

The impact of Espoo's ecosystems



Results

UPRIGHT  PROJECT

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BACKGROUND OF THE PROJECT



Background for this project

- The procurement of this analysis is part of Espoo's RAKKE (Ratkaisupolku kestävän kasvun ekosysteemeihin) project, in which the City of Espoo works to develop the ecosystems for digital development and the green transition together with 100 companies and development partners
- The outcome of this analysis is the net impact quantification of 79 select companies within 4 ecosystems:
 - The ecosystem for circular economy in construction (Rakentamisen kiertotalouden ekosysteemi)
 - The ecosystem for renewable energy (Uusiutuvan energian ekosysteemi)
 - The ecosystem for EV charging services (Sähköautojen latauspalveluiden ekosysteemi)
 - The ecosystem for the reuse of recycled plastic (Kierrätetyn muovin hyötykäytön ekosysteemi)
- The goal of the analysis is to understand the holistic impact of the chosen companies on society, knowledge, human health and the environment, as well as the climate and sustainable development goals of Espoo. The focus is on understanding the impact of the current state of the companies and identifying which aspects and themes stand out
- This analysis is produced simultaneously and will be presented together with a project by Gaia Consulting. Gaia's project focuses on defining the larger ecosystems within Espoo and understanding how companies and organisations can leverage working together to further develop their business and impact
- Note: The analysis focuses only on the businesses included within the ecosystems. This means that for some companies only the relevant business units have been included in the analysis.

Ecosystems members included in the analysis: 'Circular economy in construction' ecosystem

- A-insinöörit
- Bonava
- Ethica
- Etteplan
- Gaia Consulting
- HSY (Waste management and recycling of construction waste)
- Kierrätysoperaattori
- Lotus Demolition Oy
- OP Kiinteistösijoitus Oy
- Pohjola rakennus
- Purkupiha
- Rakennusoutlet
- Ramboll
- Ramirent
- Remeo
- Rudus (Recycling business)
- Spolia
- Tallberg yhtiöt
- XD Visuals
- YIT
- Ytekki

Ecosystems members included in the analysis: 'Renewable energy' ecosystem

- Adven (Renewable energy)
- Caruna (Electricity distribution and renewable energy)
- Caverion (Energy and smart solutions)
- Clicinnovation
- Energio
- Envitecpolis
- Fortum (Renewable energy and district heating)
- Gasum (Biogas)
- HSY (Climate information and biogas)
- Korkia Consulting
- Naps Solar Systems Oy
- Neste (Renewable fuels and hydrogen)
- QUANTITATIVE HEAT OY
- Ramboll
- Schneider Electric (Smart buildings and electricity related products)
- Siemens (Smart buildings and electricity)
- Solarok Oy
- ST1 (Renewable energy)
- Teknologian tutkimuskeskus VTT (Research and innovation for energy)
- Vantaan Energia (Renewable Energy)
- WSP Finland

Ecosystem members included in the analysis: 'EV Charging' ecosystem

- ABB (Electric vehicle infrastructure products)
- Aimo Park
- Beast
- Caruna (Electricity distribution and renewable energy)
- Destia (Smart transport solutions, electric vehicle charging products and services)
- eParking
- GreenMobility
- Helen (Electric vehicle charging services)
- Kempower
- Lease Plan Finland (Electric vehicle leasing and retail)
- Liikennevirta Oy / Virta
- Omago (Electric cars)
- Plugit
- ReCharge
- Tehomen
- Teknologian tutkimuskeskus VTT (Research for traffic, transportation and electric vehicle charging)
- Tesla
- Wallbox

Ecosystem members included in the analysis: 'Reuse of recycled plastics' ecosystem

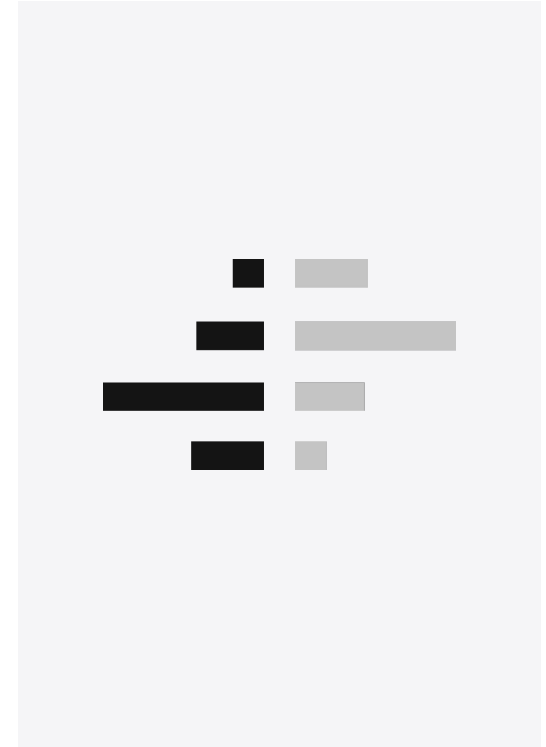
- Kompan Suomi Oy
- RayLab
- HSY (Plastic waste management services)
- Rosk'n Roll (Plastics and consumer waste recycling services)
- Salpakierto (Plastics and consumer waste recycling services)
- Teknologian tutkimuskeskus VTT (Plastics research and recycled plastic innovations)
- Siemens (Plastic recycling)
- Kamu Collective Oy
- Novago Yrityskehitys (Excl. travelling)
- Fortum (Plastics recycling services)
- Kuusakoski Recycling
- Lassila & Tikanoja (Plastics recycling services)
- Ikea (Recycled plastics based products)
- Sinituote
- Uponor
- Muovipoli Oy
- Bloft Design Lab Oy/Viima Mobility Oy
- Wipak
- Borealis Polymers

