

The logo for Systemiq Capital, featuring the company name in a white, lowercase, sans-serif font enclosed within a white rectangular border.

systemiq capital

# System Impact Report

July 2022



# I Contents

Foreword	2
Introduction	4
Our investment themes	16
Our portfolio	18
Sustainable food and materials	20
Clean transport	38
Climate intelligence and finance	60
Climate restoration	72
Reflecting on our impact journey	82
Looking ahead	84
Acknowledgements	86
References	88

# I Foreword

At Systemiq Capital, the pursuit of positive climate and biodiversity impact is at the heart of why we invest. As an early-stage climate tech VC fund, our goal is to find the entrepreneurs building great companies to address the unfolding climate crisis. Since our inception in 2018, Systemiq Capital has been working with our portfolio companies to help them amplify their impact through access to unparalleled climate knowledge and networks.

The next decade will shape how the world responds to climate change. The United Nations Intergovernmental

---

**It's our fifth year on this journey: a blink of an eye for a planet, yet five of the most important years in the fight against climate change.**

---

Panel on Climate Change has warned that there are less than 10 years to halve global GHG emissions in order to stay under two degrees Celsius<sup>1</sup> and \$32 trillion of investment in decarbonisation is needed this decade to put the world on a path to net zero.<sup>2</sup> Against the backdrop of headlines of unprecedented wildfires, droughts, and floods, we have seen – and invested in – breakthroughs we wouldn't have thought possible when we first started.

We have grown from an idea about creating system change through climate-tech investing, to a dedicated team of 7, with 15 remarkable companies in our portfolio and 3 exits.

We invest in companies that have the potential for outsized climate and financial returns – for us, the two go hand in hand. Our portfolio companies need to scale in order to reach their climate impact potential; and if they do not offer commercial returns, their path to scale will be slower, more challenging, and potentially non-existent.

In our first-ever System Impact & ESG report, we make a pitstop on this journey to reflect on the impact of Systemiq Capital and our portfolio. We start with the foundational questions: Where can our investments create the biggest positive impact for the climate? What do we want to measure? How can we better support companies as they chart their own paths through this shifting world?

In writing this report, we sat down with senior leaders in our portfolio to hear their impact story. As always, we came away immensely proud and inspired by what they are achieving. If you want to learn how a two-year-old company delivered 90% of the world's engineered carbon removal credits last year, how bacteria are being trained to decarbonise the \$2 trillion-a-year chemical industry, or how hydrogen aviation is being brought from concept to reality, read on.

We hope you enjoy it.  
**Systemiq Capital Team**

# I Introduction

## ABOUT SYSTEMIQ CAPITAL

Systemiq Capital backs the best climate-tech founders and helps them to scale faster. We were spun out from Systemiq, the world's leading pure-play climate advisory firm: it partners with business, finance, policymakers and civil society to make economic systems truly sustainable and to meet the objectives of the Paris Agreement and the Sustainable Development Goals.

Systemiq has different vehicles to achieve its mission: advisory, coalition building, mobilising large-scale capital. Systemiq Capital extends this mission to venture capital, to ensure that emerging technologies can have the greatest positive impact for climate.

Fund I launched in 2018, and since then has deployed \$30m of capital towards leading climate-tech companies across four themes. We recently announced the launch of Fund II, which allows us to put more capital to work in this vital space.

## IMPACT & ESG AT SYSTEMIQ CAPITAL

To us, climate and biodiversity impact focuses on the outcomes and effects of a product or service that our portfolio companies produce.

### Impact

#### System Impact

Our impact approach begins with ensuring that we invest in companies operating in systems and sectors that have significant potential for climate and biodiversity impact.

#### Company Impact

During due diligence, we think carefully about whether the company can make a meaningful difference to that system and sector.

#### Impact KPIs

Upon investment, we work with the founders to agree a bespoke set of impact KPIs that they will report on annually, to track their progress towards realising their impact potential.

As we and our portfolio companies grow, we will be able to track the quantitative impact of portfolio companies over time. With all reporting and tracking, we are cognisant that we invest at an early stage in a founding team with a clear vision of the climate impact they plan to achieve. We want to help companies achieve that vision, which means measuring what is necessary but minimising any unnecessary reporting layers that could slow them down.

### ESG

In contrast to impact, ESG metrics are not designed to measure positive impact on the environment and society, but rather how well a company manages its environmental, social and governance risks and priorities. Where impact is outward-looking, ESG is inward-looking and focuses on how a company operates. Our next fund will be an Article 8 fund under EU SFDR and we will comply with the reporting and disclosure requirements as required.

## THIS REPORT

For this report, we interviewed our portfolio companies' Founders, CEOs, and senior leaders about how they think about impact and what they are doing around ESG.

Unless otherwise stated, all the data you see has come directly from the companies. We have agreed specific impact metrics with the companies we've invested in over the last year.

As always, we wanted this process to be supportive of our portfolio companies' growth, rather than an additional burden. We are not trying to rank companies on a scorecard or get them to maximise a specific KPI, but rather to understand their clear vision for climate impact and how we can support them in realising it.



## OUR BELIEFS AS CLIMATE-TECH INVESTORS

Our partnership with Systemiq gives us unparalleled access to leading analysis on how the world is responding to the climate emergency. These insights in turn have shaped our beliefs as investors seeking to maximise climate impact:

### 1. **Climate change is a system challenge.**

It's not just about energy, or even just about CO<sub>2</sub>. We believe the shifts needed to urgently address the climate crisis will affect every part of our lives: the food we eat, the way we move, and what we value.

### 2. **There are many paths to climate impact.**

Because climate change is a system challenge, it requires us to rethink most aspects of our economies and societies. From Apolitical – a leading training software provider for government – to ZeroAvia – a hydrogen aviation hardware pioneer – our investments in climate tech reflect our view of climate change as a complex problem that requires broad solutions.

### 3. **There is no climate without nature.**

The world's ecosystems are just as valuable as buffers for the greenhouse gases we emit as they are for inspiring the next generation of natural climate solutions. Companies in our portfolio such as NatureMetrics and Basecamp Research are pioneering the next era of data discovery in nature. By using this data to dramatically improve our understanding of nature's value, we can unlock new pools of capital for financing its protection.

### 4. **Nobody should go it alone.**

Success isn't just about a single company's growth – although that's where it starts! It's about building an ecosystem around our portfolio that can amplify success and accelerate action towards positive climate tipping points.

### 5. **"The next 1,000 unicorns will be businesses working on the green transition." The words of Blackrock CEO Larry Fink... and we agree.**

#### **The companies we invest in make it their business to improve the world.**

We reject the idea that there must be an 'impact vs returns' trade-off. We think it's just the opposite: start-ups tackling the climate crisis will be tomorrow's unicorns.

### OUR APPROACH TO SYSTEM CHANGE INVESTING

We see Systemiq Capital as an investment platform built around deep thought leadership combined with best-in-class practices on deal sourcing, investment decision-making, and portfolio management. Our ambition is to help build the field of system change investing which means:



# Fund highlights

## IMPACT

 **\$30m**  
invested in climate-positive companies

 **\$350m**  
of additional capital raised by portfolio companies

We're wary of trying to compare apples with oranges, so deliberately haven't tried to sum up a CO<sub>2</sub> impact across our portfolio. For more in-depth impact results, see our portfolio case study section.

Follow on / co-investors include:



andreessen.  
horowitz



LOWERCARBON  
CAPITAL

**Climate Innovation Fund**

2150



## ESG

### Environment

We have used a simple methodology to estimate our scope 1 and 2 emissions. These are lower than we anticipate them being next year as we emerge from the COVID pandemic and travel restrictions. Measuring our scope 3 emissions would require all portfolio companies to measure their environmental footprint. We have not asked Fund I companies to do this, but it will be part of the ESG requirements for Fund II companies.

2021 Emissions: 3,930 kgCO<sub>2</sub>/employee, or 23,500 kgCO<sub>2</sub> as a Fund.

To offset these emissions Systemiq Capital has purchased 25 tonnes of carbon credits from Envira Amazonia through StandForTrees. The project protects an exceptionally bio-diverse area of the Brazilian rainforest, where Systemiq has one of its country offices!

### Social

Systemiq Capital has been a female-run and led fund to date. We feel this has contributed to our ability to find and work with brilliant female founders. We are proud that 40% of our voting Investment Committee is female, along with 60% of our Investment team. 100% of our ExCo, who make decisions on the day-to-day running of the business, are women.

Even so, we recognise more remains to be done. As we grow, we will strive to maintain our gender balance, and improve on other forms of diversity, including race and socio-economic background. We see this as key to achieving our mission of system change.

