platform for piloting new business models and training a larger group of people to consume services rather than products.

Immediate measures to be taken:

- The criteria applied in public procurement should be revised to support the use of producer ownership models. For example, “all procurement must be at least 10% based on models that implement and promote producer ownership models”.
- The government, public agencies and municipalities should increase their procurement competences for different business models, such as buying services instead of products. The network-based competence centre for sustainable and innovative public procurement, KEINO, can serve as a platform in this respect, providing support and assistance in the development of sustainable public procurement.
- Finland should assess opportunities to include repair and rental services within the scope of tax credit for household expenses.

Supporting business ecosystems for producer ownership

Establishing business ecosystems or industrial symbioses brings together companies of different types and sizes as well as entire industries to enable producer ownership. This calls for new competences, where it becomes important to not only

know one's own company but also to have a comprehensive understanding of the co-operation opportunities that relate to one's company and that span the boundaries between industries.

Start-ups and SMEs benefit from the competences and service networks of larger corporations as well as various accelerator and development programmes. Larger corporations, in turn, can assess new business opportunities through pilot and spin-off projects with smaller players. Open data and expertise networks between companies are needed, especially to increase understanding of the circular economy and to scale up business. The creation of business ecosystems requires incentives, such as making public funding contingent on co-operation between large and small companies.

Immediate measures to be taken:

- The creation of regional, national and international business ecosystems should be supported by early-stage RDI funding.
- Incentives should be created for the development of co-operation models between large and small companies by making RDI funding contingent on co-operation, for example.

Making the circular economy a core element of education

The transition from a linear economy to a circular economy is a major leap that will change society as a whole. Education must support this change both through the public system of education and through lifelong learning in companies and the public sector.

Understanding the principles of sustainable development is increasingly a key civic skill and part of the basic skill set of the future. With this in mind, skills related to the circular economy and its practical

implementation need to be promoted at all educational levels. It is important to identify each industry's angle of approach to the circular economy, and to customise curricula and support investment in education to promote circular economy thinking. Increasing circular economy competences is necessary in every industry and every programme of education. In the field of construction, for example, this could involve new kinds of life-cycle planning or demolition practices, while in the food industry, the focus could be on reducing waste. Research institutes and universities must be offered incentives to engage in research and education on the circular economy.

New technical and economic competences are needed in both the business and public sector to make the transformation of the economy possible. This need can be addressed by developing the adult education system and lifelong learning tools.

Immediate measures to be taken:

- Significantly increase the amount of learning content on circularity at all levels and in all fields of education. Incorporate the circular economy into the required qualifications of various professions.
- Incentivise research institutes and universities to enhance their applied research and teaching on the circular economy by incorporating circularity into existing research projects and programmes of education.
- Vocational schools and universities should make the creation of a sustainable future a strategic priority and promote a carbon-neutral circular economy as a solution that spans all academic disciplines. While the change concerns all fields of education, it is particularly significant in teaching in the technical and economic disciplines.

5 Conclusions

The circular economy is one of the most important ways of mitigating climate change and reducing the consumption of natural resources and the loss of biodiversity. Business models based on producer ownership are one solution for enabling a circular economy. They provide incentives for designing products that are long-lasting, durable, recyclable and reusable, with ownership remaining partly or fully with the producer or an intermediary instead of the user.

However, producer ownership cannot be scaled up at the required speed because the current economic and regulatory systems do not provide the right conditions or incentives for its success. Changing the existing business operations require companies to make major investments and changes in strategic direction. This change cannot be achieved without the necessary political decisions to support and accelerate the transition.

The EU already has several legislative initiatives under way to support producer ownership models. To accelerate the transition, it is important that these initiatives are approved and incorporated into EU and national legislation as quickly as possible. Finland is in a position to be a pioneer in this development in Europe. However, the producer ownership models require more targeted actions in decision-making in Finland and at the EU level. To this end, we make several proposals in this report for decision-makers in the following areas.

- The creation of a national action plan and indicators for the transition to producer ownership
 - The introduction of tax reforms based on sustainable development and public funding instruments to support circularity
 - New legislative initiatives related to producer ownership models, such as Extended Producer Responsibility, product and material passports and the standardisation of information
 - Development of the criteria applied in public procurement and the steering of private consumption
 - Support for business ecosystems related to producer ownership models
 - The teaching of the circular economy as a core component of learning in the education system, companies and the public sector
- In addition to changes in the operating environment, transitioning to producer ownership models requires companies to make significant strategic and operational changes. If the transition is to happen, the new business models must always be more profitable to companies and more attractive to customers than linear business models. This creates certain requirements for companies:
- An understanding of the changes in the operating environment and new business models
 - A profitable business idea based on ownership and carefully defined added value for the customer
 - Technology, a physical infrastructure and a digital infrastructure that enable change in ownership
 - Circular economy competences in the planning and implementation of business models
 - The securing of funding for businesses
 - Effective internal and external change management
 - Participation in circular economy business ecosystems and networks
- Making the shift to producer ownership is possible. It is plausible that by 2030 economic steering methods, legislation and the financial markets will have supported the transition from a business sector that merely sells products to the profitable and sustainable adoption of new forms of ownership.

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Appendices

Appendix 1. Interviewees

Company interviews

Jonne Hellgren, CEO & Co-Founder, RePack
Satu Kaivonen, Environmental Manager, Konecranes
Kati Lindholm, Marketing Director, 3StepIt
Shahriare Mahmood, R&D and Sustainability Director, Reima
Pasi Nurminen, CEO, Palpa
Sissi Penttilä, CSR Coordinator, Reima
Timo Pulkki, CEO, Tamturbo
Harri Puputti, Quality Director, Lindström
Kristian Rajj, CEO & Founder, Skipperi
Beda Rasinen, Sustainability specialist, Finlayson
Anssi Takala, Director, Encore
Tapani Tilus, Vice president, Konecranes

Interviews with experts and decision-makers

Ruben Dekker, Policy Officer, DG Environment, European Commission
Professor Paul Ekins, Institute for Sustainable resources, UCL
Sirpa Pietikäinen, MEP, European Parliament
Janez Potočnik, Partner, SYSTEMIQ
Sarianne Tikkanen, Senior Specialist, Ministry of the Environment

Appendix 2. Workshop participants

Ilmari Absetz, Director, Business Finland

Sini Hynynen, Head of Insight, Kuudes

Petrus Kautto, Director, Finnish Environment Institute

Antti Lehtinen, Specialist, Sitra

Pirita Lindell, Head of Sustainable Development, Technology Industries of Finland

Kati Lindholm, Marketing Director, 3stepIT

Marika Ollaranta, Head of Program, Business Finland

Johanna Penttjärvi, Chemical Industry Federation of Finland

Moona Pohjola, CEO, Avanto Ventures

Petteri Repo, Research Director, Centre for Consumer Society Research, University of Helsinki

Heikki Sorasahi, Senior Specialist, Ministry of the Environment

Sari Tasa, Program Director, Ministry of Economic Affairs and Employment

Lotta Toivonen, Specialist, Sitra

Saija Vatanen, Senior Scientist, VTT Technical Research Centre of Finland


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