INTRODUCTION TO THE UPRIGHT METHODOLOGY



Upright in brief

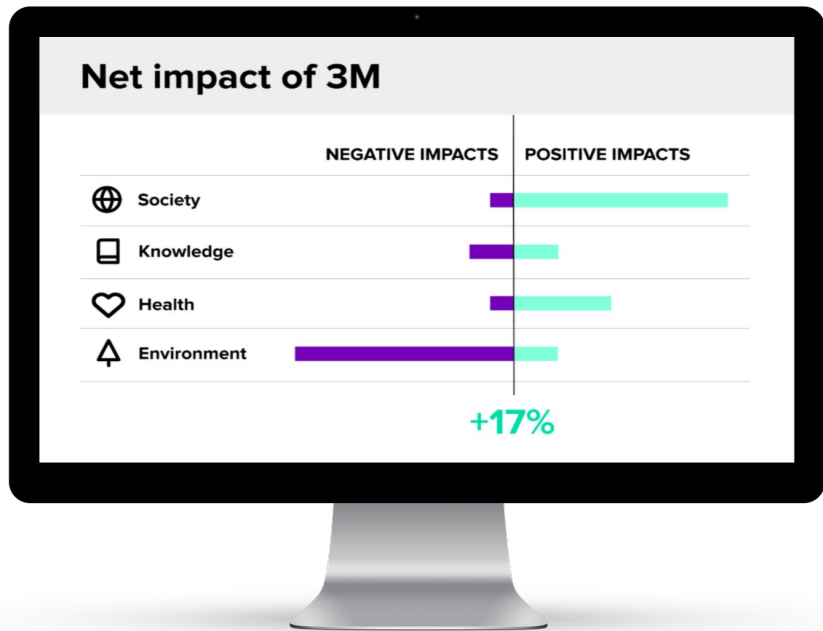
- A market-leading **net impact data provider** for both public and private market companies and investors, currently servicing **190+ customers** globally.
- Upright offers four datasets for a **coverage of 24,000+ companies: net impact, UN SDGs, EU taxonomy and SFDR PAI**.
- Compared to more traditional ESG metrics, we focus on measuring the **impact of the core business** of a company.
- Our model is based on a neural network summarizing **200M+ scientific articles** and our proprietary modelling of the economy with a **taxonomy of 150,000+ possible product categories**.



The Upright model quantifies the net impact of companies and is used by companies and investors alike

The Upright model creates comparable data about companies' net impact...

...building ways for companies' key stakeholders to use the data in their decision-making



INVESTORS



"Where do I dedicate my equity i.e. which company do I **invest** in?"

CUSTOMERS



"Where do I dedicate my money i.e. which company do I **buy** from?"

EMPLOYEES



"Where do I dedicate my time i.e. which company do I **work** for?"

LEADERSHIP



"Which **strategic decisions** help us constantly improve our impact?"

The current impact discourse lacks analytical rigour, comparability and sense of scale

The current impact discourse is...	Example	...which leads to:	How the Upright Net Impact Model addresses the problem:
Stuck at minimizing downsides	<i>"We aim to reduce our CO2 emissions by 10 percent"</i>	Not understanding what the resources are used for	Measure both negative and positive impacts of companies
Confusing big and small things in a colourful mess	<i>"We are now using recycled office paper"</i>	Big things get overshadowed by masses of secondary details	Build a macro model that reveals scale of impact
Focused on internal impacts	<i>"We installed solar panels on the roof of our HQ"</i>	Majority of significant impacts in downstream or upstream are overlooked or completely missed	Model whole value chain
Confusing compliance practices with impact	<i>"We signed the UN Global Compact"</i>	Tobacco companies get nice ESG scores	Model companies via their core business (products + services)

The modelling is based on science-based impact of companies' products and services across the value chain

The Upright model logic summarized



1. An unprecedented value chain simulation of the global private sector



a graph of all products and services traded in global markets + value chain relations + market sizings + product family relations



2. A science-based, comparable impact modeling for all products in the graph



net impact profiles for all products



3. A mapping of companies to the product graph



net impact quantifications for companies



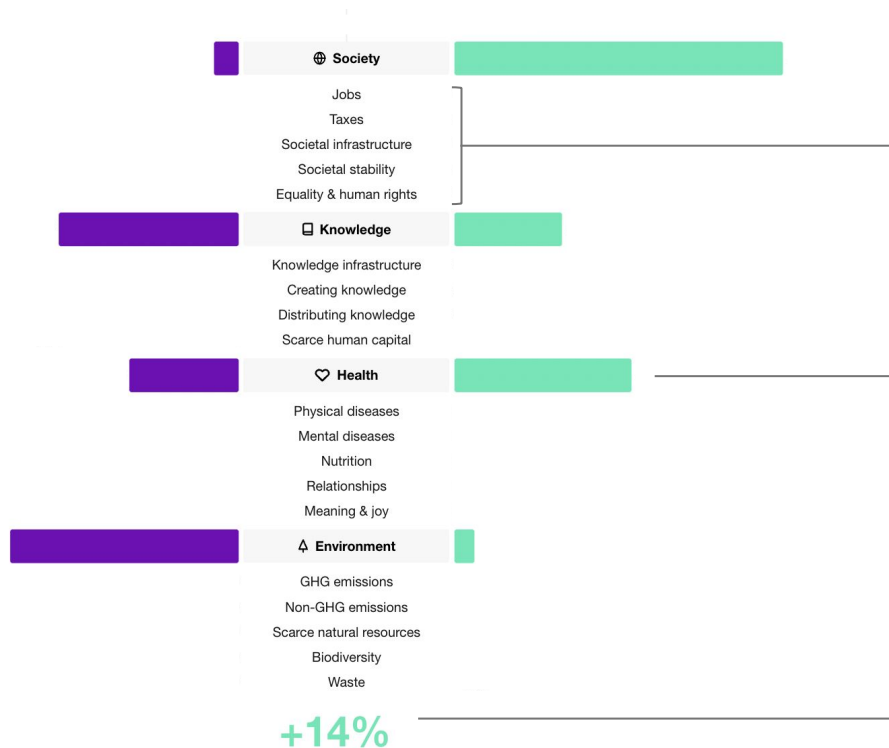
4. Company disclosure database



sanity-checking against companies' own disclosures + complementing data

The net impact profile illustrates the net sum of costs and gains of a company's business

Example net impact profile of a company



Impact categories

- Impact quantified in 4 main dimensions and 19 categories
- Categories designed to consider all different types of costs and gains of a company's business

Impact scores

- Scores based on the impact of the different products and services a company produces
- Both positive and negative impacts considered
- Impact quantified across the entire value chain

Overall score: Net Impact Ratio

- Net Impact Ratio tells the ratio between positive and negative impacts. Formula: $(\text{positive} - \text{negative}) / \text{positive}$
- Average company scores range between -15% to +25%, with the theoretical maximum being +100% and minimum $-\infty$

THE IMPACT OF ESPOO'S ECOSYSTEMS



Net impact of Espoo's RAKKE ecosystems*

These ecosystems stand out with modest use of resources and positive impact particularly within environment and society