### Governance

Our Board of Directors has four independent members who offer strategic guidance to the business.

# Portfolio highlights

## IMPACT



# 2.6m

tCO<sub>2</sub> savings  
(Cool Planet)



# 90%

of global engineered  
carbon removal  
delivered (Charm)



# 50m

kilometers driven on  
electric powertrains  
(BEDEO)



# 35

test flights of  
hydrogen-electric  
aircraft (ZeroAvia)



# World's largest

database of proteins  
derived from nature  
(Basecamp)

## ESG

Diversity – 40% of our portfolio companies have a female co-founder or CEO.

You can learn about the ESG initiatives our portfolio companies are undertaking in their respective case studies.



# Our investment themes

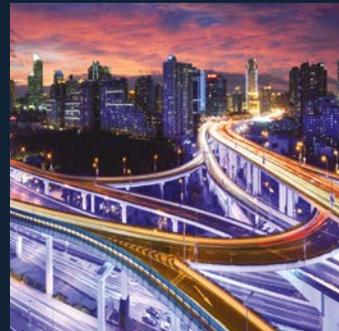
Our themes allow us to focus on the climate-critical sectors, while always keeping an eye on the broader system. Within each theme, we develop a view on where systems stand today, what's necessary to shift towards climate-positive economies, and which technologies can catalyse tipping points for these shifts. Our investments are always targeted towards these tipping points. The world never falls neatly into categories – especially through the eyes of entrepreneurs; many of our investments work across several themes at once.

## SYSTEMIQ CAPITAL INVESTS ACROSS FOUR AREAS:



# 1.

**Sustainable food and materials** – how goods are produced



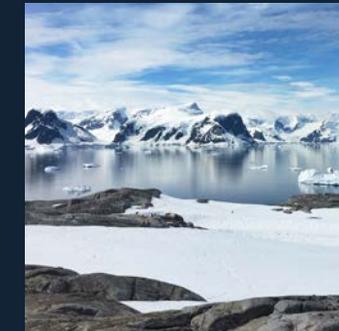
# 2.

**Clean transport** – how goods and people move around



# 3.

**Climate intelligence** – leveraging data for better capital allocation



# 4.

**Climate restoration** – how to rebalance the Earth's natural systems

# Our portfolio

SUSTAINABLE  
FOOD AND  
MATERIALS



BASECAMP  
RESEARCH



BRIMSTONE

CLEAN  
TRANSPORT



BEDDO



TRC

CLIMATE  
INTELLIGENCE  
AND FINANCE



apolitical



CLIMATE  
RESTORATION



— Exited investments

# Sustainable food and materials

The production of food and materials is a vast global enterprise that affects every part of our lives: the food we eat, the clothes we wear, the cities we build. Taken together, the production of food and hard-to-abate materials (including cement, steel, aluminium, plastics and chemicals) accounts for 24 gigatonnes, or over 60%, of CO<sub>2</sub> emissions annually and nearly all nature loss.<sup>3</sup> In the quest to feed, clothe, and house a population nearing 8 billion people, the world has increasingly relied on fossil fuels as both fuel and feedstock for global production systems. But along the way we forgot that nature already

has some of the best and most efficient builders on the planet.

From microbes to microprocessors, we believe innovations in biology, chemistry, and engineering will converge to shift the world from a paradigm of extractive, fossil fuel-based production of food and materials to one that is regenerative and circular. This new paradigm will emphasise working with nature's inherent capacity to build, rather than against it, in the process uncovering the true value of biodiversity in all its forms. It will also unlock new, climate-neutral, chemical and

manufacturing processes in the highest emitting industries, such as cement.

To complement these breakthrough technology innovations, we look for innovative business models, typically underpinned by AI, IoT and distributed ledger technologies. Leveraging these accelerates the shift away from traditional make-use-dispose value chains towards circular ones, therefore decoupling resource production from GDP growth.

We look for companies at the forefront of these shifts.



# Sustainable food and materials

COMPANY	FIRST INVESTMENT DATE	SUB-SYSTEM	SYSTEM CHALLENGE	SYSTEM CHANGE PROPOSITION
 <b>Circulor</b>	June 2020	Supply chain traceability	Opaque supply chains leading unmanaged climate and ESG risks	Tracking materials through supply chains using blockchain and digital twin technologies
<b>BASECAMP RESEARCH</b>	August 2021	Biodiversity and biotechnology	Unprecedented rates of nature and biodiversity loss from extractive industries	Platform for linking valuable proteins found in nature with biotech industry
 <b>MicroByre</b>	March 2022	Biotechnology and chemicals	Increasing reliance on fossil fuels as feedstock for the things we make	Finding and training bacteria to become the backbone of the bio-economy
 <b>BRIMSTONE</b>	March 2022	Cement and concrete	Decarbonising the 2+ gigatonne/year cement industry	A new process for cement production that is carbon neutral and produces the same end-product

# Pioneers of proof



## COMPANY OVERVIEW

Supply chains are often a black box: inputs go in, products come out, and there's typically no record of what's happened in between. Circulor's technology enables customers to create a digital chain of custody of their materials and track the physical flow from source all the way through the manufacturing process. It provides an immutable record of provenance, activity, emissions, and compliance. Circulor's mission is to enable industries using commodities in their products to reduce the impact on people and planet.



## FOUNDER INTERVIEW

**Doug Johnson-Poensgen**  
Circulor Founder and CEO

### **What climate impact do you aim to achieve? Are there other impacts outside of climate that you think about?**

"Because we make supply chains transparent and traceable, we think there will be huge impact for business, society and the planet from what we do. Being able to understand and manage supply chains – to ensure they meet ESG goals and reduce GHG emissions and to be fully in control of logistics and procurement – means that doing business 'better' can be integrated into every organisation. From efficiencies through to ensuring that there is no child labour, the more real-time visibility organisations have, the more they can ensure a better way of doing business – for everyone."

### **Are there broader trends supporting your success?**

"The whole world is beginning to understand the importance of supply

chains. From the dawn of the pandemic, supply chain fragility has become something that everyone is painfully aware of – from toilet roll shortages through to delays in factories and the Ever Given stuck in Suez. Sadly, even more recently the current geopolitical instability has meant that businesses are needing to understand their supply chains, the source of the materials used and the potential risks like never before."

### **What's it been like to work with Systemiq?**

"We've been collaborating with the Systemiq advisory team since 2020. Their analysis allowed us to better scope our market and refine our go-to-market strategy. Their ongoing advisory work helps corporates, and potential clients, learn what is possible today with supply chain traceability."

# Tracking lithium from source to product

## HOW IT WORKS



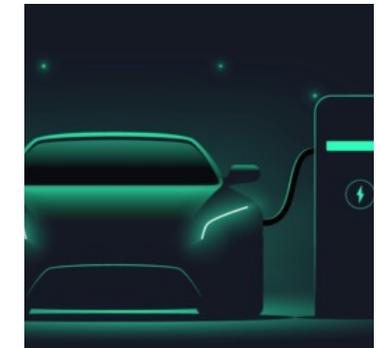
Upon extraction, Circular creates a digital twin for each kilogram of lithium, including how it was produced, where, and by whom

Circular tracks how the lithium is processed and any embedded GHG emissions



Processed lithium is followed on its journey through the supply chain using blockchain technology

Auto manufacturers are provided with full details of the provenance and embedded emissions of the lithium they source



A truly, verifiably, sustainable electric vehicle

# Bridging biodiversity and biotech

## BASECAMP RESEARCH

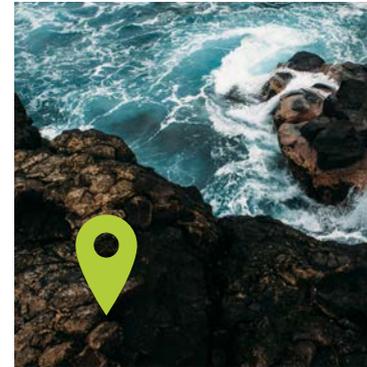
### COMPANY OVERVIEW

Basecamp Research brings nature's molecular recipes into biomanufacturing processes. In doing so, it will change the way we value nature.

Hidden away in the world, whether in a tropical rainforest or the arctic permafrost, is a treasure trove of genetic data. Basecamp's machine learning platform identifies and investigates proteins found in nature that can have huge potential for industrial application.

By linking these proteins to the ecosystems in which they are found, Basecamp helps build a bridge between those who protect biodiversity, and those who benefit from its use in our economy. Its mission is to use this bridge to create a new value chain for protecting nature, not destroying it.

