

# CLEANTECH 50TOWATCH

The early-stage companies taking  
action on the climate crisis





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**Cleantech Group Executive Editor:**

– Richard Youngman CEO

**Major Contributors:**

- Sasha Bukhari Analyst, Data & Ecosystems
- Nicole Cerulli Associate, Transportation & Logistics
- Natalie Cox Junior Events & Programs Manager
- Anthony DeOrsey Research Manager
- Jack Ellis Sr. Associate, Agriculture & Food
- Zainab Gilani Associate, Energy & Power
- Ian Hayton Sr. Associate, Materials and Chemicals
- Carole Jacques Director of Marketing
- Selene Law Sr. Associate, Energy & Power
- Sarah O’Connell Director of Events & Programs
- Holly Stower Sr. Associate, Resource & Environment



# 2023 Cleantech 50 To Watch Trend Watch



By Anthony DeOrsey, Research Manager

## Introduction

We hope you enjoy reading the fifth publication of the **Cleantech 50 to Watch**, Cleantech Group's annual publication that highlights and applauds the early-stage companies bringing forth state-of-the-art solutions.

This year you will find companies across 15 sectors, from soil monitoring to solar to water scarcity and everything in between. We must also recognize the valuable input from 32 leading specialists who acted as the expert panelists for this report and contributed their knowledge and insight – without them this list would be much more difficult to produce.

Before we dive into an analysis from our team, I want to give special recognition to all the companies that made this year's list—all of them are addressing crucial challenges with the potential to shift us in the right direction and change our future. Keep up the hard work.

Through many of our recent annual analyses (see the **2023 Global Cleantech 100** and the **2023 APAC Cleantech 25**), we have commented on two consistent dynamics: innovation in reaction to the chaos of the early 2020s and a building

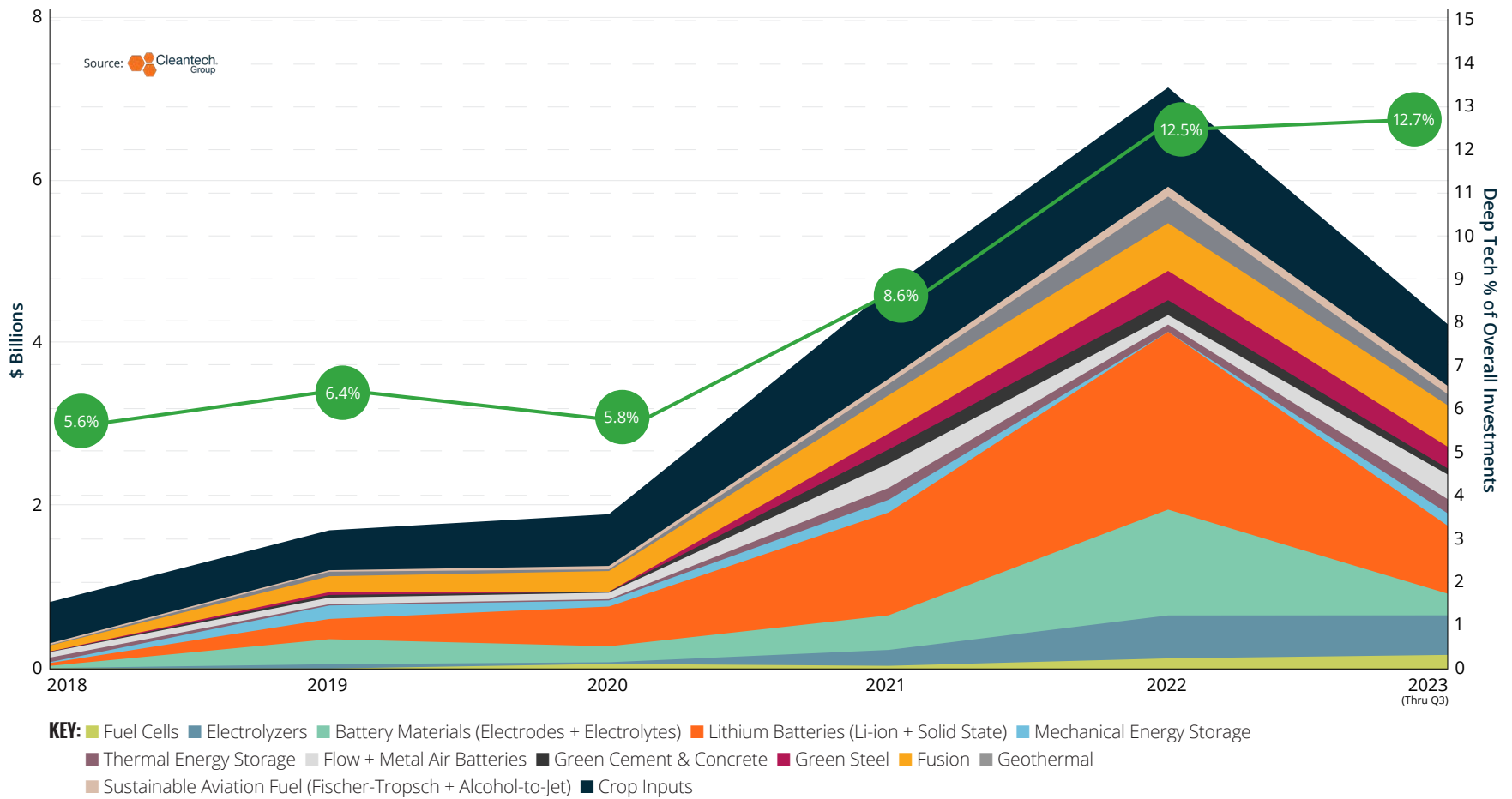
embrace of “bigger bets” for long-term sustainability. When we last put the **Cleantech 50 to Watch** list together, it was still unclear how the unfolding events in 2022 would affect the staying power of cleantech trends today. As the U.S. Inflation Reduction Act hurtles into its second year and Russia's land war in Ukraine creeps towards its third year, we are seeing innovators lean hard into the hardest tech areas.

