

PATHWAYS TO CIRCULAR BUSINESS

**15 Tools and Guides for
Product-Service System
Innovation**



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WHY THIS GUIDE?



Developing or refining a Product-Service System (PSS) requires a holistic approach that spans the entire value chain. Unlike traditional product development and sales strategies, PSS involves balancing the relationship between physical products and the services that enhance or accompany them.

This guide was developed as part of the “Product-Service Systems in the Nordics” project for the Nordic Council of Ministers’ Vision initiative. As part of this project, over 100 stakeholders were consulted, offering invaluable insights into the opportunities and challenges of implementing PSS across the region. For further insights about the project, read the [full project report](#).

Many PSS providers face recurring challenges, such as a shortage of specialised expertise and a lack of necessary tools and templates. PSS development is an iterative process where each cycle of learning informs and improves the business model.

Tools and guides are instrumental in this process, providing structured methods to evaluate and enhance PSS components from initial concept to full implementation. By using these resources, companies can streamline their development cycles, reduce risks, and improve the synergy between product features and service delivery.

This guide highlights essential international and Nordic tools for advancing PSS solutions in the Nordics. It is intended for current PSS providers, as well as businesses exploring PSS for the first time and aiming to integrate it into their operations.

OVERVIEW OF RESOURCES



This section provides a visual overview of the 15 Nordic and European tools identified. The tools, templates, and guides are categorised by their level of PSS integration and grouped according to key business needs. The overview is designed to help you quickly find the most relevant resources, whether you are a start-up seeking guidance on developing a PSS model or an established company looking to enhance and optimise your current operations.

TOOLS AND GUIDES

The following is a curated list of the resources featured in this report. While not an exhaustive list, it includes tools that are specifically designed to support circular business models, such as PSS. The tools highlighted were identified between 2022 and 2023 as part of the broader “PSS in the Nordics” project, primarily focusing on Nordic and European sources.

Each resource has been chosen for its relevance and practicality in supporting companies on their PSS journey, whether they are at the early stages of exploration or looking to optimise existing systems. All tools and guides are freely available, accessible online, and can be downloaded without restrictions. Most are in English, with two resources offered in Danish, specifically for organisations operating in Denmark.

- Accelerating System Transitioning Towards
- CEvaluator
- CIRCit Norden
- Circularity – ATTC 2 toolbox

- Circular X tools
- Guide for developing product as a service business
- Klimakompasset (the climate compass)
- Lean Service Creation (LSC) Handbook
- PROTEUS PSS Tool Book
- ready2LOOP
- ResCoM
- The Circular Design Guide
- The Circular Toolbox
- The Circulator
- Total Cost of Ownership tool

VISUAL OVERVIEW

The following figures visually map out the tools, categorising them by their level of PSS integration and the specific business needs they address.

In these visualisations, PSS integration is shown on a spectrum from "No PSS model" to "PSS developed & tested," representing the extent to which an organisation has integrated PSS into its business model and offerings.

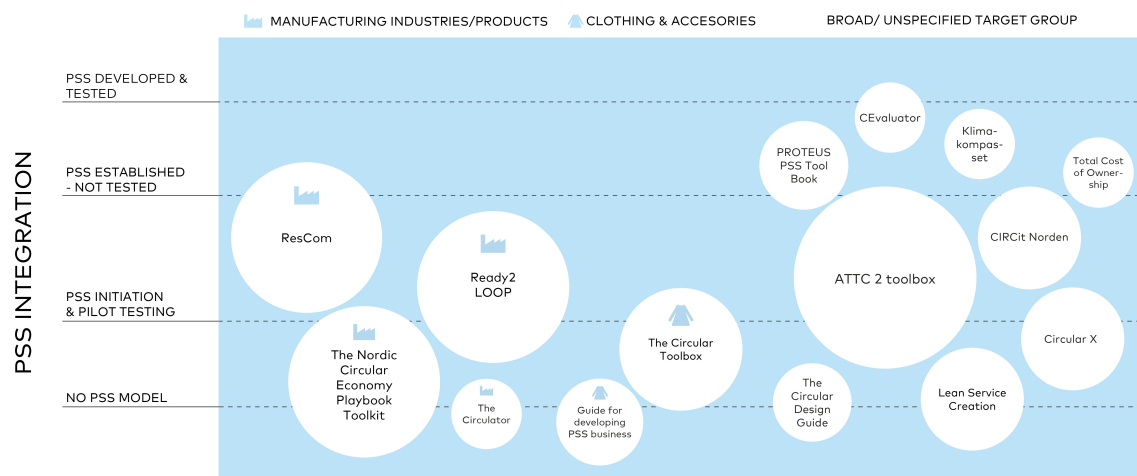
"No PSS model": This category includes businesses that have not yet incorporated PSS elements into their operations. Tools in this section are designed to help companies explore PSS concepts and introduce circular and service-oriented thinking into their business models.

"PSS developed & tested": This category refers to businesses with a mature level of PSS integration. Tools here focus on evaluating, optimising, and refining existing PSS solutions to improve efficiency and performance.

It is important to highlight that these visualisations and categorisations are intended as a guide. While tools are categorised based on their relevance to specific integration levels, many can be applied flexibly across different stages of PSS development.

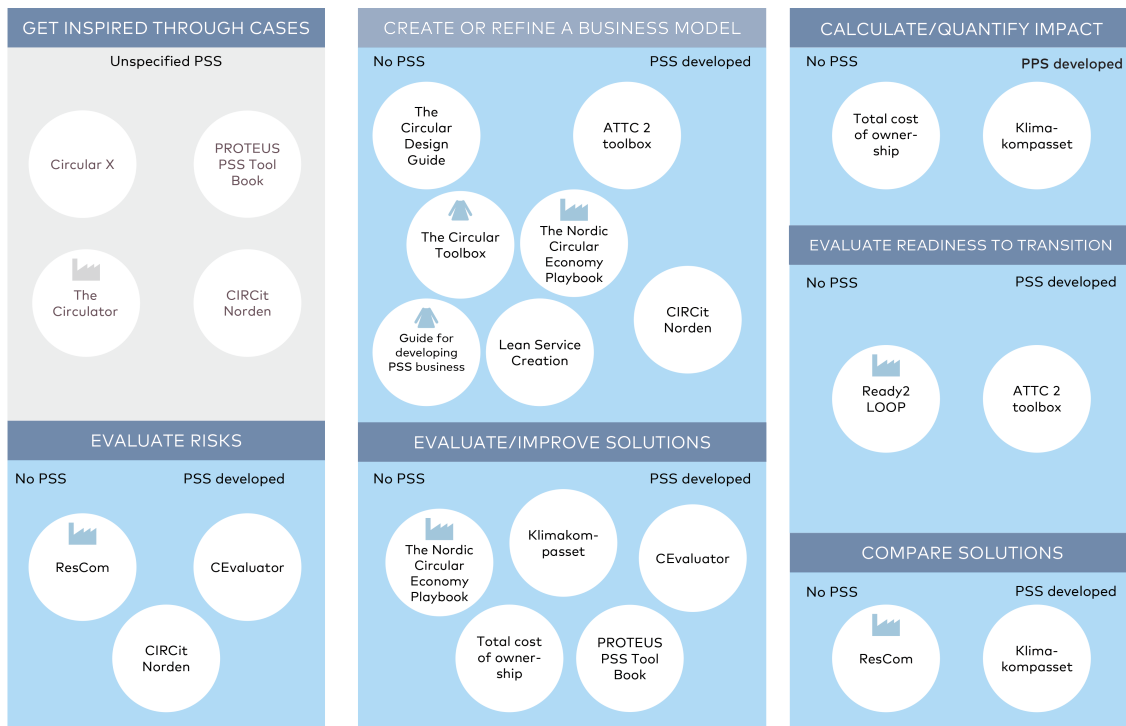
WHERE ARE YOU?

The figure below provides an overview of the PSS tools, categorised by their intended target group and the level of PSS integration within a business. At the bottom of the spectrum, you'll find tools designed for companies with no existing PSS model, offering support from the ground up. As you move upward, the tools become more specialised, helping businesses refine and advance their PSS solutions as they mature. The size of the circles indicates the versatility of each tool: larger circles represent broader tools that can support businesses across multiple stages of PSS development.