### HOW IT WORKS



Sample collected here



Industry partners compensate the 'guardians of biodiversity' for the value that these nature-derived proteins create for their business

A novel protein is discovered in nature by Basecamp's on-the-ground partners

## BASECAMP RESEARCH

Basecamp's machine learning platform identifies potential uses for the protein for the biotech industry

## FOUNDER INTERVIEW

# Biodiversity standing up, not down

**What is Basecamp Research's mission?**

"We want to change the idea of the value of biodiversity, that it is more valuable when it standing up, or intact, than it is standing down. We do this by connecting the biotechnology industry with the places in nature that source the species and proteins they use for their business."

**How to you plan to achieve that mission?**

"We like to say we're building a graph network

with the language of life. What this means is basically we want to be able to run 'Google translate' on DNA data so that we can identify potential functions of proteins derived from nature and compensate those that are protecting it."

**What do you look for in mission-aligned investors?**

"There are lots of investors that back biotech companies, but very few that invest

for biodiversity and biodiversity impact. We wanted to work with Systemiq Capital because they recognise our impact potential and have the experience working internationally with Systemiq on biodiversity projects. For us that experience is invaluable as we begin to work with partners around the world."

**Oliver Vince & Glen Gowers**

Basecamp Research  
Co-founders

## COMPANY IMPACT



## 100k

Genetic samples taken to date



## 300

New species identified for industry



## \$500k

Returned for protecting nature



## 5

New publications in major scientific journals

**ESG at Basecamp**

All flights by Basecamp staff for field research are offset

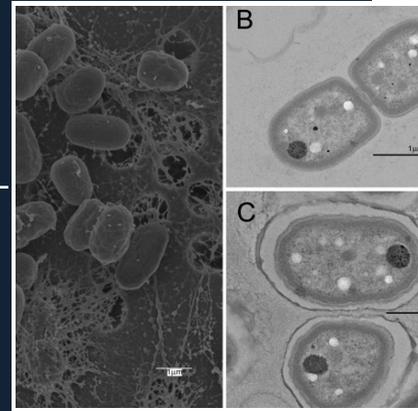
# Building with bacteria



## COMPANY OVERVIEW

MicroByre like to call themselves ‘germ wranglers’. They have made it their mission to find ways that bacteria can save the planet. Using advances in machine learning, robotics, and genetics, MicroByre have developed the world’s most advanced bacterial domestication platform, which can identify and ‘train’ new bacteria for industrial processes. Currently many of these processes use fossil fuels as feedstock, accounting for 2 gigatonnes of emissions annually.

**Take this bacteria** – one of MicroByre’s favourites! Using their platform they’ve uncovered its ability to turn dairy waste into a precursor of acrylic acid, an important chemical used in everything from plastics to diapers. The discovery promises to not only eliminate fossil fuels from the production of acrylic acid, but also make use of dairy waste that would otherwise produce harmful methane emissions.



## FOUNDER INTERVIEW

We sat down with **Sarah Richardson**, MicroByre’s Founder and CEO, to discuss what MicroByre does and its impact

### Can you explain in your words what MicroByre does?

“Most functions on the planet are ruled by bacteria, yet there has been very little technological advancement around using novel bacteria. Bacteria that are used at scale tend not to be engineerable, while those that are engineerable aren’t used at scale. MicroByre has set out to solve this problem by building the world’s most advanced bacterial domestication platform. Our mission is to bring many many more bacteria into the industrial fold and ‘outcompete’ fossil-fuel feedstocks.”

### What impact do you see MicroByre having over the next five years? Ten years?

“We want to change the way biotechnology is practiced. MicroByre offers more space, more tools, more possibility, and more power to any business in the biomass space. Whether it’s because you couldn’t grow the bacteria, couldn’t engineer it, or you didn’t know it existed, MicroByre can solve for these challenges. In the process we can offer a better bottom line for businesses and better outcomes for the planet. Fossil fuels are increasingly used to make chemicals and materials, using our platform we want to take petroleum out of the picture and enable the use of ‘waste’ biomass feedstocks to build with bacteria.”

### What challenges have you faced as your company has grown?

“The world has certain perceptions about what bacteria are and what they do, and many don’t understand what a fundamental role bacteria play in our lives. Our foremost challenge is to change this perception. We’re also not the first company to say ‘bacteria are the answer’. It’s on us to prove how MicroByre is different than other biotech companies on the market, and our initial results are beginning to do that.”

### What’s it like to work at MicroByre?

“I like to imagine I’m building a spaceship and the MicroByre team is the crew. I know the spaceship is going to grow in weird and wonderful ways and my

job is to set the course and create an ecosystem onboard that allows my crew to thrive. We’ve set out a code of conduct based on mutual respect and intellectual rigor as the basis for that ecosystem. We invest into the training and development of our employees – my goal is that anyone leaving MicroByre does so better off than they arrived.”

### How has Systemiq Capital been helpful to your ambitions?

“We were looking for investors with the knowledge to look at MicroByre and say ‘this is different’, and the experience to help us learn from the mistakes of others and connect us with the right people to grow. Systemiq Capital have brought that and have a shared vision of system change that aligns with our own.”



**The world is ruled by bacteria. But we haven’t discovered even a fraction of what bacteria can do for our industries and society. MicroByre has set out to change that.**

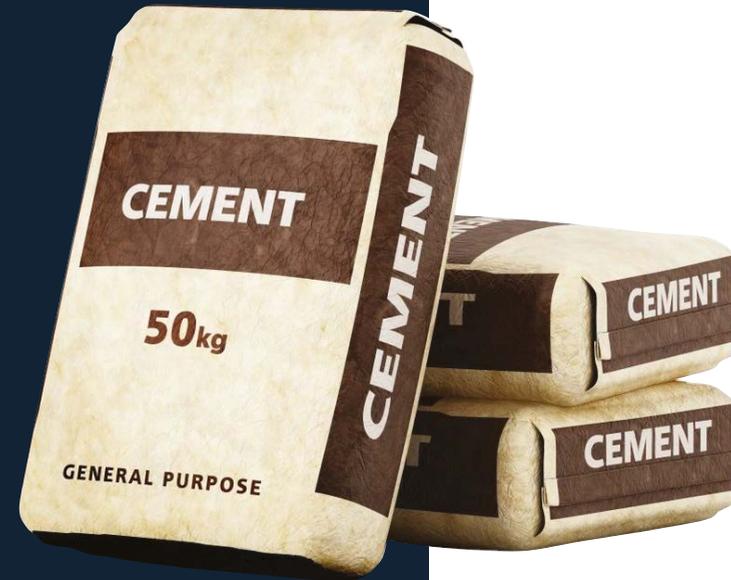
**Sarah Richardson**

MicroByre Founder & CEO

**ESG at  
MicroByre**

All of biologists and chemists at MicroByre are trained in Python, and all of the coders learn biology!

# Zero-carbon cement



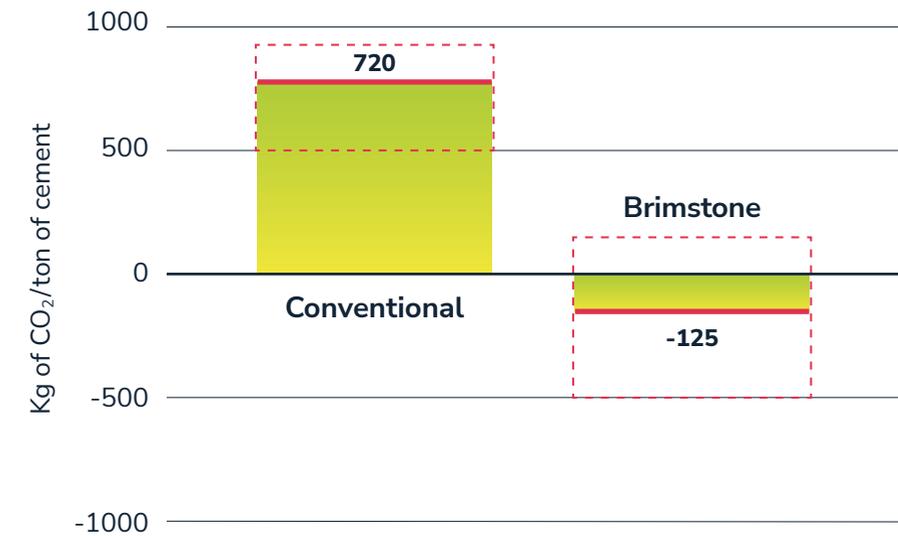
## COMPANY OVERVIEW

Brimstone's mission in two words: decarbonise cement. It may sound simple, but in reality it involves transforming a \$1tn industry responsible for 7% of global CO<sub>2</sub> emissions.<sup>4</sup> Brimstone has developed a process for producing carbon-neutral ordinary portland cement using calcium silicate – one of the most abundant rocks in the Earth's crust. The technology eliminates all process emissions from cement production, can be done at lower cost than conventional cement, and creates by-products that drawdown CO<sub>2</sub>, all while producing the exact same end product.