This year's **Cleantech 50 to Watch** marks a stand-out year in which “deep” tech solutions for sustainability are entering into commercialization in force, as innovators in the hardest-to-abate and dirtiest areas of the economy dig their heels in for the late 2020s and 2030s. Demand owners are beginning to believe in the viability of deep sustainability solutions and policy bumps are nudging supply of technology closer to acceptable economics.

## Trend Watch

Despite a challenging macroeconomic environment with high interest rates and slimmed prospects for venture returns, companies in these areas are still getting funded. In 2022, we observed more investments in deeper cleantech than ever before (see Figure 1). Keeping the lens on these sectors through the first three quarters of 2023, these investments are even stronger as a percentage of overall venture and growth investments in cleantech. Another way to say it, we are moving away from the era of “asset light, highly scalable” as the primary growth evaluation criteria, and moving to an era where forward-positioning for supply into hard-to-change sectors is valued.

Fig. 1: Venture & Growth Investments in Deep Tech Cleantech (2018 - Q3 2023)



\* Excludes outlier deals >\$350M \*\* Including only Venture & Growth Investments: Seed, Series A, Series B, Growth Equity

This dynamic was reflected in our **Cleantech 50 to Watch** expert panel's views as well, which saw an overwhelming percentage of nominations towards hardware, materials, and industrial process companies for this year's list. Just as they are beginning to make up a larger percentage of overall growth in cleantech, this year's list includes:

- 4 companies in devices or materials that produce green hydrogen (b.spkl, Evoloh, QD-Sol, Sungreen H2)
- 7 companies involved in materials innovation or novel production for construction materials (Adept Materials, Concrete4Change, Hertha Metals, Neocrete, Strawcture Eco, Strong by Form, Tectonus)

- 3 companies in long-duration energy storage (Inlyte Energy, MGA Thermal, Renewell Energy) and 2 in new battery chemistries (Offgrid Energy Labs, PJP Eye)

- 4 companies in heating and cooling, including heat pumps and geothermal (Bedrock Energy, Harvest Thermal, Heatrix, Innova GEO)

- 4 companies in alternative fuels (Dimensional Energy, Koko Networks, Metafuels, Nium)

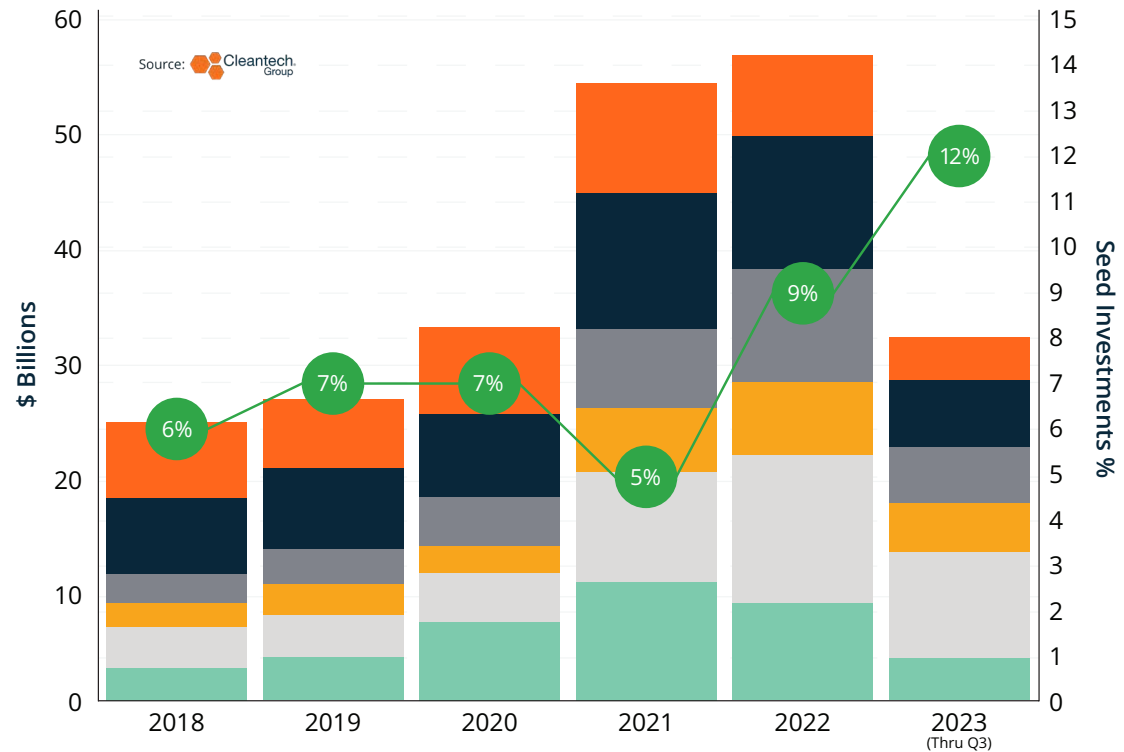
The enthusiasm for deep tech companies with hypotheses for end-of-decade market growth is likely not a coincidence – the overall crop of cleantech innovators is getting younger. The first half of 2023 saw seed investments make up their largest percentage of overall venture investments in cleantech, continuing a trend that began in 2019 despite a dip in 2020.