Scarce human capital

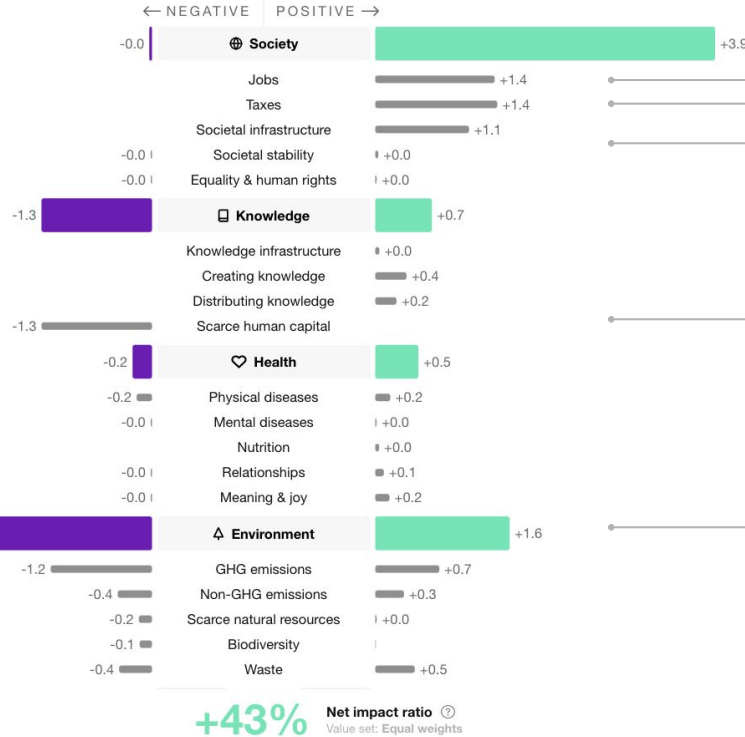
This impact depicts the opportunity cost of employing scarcely available human capital, and is a negative value for all companies. In this profile this is among the most significant resources used and implies that the companies employ many highly skilled individuals whose efforts make all the positive impact possible

Creating emissions

Almost all companies create some emissions. Within the Espoo ecosystem, the biggest contributions stem from companies involved in the production of energy sources such as biogas and renewable diesel.

Reducing emissions and waste

With products and services ranging from renewable energy to plastics recycling, all of the ecosystems have a range of companies that have a positive impact on the environment by creating alternatives for highly polluting fuels or virgin material use



Jobs & Taxes

All members in the ecosystems contribute to society through the provision of jobs and payment of taxes

Societal infrastructure

Many members of the ecosystem are also involved in the provision of societal infrastructure i.e. the products and services needed for modern society to function. In this ecosystem, this impact is driven by members involved in energy production and transportation

Creating & distributing knowledge

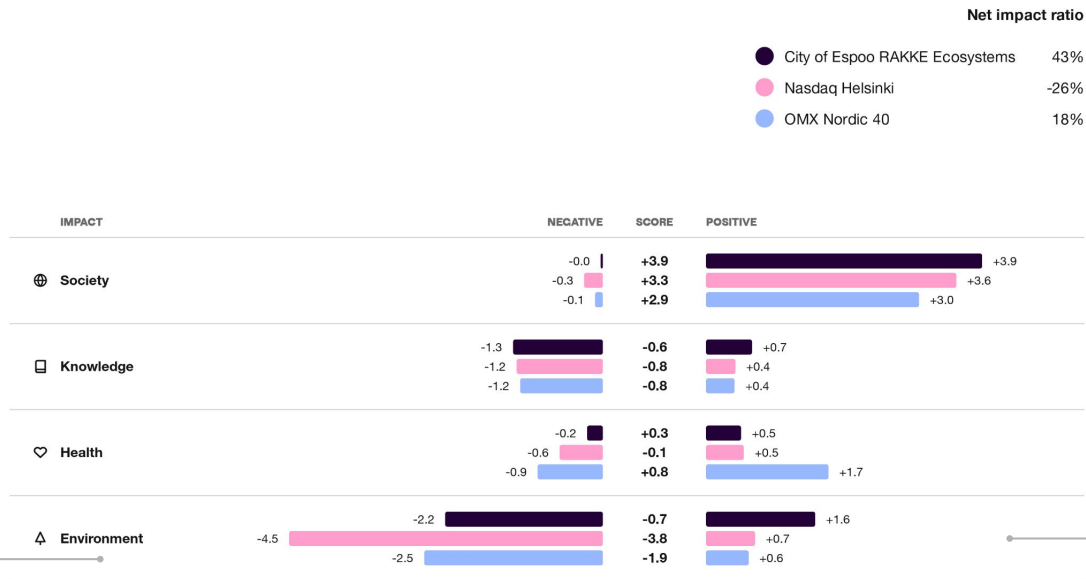
Within this ecosystem, new knowledge is created and distributed through the development of energy efficient construction and the engineering of new low carbon energy sources and recycling methods

Health

The health impacts of the ecosystem are modest and mainly stem from the ecosystem for reuse of recycled plastic (see ecosystem drilldown for details)

Comparison: the ecosystems, the Nasdaq Helsinki main list and OMX Nordic 40

The Espoo ecosystems create fewer emissions and save more environmental resources compared to the average stock-listed company in Helsinki and the Nordics



Net impact ratio

- City of Espoo RAKKE Ecosystems 43%
- Nasdaq Helsinki -26%
- OMX Nordic 40 18%

Overall

The impact profile of an average RAKKE ecosystem member is very similar to the nordic comparison stock-listed companies with the exception of the environmental impacts. These impacts balance the net impact ratio of the ecosystem members to a high positive value

Creating emissions

The ecosystem members utilize few environmental resources compared to the stock-listed ones. The Nasdaq Helsinki main list and OMX Nordic 40 include many companies operating in emissions intensive businesses such as non-renewable energy, transportation, and manufacturing

Reducing emissions and waste

The ecosystem stands out in positive environmental impacts. The impacts of the stock-listed groups are mainly driven by the forest and energy industries (Fortum, Neste, Ørsted)

Upright model version 0.7.100
on 12th Feb. 2023 at 11:09 GMT

Comparison: the ecosystems

All ecosystems are highly net positive and have few individual differences

Overall

The ecosystems are relatively similar to one another in terms of impacts.

Creating emissions and reducing emissions

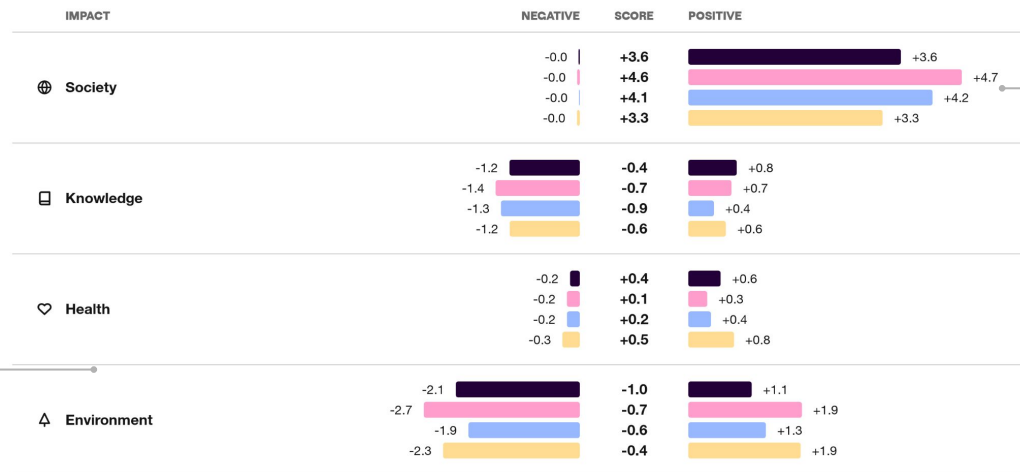
All of the ecosystems create emissions and also help reduce them through their products and services. The renewable energy ecosystem creates both the biggest emissions as well as the biggest savings due to the nature of the energy products - the renewable fuels create emissions in combustion but help create large savings in emissions compared to the fossil fuels they displace.