## COMPANY IMPACT

### Carbon emissions per tonne of cement

Fuel used:  
  Coal  
  Natural Gas  
  Clean energy



Depending on the fuel used, Brimstone's patented process for producing cement is carbon-neutral or even negative. They plan to pilot their first production facility by 2023.

### ESG at Brimstone

At their production facilities, Brimstone have a target to employ 80% of the workforce from local communities

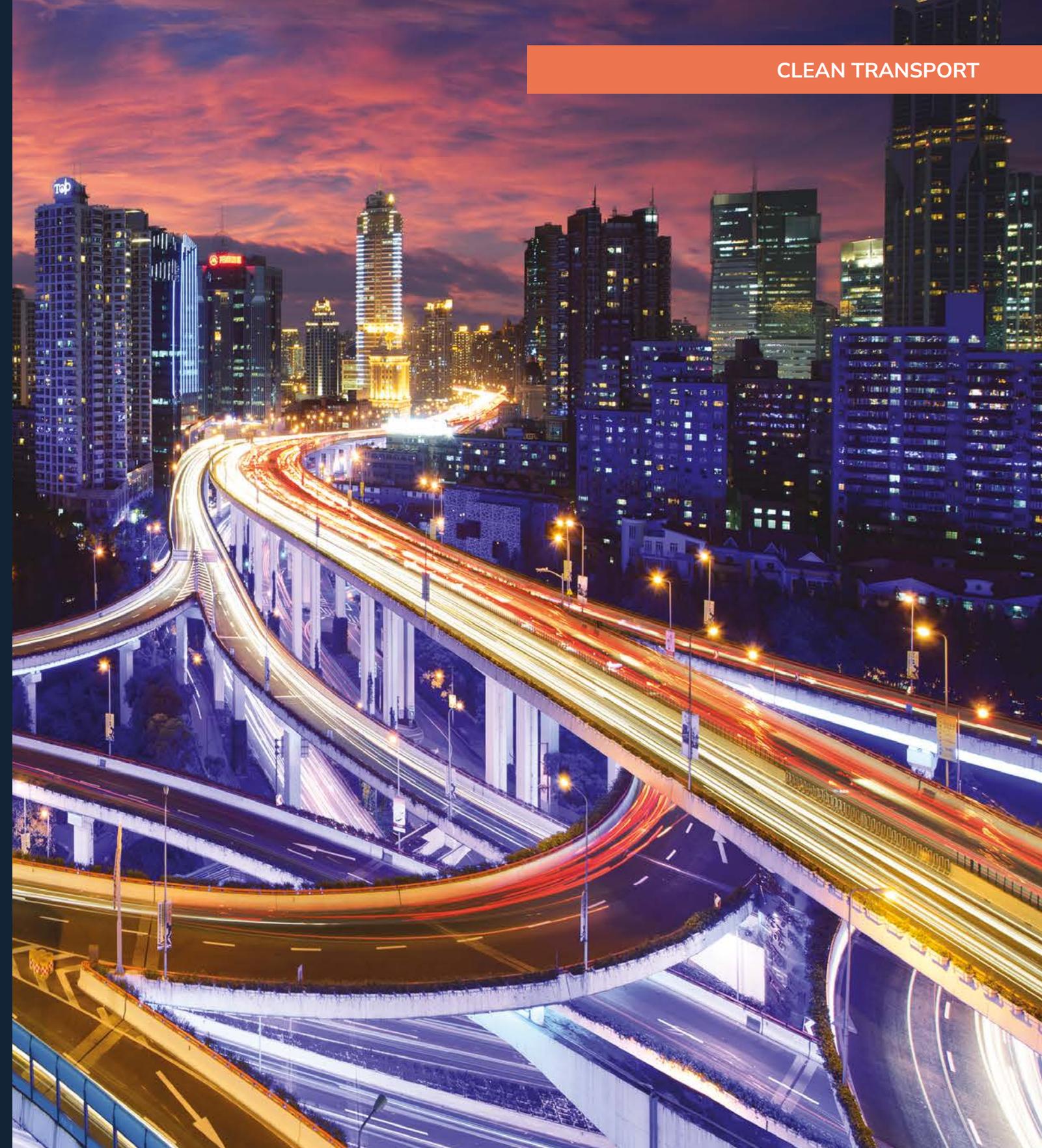
# Clean transport

Today we remain stuck in century-old constructs for transport. On the road, cars are used less than 5% of the time, carry 1.2 people per trip, and are (mostly) powered by inefficient internal combustion engines. By sea, ships rely on a single data point per day to determine their route and speed, often leading them to 'hurry up to wait'. In the skies, it's hard to imagine a fossil-free future for planes. Taken together, the transportation sector accounts for nearly one-third of all emissions globally.

Recent advances in electric vehicle technology have begun to change the way we move, but much more needs to be done to build a transport system

fit for the future. Shared mobility will shift us from a 'one car, one household' model to one that can match the best transport option to every journey. Advances in AI-powered routing and vessel optimisation will accelerate decarbonisation of shipping. Direct and indirect electrification technologies (like hydrogen fuel cells) will unlock truly climate-friendly fuel sources for the 'hardest-to-abate' sectors. We have companies across our portfolio proving these solutions are possible.

Within the transportation sector we invest in companies enabling a shared mobility system, and those directly tackling decarbonisation in the 'hardest-to-abate' sectors.



# Clean transport

COMPANY	FIRST INVESTMENT DATE	SUB-SYSTEM	SYSTEM CHALLENGE	SYSTEM CHANGE PROPOSITION
 <b>ZEROAVIA</b>	July 2019	Hydrogen aviation	Bending the curve for the world's fastest growing source of emissions: aviation	Developing world's first zero-emission aviation powertrain using hydrogen-electric power
<b>BEDDO</b>	December 2020	Electric vehicles	Massive increase in pollution and emissions from last-mile delivery	Bespoke design and manufacture for light commercial vehicles, including retrofit
	December 2021	Electric vehicles and smart charging	Uptake of electric vehicles slowed by challenges of home charging	Cheaper, more efficient home charging using smart charging software + hardware
 <b>NAUTILUS LABS</b>	January 2022	Ocean transport	Inefficient use of data in global shipping industry for vessel routing	Data-enabled decision-making platform for ocean transport
<b><u>THE ROUTING COMPANY</u></b>	March 2022	Public transport	Public transport systems relying on decades-old, inefficient routes	Advanced routing algorithm for public transport to enable more convenient, dynamic routes

# World's first practical zero-emission aviation powertrain



## COMPANY OVERVIEW

ZeroAvia has developed the world's first true zero emission aviation powertrain using hydrogen-electric fuel cell technology. In contrast to conventional turbines, their powertrain is emission-free, quieter, and doesn't pollute city skies.

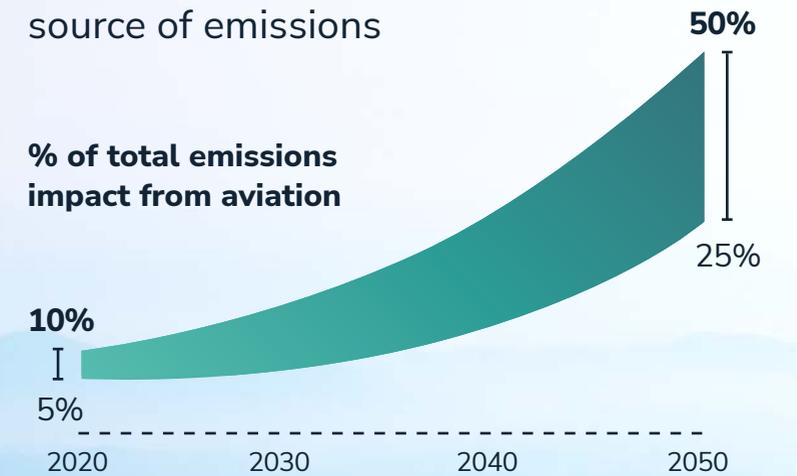
ZeroAvia's planes have already completed 35 test flights using hydrogen-electric powertrains, and the company is on a path to scaling this to commercial flights by 2024.