**Fig. 1: Venture & Growth Investments in Cleantech, % of Seed Investments vs. Overall (2018 – Q3 2023)**

- KEY:**
- Agriculture & Food
  - Energy & Power
  - Materials & Chemicals
  - Resources & Environment
  - Transportation & Logistics
  - Enabling Technologies

\* Excludes outlier deals >\$350M

\*\* Including only Venture & Growth Investments: Seed, Series A, Series B, Growth Equity



As noted in this year's **APAC Cleantech 25** report, innovation in cleantech is going more global, too. The U.S. is still dominant, and the next runners up are generally predictable (China, Germany, UK), but it can be seen from zooming in on early-stage investments over the past two-and-a-half years that there is close competition between the next 10 or so countries.

This dynamic indicates that we may see continued regional shifts in innovation growth over the next few years as early-stage companies mature and aim to break out of their home markets. This year's **Cleantech 50 to Watch** list indeed includes examples of countries outside of North America, Europe, or North Asia punching above their weight in early-stage cleantech innovation:

- 4 companies from Africa – EarthBond (Nigeria), EWaste Africa (South Africa), Koko Networks (Kenya), Octavia Carbon (Kenya)
- 4 companies from South and Central America – NILUS (Chile), Strong by Form (Chile), Symbiomics (Brazil), Plybion (Mexico)
- 3 companies from New Zealand (b.spkl, Neocrete, Tectonus) and 1 from Australia (MGA Thermal)

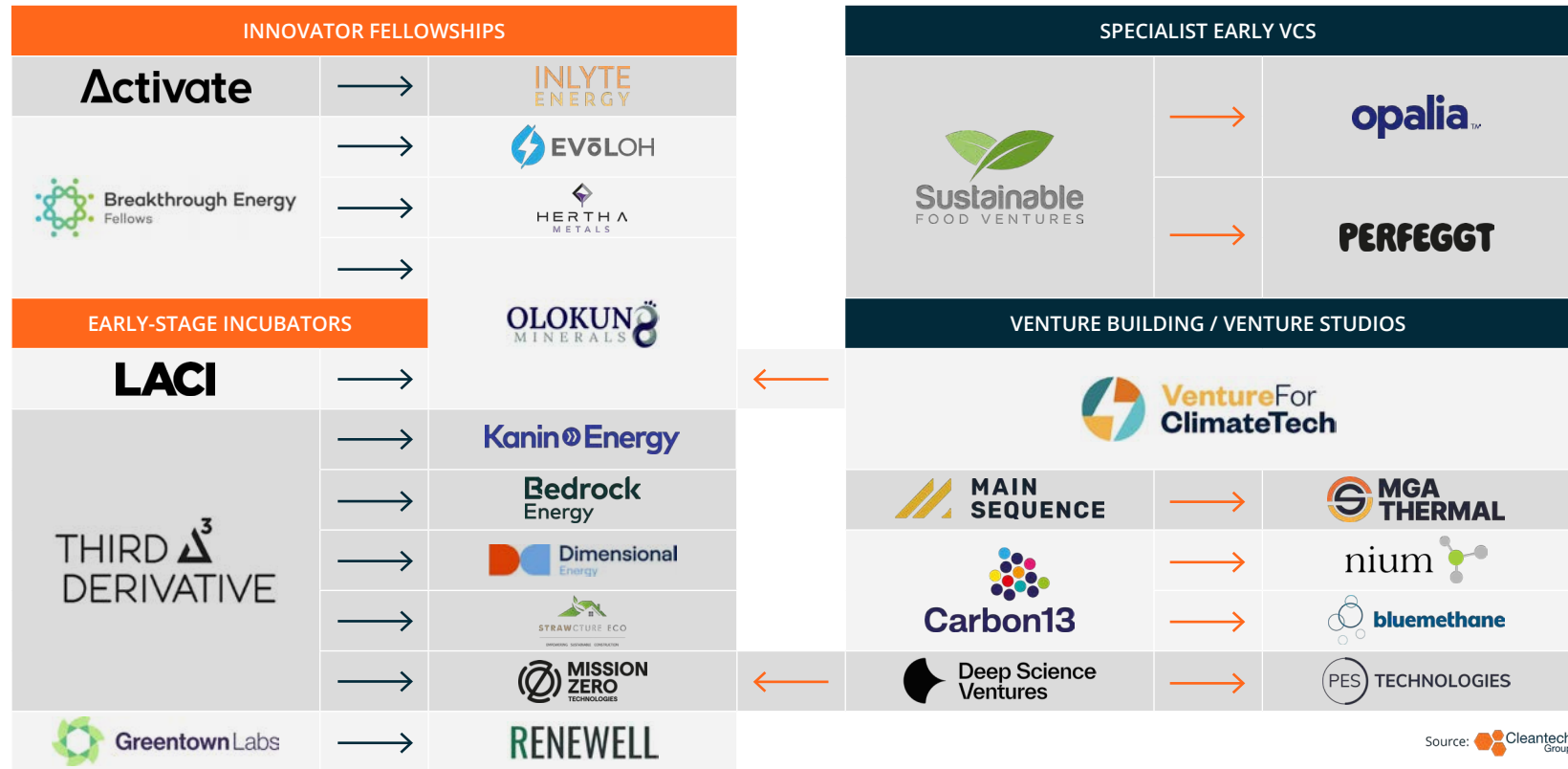
**Fig. 3: Destinations for Cleantech Venture & Growth Investments, 2021 – Q3 2023**