WHAT IS NEEDED?

This overview organises the tools based on the specific needs businesses may have when developing or enhancing their PSS solutions. The PSS integration levels are simplified into "No PSS" for businesses that have yet to integrate PSS into their operations and "PSS developed" for those with established PSS models. Tools marked as "Unspecified PSS integration" are flexible and applicable across different stages of PSS development, making them relevant for businesses regardless of their current level of integration.



CATEGORIES OF NEEDS

To help you easily identify the purpose of each tool, they are organised into seven categories that reflect the specific challenges businesses encounter when developing or refining their PSS solutions. Some tools appear in multiple categories, as they address a wide range of business needs.

GET INSPIRED THROUGH CASES

If you're looking for real-world examples of organisations implementing circular solutions relevant to PSS, start with the case catalogues in this category. These resources feature examples from various sectors, showcasing organisations at different stages of PSS integration.

COMPARE SOLUTIONS

These tools are best suited for businesses with existing PSS models or products that need to be evaluated for their environmental or economic performance. Tools like ResCom allow you to compare PSS models with traditional linear models, while tools such as Klimakompasset help track climate impact over time. Accurate data is essential for conducting meaningful assessments.

CALCULATE/QUANTIFY IMPACT

For businesses looking to measure the environmental or economic impact of their products or operations, the tools in this category offer guidance on collecting and utilising relevant data. If you don't yet have the necessary data, these tools can help identify what information should be gathered. Please note that some tools are tailored specifically for Danish organisations and require MitID access.

CREATE OR REFINE A BUSINESS MODEL

This category offers tools to help you develop or refine your business model toward a PSS or circular approach. The resources here introduce different types of circular business models and offer broad perspectives on stakeholders, value chains, products, and end-users, enabling you to identify new opportunities.

EVALUATE SOLUTIONS/IMPROVE EXISTING SERVICES

These tools are designed for businesses familiar with PSS and looking to evaluate or optimise their existing solutions. Some tools may require specific data for a thorough evaluation. If you're ready to critically review and enhance your PSS business, this category will support your efforts.

EVALUATE READINESS TO TRANSITION

Before jumping into changes, it is essential to assess your organisation's starting point and readiness for the shift to circular and PSS models. The tools in this category help you evaluate and diagnose your current state, providing insights into how prepared your business is for the transition.

EVALUATE RISKS

This category includes tools designed to help businesses assess the risks associated with transitioning to and implementing PSS solutions. Key resources include SWOT analysis tools (CIRCit), financial evaluation questionnaires (CEvaluator), and MI:BoM Analyzer (ResCom) for material impact evaluations.

GUIDE STRUCTURE

The guide is organised into three chapters, simplifying the PSS integration levels into three distinct stages.

[Chapter 1: Getting Started with PSS](#) focuses on tools and guides suited for businesses in the early stages of PSS integration. At this level, the PSS solution has not yet been defined, and a foundational understanding of PSS models is required. Many of the tools in this chapter provide introductory content on Circular Economy and PSS concepts.

[Chapter 2: Developing PSS Strategies](#) offers tools to help businesses advance their PSS solutions, providing a pathway towards deeper integration. These resources assist in moving from basic PSS models to more structured and strategic approaches.

[Chapter 3: Refining PSS Strategies](#) is designed for businesses with established PSS models. It includes tools, templates, and guides that enable providers to reassess and optimise their PSS solutions for continued improvement and efficiency.

The chapter overview indicates which tools are explained in each section of the report, aligning with the progression of PSS integration levels.

GETTING STARTED WITH PSS



Establishing a strong foundation in circularity is key to beginning your PSS journey. This involves learning the key concepts of PSS, how it fits into business models, and its role in sustainability. In this section, you will find five introductory resources that explain these concepts and help you begin developing your PSS. These resources include toolkits, guides, handbooks, and interactive platforms designed to provide a solid foundation for building your PSS business.

THE NORDIC CIRCULAR ECONOMY PLAYBOOK TOOLKIT

USEFUL FOR

Developing PSS business models or improving existing solutions. Many of the exercises are also relevant for distributors and retail PSS providers, particularly the 'Ecosystem Partner Identification' and 'Roadmap Development' templates.

TARGET GROUP

Companies in the Nordic manufacturing industry, in particular within Machinery and equipment; Maritime; Energy; Transportation; and Construction.

DEVELOPED BY

Nordic Innovation

→ [VISIT](#)

This toolkit offers a comprehensive guide to achieving circular advantages for businesses. Companies can use the playbook to better align with customer expectations, deliver outcome-oriented solutions, and enhance efficiency through technology and digitalisation. The playbook is particularly valuable in the Nordic manufacturing industry, covering five key sub-sectors: machinery and equipment, maritime, energy, transportation, and construction.

The Nordic Circular Economy Playbook includes nine tools and templates to help businesses develop, evaluate, and refine their PSS models. Four of these tools are automated Excel files that provide outcome calculations:

- **A Business Model Development tool** that helps iterate circular business models by identifying inefficiencies and customer pain points and evaluating the potential of circular approaches. It prioritises development opportunities and guides companies in shaping their most promising business models.
- **A Value Case Tool** estimating revenue potential, cost impacts, and investment needs. It helps companies understand the value drivers of circular business models and assess various sub-models.
- **A Capability Maturity Assessment Tool** for evaluating whether a company has the human resources needed to achieve its circular business goals. It assists in assessing and prioritising the maturity of business capabilities for effective implementation.

- **A Technology Maturity Assessment Tool** to determine the maturity of the technologies in use, addressing common challenges like market readiness, technological capacity, and funding shortages, which many PSS providers face.

In addition to these, the toolkit includes five organisational development templates:

- **Culture Gap Analysis:** This template helps assess how company culture supports (or hinders) the adoption of circular business models, offering ways to bridge cultural gaps for smoother integration.
- **Ecosystem Partner Identification:** This template helps businesses identify key external partners and resources that can assist in building internal capacity and forming strategic partnerships.
- **Funding Requirement Analysis:** Highlights areas where external funding can support the piloting of new business ventures, facilitating the transition to circular business models.
- **Roadmap Development:** A practical planning tool that outlines key activities, estimates timelines, and prioritises goals from short-term to long-term, helping companies chart their path towards circular transformation.
- **Business Model Canvas:** A high-level overview of the key building blocks of a PSS business model, including value propositions, infrastructure, customers, and financing, enabling businesses to visualise their product, resource, and business flow processes holistically.

THE CIRCULATOR

USEFUL FOR

Aspiring entrepreneurs and businesses seeking guidance on how to integrate circular strategies into their business model and value proposition. Developed as part of an EIT Raw Materials-funded project in the raw materials industry, this tool offers inspiration and practical insights through real-world case examples, encouraging organisations to explore and adopt circular strategies.

TARGET GROUP

All types of PSS, in before, during and after the development of a PSS solution.

DEVELOPED BY

VITO, Circular Flanders, TUDelft & Radboud University.

→ [VISIT](#)

The Circulator is a web-based tool that provides an overview of companies successfully implementing circular business models. Its core concept is that circular business models often involve a combination of strategies, organised into three main types:

- **Circular Value Creation:** Focuses on creating economic and environmental value by managing products and materials in a circular way. In a Business Model Canvas framework, these strategies are linked to key activities, resources, capabilities, and partners.
- **Value Proposition:** For PSS models, this focuses on delivering core value to customers that aligns with circular strategies. These are linked to product offerings, customer segments, and customer relationships in the Business Model Canvas.
- **Value Network:** Recognises that true circularity requires collaboration across the entire value chain. These strategies involve delivery channels, customer relationships, key partners, and resources.

In addition to these, the Circulator offers archetypes representing four key organisational focuses: customer relationships, product/process development, value network building, and sustainability. These archetypes help companies understand the different approaches to circular value creation.



The Circulator mixer tool can be used to filter relevant cases.