Net impact ratio

- The ecosystem for circular economy in construction 42%
- The ecosystem for renewable energy 43%
- The ecosystem for EV charging services 45%
- The ecosystem for the reuse of recycled plastic 42%

Societal impacts

The ecosystems for EV charging services and Renewable energy ecosystems stand out with a positive impact on society due to their high positive impacts on societal infrastructure. These ecosystems include members that help uphold and maintain essential power and energy networks.



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The UN SDG alignment of the ecosystems

The SDG alignments mirror the the net impacts of the ecosystems

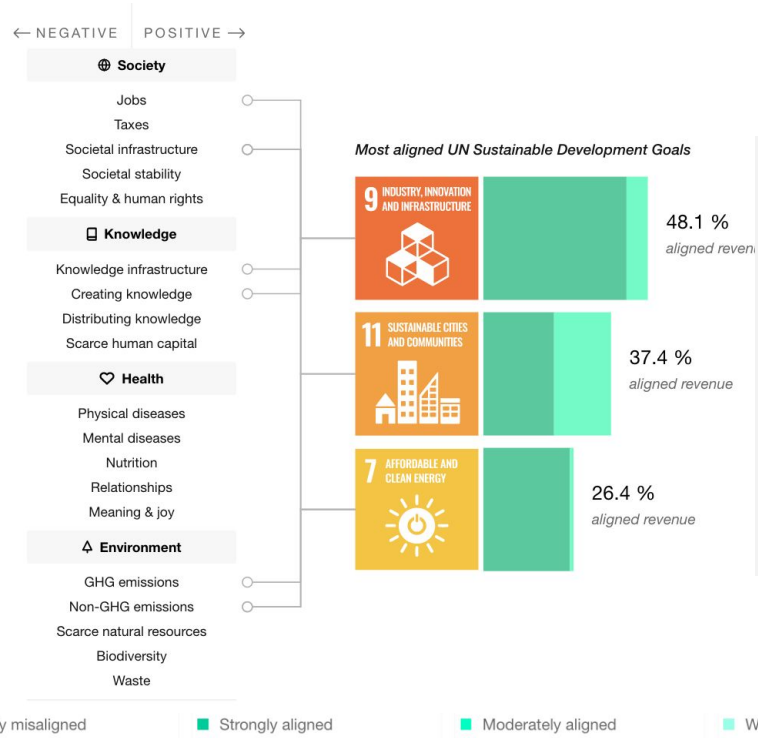
Misalignments

There are no significant misalignments in the aggregated ecosystem profile.

No misalignment found

No misalignment with any of the UN Sustainable Development Goals was found.

Overall, the SDGs have been created from goal-oriented standpoint, focusing on what should be achieved rather than what should be avoided. For this reason, the SDG data represents positive impacts more comprehensively than negative ones. For a more comprehensive perspective to both positive and negative impacts, we recommend referring to Upright's net impact data in favor of the SDGs.



Alignments

The ecosystems contain businesses working towards environmentally sustainable alternatives to produce the necessary infrastructure needed by our society aligning them with the sub-goals of especially:

9: Industry, innovation, and infrastructure

11: Sustainable cities and communities

7: Affordable and clean energy

Ecosystem: Circular economy in construction

Net impact of the 'Circular economy in construction' ecosystem

Treatment and recycling of construction waste helps reduce both health and environmental hazards

Scarce human capital

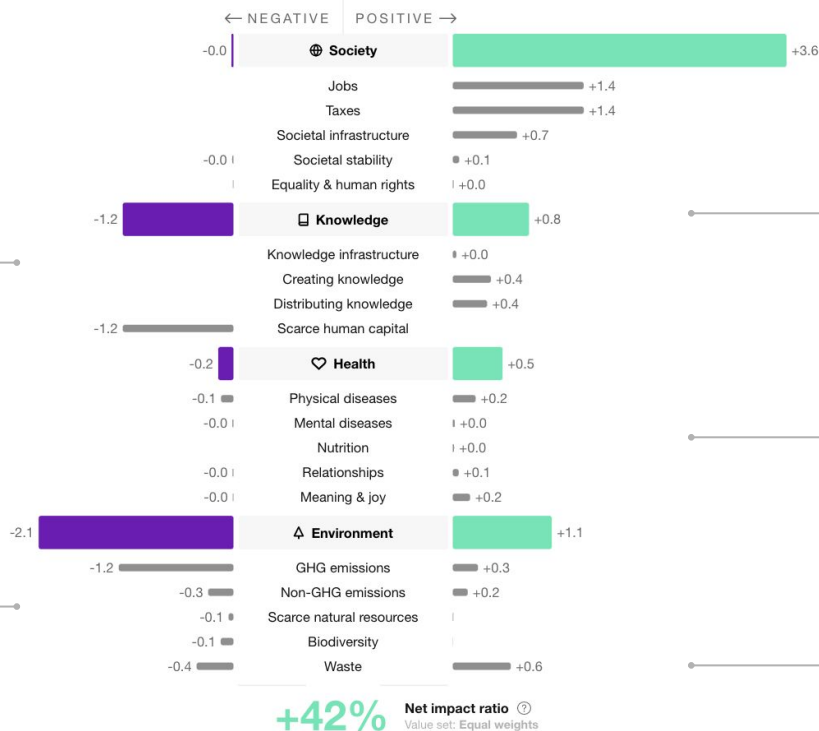
Similar to the other ecosystems, this ecosystem also utilises scarce human capital as one of its most significant resources. The highly skilled engineers and business professionals working in these companies make all the positive impact possible through their effort

Creating and distributing knowledge

In this ecosystem, new knowledge is created in and by construction planning and modelling, waste treatment and recycling engineering, as well as the development of construction engineering tools. Consulting services also help distribute this knowledge

Creating emissions

Construction creates a range of emissions. The most significant emissions within this ecosystem stem directly from the construction companies. Some members, through engineering and planning services enable construction and therefore are allocated a share of the impact created



Types of businesses found within the ecosystem:

- Construction waste management
- Construction and real estate development
- Consulting

Societal infrastructure

In building and maintaining our homes and offices, the construction industry forms a vital part of our societal infrastructure, ie, the basic infrastructure needed to keep our modern society running

Health

Most of the members within this ecosystem have some role in the positive health impacts through the recycling and treatment of construction waste. Proper treatment of construction waste reduces health hazards and injuries

Reducing waste

Recycling of what would otherwise be waste makes this ecosystem stand out in the positive impact on waste

Ecosystem member example: A-Insinööri

A-Insinööri offers knowledge for the construction and maintenance of society's necessary infrastructure