## INDUSTRY OVERVIEW

### Aviation

The world's fastest growing source of emissions



# 2.5%

Aviation accounts for 2.5% of global CO<sub>2</sub> emissions today<sup>5</sup>

# 25% by 2050

With fewer options to decarbonise than other sectors, this could grow to 25% or more by 2050



Recent studies have begun to uncover the harmful nature of non-CO<sub>2</sub> emissions at altitude (like nitrogen oxides and water vapour)

Aviation emissions are between twice and four times as bad for the climate as emissions at ground level

COMPANY IMPACT

**Zero is in the name**

ZeroAvia’s hydrogen-electric engines will allow aircraft to fly with no tailpipe emissions. They are particularly suited to short distances and with improvements in energy density, ZeroAvia believes they will play a significant role in long-haul flight too. If powered by green hydrogen, the system can reduce the climate impact of aviation by 95%.

TRADITIONAL TURBINE JET



CO<sub>2</sub>/passenger km<sup>6</sup>

‘SUSTAINABLE’ AVIATION FUEL



CO<sub>2</sub>/passenger km

ZEROAVIA-POWERED HYDROGEN



CO<sub>2</sub>/passenger km



**“By 2030, ZeroAvia’s hydrogen-electric powertrains will be able to replace turbines that account for 50% of fuel use in aviation.”**

**Valery Miftakhov**  
ZeroAvia Founder & CEO

**ZeroAvia will save 1.0Gt CO<sub>2</sub>e by 2040**



Year	2024	2026	2030	2035	2040
Image					
Capacity	• 10-20 seats	• 40-80 seats	• 100-200 seats	• 200 seats	• 200+ seats
Range	• 300 NM range	• 1,000 NM range	• 2,000 NM range	• 3,000 NM range	• 5,000 NM range

**ESG at ZeroAvia**

Employees at ZeroAvia get access to the company’s EV car scheme, and can even fill up their hydrogen cars at their test facilities!

# Electrified transport, delivered

# BEDEO

## COMPANY OVERVIEW

'Build Electric, Drive Electric, 0 emissions' – this is BEDEO. They are a leading developer and manufacturer of electrified light commercial vehicles. Whether it's delivery vans, passenger buses, or even their latest venture into ships, BEDEO's proprietary electric powertrains are already powering over 1,000 vehicles. BEDEO is now poised to roll out revolutionary new technology that will enable easy retrofit of internal combustion vehicles to electric, addressing a major gap in tackling emissions from legacy car fleets.



## INDUSTRY OVERVIEW

### The delivery van

It has become a ubiquitous sight in our cities with the rise of e-commerce. But it's also a major source of emissions and pollution.

# 35<sub>m</sub>

Today there are some 35 million light commercial vehicles in Europe alone



99% of which still use internal combustion engines

That  
needs to  
change,  
and fast.



## FROM THE FOUNDER

**“We don’t believe in impact because it’s sexy or ‘nice’ to do. We are a decade-old, family-run business with impact & ESG in our DNA.”**

**Osman Boyner**  
BEDEO Founder & CEO

## COMPANY IMPACT

**50** **x** **180** **=** **9k**  
**million** **grams CO<sub>2</sub>** **tonnes**

Kilometers  
already traveled  
by BEDEO vehicles

Per-kilometer emissions  
difference between BEDEO  
vehicles and conventional LCVs<sup>7</sup>

Of CO<sub>2</sub> saved by  
BEDEO vehicles

**ESG at  
BEDEO**

All workers at BEDEO’s international production facilities get access to sponsored English language lessons

# Enabling fast adoption of EVs



## COMPANY OVERVIEW

Ohme provides smart charging solutions that enable the fast adoption of electric vehicles. With smart hardware and software, and relentless attention to providing a seamless customer experience, it simplifies the charging experience from end to end. It also reduces cost of the charge and the CO<sub>2</sub> involved, making Ohme’s solution the cheapest and most sustainable way to charge a vehicle. Its intelligent technology integrates with customers’ energy tariffs so they can charge at the cheapest time.

## COMPANY IMPACT

**Once a month, Ohme users pay “negative prices” to charge their cars. Meaning they are paid to top up!**



and



can be saved when customers can charge at non-peak times

### ESG at Ohme

All Ohme staff have access to mental health support services

# Enabling a carbon-free shipping future



NAUTILUS LABS

## COMPANY OVERVIEW

Nautilus Labs has developed a 'single source of truth' platform for ship owners and operators to dramatically improve the efficiency of ocean transport. Combining proprietary vessel-specific machine learning models with meteorological data, oceanographic conditions, market rates and customer preferences, Nautilus optimises route and speed, leading to measurable cost savings and carbon reduction for the shipping industry.



## INDUSTRY OVERVIEW

**Over 50,000 ships help to run the global economy**

Shipping is one of the oldest and most important industries for global growth, yet has been one of the slowest to use data and new technologies to improve its efficiency and reduce emissions. Today, shipping accounts for around 3% of global man-made emissions.<sup>8</sup> Nautilus's technology could reduce this by up to 30%, by taking a data-driven approach to voyage optimisation.

## COMPANY IMPACT

**It starts with one voyage**

Nautilus Labs analysed a single voyage that used their technology. The impacts were astounding.

Yearly impact:

**5,376**<sub>MT</sub> or **1,169**  
CO<sub>2</sub> savings cars off the road

Voyage from Australia to Asia:

<b>29</b>	<b>144</b> <sub>MT</sub>	<b>\$56</b> <sub>K</sub>	<b>448</b> <sub>MT</sub>
days	fuel savings	profit uplift	CO <sub>2</sub> saved

**= 15 tonnes / day**

FROM THE CEO



**“In Systemiq we saw an investor whose vision for system change in the shipping industry aligned with our own, and who were engaged with major stakeholders in this space to help us execute on this vision.”**

**Matt Heider**  
Nautilus Labs CEO

**ESG at Nautilus**

Every year the Nautilus team run a yearly fundraiser to support the ISWAN (International Seafarers' Welfare and Assistance) foundation

# A-to-B, seamlessly

## THE ROUTING COMPANY

### COMPANY OVERVIEW

Most of us are familiar with the sight of an empty bus driving along its route, still running despite having no passengers to pick up. The Routing Company saw this and spotted an opportunity. What if the bus goes only where it needs to, when it needs to? A straightforward idea, but with huge potential to take cars off the road, cut transport emissions, improve access to public services, and ultimately create more livable, breathable cities. Developed at MIT and being deployed by ex-Uber executives, TRC's superior routing algorithm has shown that this is possible.

### COMPANY IMPACT

7x

The Routing Company's algorithm can reduce the number of public transport vehicles needed on city streets by 7x

efficient and  
profitable

Transit operators deliver more efficient and profitable services

more  
convenient

Riders get more convenient and equitable transport to where they want to go

quieter & less  
polluted

City streets are quieter and less polluted, freeing up space for creating more livable cities

## COMPANY IMPACT



**The role of technology in this ‘bus on demand’ project, and more broadly any project aimed at improving the lives and well-being of our citizens, is absolutely fundamental and essential.**

**Rosa Gili Casals**  
Mayor of Escaldes-Engordany

In 2021 The Routing Company rolled out its on demand public transport platform in a parish in Andorra, which has few alternatives to private cars. 10% of the population in Escaldes-Engordany now use TRC’s offering once a week, leading to a reduction in the number of driver’s licenses registered in the parish.

### SOME OF TRC’S OVERALL IMPACT FIGURES INCLUDE:

**+130k** passengers moved

20% of riders take **1 trip every 3 days**

## FROM THE FOUNDER



**“Often time when we talk about solutions that are more environmentally friendly, there is a concession to be made on convenience. Our approach is to create climate impact through convenience.”**

**Menno Van Der Zee**  
The Routing Company Co-founder

### ESG at TRC

As lovers of public transport, TRC reimburse their employees for any public transit used for their commutes

# Climate intelligence and finance

How will global warming affect my business's supply chain? Does the way my pension is being invested reflect my values as a climate-concerned citizen? Is my neighbourhood safe from increased risk of flooding as weather patterns shift? These are some of the questions we will increasingly need to ask ourselves as the world grapples with and adapts to the implications of climate change. What we do know, and the IPCC's latest climate report makes clear, is that the impacts are no longer long-term 'what-ifs'; they are on our doorstep now.

We have built a world that assumes a stable climate. Timely, reliable and accurate information about how climate is changing has never been more important. Climate intelligence, will shape investment decisions and policy actions, and allow businesses and consumers to navigate the climate crisis. Climate intelligence companies collect, aggregate, and/or process data sources to enable radical supply chain transparency, climate risk assessments, or true measures of what impact and ESG mean. As this happens 'sustainability' or 'environment'

will no longer be solely the purview of sustainability departments, but fully integrated within managerial decisions. Leading providers of climate intelligence are already emerging, spurred by companies worth over \$25 trillion<sup>9</sup> combined having committed to disclosing their climate-related risks.