Source: Cleantech Group

\* Excludes outlier deals >\$350M

Fig. 4: Early-stage Ecosystems: Where are Cleantech 50 to Watch Companies Emerging From?



Source: Cleantech Group

To get a pulse on where innovation in cleantech is going next, take note of how ecosystems are developing. While there are plenty of venture capital funds that have become global household names in cleantech, incubators and accelerators still tend to have local or regional influence, but some have now transcended to global kingmakers – five of this year’s **Cleantech 50 to Watch** are members or alumni of Third Derivative, for example.

Early-stage incubators and seed investors that go even further upstream to venture-building – the practice of first identifying promising technologists or aspiring entrepreneurs and then building companies around them – are generating some of tomorrow’s key players at a fast clip. Six of this year’s **Cleantech 50 to Watch** participated in a program or received investment from an entity with a venture-building mission statement.

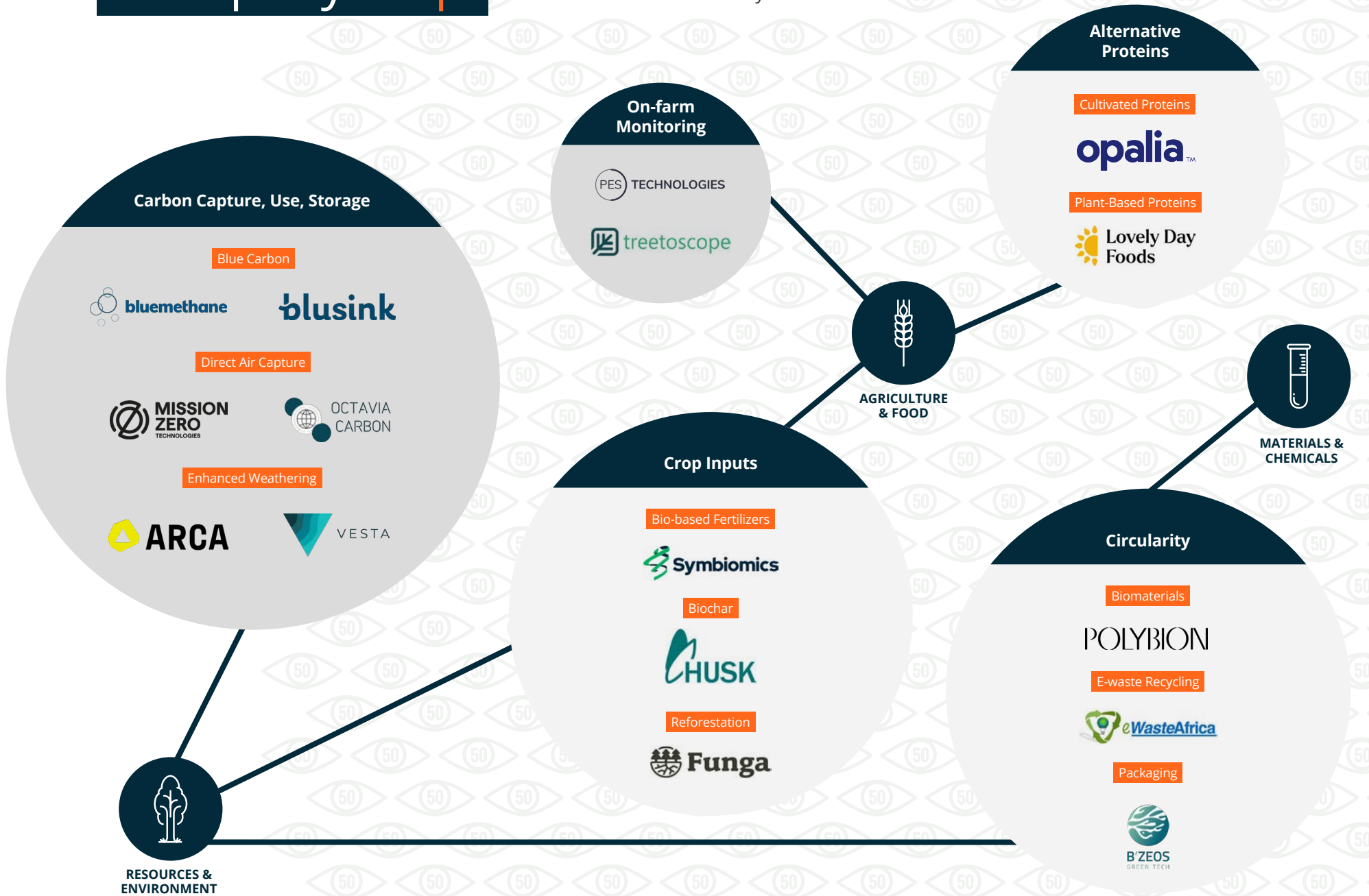
Breakthrough Energy Fellows, Breakthrough Energy’s program for high-potential energy and heavy industry decarbonization entrepreneurs, which only launched in 2021 - landed 3 companies on the 2023 **Cleantech 50 to Watch** list.