GUIDE FOR DEVELOPING PRODUCT AS A SERVICE BUSINESS

USEFUL FOR

Businesses looking for an introduction to PSS models, their potential, and the requirements for building and implementing such models, with a particular focus on the textile industry.

TARGET GROUP

All business providers wanting to develop and implement PSS solutions.

DEVELOPED BY

Turku University of Applied Sciences, VTT Technical Research Centre of Finland and LAB University of Applied Sciences

→ [VISIT](#)

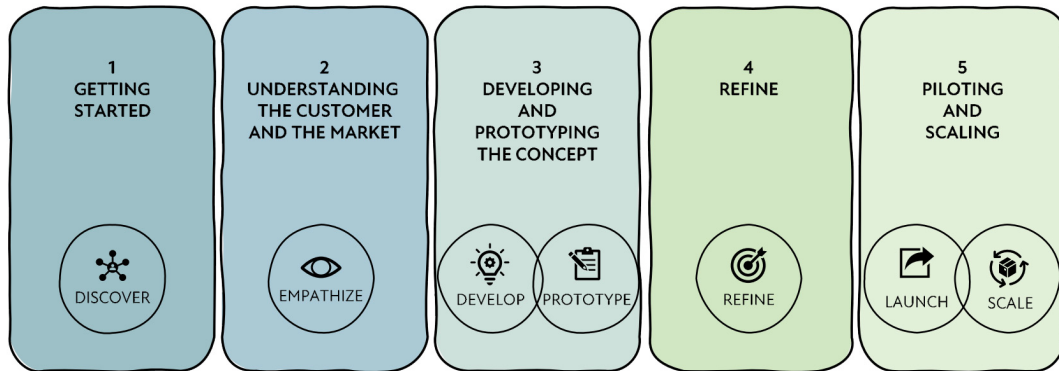
The Guide for Developing Product as a Service Business was developed as part of the Paas Pilots research project (2021–2022) and incorporates practical insights from two Finnish companies, Pure Waste and Image Wear. Their real-world examples, drawn from the textile sector, showcase how to implement and develop a PSS model successfully. While the guide focuses on textiles, it offers valuable tools and tips that can be applied across industries, including B2C and B2B markets.

The guide offers practical advice on preparing for and implementing a PSS, illustrated through case studies. It covers the economic, societal, and environmental benefits of PSS and introduces a structured approach through its “Developer’s Path,” which consists of five key steps:

- **Getting Started:** Focuses on identifying the needs and demands for circular business models, exploring collaborative opportunities, and mapping out success goals, key focus areas, stakeholders, and priority targets.
- **Understanding:** Examines what makes the business model unique compared to traditional models and identifies the target customers and market segments that will benefit most from the PSS.
- **Developing and Prototyping:** Shifts attention to the concept itself, involving price setting, customer testing, visualising customer journeys, and identifying potential gaps.
- **Refining:** Involves reviewing the environmental and social impact of the business model, evaluating partnerships, and finalising the steps needed before launch.

- **Piloting and Scaling:** Focuses on launching the concept, creating marketing campaigns, measuring the impact, and conducting pilot tests through practical iterations.

Each step highlights key considerations and actions for developing a product-as-a-service business and recommends suitable tools to support each phase.



The five steps outlined in the Guide for Developing a Product-as-a-Service Business.

THE CIRCULAR DESIGN GUIDE

USEFUL FOR

Organisations looking to refine business models toward PSS and adopt circular economy solutions. It also helps innovators design more elegant, effective, and creative circular solutions. This guide is ideal for organisations looking to follow the Design Thinking framework.

TARGET GROUP

All types of PSS, in before, during and after the development of a PSS solution.

DEVELOPED BY

The Ellen MacArthur Foundation & IDEO

→ [VISIT](#)

The guide's primary aim is to shift the mindset of business owners, developers, and innovators towards circular approaches. By leveraging the Design Thinking methodology, it encourages businesses to explore sustainable, resilient, and long-lasting value creation within the Circular Economy (CE).

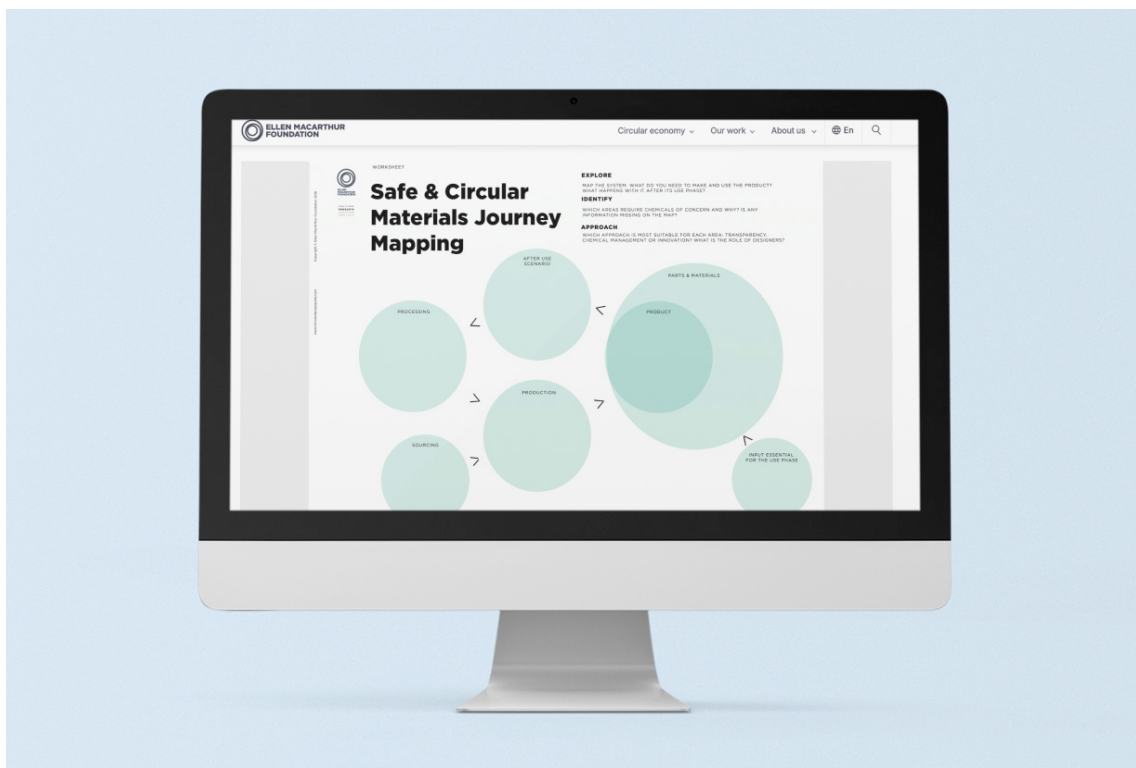
The Circular Design Guide offers a wide range of methods to support businesses as they transition to CE. These methods are grouped into four main categories – Understand, Define, Make, and Release – with six key activities within each category:

- **Understand:** In the context of PSS, activities such as the Service Flip help transition from product-based models to product-service models. Supported by the Service Flip Worksheet, this activity promotes creative thinking by understanding user needs. It helps PSS providers address cultural habits and compete with traditional business models by aligning their services with consumer desires – despite market readiness challenges.
- **Define:** The guide offers activities to help businesses define their CE strategy by identifying challenges, finding circular opportunities, building teams, and aligning brand identity. The Circular Buy-in activities support gaining stakeholder commitment and overcoming cultural and market barriers to adopt circular business practices.
- **Make:** This category focuses on creating circular business designs. Activities include user-centred research, circular brainstorming, feedback mechanisms, material selection, concept development, and rapid prototyping. The

User-Centred Research activity is especially valuable for PSS providers with B2C models. Interview templates help engage stakeholders to better understand their needs during the product's lifecycle, ensuring that services are relevant and user-centric.

- **Release:** This section supports businesses in launching their circular solutions. Activities like Product Journey Mapping help PSS providers map the lifecycle of products, reviewing all use phases and end-of-life processes. Templates offer insights into the product's journey and ensure smoother implementation in complex PSS systems.