The climate crisis poses difficult questions about how to operate in a changing world. We believe it's critical to support companies finding the answers.

# Climate intelligence and finance

COMPANY	FIRST INVESTMENT DATE	SUB-SYSTEM	SYSTEM CHALLENGE	SYSTEM CHANGE PROPOSITION
 CoolPlanet	November 2019	Energy efficiency	The world's highest emitting businesses have the most difficult path to net-zero	Integrated software platform to improve energy efficiency, manage and reduce emissions for business
 JUPITER	June 2020	Climate risk analytics	Trillions of dollars of assets at risk due to physical changes in climate	Forecasting of physical climate risks across seven perils and at portfolio or asset level
 apolitical	October 2021	Climate policy	Governments set the course on climate action, yet often lack latest training tools	Training and knowledge sharing platform for governments to

# Bringing clarity to climate



## COMPANY OVERVIEW

Even for the most ambitious companies, decarbonising can be a challenging task. Cool Planet Group has created a one-stop software platform for companies to tackle net zero. This platform combines leading energy efficiency tools with carbon accounting and reporting software to provide an integrated solution for decarbonization.

## COMPANY IMPACT

Businesses with big supply chains have a mammoth task to reach net-zero. Cool Planet has developed the tools and expertise to get them there.

**Working with some of the hardest-to-abate sectors, Cool Planet has helped customers save:**



**2.6m**  
Tonnes of CO<sub>2</sub>



**8.8bn**  
kWh of electricity



**\$400m**  
In energy bills



**21%**  
Reduction in energy use

### ESG at Cool Planet

In 2019, Cool Planet created the 'Cool Planet Experience' to educate kids and families how cool climate tech can be. Think Disneyland for sustainability!

# Putting a price on climate change



## COMPANY OVERVIEW

Flood, wind, heat, cold, wildfire, drought and hail: seven perils with dramatic impacts on businesses, supply chains, portfolios, and people. With climate change the risk of these perils is both increasing and moving like never before. Combining the world's most advanced climate models with machine learning, land use, and elevation data, Jupiter Intelligence models these perils across the globe. Their ClimateScore platform forecasts the impact of different climate change scenarios, giving their customers vital information on physical climate risk that helps them plan to protect their assets.

## INDUSTRY OVERVIEW

### A global economy at risk



#### of companies

in the S&P 500, worth a combined \$18 trillion<sup>13</sup>, hold assets at high risk of physical climate change impacts.

Industries, finance & insurance providers, and governments all need accurate and reliable information about the climate risk exposure of their assets in order to make informed decisions on how to manage these risks. Jupiter's ClimateScore platform provides this information across 7 climate-related perils, and can be scaled to forecast the impacts of climate across entire economies, portfolios or individual assets.

# Transforming 21st century governments **apolitical**

## COMPANY OVERVIEW

Government and policy makers play a critical role in system change. We know this to be true on climate and across other issues from diversity and inclusion to the impact of technology. Public servants need knowledge, skills and connections to develop and implement impactful policy. However, they are chronically underserved by innovation. Apolitical, a social learning platform for government with a mission to help build 21<sup>st</sup> century governments that work for people and the planet, is out to change this. They equip policymakers with the knowledge, skills, and community they need to solve the world's hardest challenges. Apolitical has an engaged and growing community of more than 180,000+ verified public servants and policymakers in more than 160 countries, with members ranging from mayors, ministers, and heads of civil services to policy pioneers and digital disruptors.

## INDUSTRY OVERVIEW

### The role of government in numbers

**40%**

Proportion of global  
GDP directly controlled  
by government

**200m<sup>10</sup>**

People work in civil  
service worldwide

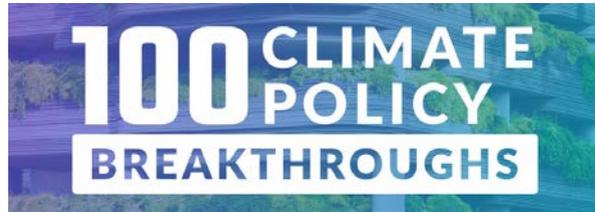
**\$3.5 trillion  
per year<sup>11</sup>**

The estimated value  
unlocked by governments  
implementing 'best in  
class' policies

**\$3.5 trillion  
per year<sup>12</sup>**

Also the estimated  
global cost of the  
clean transition

## COMPANY IMPACT



### **Apolitical is already driving government action on climate.**

Their list of the top 100 climate policy breakthroughs in the world was used by one European country to review and adapt its national climate strategy to incorporate the most impactful policies. Their Sustainable Finance course with the Oxford University has been taken by public servants from 84 countries, with the knowledge already applied in countries ranging from Canada to Mongolia.

Apolitical is launching a **Government Climate Action Accelerator** with a target to **upskill 50,000 public servants** in countries with the highest impact on **cutting emissions by 50% this decade.**

**And the results are already promising:**

# 166k

Monthly active members



Of users say using the platform makes them more effective at their job

### **Partners**

Apolitical is a **preferred supplier for government learning in the UK and Canada**, and have partnerships with public service schools globally. Other partners include foundations like the **Bill and Melinda Gates Foundation**, corporations like the **AWS Institute** and academic institutions like the **Oxford University**.

## FROM THE FOUNDER



**“Government’s stated purpose is to serve society. If you make it your mission to make governments more effective, you have an elegant thread through to impact.”**

**Robyn Scott**  
Apolitical Founder & CEO

### **ESG at Apolitical**

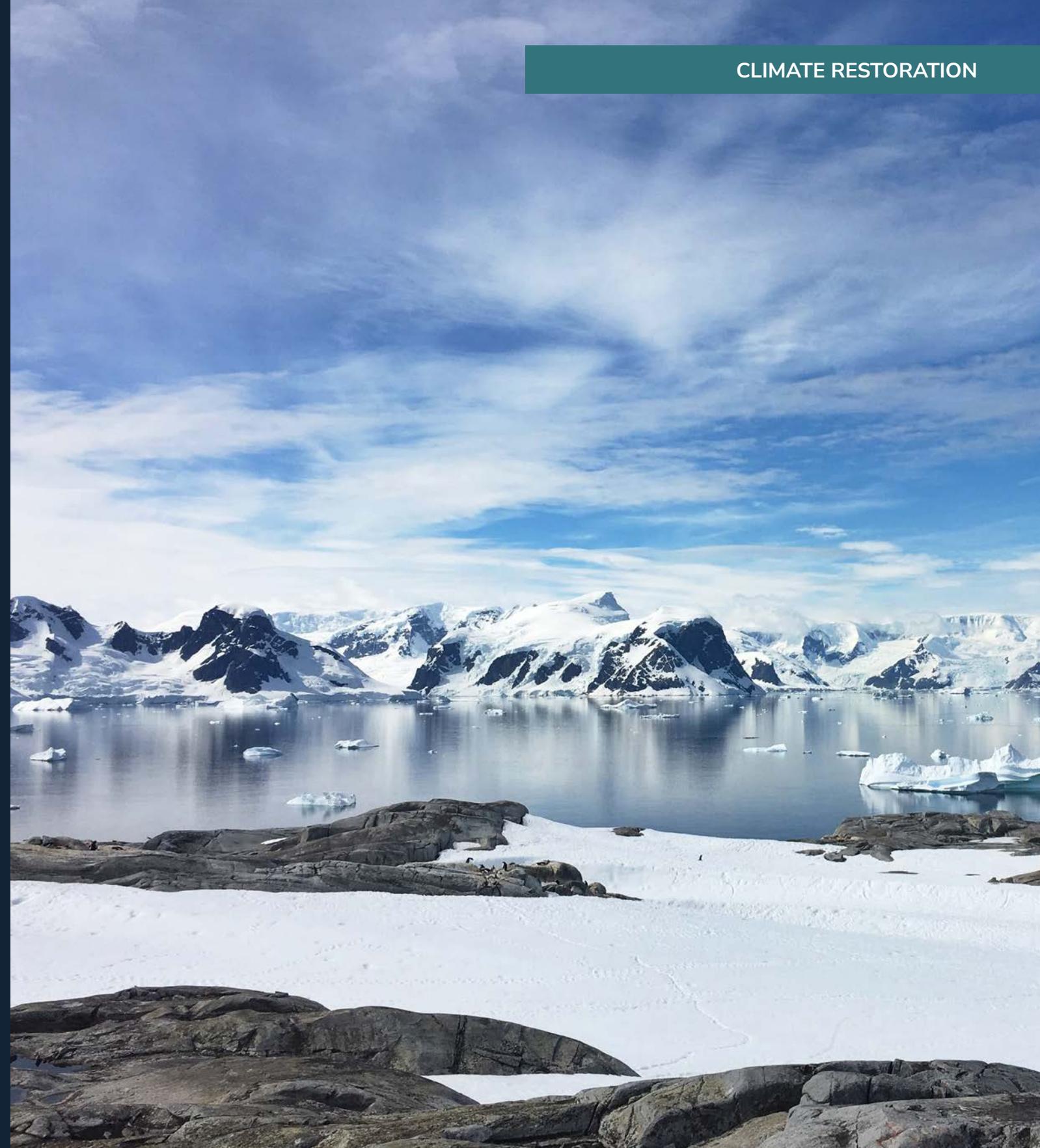
As training technology provider, Apolitical have also made sure their staff have access to sponsored training and development tools. They are also a certified B-Corp.

