

Martela creates handprints by offering an optimized office as a service

Martela wants to reduce climate impact of offices by offering Workplace as a Service (WaaS) for companies. This multifunctional service solution implements circular economy by combining optimized selection of furniture and agile updates in interior design with circularity strategies that prolong the lifetime of their furniture. The handprint assessment confirmed that WaaS provides environmental benefits compared to traditional offices.



Applying handprint assessment for a multifunctional service solution



Identifying data needs for handprint calculations and strategies for circularity implementation



Preparing for the calculation and communication of handprints for portfolios of products and services

”Circular economy and flexibility without compromising economic feasibility are at the core of Martela’s business model. The scientific application of the Handprint confirmed the most relevant factors of environmental impacts by Martela’s circular economy concept (WaaS).

The circular economy affects the entire value chain, which requires cooperation, data collection and data transfer between different actors across the value chain. To facilitate this, Martela recognized the need for practical solutions and tools for the reliable calculation, communication and comparison of positive environmental effects. Handprints provide a good basis for reaching these goals.”

**Anne-Maria Peitsalo, Director,
Sustainability & Quality at Martela Group**

Handprint helps Konecranes on its journey to decarbonize material flows

Konecranes targets to reduce the environmental impacts of the offering by **circular economy solutions**, ranging from predictive product maintenance to remanufacturing and repurposing components.



Applying carbon **handprint assessment** for predictive maintenance, remanufacturing & repurposing



Ensuring positive impact of **circular solutions**



Communication of practical solutions for circularity

Handprint project has ..

- .. provided inspiring sparring sessions with sustainability researchers and provided us valuable feedback on our circularity and carbon handprint case studies*
- .. helped to develop our skills and expand the expert network*
- .. supported us in navigating in the jungle of standards and regulations*
- .. supported our long-term Zero4 program journey towards zero emission material flows*

Marja Myllysilta

Ecodesign and Sustainability Assessment Manager
Konecranes

Aapo Räsänen

R&D Sustainability Engineer

Handprints enable Fortum to find optimized life cycles for their bio-based materials

Fortum Bio2X aims to provide new bio-based circular materials to replace fossil components, among others in resins. However, the environmental impacts of these materials rely on the life cycle of the products that they are used in. Handprint framework developed by LUT&VTT was tested for the ability to evaluate the positive climate impacts of a material achieved over its life cycle when used in an application of another company.



Applying handprint assessment for the life cycle of a bio-based circular material



Understanding the total impact of the material by assessing the whole life cycle involving several companies



Handprint as a tool for identifying potential partners in the value network through life-cycle design

” It’s really eye-opening to get a glimpse at the impacts of our materials across the whole value chain. Sustainability is increasingly asked by customers and consumers, and to really embed it in business and decision-making, it’s necessary to develop tools to estimate, compare, and eventually quantify these impacts also on the value chain –level. ”

Matti Sonck
Business Development
Manager, Fortum Bio2X

Increasing material circularity by plastics recycling with Neste & Borealis' solutions

Plastic industry is moving from linear value chains to circular value chains in an increasing speed. Mechanical and chemical recycling are complementary solutions to improve the circularity of plastic value chains. Neste & Borealis worked with VTT and LUT to model the benefits created by the increased circularity in the plastic value chains.



Recycling saves non-renewable energy sources and reduces climate impact of plastic products



Chemical recycling can increase circularity by utilising materials that are not mechanically recyclable



Handprints of products from recycled plastics can be maximised with optimal product design and proper quality requirements

"Plastics recycling case study showed that the handprint concept can be used to provide systematic comparison data of feedstocks and recycling processes. Circular solutions are needed to simultaneously reduce carbon footprints of plastics production and plastic waste incineration as well as meet end product quality requirements in different application areas of plastic products."
Sanna Martin, Sustainability Project Manager, Borealis Polymers Oy

"The study results underline the need for both mechanical and chemical recycling to make plastics more circular and sustainable. Quantified handprint results indicate that plastic applications benefit from combinations of circular and low carbon solutions."
Jarmo Kela, Senior Program Manager, Innovation Excellence, Neste Corporation

Hartwall searched for solutions in their value chain to aim for carbon neutrality in transportation and logistics services

Hartwall acts as a transport service operator and as an organizer. The company uses subcontractors and purchased deliveries to deliver the goods. VTT calculated carbon footprint of domestic transport and identified significant ways to mitigate emissions and estimated the amount of potential emission reductions for logistics – showing the need for handprints.



Adaptation of new zero emission technologies requires changes in business operations



Route planning and drivers shift planning are key actions in mitigation



Cost-minimisation needs constraints for max allowed WtW emissions

“Minimising environmental impact is an important aspect of our commitment to sustainability. We reduce our carbon dioxide emissions by optimising the sizes and transport routes of transport equipment. We require sustainability also from our subcontractors.”

**Tomi Heinäaho
Logistics Manager
Hartwall**

Examining the upstream and downstream effects of handprints

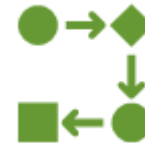
Verdis (formerly Urbaser) provides waste management and transportation services. LUT examined the effects of carbon handprints in the waste value chain. Two scenarios were examined: optimizing the transported loads and replacing fossil diesel with renewable diesel in collection vehicles.



The waste management industry has great handprint potential due to its vast interconnections to other businesses



Strides towards global carbon neutrality should be viewed from a multi-company system perspective



Handprints in waste management can advance the climate targets of companies in the upstream and downstream

“Working with LUT helped us understand the role of mitigating emissions from waste management to benefit the whole waste value chain.”

Hanna-Liisa Järvinen
Head of customer services
Verdis Oy

Assessing the systemic effects of emission-reducing energy solutions with Höyrytys

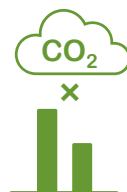
Höyrytys provides gas engine solutions, and with the help of VTT their potential to offer customers handprint solutions was explored. For this, a gas engine running with natural gas and different biogases was examined against an oil boiler. Moreover, it was tested how changing initial circumstances affect the potential handprint.



It makes difference what kind of electricity production is replaced by the gas engine, e.g. hydro power or grid electricity



Both the fuel type selection and ensuring its continuous availability play a critical role



Handprint can be achieved when aspects, like baseline and selected fuel meet certain criteria, which are always defined on a case-by-case basis

Höyrytys case helps to demonstrate the importance of carbon handprints in advancing collective climate goals.