Jobs & Taxes

Due to its workforce intensity, the construction sector generates a large number of jobs

Societal infrastructure

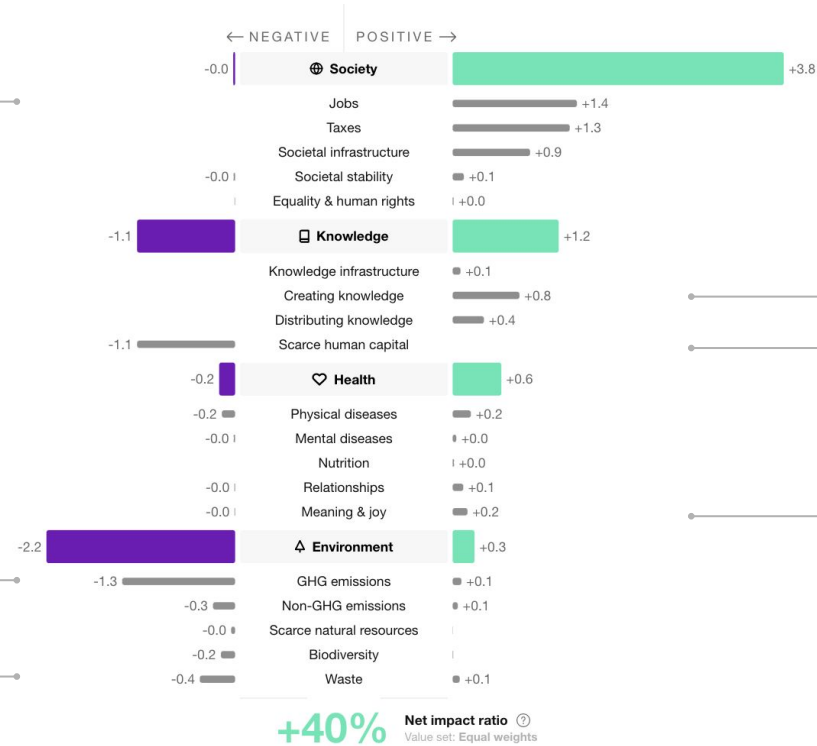
With their services, A-Insinööri makes it possible to build and maintain the essential infrastructure required by our society, such as housing

GHG emissions & Waste

The construction industry also creates substantial adverse environmental impacts such as emissions and waste. A-Insinööri is tightly linked to this industry, thus these impacts are also visible in their impact profile

GHG & non-GHG emissions

The lifespan of buildings and infrastructure is increased by engineering services such as building renovation planning services which have a positive impact on emissions and waste reductions



Creating knowledge

By offering engineering services, A-Insinööri creates knowledge that is then used to develop essential infrastructure

Distributing knowledge

Services like construction project management distribute knowledge so that others can operate more effectively and productively

Scarce human capital

A-Insinööri employs largely highly educated personnel such as engineers

Health

Many of the engineering services offered by A-Insinööri improve e.g. our urban surroundings resulting in better health and improved life satisfaction

Ecosystem: Renewable energy

Net impact of the 'Renewable energy' ecosystem

Renewable energy stands out within societal and environmental impacts

Scarce human capital

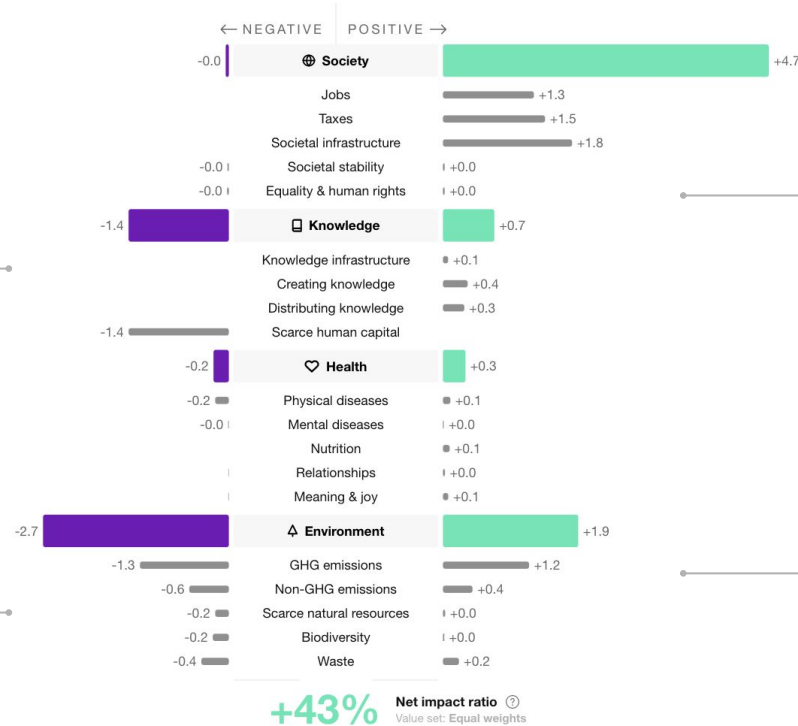
Similar to the other ecosystems, this ecosystem also utilises scarce human capital as one of its most significant resources. The highly skilled engineers and business professionals working in these companies make all the positive impact possible through their effort

Creating & distributing knowledge

New knowledge is created widely through the research and engineering of renewable energy. In addition, many of the members of this ecosystem create and distribute knowledge in energy efficiency engineering as well as environmental surveying and assessment

Creating emissions

Renewable fuels, despite creating lower emissions than their fossil counterparts, still release emissions in combustion. In this ecosystem, emissions are created by biogas and renewable diesel



Types of businesses found within the ecosystem:

- Renewable energy and heating
- Research, engineering and consulting
- Smart buildings and electricity grids

Societal infrastructure

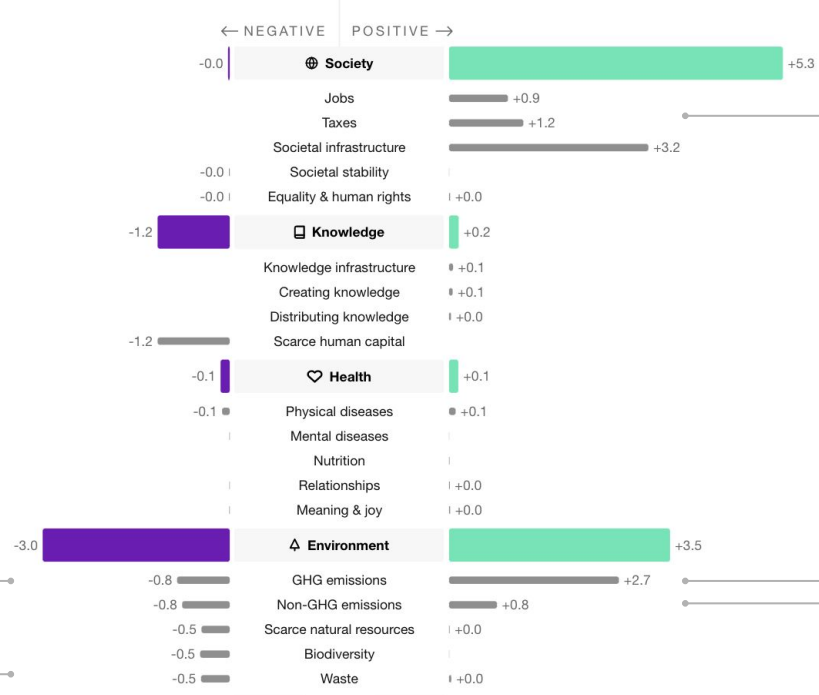
Energy is the pillar of our modern society, and therefore these members play a significant role in our societal infrastructure