# Climate restoration

Climate restoration is about investing in the tools we need to deploy to rebalance the Earth's systems by removing greenhouse gases from the atmosphere and oceans, while mapping global biodiversity and properly valuing it as the crucial asset that it is. Even under the most ambitious climate change mitigation scenarios, we are going to overshoot our carbon budget to limit global warming to 1.5C. According to the Energy Transitions Commission, alongside rapid and deep decarbonisation across energy, transport, agriculture and industry, the world is going to need to deploy an estimated 70 – 220 gigatonnes of carbon dioxide removals by 2050 to avoid the worst impacts of climate change. At its peak, the carbon dioxide removal industry

will need to reach around 10 gigatonnes per year, comparable to the size the entire oil industry today.

This is no mean feat, especially considering total engineered CO<sub>2</sub> removal in 2021 amounted to less than 0.001% of the capacity required.<sup>14</sup> We believe climate restoration will happen both in forests and in labs, and that fixing the climate and biodiversity crises are two joint and interdependent endeavours. We support companies that are uncovering the value of nature, and those developing and scaling new technologies for greenhouse gas removal.



# Climate restoration

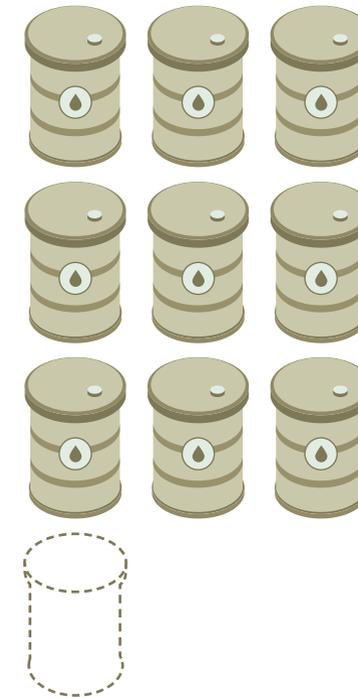
COMPANY	FIRST INVESTMENT DATE	SUB-SYSTEM	SYSTEM CHALLENGE	SYSTEM CHANGE PROPOSITION
	May 2021	Engineered carbon removals	The world will overshoot 1.5C carbon budget and removal solutions lack scale	Permanent, scalable carbon removals via pyrolysis and storage of biomass into bio-oil
	May 2021	Biodiversity data and analytics	Expensive and difficult to accurately measure biodiversity, leading to nature loss	Next-generation biodiversity monitoring and metrics using DNA sequencing

# Planetary scale carbon removal



## COMPANY OVERVIEW

Charm puts (bio)oil back in the ground, forever. The company has developed a process for converting carbon from waste biomass into stable, carbon-rich liquid called bio-oil that can be injected deep underground, permanently removing it from the atmosphere. This represents a massive leap forward for carbon removal technology. They are now also exploring using the bio-oil as a replacement for the natural gas used in steel production, which has the potential to decarbonise the entire steel industry.



## COMPANY IMPACT

**5,451** Tonnes

carbon removal contracted in second year of operation

## Representing

**90%**

of all permanent carbon removals delivered in the global market

## ESG at Charm

Moving forward, Charm will be able to offset their own carbon emissions as a company with the removals they produce

# True biodiversity measurement



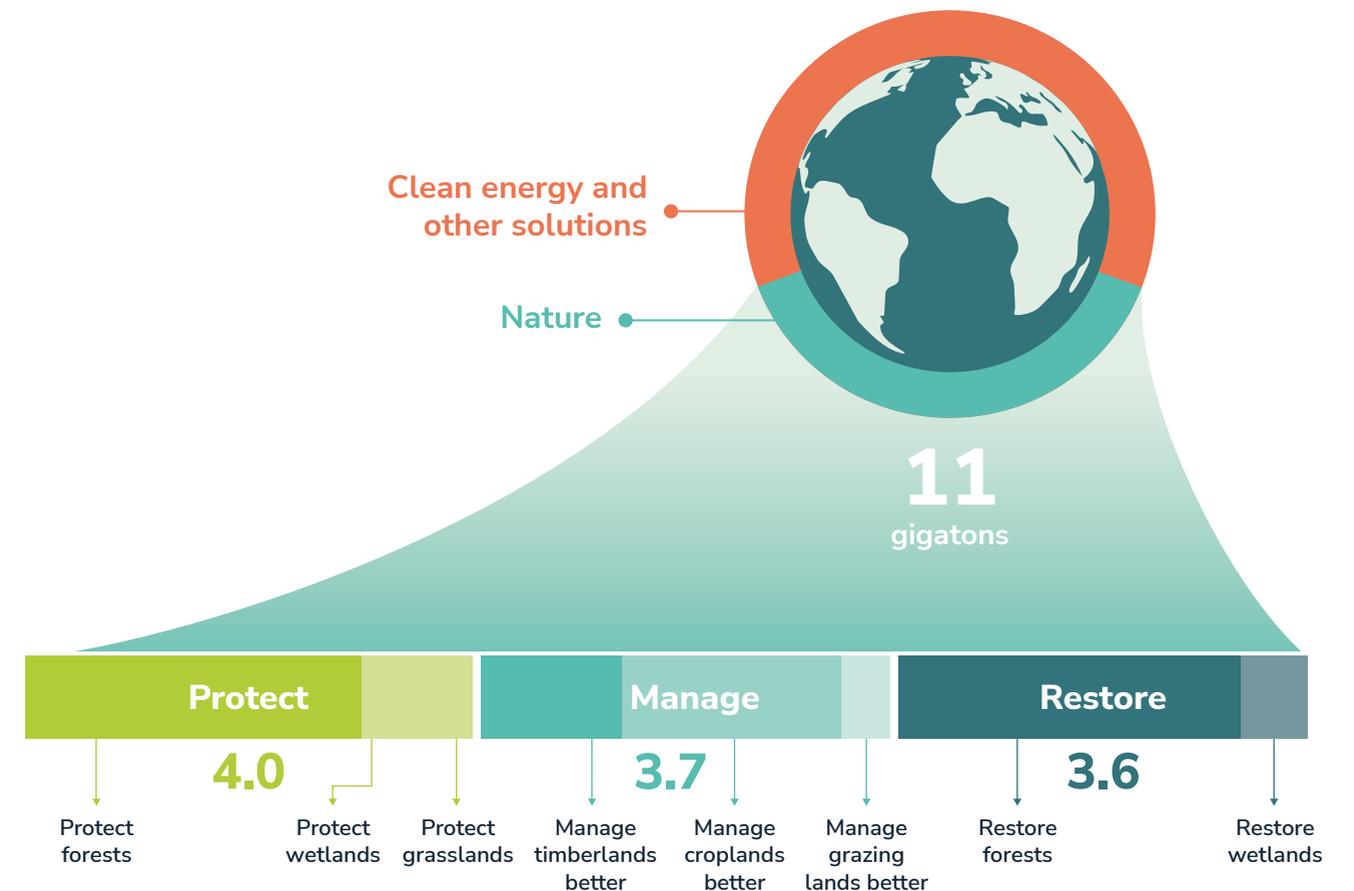
## COMPANY OVERVIEW

As the old adage goes, you can't manage what you don't measure. For decades this has been the case for ecosystems and biodiversity. NatureMetrics is transforming the way we collect and use biodiversity data. Its eDNA technology works by identifying genetic material – a 'fingerprint' specific to each species – left behind by animals and organisms as they interact with their environment. Samples taken from water, sediment or soil are sequenced and compared with reference libraries, through a process called 'metabarcoding', identifying which species they come from. Unlike conventional methods of surveying biodiversity, eDNA can identify hundreds of species from different taxonomic groups from a single sample, while being quicker and safer to undertake in the field.