Some of the most critical technologies for long-term sustainability may not yet gel with the traditional venture capital model – we are making concerted efforts to better analyze cleantech ecosystems and what movements there indicate for the future, and we encourage those reading this report to do the same.

We hope you enjoy this year’s **Cleantech 50 to Watch** –younger, faster, and gutsier. This year’s list is a testament to the dynamics that we are seeing slowly crescendo in the overall cleantech innovation universe, and indeed the same ones that will be necessary to tackle the most pressing climate challenges.

# Company Map

Presenting the 2023  
Cleantech 50 to Watch by Sector





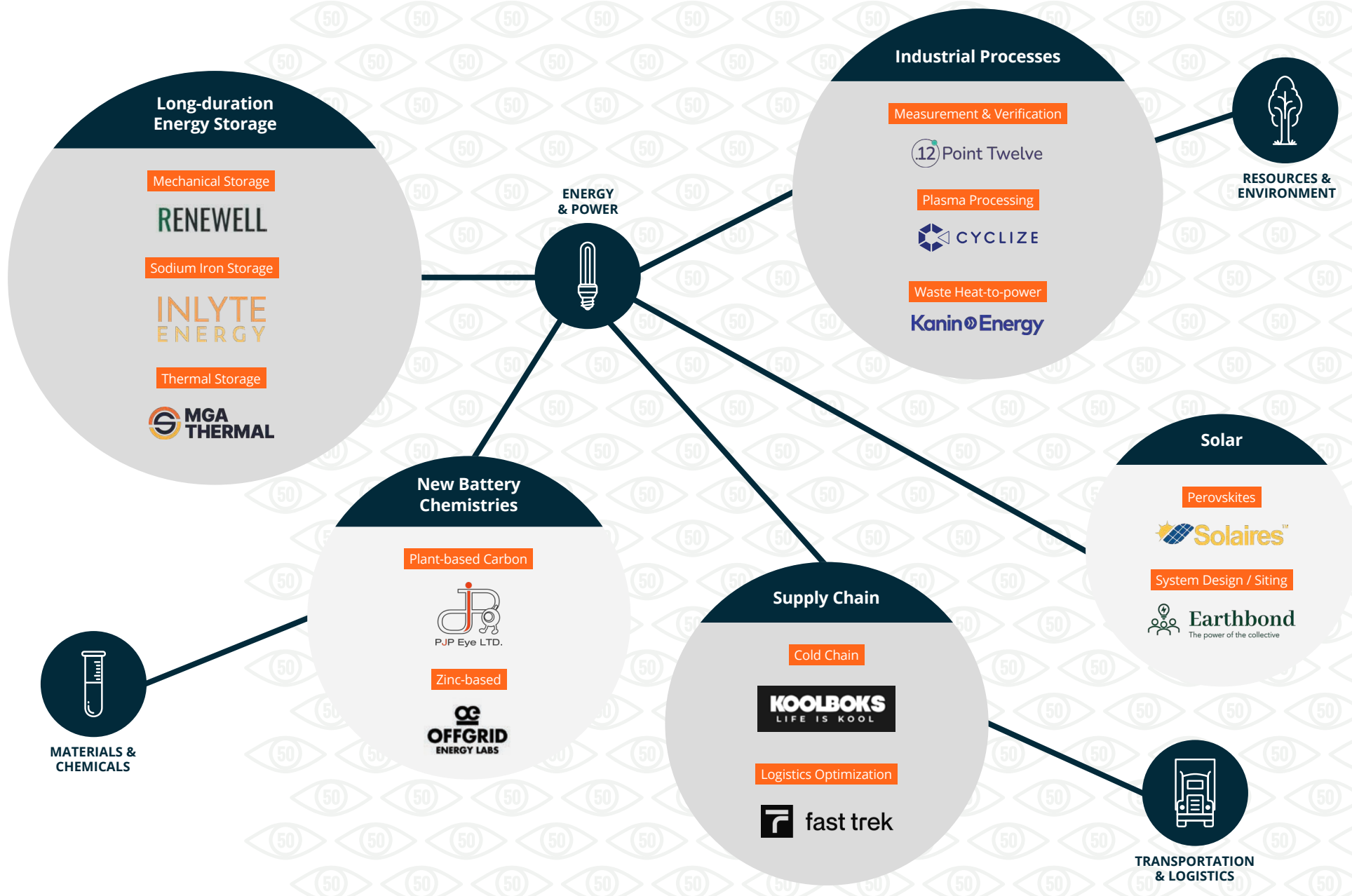
# Company Map

Presenting the 2023  
Cleantech 50 to Watch by Sector



# Company Map

Presenting the 2023  
Cleantech 50 to Watch by Sector



RESOURCES &amp; ENVIRONMENT

# BLUEMETHANE

## DETECTS, CAPTURES AND

## REMOVES METHANE



ONE OF THE BIGGEST CHALLENGES IS THE LOW AWARENESS OF METHANE RELATIVE TO OTHER GREENHOUSE GASES. ALTHOUGH METHANE CONTRIBUTES TO 1/3 OF GLOBAL WARMING, ONLY 2% OF INVESTMENT IN CLIMATE MITIGATION IS GOING TOWARDS METHANE MITIGATION TECHNOLOGIES.



**ABOUT BLUEMETHANE**

Country: United Kingdom | Founded: 2021 | Employees: 1-10

→ **Bluemethane** is developing patent-pending methane detection and capture technology for methane in water sources. Its solution will remove methane, which it will sell as an offset and as a feedstock to low-carbon fuel and renewable energy.

**KEY TAKEAWAYS:**

#1

Bluemethane aims to remove 1B tonnes of CO<sub>2</sub>e, equivalent to 200M cars taken off the road

#2

51B tonnes of greenhouse gases are emitted by people every year and three billion are from methane escaping from water. This solution removes methane from water at scale