The Circular Design Guide also includes advanced activities like Materials Journey Mapping, Product Redesign Workshops, Material Selection, and Moving Forward with Materials. These methods, accompanied by descriptions, videos, templates, and exercises, are highly applicable to PSS providers, offering valuable tools for developing and improving circular practices.



LEAN SERVICE CREATION (LSC) HANDBOOK

USEFUL FOR

Developing a business concept from scratch or adding a service to an existing business model. While the focus is on digital solutions, the LSC Handbook is adaptable to any company aiming to create customer-centric services

TARGET GROUP

Early stage PSS and PSS providers experiencing challenges due to the existing company culture.

DEVELOPED BY

Futurice

→ [VISIT](#)

The Lean Service Creation (LSC) method is a well-established, open-source framework that combines lean business thinking, agile development, user-centric design, and start-up methodologies. Developed by Futurice, the LSC Handbook helps companies create innovative digital services that balance commercial viability with user needs – while also considering social and environmental impact. It can be used to build new businesses or iteratively improve existing services.

The handbook features seventeen different canvases, organised into seven phases, providing a structured approach to business development. These canvases guide companies through key processes such as co-creation, prototyping, experimentation, and problem-solving. They ensure that the right questions are asked and that solutions address real challenges. The canvases also facilitate teamwork, turning abstract ideas into actionable solutions.

The LSC process is centred around a business objective – often referred to as the design phase – where the entire team sets a common goal to ensure effective collaboration. The process is broken down into the following sub-phases:

- **User Needs:** For PSS providers, this phase focuses on deeply understanding customers' needs, emotions, motives, and values to create services that truly resonate with them.
- **Ideation:** Using the canvases, teams generate technically feasible ideas that fulfil the needs of businesses, users, and society.

- **Concepting:** Ideas are refined and strengthened to create more compelling and viable solutions.
- **Business Model:** The concept is evaluated for its business potential, with a focus on value exchanges.
- **Validation:** Assumptions underlying the new concept are tested to ensure they lead to the desired outcomes and objectives.
- **Wrapping it all up:** The team defines the minimum lovable product (MLP)—the smallest version of the product or service that customers will love, enabling the business to launch with confidence.

The broad set of canvases can be used as a complete step-by-step guide or selectively, depending on specific business needs. The handbook also includes tips for improving teamwork and a handy “cheat sheet” for conducting customer interviews, enhancing both the development process and user research.



DEVELOPING PSS STRATEGIES



Once you have a foundational understanding of PSS and circularity, the next step is to experiment and further develop your PSS concepts. This section provides tools, platforms, and handbooks designed to help you build a robust PSS strategy. Key areas include evaluating risks, comparing solutions, and initiating pilot projects to test your ideas in practice. Like the tools in the previous chapter, many of these resources also offer additional insights to deepen your understanding of PSS concepts.

ResCoM – RESOURCE CONSERVATIVE MANUFACTURING

USEFUL FOR

Evaluating risks related to product manufacturing, business design, and environmental performance. It also supports informed decision-making and the comparison of sustainable solutions.

TARGET GROUP

Manufacturing companies and their value chain collaborators to make the transition to CE.

DEVELOPED BY

KTH, Fraunhofer, TUDelft, Insead, Ideal & Co, Eurostep, Granta, Bugaboo, Gorenje, Loewe, Tedrive Steering, the Ellen Macarthur Foundation.

→ [VISIT](#)

The ResCoM platform integrates 11 software applications, descriptive tools, and methods that guide decision-making in closed-loop manufacturing. One key feature is the Circular Pathfinder, designed to help users identify the most relevant ResCoM tools for their specific product pathways. While the platform is primarily focused on manufacturers, many of the tools are also highly beneficial for PSS providers involved in distribution, retail, or reselling products.

Key tools on the ResCoM platform include:

- **Multiple Lifecycle Product Design Tool:** This ideation tool uses the Modular Function Deployment (MFD) method to plan for multiple product lifecycles, identifying modular interfaces and standardisation to support extended product use.
- **Circular Calculator:** An assessment tool that allows designers to evaluate how their strategic decisions affect the circularity of resource flows and the potential value capture of a PSS. It provides visual representations of mass and value flows based on reuse, remanufacturing, or recycling scenarios, enabling the exploration of different design solutions.
- **Economic and Environmental Performance Tools:** Tools such as the multi-method simulation tool, multiple product lifecycle management tool, and the MI: BoM Analyzer (Eco Audit Reports) provide detailed overviews of the business model's economic and environmental performance. The MI: BoM

Analyzer also assesses regulatory and supply chain risks associated with circular scenarios.

For Nordic PSS providers, regulatory and financial risks can pose significant challenges, particularly in developing new products and services. ResCoM helps mitigate these risks through early assessments, including evaluating regulatory uncertainty.

Additionally, ResCoM features an interactive game, 'Lease or Buy', which helps users explore different business models, revenue streams, and risks associated with ownership. This game particularly benefits new PSS providers, offering insights into the uncertainties in designing a successful business model.

The platform also includes relevant publications and case studies that provide additional insights into PSS models, making ResCoM a comprehensive resource for any business looking to adopt or refine closed-loop manufacturing and circular economy practices.

READY2LOOP

USEFUL FOR

Assessing a company's readiness for transitioning to a circular economy, identifying strategic opportunities, prioritising key areas of focus, and planning the implementation of circular actions.

TARGET GROUP

Support manufacturing companies and their value chains to make the transition to CE.

DEVELOPED BY

The Technical University of Denmark in consortium with other Nordic partners.

→ [VISIT](#)

Ready2LOOP is an online platform developed to help manufacturing companies and their value chains transition to a circular economy (CE). While originally developed for manufacturers, the platform is versatile and can be used by any business. Its goal is to enhance industry competitiveness by supporting the transition to CE across the entire value chain.

The platform resulted from a three-year project in which the ready2LOOP consortium collaborated with multiple companies to define, develop, and implement initiatives that improved their transition to CE. Insights from these collaborations were used to create the Transition Paths tools available on the platform.

Ready2LOOP offers three main tools for businesses looking to develop or enhance their PSS strategies:

- **MECO Analysis Tool:** Screens products for environmental impact.
- **Readiness Workshop Toolkit:** Helps businesses identify and prioritise key areas for transitioning by assessing readiness dimensions.
- **Circular Strategy Scanner:** Provides an overview of circular economy strategies to inform decision-making.

In addition to these free tools, the platform offers 21 exclusive tools for registered members, such as the Circular Economy Sustainability Screening Tool, the Recirculation Strategy Decision Tree, and the Business Eco-system Mapping Tool. These tools are particularly useful for PSS providers seeking to collaborate with new partners or enhance existing partnerships.

Ready2LOOP also features five tool databases that provide an extensive overview of relevant resources for PSS providers and other businesses offering circular products or services. Accessing these additional tools requires creating a profile on the website.



A snapshot of the MECO tool template from the ready2LOOP platform.

THE CIRCULAR TOOLBOX

USEFUL FOR

Facilitating the introduction of rental schemes into new or existing business practices and preparing and launching pilot programmes.

TARGET GROUP

Apparel branches, wanting to implement PSS solutions; gaining knowledge on implementation of pilot.

DEVELOPED BY

Cicle Foundation.

→ [VISIT](#)

The Circular Toolbox is a comprehensive and educational, step-by-step guide designed primarily for apparel brands to plan and execute a rental pilot in 10 months. It is a versatile resource which offers a range of valuable resources, such as podcasts, workshop sheets, interview guides, educational slides, and templates. Although tailored for the apparel sector, the resources in the toolbox can easily be adapted to pilot projects in other industries. The Circular Toolbox was developed as part of the Circle Textiles Programme, the first sector programme by Circle Economy, launched in 2014. The guide is organised into five modules, each focusing on critical aspects of piloting a rental business model:

- **Getting started:** This step provides foundational knowledge on circular business models, archetypes, and impact potential. It includes exercises and tools to ensure a shared understanding of Circular Economy and resources to identify relevant business models and their application in the market. Furthermore, team building, scoping intended outcomes with management and establishing company goals are also aspects supported by the tools provided in this module.
- **Understanding the customer and the market:** Here, tools assist in mapping, clustering, and analysing customer and market data for rental business models. This module offers "dos and don'ts" from established businesses, methods for identifying customer needs, and framing challenges as opportunities for new ideas. All the resources focus on helping you translate valuable customer and market insight into value propositions for your business model.