Reducing emissions

Many of the fuels developed and sold by the businesses in these ecosystems have a much smaller emissions footprint than fossil fuels, leading to a positive impact on the environment

Ecosystem member example: Fortum (Renewable energy and district heating)

Fortum's renewable energy and heating business offers environmentally sustainable options for powering our societies



Jobs & Taxes

Fortum's renewable energy and district heating business, like all companies, contributes towards society by offering jobs and paying taxes

Societal infrastructure

Electricity and district heating is a very necessary part of the functioning of our modern society

GHG emissions & Waste

The production of renewable energy also creates some modest emissions and other adverse environmental impacts.

Biomass-based renewable fuels create emissions from burning and the raw materials also have an impact on the environment

GHG & non-GHG emissions

Renewable energy sources offer a big potential for emission reductions by replacing still vastly used fossil-fuel-based electricity and heating production methods

+53% Net impact ratio [Ⓢ]
Value set: Equal weights

Ecosystem: EV charging services

Net impact of the 'EV Charging' ecosystem

By enabling electric vehicles, this ecosystem has a positive impact on societal infrastructure and the environment

Societal infrastructure

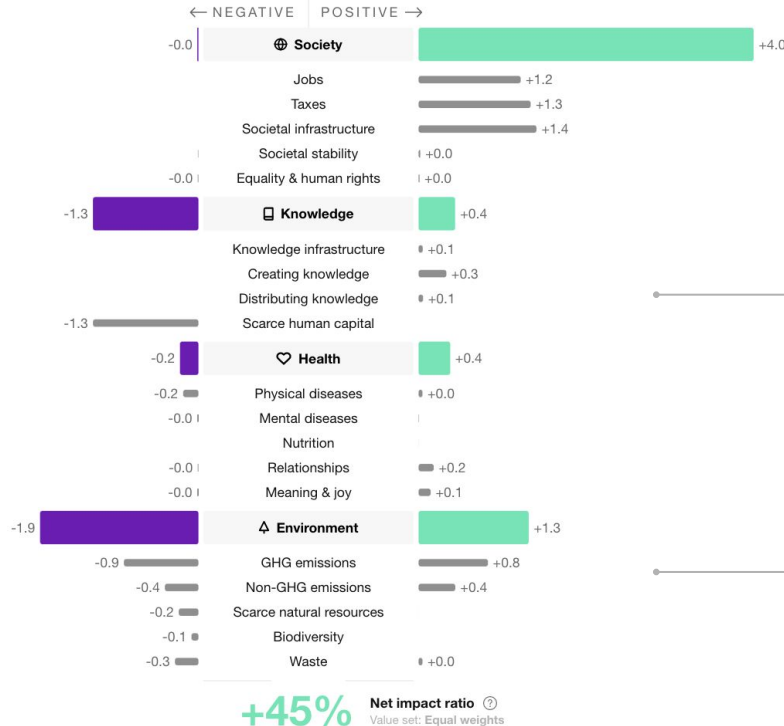
Each of the members within this ecosystem contribute to societal infrastructure ie. the basic infrastructure needed for our modern society to run efficiently by developing, building and maintaining logistics infrastructure

Creating knowledge

Knowledge is created in particular by the organisations conducting research into the future of traffic

Creating emissions

The biggest contributors to the adverse environmental impacts in this group are the members offering parking related services, which enables also other than electric transportation methods. The electric vehicle charging equipment and services also create emissions and waste, though considerably less compared to fossil fuel vehicles. Production of electricity for EV charging creates emissions, since it can't yet fully be done using renewable energy



Types of businesses found within the ecosystem:

- Charging service and equipment providers
- Electric car providers
- Parking lot services and smart transportation products

Scarce human capital

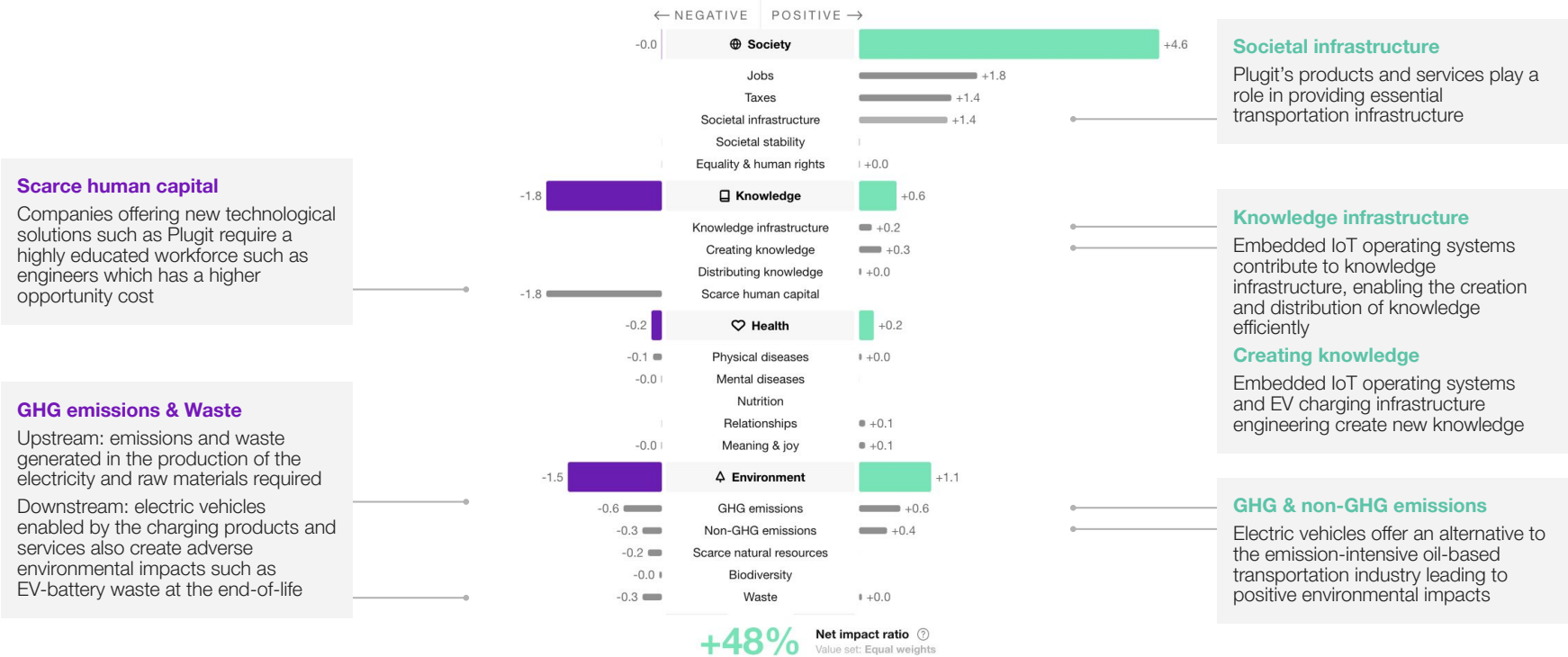
Similar to the other ecosystems, this ecosystem also utilises scarce human capital. The highly skilled engineers and business professionals working in these member companies make all the positive impact possible through their effort