**HOW IT WORKS**

The core of Bluemethane’s technology is similar to when you hold a bottle of fizzy water; you can’t see the CO<sub>2</sub>, but when you shake the bottle, bubbles rise and escape. This is what it can do with methane gas in water.

**POTENTIAL IMPACT**

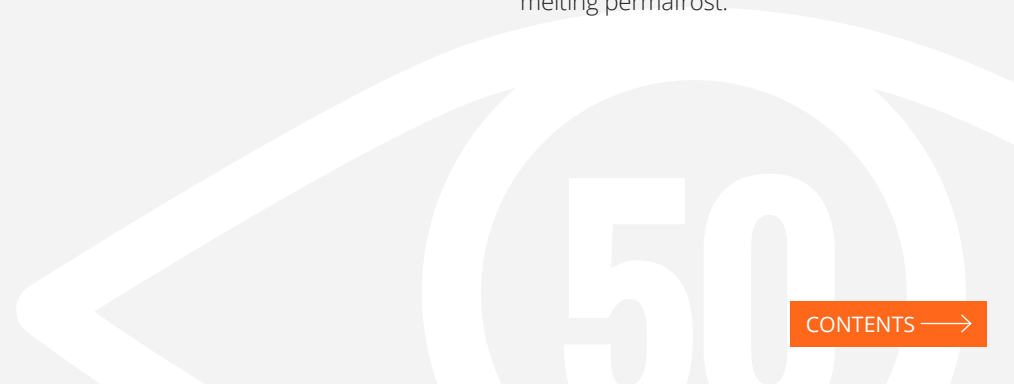
Bluemethane aims to reduce a billion tonnes of emissions with its technology, which removes the most methane using the least amount of energy. The system is designed to be flexible, so it can be used by multiple industrial players with methane dissolved in water, from FMCGs to wastewater treatment facilities.

**AMBITION**

Currently moving into the proof-of-concept stage, Bluemethane aims to implement this technology in hydropower plants, with plans to expand its application to non-hydropower reservoirs, wastewater treatment facilities, and natural water bodies.

Bluemethane aims to start with water utility companies who are treating wastewater, as the solution can help water utility companies get closer to net-zero by 2030 by reducing substantial process emissions. In parallel, they are working with energy companies who own hydropower assets to make their reservoirs even more sustainable by removing methane.


Bluemethane plans to utilize their technology for methane emissions from rice paddies, wetlands and even melting permafrost.





TRANSPORTATION &amp; LOGISTICS

# REDUCING CARBON WITH FAST TREK'S DELIVERY PLATFORM



A CHALLENGE FOR INNOVATORS IN THE LOGISTICS INDUSTRY GROUP IS THE WIDE RANGE OF TECHNICAL DEVELOPMENT OF LOGISTICS COMPANIES THEMSELVES—WHILE SOME ARE VERY HIGH TECH, MANY USE OLD, OUTDATED SYSTEMS. FAST TREK'S PLATFORM WILL BE COMPATIBLE WITH ALMOST ANY EXISTING LOGISTICS TECH STACK WITHOUT REQUIRING SYSTEM UPGRADES OR CHANGES.