- **Prototyping your concept:** This step guides the creation and testing of prototypes using a "Customer Journey Tool" and "Prototype Canvas". The focus is on getting you to test and validate your concepts and ideas as early as possible, inexpensively. This entails engaging with feedback from your customers before you move on.
- **Fine-tuning your business model:** After this module, you'll have a clear blueprint of your resale or rental model, helping you identify the partnerships, decisions, and steps needed for a successful pilot launch. It will also help you assess if your model is financially viable, customer-friendly, and positively impacts people and the planet. Importantly, for PSS solutions, tools focused on challenges and opportunities when creating meaningful partnerships can be found in this module.
- **Piloting your business model:** This final step provides tools for storytelling ("Get To By" or "Letter from a fan" tool), billboard design, and setting objectives, key results, and initiatives. This last module contains a bonus podcast episode with examples of how other companies have benefitted from their circular innovation process. It includes advice on what to avoid and focus on in your pilot execution. After this module, you will have concretised time horizons and scaling for your pilot launch.

Each step includes time estimates and clear guidance on whether exercises are meant for the core or extended team, making integrating these activities into everyday workflows easier. Some modules also include recommended reading to better understand the core principles and concepts used.

The toolbox is designed for brands, consultants, professors, and students. To access the resources, users must create an account on the platform to access the tools.

ATTC 2 TOOLBOX

USEFUL FOR

Assessing readiness for organisational change, identifying necessary changes, and facilitating business model innovation toward circularity.

TARGET GROUP

Organisations/management professionals moving towards circular business models.

DEVELOPED BY

Rise Research Institutes of Sweden

→ [VISIT](#)

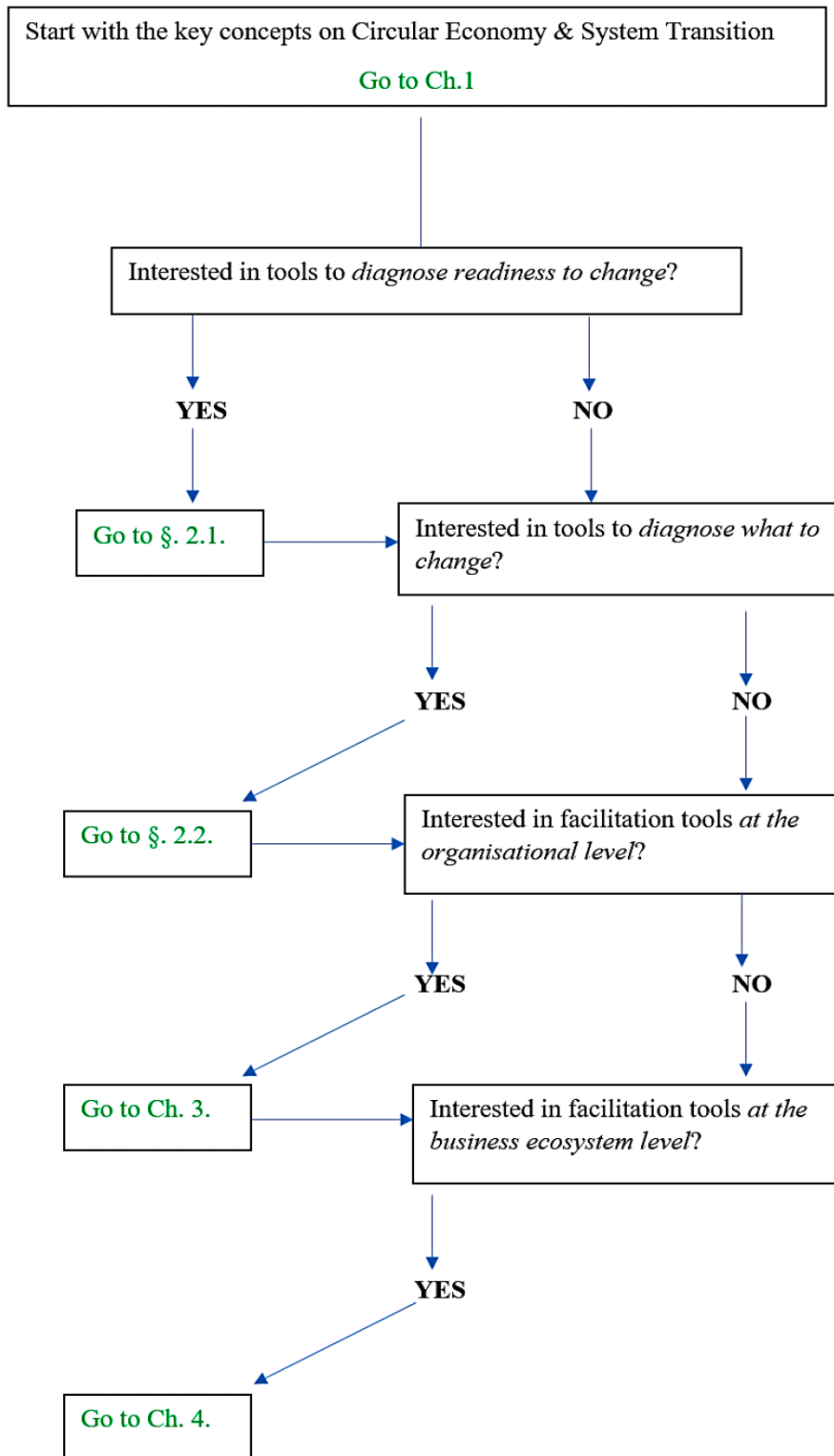
The ATTC 2 Managerial Toolbox provides a broad range of methods designed to diagnose and facilitate organisational change and business model innovation toward circularity within organisations and business ecosystems. The toolbox combines theoretical research and practical managerial insights to offer theoretically robust and easy-to-use tools, making them ideal for driving organisational transformation toward more sustainable practices.

The toolbox's primary aim is to help organisations break free from the "management of unsustainability" lock-in and transition towards more sustainable configurations. It shifts the focus from merely "doing things better" to fundamentally "doing better things."

The toolbox includes:

- 15 diagnostic methods to assess readiness for change and identify areas that need improvement.
- 9 methods for facilitating organisational change, which can be applied by organisations themselves or external facilitators.
- 9 methods for creating and developing business ecosystems, intended for ecosystem leaders.

The selection and application of tools should be carefully planned and adapted to the organisation's specific needs. Ideally, this process is supported by change management experts who can help identify the root causes of unsustainable practices and recommend a tailored combination of methods to address these issues effectively.



A navigation chart (from ATTC 2, p. 12) guiding the reader to the relevant chapter.

CIRCULAR X TOOLS

USEFUL FOR

Getting inspired through case descriptions from 150 companies, podcasts, academic publications, and annual reports. Getting insights into circular business model design, service providing and circular transitions.

TARGET GROUP

All types of PSS, in before, during and after the development of a PSS solution.

DEVELOPED BY

The Circular X Project, funded by ERC

→ [VISIT](#)

The Circular X tools, developed as part of an ambitious 6.5-year research project focused on experimenting with circular service business models, are funded by the European Research Council (ERC), which supports top researchers globally. The platform provides a range of resources to help businesses adopt circular strategies. Among the ten tools currently available, five are especially relevant for PSS providers or businesses exploring PSS opportunities:

- **Business for sufficiency database:** This tool showcases publicly available data from organisations promoting sustainable consumption practices. A common challenge faced by PSS providers in the Nordics is the lack of market readiness and the persistence of traditional ownership patterns. The database provides real-world examples of companies tackling these issues through initiatives like awareness-raising, product life extension services, repair support, and personalised production. It serves as a source of inspiration for developing strategies aimed at circular business actions.
- **Boundary tool:** This process template is designed to help businesses engage in multi-stakeholder collaboration to enhance circular practices and foster innovation. Many Nordic PSS providers need to establish new partnerships for their solutions, and this tool facilitates the partnership selection process by focusing on complementarities and mismatches in stakeholder relationships, competencies, and activities. The template is structured as an activity wheel with five key steps, helping businesses navigate the complexities of partnership building.
- **Circular rebound tool:** This tool helps business innovators reduce the environmental impact of circular business models by addressing rebound

effects. It's designed for business designers, entrepreneurs, and consultants developing circular products or business ideas. If you're working on a circular product or model, this tool can help you ensure that your solution truly reduces environmental impact. If you're not actively working on a circular project, the tool can still be valuable for learning through role-playing with a case study.

