

PROJECT OVERVIEW

ResCoM, which stands for Resource Conservative Manufacturing, is working to develop an innovative methodology and software platform for the industrial implementation of closed-loop manufacturing systems. It is co-funded by the European Commission and runs until autumn 2017. ResCoM will help designers and manufacturers understand how collection, remanufacturing and reuse of products can lead to more profitable, resource-efficient and resilient business practices compared to the current linear manufacturing system. The platform and methodology will be complemented by a series of industrial case studies that demonstrate the benefits of its application across various industries.

THE ResCoM PILLARS

ResCoM considers four pillars that are all dynamically interrelated and should be considered as a whole.

DESIGN

Design methodologies for longer and more versatile product life

SUPPLY CHAIN

Integrated forward and reverse supply chain solutions to close loops.

BUSINESS MODEL

Innovative business models that unlock added value through the application of closed-loop principles.

TECHNOLOGY

A product lifecycle management software platform capable of managing complex use patterns of products, supported by access to material databases, remanufacturing technologies and best practices.

A SYSTEMS APPROACH

By shifting away from optimising isolated parts of a system, companies can make greater returns by addressing the whole system in which their products are made, rethinking the relationships between materials, design, supply chain and business models.

However, currently, to our knowledge, there are no tools that can support manufacturers in adopting such a systemic approach in product design for multiple lifecycles. ResCoM seeks to redress this by developing a systems-led circular design and decision making tool for manufacturers that can support industry in transitioning to more closed-loop models and facilitate the transition to circular industrial systems. The diagram above shows the four pillars of the ResCoM approach which dynamically interact with each other.



Visit our website to learn more,
watch our animation, sign-up
for the newsletter or join the
LinkedIn group.

www.rescoms.eu

The ResCoM project comprises twelve organisations across research, industry and technology. Each partner brings their specialist focus to the project whilst collaborating closely to ensure an integrated approach is applied.

KNOWLEDGE PROVIDERS



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ResCoM

We help manufacturers capture value
by closing the loop.

www.rescoms.eu

THE RESCOM PLATFORM AND TOOLS

The ResCoM Platform will bring software applications and descriptive (i.e. non-software) tools and methods together in one place to support decision-making and implementation of closed-loop product systems.

THE RESCOM PLATFORM WILL CONSIST OF FOUR CONNECTED PARTS:

ResCoM descriptive tools and methods: to support companies in exploring business models and understanding best design practices for multiple lifecycles.

ResCoM collaborative software platform: consisting of economic and design decision-making tools, and further tools to support implementation of new closed-loop products.

User interface: containing additional information about the tools and methods as well as providing access to the software platform.

Use cases: demonstrating the benefits of implementing ResCoM for manufacturers.

Some of the ResCoM descriptive tools and methods under development are listed below.

CIRCULAR PATHFINDER

Informed by the best practices of other companies, the Circular Pathfinder guides users towards specific circular pathways, such as product remanufacturing, life extension, or recycling. Based on the outcomes, the pathfinder offers examples and suggests further steps to take.

CIRCULARITY CALCULATOR

The Circularity Calculator can help designers working in the fuzzy front end of product development to obtain a 'circularity instinct': an understanding of how strategic design decisions influence the degree of circularity of resource flows, and potential value capture within the product-service-system. The Circularity Calculator tool displays the potential mass and value flows of a product, based on whether the different parts are either reused, remanufactured and/or recycled. Designers can model different conceptual design solutions and business models to explore and compare design scenarios, and see their impact on performance indices such as overall circularity, recycling rate, and value recovery potential.

PART PLANNING

The Part Planning tool supports design for durability, remanufacturing, and reparability which require the availability of spare parts. Designing for spare part compatibility across product generations provides a solution for offering spare parts in a way that is economically viable. The Part Planning tool provides designers with a fast and simple tool via an interdisciplinary workshop session. The tool supports design teams to analyse and plan for carry-over parts across multiple product use-cycles.

MODULAR DESIGN TOOL

Modular design is a key enabler of circular business models that rely on exchange of components between products. The tool uses the existing Modular Function Deployment (MFD) method and extends it

for multiple lifecycles, allowing companies to plan their chosen product modules for multiple product uses. MFD helps to determine the module interfaces and how they are to be standardised to support multiple lifecycle value propositions.

REMAN DESIGN CHECKLIST

The Reman Design Checklist supports designers to take remanufacturing into account when designing a product. The checklist helps product engineers explicitly consider the remanufacturability of a product design by analysing and scoring the remanufacturability of its components: information that allows the team to track progress between design iterations. The output of the tool includes an evaluation of product components and recommendations for design improvements.

UPGRADE FORECAST

Many products that are subject to rapid technological improvements are frequently replaced before they break down, in favour of a new product with improved capabilities. Product upgrades, that allow new features to be added, can prolong product lifetime and offer better value for money to customers. The Upgrade Forecast tool is designed to help OEMs determine the upgrade specifications to include in product design. The tool facilitates interdisciplinary development teams to visualise future trends, demands and disturbances, select the product features that will require upgrading, and determine the specifications of these future upgrades.

ANALYTICAL TOOL

The Analytical Tool helps OEMs compare the profitability and environmental performance of conventional linear models with that of closed-loop scenarios. A number of parameters related to cost (e.g. production costs, forward and reverse logistics costs) and critical factors (e.g. remanufacturing success rate, return rate) can be modified to test different cases. Investment costs for design, reverse engineering, or facilities can also be included where needed.

MI:BoM ANALYZER (ECO AUDIT REPORTS)

MI:BoM Analyzer enables assessment of environmental, regulatory, and supply chain risks, and can support increased resource efficiency for products. By importing a bill of materials the tool can run reports that apply an extensive database of materials, process, and environmental data to assess product risk and guide design decisions. Enhanced Eco Audit reports assess environmental impacts and cost across multiple use-cycles, providing detailed information on reverse logistics and estimating the break-even point for closed loop remanufacturing against linear production, in terms of both environmental impacts and cost.

MULTIMETHOD SIMULATION TOOL

The Multimethod Simulation tool is capable of assessing the economic and environmental performance of circular products from an overall system perspective. The tool considers over 120 variables simultaneously using system dynamics and agent based modelling. The output helps designers and manufacturers to consider the effects of - and address the challenges related to - customer acceptance and expected demand of new business models, effects of product design alternatives, and supply chain design to respond to the needs of new business models.

CASE STUDIES

Bugaboo

Bugaboo is developing a flexible leasing plan of their innovative pushchairs and strollers in combination with value creation through reuse and remanufacturing.

Gorenje

Gorenje is exploring alternative business models for their washing machines including leasing plans or selling wash cycles instead of products, and additionally developing a parallel business of product returns for remanufacturing.

tedrive

tedrive wants to understand how new business models, product design, supply chain and IT solutions can increase the share of reuse of their steering equipment and optimise their remanufacturing operations.

Loewe

Loewe wants to increase the life of their products by turning televisions into entertainment platforms where maintenance and upgrade of the experience via 'product features' becomes the new key component of the business model.