**ABOUT FAST TREK**

Country: Sweden | Founded: 2022 | Employees: 1-10

→ **Fast Trek** is a platform that optimizes long-haul delivery logistics, reducing both the overall kilometers driven and the carbon emissions of delivery fleets. The platform also provides data and visualization tools for carbon emissions and climate impact reporting.

**KEY TAKEAWAYS:**

#1

Fast Trek participated in the 2022 European Institute of Innovation and Technology Accelerator and the 2022 Rockstart Accelerator programs

#2

Fast Trek aims to reduce fleet emissions by 3% and save companies money through route optimization, reducing fuel consumption and fleet wear and tear

**HOW IT WORKS**

Fast Trek's proprietary algorithm identifies where individual vehicle routes can be combined to optimize both distance traveled and vehicle use. The platform is compatible with a wide range of data and tech stacks and is offered as a subscription service with access to both data management and visualization tools.

**AMBITION**

Fast Trek aims to improve data availability and usage in the logistics sector to optimize efficiency and reduce climate impact. The company is finalizing product development, preparing for commercial launch of their proprietary platform, and is raising a seed funding round.

**POTENTIAL IMPACT**

Fast Trek's platform currently reduces fleet emissions by about 3%. With upcoming platform updates and optimization, emissions reductions are expected to increase. By reducing overall distance traveled, logistics operators can reduce emissions as well as increase profit margins. Data visualization tools provide required emissions and carbon footprint data to comply with climate impact reporting mandates.



ENERGY &amp; POWER

# KOOLBOKS REDUCES FOOD WASTE FOR SMALL BUSINESSES

AROUND 600 MILLION PEOPLE LACK ACCESS TO REFRIGERATION AND ELECTRICITY IN SUB SAHARAN AFRICA WITH 70% OF THE POPULATION NOT HAVING ACCESS TO REGULAR SOURCES OF ELECTRICITY. THIS GENERATES SUBSTANTIAL VOLUMES OF FOOD WASTE WHEN REFRIGERATORS STOP RUNNING. KOOLBOKS FREEZERS PROVIDE SMALL BUSINESS OWNERS WITH THE PEACE OF MIND THAT THEIR PRODUCTS WILL BE REFRIGERATED DESPITE ISSUES WITH GRID RELIABILITY.



3 to 4 Days Cooling Without Sunlight Or Power

→ **Koolboks** provides solar-powered refrigeration and freezer systems to regions in Africa with limited and intermittent electrical services.

## KEY TAKEAWAYS:

#1

The company promises affordable and accessible refrigeration powered by solar and without access to on-grid electricity

#2

Raised \$3.5M since 2018 with a seed round in 2022

**KOOLBOKS**  
LIFE IS KOOL

OCTOBER 2023

### ABOUT KOOLBOKS

Country: France | Founded: 2018 | Employees: 120

### HOW IT WORKS

Koolboks uses solar power to freeze ice to keep items cool overnight with the support of lithium-ion batteries to store energy. This keeps food refrigerated and frozen without using harmful refrigerants.

Customers pay a small percentage of the down payment of the product up front and then pay a monthly fee to use the product (\$20-\$30) each month.

### POTENTIAL IMPACT

Diesel generators are often used by small businesses and food service providers to ensure refrigerators keep food cool and reduce the risk of spoilage when the grid is not reliable. These generate substantial emissions, are expensive, and can be replaced by Koolboks' systems

which use renewable solar power to keep food cool and prevent food waste. Over 5,500 freezers have been sold across Sub-Saharan Africa, with an estimated emissions diversion of 1,309.82 tonnes of CO<sub>2</sub> in Nigeria alone. 10X that amount is expected to be saved over the lifetime of each product.

### AMBITION

Currently Koolboks is working in over 17 countries with a variety of distributors and partners and they have offices in Kenya, Nigeria, and Uganda with close to 120 employees. Future plans include expanding to additional countries in Africa and developing a "take back" program for customers who already have refrigerators but are looking to transition to Koolboks systems.



AGRICULTURE &amp; FOOD

# LOVELY DAY FOODS CREATES EGGS USING PRECISION FERMENTATION, NOT CHICKENS

TRANSFORMING THE FOOD INDUSTRY IS ONE OF THE MOST PRESSING TASKS WE NEED TO TAKE ON IF WE WANT TO BUILD A SUSTAINABLE, HEALTHY FUTURE FOR GENERATIONS TO COME AND ACHIEVE OUR NET-ZERO GOALS. WE NEED 100% MORE PROTEIN BY 2050 BUT WE'VE ALREADY REACHED OUR PLANETARY LIMITS.



→ **Lovely Day Foods** has developed a proprietary precision fermentation platform to formulate proteins that are bioidentical to those typically found in animal-derived products such as meat, dairy, and eggs.