- **The Circular Experimentation Workbench:** The Miro templates aim to help entrepreneurs and innovators rethink and refine their business models for the circular economy. It's particularly useful for identifying low-cost, resource-efficient ideas to start experimenting with. Whether you're part of a startup or a larger business, this tool is great for teams with diverse backgrounds – like marketing, design, engineering, or product development – and encourages collaboration to drive innovation.
- **Circular Business Model Pilot Plan:** This poster tool helps you turn circular business ideas into action by guiding you through the execution of a small-scale pilot. It's designed as a planning tool to engage stakeholders to balance economic, environmental, and social value. It pushes you to focus on practical, immediate steps using available resources.

These tools and others developed as part of the Circular X project provide valuable resources for organisations aiming to transition towards more sustainable and circular business models.

REFINING PSS STRATEGIES



After establishing your PSS business solution and gaining a solid understanding of PSS principles, the next step is to optimise your solution. This can involve leveraging your organisation's data or mapping ecosystems in greater detail. In this final chapter, you will find digital calculation tools, workbooks, and checklists that support data-driven decision-making. For organisations in the process of tracking climate impact and financial performance, these resources help identify the necessary data, such as climate accounts, and clarify how to use it effectively for further optimisation.

PROTEUS PSS TOOL BOOK

USEFUL FOR

Gaining a deeper understanding of the PSS context through case examples and insights into the processes behind developing and delivering PSS solutions. This tool book supports the evaluation and improvement of PSS solutions, focusing on the maritime industry.

TARGET GROUP

All business providers wanting to develop and implement PSS solutions. There is a maritime industry analysis, but the tools are for broad use.

DEVELOPED BY

Consortium of private companies, a branch organisation, research institutions and an engineering consultancy.

→ [VISIT](#)

The PROTEUS project was a 3.5-year Innovation Consortium funded by the Danish Agency for Science, Technology, and Innovation (DASTI), and the tool book is designed to assist companies in creating user-centric PSS solutions.

The toolbox is built around four fundamental dimensions of PSS, identified through observations of industrial PSS practices. A successful PSS concept must address the value proposition that considers and serves key stakeholders. This includes extensive consideration of the target users' activities, an in-depth understanding of the entire life cycle of the offerings, and careful consideration and integration of various stakeholders in the business ecosystem.

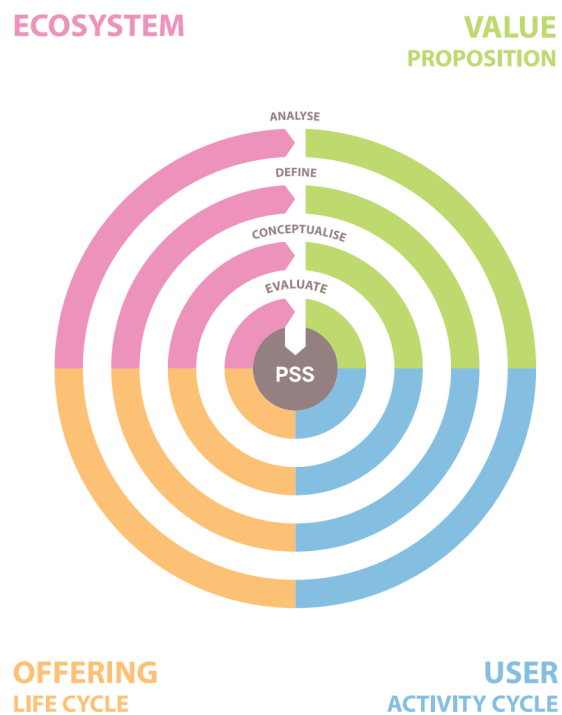
The PROTEUS PSS Tool Book provides 11 practical tools, each aligned with one of the four key dimensions of PSS:

- **PSS Audit Matrix:** A template that facilitates collaboration between product-service developers and strategists by translating modular design rules into PSS development strategies.
- **Ecosystem Map:** A template that gives an overview of stakeholder interactions relevant to a PSS concept.
- **User Activity Cycle:** A template that helps identify user activities and the associated needs in the context of a PSS solution.
- **Product Life Gallery:** A template for tracking the life cycle of physical products within the PSS.

In addition to these, the tool book offers other valuable templates and tools, including:

- Service Blueprint template
- TCO Chart tool
- Value Strategy Canvas
- PSS Configurator tool
- PSS Morphology template
- PSS Concept Evaluator tool
- Design for PSS template

The tool book provides comprehensive resources for PSS product development, pricing, and strategy formulation, helping organisations refine and optimise their PSS models.



CEvaluator

USEFUL FOR

Identifying typical funding opportunities and assessing financial risks related to circular business cases and revenue models. This tool helps evaluate circular solutions from a financial perspective.

TARGET GROUP

All types of PSS financiers, and PSS businesses seeking an understanding of financiers valuation process.

DEVELOPED BY

VITO, Econocom & the Foundations for Future Generations.

→ [VISIT](#)

The CEvaluator is a systematic checklist designed for the financial sector, created to objectively assess the circularity performance of investments. Developed by Flanders Circular, a partnership of authorities, companies, and research organisations, the tool is aimed at facilitating actionable steps towards circularity in financial decision-making.

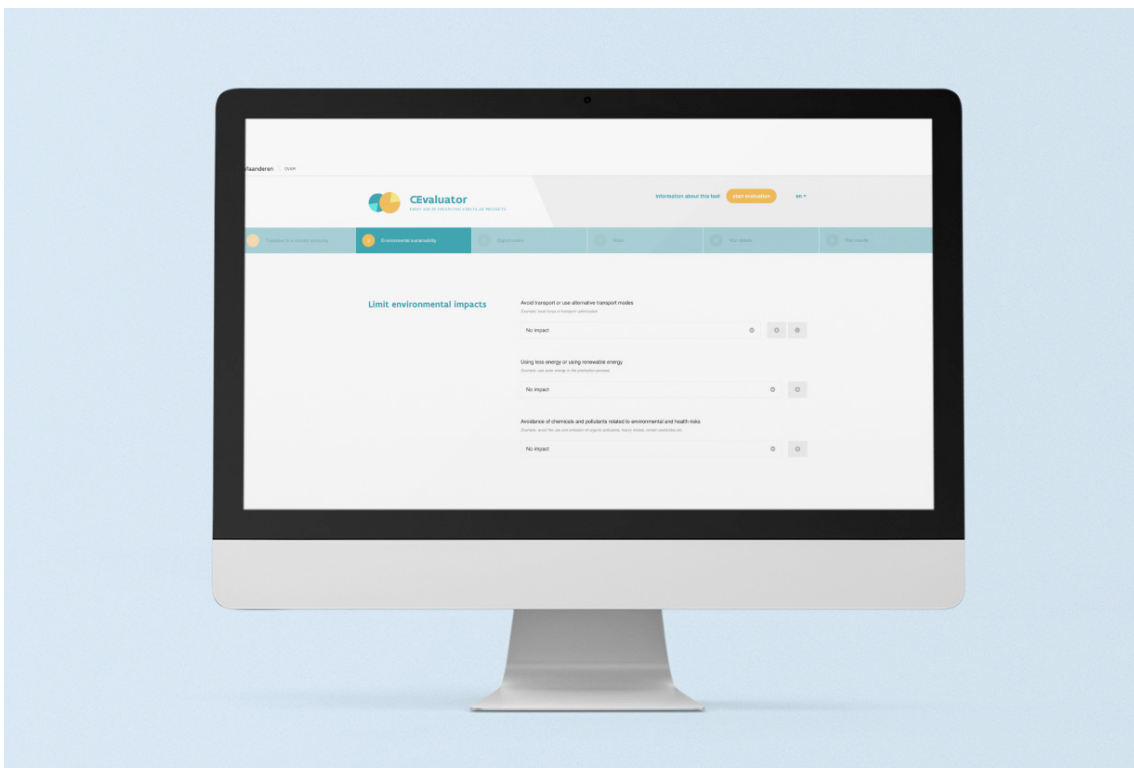
The CEvaluator considers product and material flow and broader aspects of ecological sustainability without relying on percentages or scores. Instead, it provides a nuanced overview of the opportunities and risks associated with circular economy investments.