Reducing emissions

The positive impact on the environment within this ecosystem stems from the role of electric vehicles in displacing regular petrol vehicles that create higher emissions

Ecosystem member example: Plugit

Electrification of vehicles offers a more environmentally sustainable option for essential transportation



Ecosystem: Reuse of recycled plastic

Net impact of the 'Reuse of recycled plastics' ecosystem

Through increasing the reuse of plastic waste, this ecosystem stands out with a positive impact on waste reduction

Scarce human capital

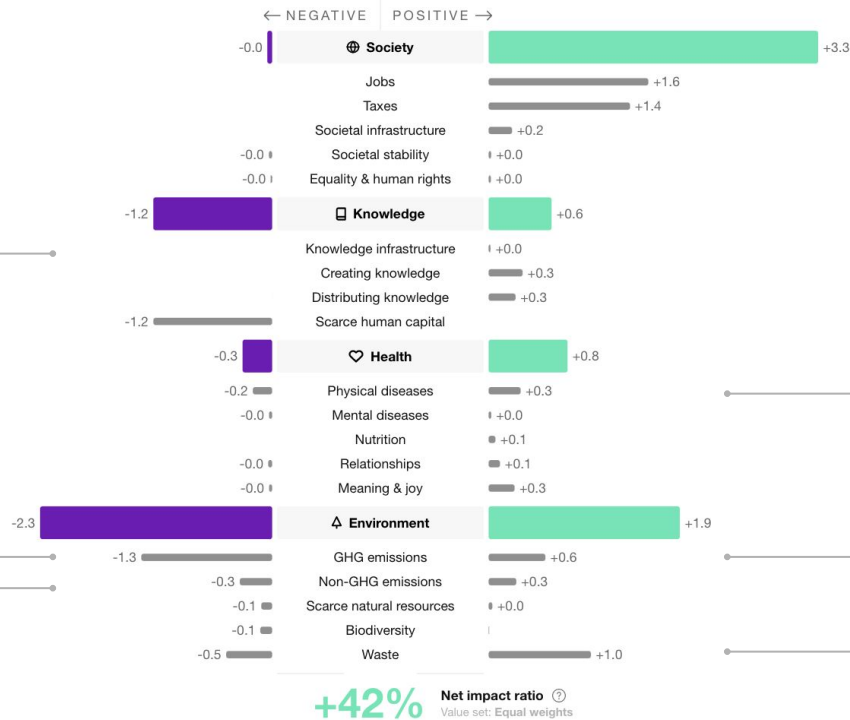
Similar to the other ecosystems, this ecosystem also utilises scarce human capital as one of its most significant resources. The highly skilled engineers and business professionals working in these companies make all the positive impact possible through their effort

Creating & distributing knowledge

New knowledge in this ecosystem is created and distributed by product development engineering, testing, and research of plastics and plastics recycling

Creating emissions

In this ecosystem, emissions are created through the production of plastics. Starting from the extraction of the fossil fuels needed in production to the manufacturing of products such as ethylene, emissions are created along the way. The plastic that does not get recycled also creates waste



Types of businesses found within the ecosystem:

- Utilization of recycled plastic
- Consumer and commercial plastic waste management
- Consulting and research

Health

The positive health impacts of this ecosystem are largely created in the downstream, ie. by the products made of the recycled plastics. This includes gym equipment, pharmaceuticals and food packaging, and cleaning products

Reducing emissions and waste

This ecosystem stands out with its positive impact on emissions and waste reduction. Recycling plastics means fewer emissions from the production of virgin plastics or the incineration of plastic waste

Ecosystem member example: Lassila & Tikanoja (Plastics recycling services)

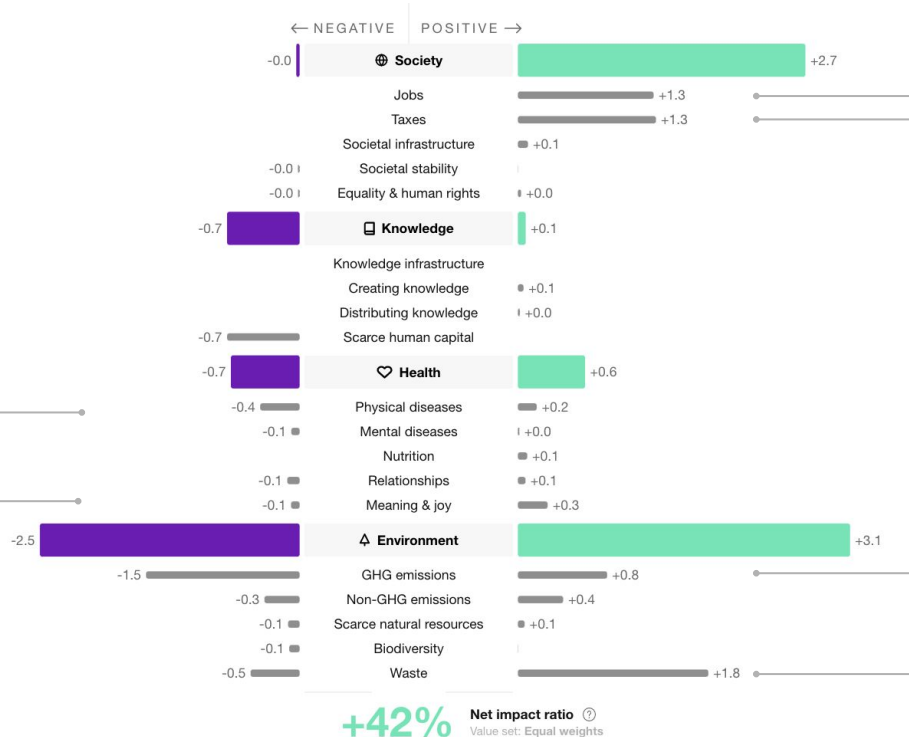
Recycling of plastic enables the reduction of non biodegradable waste and the wastage of end-of-life materials

Improving health

Plastic waste streams result from a wide range of consumer applications, from which recycled plastics also inherit some impacts in the health category

Increasing physical diseases

A considerable share of recycled plastic is used for drink packaging for alcoholic beverages and soft drinks, both of which have adverse impacts on health. Same as with positive impacts, some of these negative impacts are inherited through the value chain.