## INDUSTRY OVERVIEW

Nature accounts for more than one-third of the climate mitigation potential we need to tap if we're to make it to net-zero.

Climate is underpinned by nature, and nature is underpinned by biodiversity. Until now, we have lacked a standardised and scalable methodology for biodiversity measurement, leaving most industries in the dark as to what their impact on nature is.



HOW IT WORKS

# From biodiversity monitoring to nature intelligence at scale

**Before NatureMetrics**

- Site level species analysis by catching and counting
- Labour and time intensive
- Data unusable for most industries

**What NatureMetrics can do today**

- Site-level species composition using eDNA
- Detect endangered or protected species
- Rapidly deployable with small field presence

**What NatureMetrics' advanced analytics will do in the future**

- Landscape-level view of biodiversity composition
- Overall metrics for ecosystem health and trend over time
- Links to industry and financial flows impact on nature
- Integrate biodiversity impact into climate change outcomes



FROM THE FOUNDER

**“Working with Systemiq Capital has helped us open leads and get us speaking to the right people who are at the forefront of shaping the Nature-Based Solutions agenda. Moving forward, we look forward to working together on developing the right impact metrics for our business and our mission of developing biodiversity intelligence at scale.”**

**Kat Bruce**  
NatureMetrics Co-founder

**ESG at NatureMetrics**

NatureMetrics have committed to become net-zero by 2025

# Reflecting on our impact journey

Writing this report – and speaking to the climate-tech entrepreneurs we’ve invested in – taught us a lot. We learned more about what it takes to be successful working in climate tech, what we can do as an investor to support companies in the right places, and when to tell them “You’ve got this” in others. This process will always evolve; here’s some of what we learned this time:

## 1.

**Climate impact is unique to a company and its mission.**

Even seemingly similar start-ups will have very different impact trajectories. As a VC investor, we should help them achieve their mission, without putting a box around them.

## 2.

**Successful climate-tech companies bake impact into their business model.**

We asked the senior leaders of our portfolio companies if it’s a struggle to align commercial and climate impact goals. The unanimous answer: no. In fact, they’ve built their companies so that these always go hand in hand. In other words, scalable impact by design not as an after-thought.

## 3.

**Reporting should be in the service of impact, not vice versa.**

More collaboration is needed between climate-tech start-ups and VCs to define useful impact KPIs and broaden how we think about climate impact beyond just CO<sub>2</sub>. Over-generalising can lead to funds trying to compare apples and oranges with the same metrics.

## 4.

**ESG at small companies starts with getting the culture right.**

Policies are only as good as the collective will to implement them. Most senior leaders we spoke to stressed the importance of, for example, creating an inclusive working culture and then formalising their culture into policies as the company grows.

SYSTEMIQ CAPITAL: SYSTEM IMPACT REPORT 2022

# Looking ahead

Investing in climate tech makes us both optimistic about the future of our planet, and fully aware of all the hard work that needs to be done. We're encouraged by the unprecedented growth in the number of companies and the amount of capital devoted to climate tech: in the first half of 2021, over \$60 billion of funding went to more than 600 climate-tech start-ups, a 200% increase over the same period in 2020.<sup>15</sup> There are now 78 climate-tech unicorns (and counting).

But we don't underestimate the task ahead. The shifts that we believe are necessary for each of our investment themes must be unprecedented in both speed and scale. Yet where previously they might have been unimaginable, now we can picture each one. A food and material system that fully embraces working with biology and harnesses

the latest innovations in manufacturing and chemistry. A transport system that rapidly shifts towards electrification and shared mobility, while unlocking new fuel sources for hard-to-abate sectors. Climate intelligence that shines a light on all the 'unknown unknowns' and supports better decision making. Climate restoration to protect us and the ecosystems we depend on from the consequences of inevitable overshoot of our carbon budget.

In each of our investment themes there will need to be hundreds of entrepreneurs tackling the many challenges of the climate crisis. They will need the help of mission-aligned investors with the vision to understand their potential and the conviction to support them through what's sure to be a bumpy road.

As we grow as a Fund, so will our impact & ESG reporting: this report is just the foundation on which we will build. We will work with our portfolio to refine our impact KPIs to suit their mission and path, and navigate the reporting and disclosure required of an Article 8 fund. This will prove valuable to our companies as they prepare to bring on new investors at growth stage.

---

**The systems we work for can't wait, and neither can we. We look forward to sharing our progress with you in the next edition.**

---

# Acknowledgements

## Authors and Editors:

Karl Fletcher, Associate, Systemiq

Jessica Stewart, COO, Systemiq Capital

## Warm thanks to Systemiq Capital Portfolio Company Interviewees

**Robyn Scott** Apolitical

**Oliver Vince & Glen Gowers** Basecamp Research

**Osman Boyner & Gijs Vokamp** BEDEO

**Cody Finke** Brimstone

**Peter Reinhardt** Charm Industrial

**Douglas Johnson-Poengsen & Jenni Young** Circular

**Norman Crowley** Cool Planet Group

**Rich Sorkin** Jupiter Intelligence

**Sarah Richardson** MicroByre

**Kat Bruce and Katie Kritchlow** NatureMetrics

**Matt Heider & Vanessa Roettger** Nautilus Labs

**Derry Guy** Ohme

**Menno Van der Zee** The Routing Company

**Val Miftakhov** ZeroAvia

## Systemiq Capital team contributors:

Irena Spazzapan, Managing Partner

Georgina Fleming, Principal

George Darrah, Principal

Louis Millon, Senior Associate

Amy Varney, Senior Associate

## Design and editorial:

JDJ Creative

## Additional contributions from:

James Bilefield

Paul Fletcher

Deanna Foster

Theo Gott

Jeremy Oppenheim

Paul Polman

**For more information please reach out to:**

[contact@systemiqcapital.earth](mailto:contact@systemiqcapital.earth)

# I References

1. <https://www.ipcc.ch/report/ar6/wg3/>
2. <https://www.gfanzero.com/netzerofinancing>
3. [https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc\\_wg3\\_ar5\\_chapter11.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf) & <https://www.energy-transitions.org/sector/industry/>
4. <https://www.iea.org/reports/technology-roadmap-low-carbon-transition-in-the-cement-industry>
5. <https://www.iea.org/reports/tracking-aviation-2020>
6. [https://www.fch.europa.eu/sites/default/files/FCH%20Docs/20200507\\_Hydrogen%20Powered%20Aviation%20report\\_FINAL%20web%20%28ID%208706035%29.pdf](https://www.fch.europa.eu/sites/default/files/FCH%20Docs/20200507_Hydrogen%20Powered%20Aviation%20report_FINAL%20web%20%28ID%208706035%29.pdf)
7. [https://theicct.org/sites/default/files/publications/ICCTupdate\\_EU-95gram\\_jan2014.pdf](https://theicct.org/sites/default/files/publications/ICCTupdate_EU-95gram_jan2014.pdf)
8. <https://www.ssyonline.com/media/2016/ssy-2022-outlook-final.pdf>
9. [https://cdn.cdp.net/cdp-production/cms/reports/documents/000/006/106/original/CDP\\_SC\\_Report\\_2021.pdf?1644513297](https://cdn.cdp.net/cdp-production/cms/reports/documents/000/006/106/original/CDP_SC_Report_2021.pdf?1644513297)
10. [https://www.ilo.org/public/english/bureau/stat/download/wp\\_pse\\_e.pdf](https://www.ilo.org/public/english/bureau/stat/download/wp_pse_e.pdf)
11. <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/open-data-unlocking-innovation-and-performance-with-liquid-information>
12. [https://www.mckinsey.com/business-functions/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring?cid=netzero-pse-gaw-mst-mck-oth-2201&gclid=Cj0KCQiAuvOPBhDXARIsAKzLQ8HRDoBLdHrqq4xXNu\\_Uli0EqZRVEEGw-QMv8XSsL2eeyGsXP\\_yLUPAaAnzoEALw\\_wcB&gclsrc=aw.ds](https://www.mckinsey.com/business-functions/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring?cid=netzero-pse-gaw-mst-mck-oth-2201&gclid=Cj0KCQiAuvOPBhDXARIsAKzLQ8HRDoBLdHrqq4xXNu_Uli0EqZRVEEGw-QMv8XSsL2eeyGsXP_yLUPAaAnzoEALw_wcB&gclsrc=aw.ds)
13. <https://www.spglobal.com/en/research-insights/featured/the-big-picture-on-climate-risk>
14. <https://www.idtechex.com/en/research-article/can-direct-air-capture-really-help-in-the-fight-against-climate-change/23898>
15. <https://www.pwc.com/gx/en/services/sustainability/publications/state-of-climate-tech.html>