It is particularly valuable for professionals in the financial sector but can be used by anyone interested in assessing circularity from a financial perspective. The tool also allows users to compare data files, offering insights into how well the input aligns with circularity dimensions.

Aligned with broader European frameworks, including the EU Commission's Expert Group on Circular Economy Financing, the CEvaluator ensures that the outputs are objective and relevant across Europe. The CEvaluator takes users through six key steps:

1. Transition to a circular economy
2. Environmental sustainability
3. Opportunities
4. Risks
5. Your details
6. Your results

Steps 1–4 are structured like a survey, prompting users to reflect on whether the essential circular parameters have been addressed in the business's investment application. Step 5 gathers basic business information, and Step 6 delivers the results, offering a clear evaluation of circularity from both opportunity and risk perspectives.



The online assessment tool, CEvaluator, contains questions within 4 main categories: Transition to a circular economy, Environmental sustainability, Opportunities and Risks.

KLIMAKOMPASSET

DANISH ONLY

USEFUL FOR

Estimating and calculating an organisation's environmental impact, as well as comparing different scenarios for emission reduction measures. These calculations can help businesses strategically select the most effective reduction measures.

TARGET GROUP

All businesses, wishing to increase an understanding and calculate/estimate their Greenhouse Gas Emissions.

DEVELOPED BY

Danish Business Agency and the Confederation of Danish Industry. Funded by the European Social Fund and the European Regional Development Fund.

→ [VISIT](#)

Klimakompasset (The Climate Compass) was developed by the Danish Business Agency to help businesses calculate greenhouse gas (GHG) emissions resulting from their activities. The tool provides flexibility, allowing businesses to use it partially or fully, depending on available data and specific needs. All data and results are based on the Greenhouse Gas Protocol, which sets the standard for calculating CO₂ emissions, covering six types of greenhouse gases. The results are reported in tonnes of CO₂-equivalent (CO₂e) emissions, divided into three scopes:

- **Scope 1:** Direct emissions from business activities.
- **Scope 2:** Indirect emissions from energy and heat consumption.
- **Scope 3:** Indirect emissions from the value chain.

Klimakompasset provides a total CO₂e emissions report, using annually updated emission factors based on factors such as the implementation of renewable energy sources in Denmark.

While the tool cannot be used directly for certification or green marketing, it has several relevant functions for PSS providers. For example, it allows businesses to assess emissions from five key categories: energy and process consumption, primary and secondary procurement, transportation, waste and recycling, and products sold. The "products sold" category is particularly useful for PSS providers as it includes the emissions from the use phase of products that are sold or rented

out. The tool offers a clear overview of which categories businesses should focus on for emission reduction and calculates CO₂e emissions per employee, per million DKK turnover, and per square meter.

PSS providers can leverage the tool's results for annual climate reporting, which many Danish businesses are required to prepare in anticipation of future climate regulations.

Most importantly, Klimakompasset evaluates the impact of different emission reduction measures across scopes 1, 2, and 3. This feature makes it a valuable decision-making tool, allowing businesses to compare multiple scenarios and strategically select the most effective reduction measures. The Danish Business Agency also provides a detailed, step-by-step guide to help businesses make the best use of Klimakompasset.

The image shows a computer monitor displaying a web form titled "FORBRUG AF ELEKTRICITET". The form is used for reporting electricity consumption and emissions. It includes fields for description, electricity consumption from the grid and own production, unit of measurement, and emissions for Scopes 1, 2, and 3. There are also fields for Scope 3 category, remarks, and file attachments. A green "Gem" button is visible at the bottom left of the form.

An example of the fields the user plots data available (Klimakompasset).

USEFUL FOR

Creating a collaborative understanding of circular economy strategies by mapping existing initiatives. It is also helpful for evaluating risks, finding inspiration through case studies, and creating or refining PSS business models..

TARGET GROUP

Public procures, and business wishing to gain an understanding of TCO of a product.

DEVELOPED BY

Funded by NordForsk, Nordic Energy Research, and Nordic Innovation.

→ [VISIT](#)

CIRCit Norden was a research project that ran from 2017 to 2021, focused on developing, testing, and implementing science-based tools for the circular economy in the Nordic region. The project resulted in 32 tools and templates, which are organised into six workbooks:

1. Circular Economy Sustainability Screening
2. Circular Economy Business Modelling
3. Circular Product Design and Development
4. Smart Circular Economy
5. Closing the Loop for a Circular Economy
6. Collaborating and Networking for a Circular Economy

Each tool on the CIRCit Norden platform includes step-by-step guides, with an overview of when the tool should be applied during the development process. Depending on the product-service development stage, all workbooks offer valuable insights for designing and refining PSS business models. Some of the key tools relevant for PSS providers include:

- **Guidance for Navigating Trade-offs to Support Sustainability-related Decision-making:** This tool supports decision-makers in the early stages of developing sustainability-related initiatives at the tactical and operational levels. It helps build strong arguments and justifications for decisions, avoiding arbitrary choices. The guidance is particularly useful for multidisciplinary teams, business developers, product designers, and service managers. This tool is part of the Circular Economy Sustainability Screening workbook.

- **Circular Economy Customer and End-user Journey Map:** This template assists in defining the appropriate value and experience for customers and end-users by evaluating their benefits and pain points. It encourages the refinement of business models and promotes resource decoupling practices, helping PSS providers address challenges. This tool is found in the Circular Economy Business Modelling workbook.
- **Market and Product Decision Tree:** This tool helps identify the best recirculation strategies to improve existing business models. By answering a series of product and market-related questions, PSS providers can discover optimal strategies for specific products, enabling the development of long-term solutions tailored to their unique challenges. This tool is part of the Closing the Loop for a Circular Economy workbook.

TOTAL COST OF OWNERSHIP TOOL

DANISH ONLY

USEFUL FOR

Optimising solutions by quantifying both climate and economic impacts using available data. This provides a solid foundation for comparing ownership and non-ownership models, making it relevant for all PSS providers.

TARGET GROUP

Public procures, and business wishing to gain an understanding of TCO of a product.

DEVELOPED BY

The Danish Business Authority, the Danish Environmental Protection Agency and the Danish National Association of Municipalities.

→ [VISIT](#)

The Total Cost of Ownership (TCO) Tool is a calculation platform designed to assess the total costs of a product, including its purchase price and lifetime operating costs. It is presented in a simple, Excel-based format with detailed guidance.

While the TCO tool does not cover all product types, it is relevant for evaluating a variety of product groups, including computers, displays, multifunctional devices, projectors, servers, storage, large network equipment, small network equipment, lighting, refrigerators and freezers, self-service machines, add-on bidets, motorised vehicles, air coolers, condenser units, dishwashers, ovens, and washing machines.