Jobs & Taxes

Like most companies, Lassila & Tikanoja's plastics recycling services provide value to society through employment and taxes

GHG emissions & Waste

Recycling plastics has substantial positive impacts on the environment. Recycled material replaces emissions-intensive virgin materials and prevents the return of non-biodegradable plastic to the environment or landfills

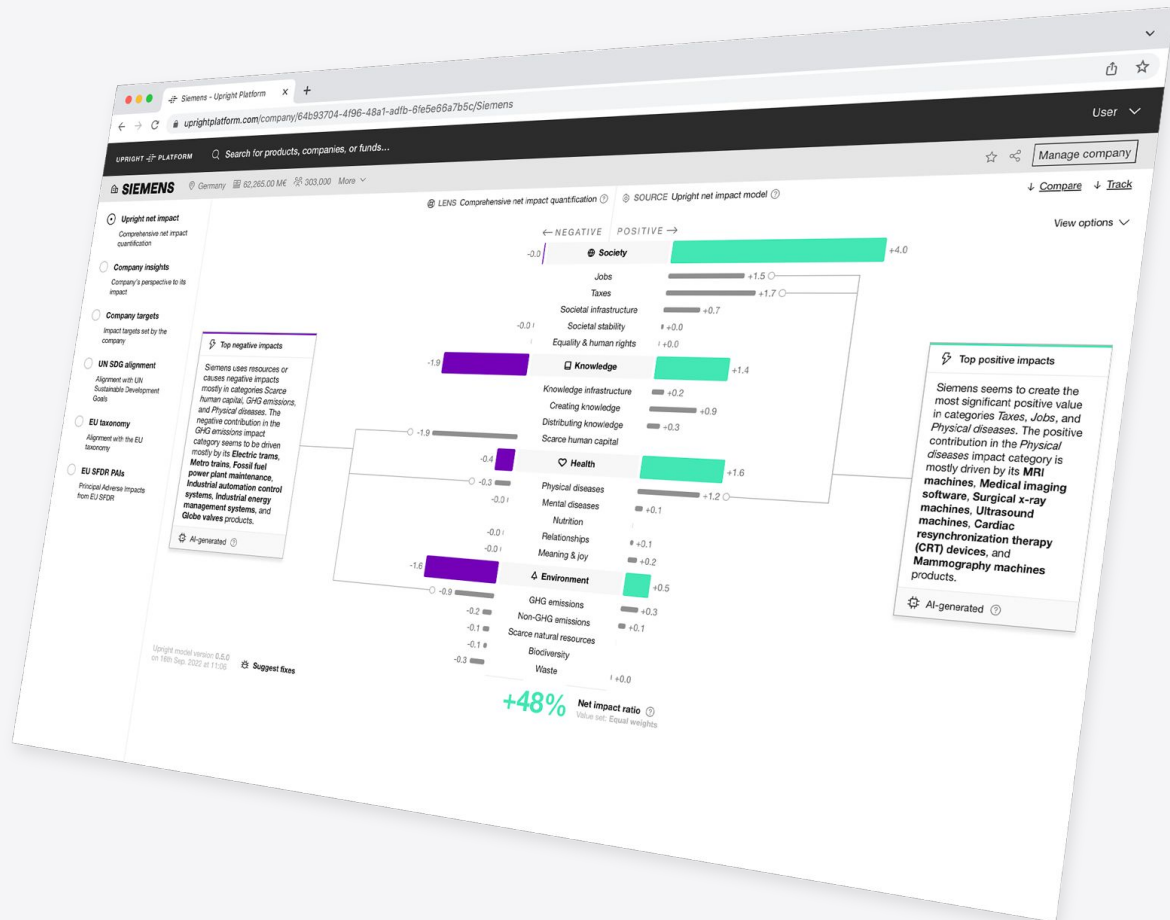
GHG emissions

Waste collection and sorting create emissions.

Currently, a lot of the plastic waste stream can't be recycled but is downcycled or burned for energy instead, which also creates emissions

All the data is accessible for Espoo through the Upright Platform at*:

uprightplatform.com



*accounts for Espoo to be set up soon

KEY TAKEAWAYS



Summary & key takeaways (1/2)

- As a whole, the RAKKE ecosystem members are a **highly impactful group**, creating a wide range of positive impact with a relatively limited use of resources
 - The main **resources** utilized by these companies are scarce human resources and environmental ones. For companies working with energy, construction, materials, and logistics engineering, this is a natural and expected outcome
 - The main **positive impacts** created by these companies are societal and environmental, with smaller positive impact also found within health and knowledge
- All of the analysed ecosystems are net positive when analysed on their own as well, with different strengths and opportunities for development
 - The companies within the ecosystem for EV charging services are all relatively similar in that they all contribute positively towards **societal infrastructure** and the **reduction of emissions**. This ecosystem can further develop its positive impact for example by increasing its positive impact on knowledge through further R&D
 - The ecosystem for renewable energy has the highest positive impact on **society and the environment**, highlighting the crucial importance of energy in our transition towards more sustainable cities. These companies however, also have the highest environmental footprints. Finding ways to reduce the environmental footprint of the energy sources is key for developing impact in the future

Summary & key takeaways (2/2)

- The ecosystem for circular economy in construction stands out compared to the other ecosystems with a **consistent positive impact across the categories**. This ecosystem has a wide range of strengths it can utilize to develop impact further, from leveraging existing engineering capabilities to innovate further and grow the positive impact on knowledge to decreasing the negative environmental impacts through the utilization of low carbon materials and development of energy efficient buildings
- The companies in the ecosystem for reuse of recycled plastic have clear strengths in the positive waste impacts ie. **waste reduction**. In this ecosystem, many of the impacts particularly within health stem from the downstream, meaning the impacts created when the products are used. This implies that the companies have the opportunity to expand their range of impact past the direct impacts of the recycled plastic itself through development of impactful products
- While the analysis does not directly address Espoo's sustainability programs, it shows that in many ways Espoo's ecosystems are already performing well in terms of the goals of the Sustainable Espoo ([Kestävä Espoo](#)) development program.
 - For goal 1, the analysis shows the ecosystem members are contributing positively towards many SDGs with no misalignment
 - For goal 2, the analysis verifies many of the members are already developing products and services with positive environmental handprints to enable carbon neutrality in the future
 - For goal 5, the analysis confirms success in building ecosystems with companies that have large potential for developing sustainable products and services