The tool is designed primarily for providers and procurers in the B2G market, but it can also be useful for PSS providers in the B2B and B2C sectors. The TCO tool is most effective in scenarios where:

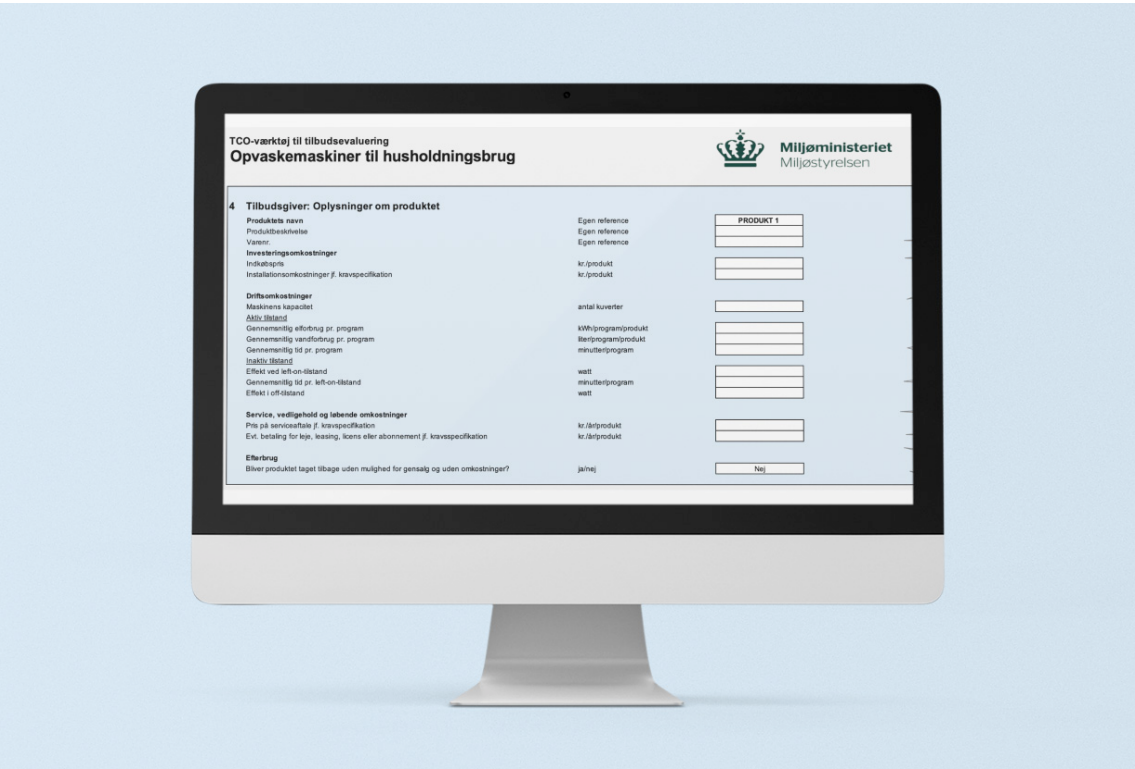
- Operating costs constitute a significant portion of the total product cost.
- There are notable differences in annual operating costs between products.
- There are significant differences in product lifespan.
- A standard for measuring product lifespan is available.

The TCO tool factors in data related to ownership expenses, such as power consumption, water use, material resources, installation, services, and labour. While it focuses on economic costs, it does not directly account for environmental

impacts. However, PSS providers can use the tool to estimate a product's climate footprint by referencing CO₂ emissions and kWh standards.

Developed as part of the Danish Strategy for Intelligent Public Procurement, the tool is frequently used during tender processes by public agencies and organisations, as well as product providers.

For PSS providers, the tool offers valuable insights into the total costs and potential climate footprints of products, serving as a guide for pricing strategies and improving service offerings. These insights are particularly relevant for addressing the challenges that many Nordic PSS providers face when developing sustainable business models.



An example of the Excel tool specifically for dishwashers for household use.

RELEVANCE OF TOOLS



The tools, templates, and guides outlined here provide valuable insights for developing, implementing, and refining circular business models, such as PSS solutions. However, during the PSS in the Nordics project, it became evident that despite their usefulness, only a few stakeholders were familiar with these resources. The Circular Design Guide was the most recognised, yet even this was known to fewer than 20% of the stakeholders consulted, which included PSS providers, researchers, public authorities, and business associations.

As part of the consultation, stakeholders highlighted key functions they desired and needed in tools, guides, and templates related to PSS. Many of these desired functions overlap with features already covered by the resources discussed in the preceding sections.

- Emission Calculation Tools (e.g., Klimakompasset, Ready2loop, ResCoM)
- Customer Experience and Value Creation Templates (e.g., Circular Design Guide, Circular Toolbox, Lean Service Creation Handbook, Guide for Developing Product as a Service Business, Nordic Circular Economy Playbook Toolkit, PROTEUS PSS Tool Book, CIRCit Norden)
- Organisational Transformation Guidance (e.g., Lean Service Creation Handbook, PROTEUS PSS Tool Book, ATTC 2 Toolbox)
- Revenue Stream Calculations (e.g., Nordic Circular Economy Playbook Toolkit)

GAPS IN AVAILABLE TOOLS

Some essential functions are still missing, particularly calculation tools that are frequently requested to help companies implement PSS solutions more efficiently and validate environmental marketing claims. These desired functions include:

- Internal Rate of Return (IRR)
- Return on Investment (ROI)
- Net Present Value (NPV)
- Social Impacts
- Environmental assessments of reused products (partially covered by ResCoM)

Most of these calculation tools require a deep understanding of economic and environmental theory and can be costly. Economic functions such as IRR, ROI, and NPV are essential for designing efficient business models, while social and environmental impact assessments help optimise business outcomes and support marketing efforts.

Although some environmental impact assessment tools exist, none specialise in evaluating circulated products in a PSS model. PSS providers have expressed a need for templates that assist with these calculations.

Additionally, PSS providers request guidance and templates to help with:

- Financial comparison of PSS and product-sales models
- Accounting standards for PSS, especially for CFOs
- LCA and environmental assessments for PSS
- Guidance for procurers on PSS procurement
- Value promises to consumers
- Standard contracts for PSS models

These tool gaps primarily relate to the economic and environmental aspects of PSS models. Companies often struggle to determine the PSS's impact and communicate this to consumers, highlighting the need for better tools and resources.

IMPROVED DISSEMINATION AND STANDARDISATION

Despite government efforts to address environmental assessments in the Nordics, consultations with PSS providers reveal that these standards and approaches are not effectively reaching businesses. This is particularly problematic given the increasing requirements for environmental marketing documentation, which is crucial for consumer communication.

Additionally, PSS providers face challenges due to the lack of standard solutions, such as contracts specific to PSS models. This creates inefficiencies in business processes and consumer communication, forcing PSS providers to "reinvent the wheel" to operate effectively. The need for guidance on best practices, legislation, and financial measures relevant to PSS models further underscores this issue.

Stakeholders noted a general lack of information on:

- Comparative regulatory frameworks and financial measures across the Nordics, EU, and other countries
- Pitfalls and 'do-nots' in circular business practices
- Best practice examples from companies, including consumer perspectives
- Comparable environmental benefits of different business model configurations
- The actual benefits (environmental and economic) and pitfalls of PSS

CONCLUSION

The consultations with stakeholders have revealed significant gaps in the tools and guidance available for companies working with PSS, especially in areas like economic and environmental calculations and social impact assessments. While many resources already exist, there is a clear need for specialised tools that offer deeper insights into the economic and environmental implications of PSS models, both for internal decision-making and external communication with consumers.

To fully support businesses in adopting and refining PSS models, these tools, templates, and guides must not only be developed but also effectively disseminated to PSS providers. This dissemination is crucial for helping companies navigate regulatory complexities, improve transparency in consumer communications, and accelerate the shift towards sustainable business practices.

By addressing these gaps, businesses will be better equipped to transition smoothly to circular business models, unlocking the full potential of PSS in delivering both environmental and economic benefits.

TOOL LINKS



- [The Circular Design Guide](#)
- [The Circular Toolbox](#)
- [ResCoM](#)
- [Lean Service Creation \(LSC\)](#)
- [Circular X tools](#)
- [The Circulator](#)
- [CEvaluator](#)
- [Guide for developing product as a service business](#)
- [Klimakompasset](#)
- [Total Cost of Ownership tool](#)
- [ready2LOOP](#)
- [The Nordic Circular Economy Playbook Toolkit](#)
- [PROTEUS PSS Tool Book](#)
- [CIRCit Norden](#)
- [Accelerating system Transitioning Towards Circularity – ATTC 2 toolbox](#)

ABOUT THIS PUBLICATION

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