## KEY TAKEAWAYS:

- #1 Lovely Day Foods raised \$4M in pre-seed funding in 2022
- #2 Perfeggt, its plant-based egg alternative, is estimated to use 98% less water and 99% less land, and to produce 96% less greenhouse gas emissions, compared to conventionally produced chicken eggs

### ABOUT LOVELY DAY FOODS

Country: Germany | Founded: 2021 | Employees: 11-50



### HOW IT WORKS

The Berlin-based start-up is initially focusing on building a bird-free replacement for chicken eggs, which are among the most widely consumed animal proteins. Its first product line is Perfeggt, a liquid egg alternative based on pea protein and developed for food service customers.

### POTENTIAL IMPACT

Historically, we have relied on animals to provide our protein; but with some estimates indicating that global protein demand could double between now and 2050, we need to find more sustainable sources. We already use 80% of our planet's agricultural land, as well as a third of our water resources, for livestock production. These animals need to be fed, resulting in deforestation and habitat destruction to provide more land to grow feed. When it comes to egg production specifically, over a third of all the soy we grow is fed to chickens.

120 billion eggs are consumed in Europe each year, with 1.3 trillion consumed worldwide. Over 700 million chickens are kept in Europe and the U.S. alone to meet this massive egg consumption. These numbers underscore the urgent need for innovative technologies aimed at developing alternative protein sources. By cutting the chicken out of the equation altogether, Lovely Day Foods claims it can reduce water usage by 98%, land usage by 99%, and emissions by 96%, when compared to conventional egg production.

### AMBITION

Lovely Day Foods raised \$4M in pre-seed funding last year. After launching the first version of Perfeggt, Lovely Day Foods is now developing the next generation, scaling up production, and refining its precision fermentation capabilities. Its proprietary fermentation platform can use sustainable feedstocks from waste streams, meaning that the start-up can drive efficiencies and sustainability as it explores the potential for new protein product lines.

MATERIALS &amp; CHEMICALS

# TRANSFORMING THE CONCRETE INDUSTRY WITH **NEOCRETE**

“

**OUR MISSION IS TO REVOLUTIONIZE THE CONCRETE INDUSTRY BY MAKING CONCRETE CARBON NEUTRAL AND MORE RESILIENT TO THE IMPACTS OF CLIMATE CHANGE – WITH NO EXTRA COST. WE ARE TARGETING ACHIEVING CARBON-NEUTRAL CONCRETE PRODUCTION BY 2027.**

**MATT KENNEDY-GOOD, CO-FOUNDER OF NEOCRETE**





→ **Neocrete's** key innovation is an activator that improves the performance of natural and industrial pozzolans, such as volcanic ash, slag, and fly ash. The activator accelerates the strength gain and workability of these materials, making them more suitable as cement replacements.

## KEY TAKEAWAYS:

#1

Neocrete's technology aims to significantly reduce the carbon footprint of concrete production by introducing an activator that enhances and activates natural or industrial pozzolans

#2

Typically, around 900kg of carbon is emitted to make one tonne of cement. Neocrete emits only 50kg per tonne



### ABOUT NEOCRETE

Country: New Zealand | Founded: 2018 | Employees: 1-10

### HOW IT WORKS

Neocrete works using:

- **Activator Technology:** Neocrete's nano-engineered Activator is applied to pozzolans, allowing them to be used as a replacement for cement, which can lead to substantial reductions in cement usage.
- **Materials:** The primary materials activated by Neocrete are natural pozzolans like volcanic ash. The company prioritizes natural pozzolans due to their higher sustainability potential compared to industrial pozzolans like slag and fly ash.

- **Emission Reduction:** Neocrete aims to reduce emissions by half a gigatonne by 2033, setting ambitious goals for environmental impact reduction.

### AMBITION

Neocrete is in the process of transitioning from the laboratory to an interim production facility. They are securing funding through a seed round of \$3.5M, which will support the establishment of a pilot plant. This plant aims to scale up production and work with more clients, with a capacity of producing 5 tonnes per hour and 7,500 tonnes per year of Activator. Neocrete's primary customers are ready-mix concrete providers, both domestically and internationally. They aim to make New Zealand their launch market and are in discussions with global partners. Neocrete has been recognized as one of the finalists in the Global Cement and Concrete Association's Innovandi Open Challenge, which includes industry giants like CEMEX, Heidelberg, and Holcim.

### POTENTIAL IMPACT

Neocrete aims to collaborate with ready-mix concrete providers globally. The company's primary focus is on developing and selling the Activator with potential licensing options.

- **Resource Efficiency:** The Activator requires only a small percentage (between 2%-4%) of the total cementitious materials (pozzolans and cement). Currently, Neocrete can reduce cement by 40% when used with natural pozzolans and 50% when used with industrial pozzolans.



# CLEANTECH 50TOWATCH

THE 2023 LIST





## AGRICULTURE & FOOD

7 COMPANIES ↓

6 COUNTRIES ↔

No.	Company	Description	Country	Founded
1	HUSK	Biochar products and carbon-based soil enhancers from husk to regenerate soil and capture carbon.	Cambodia	2017
2	KOOLBOKS LIFE IS KOOL	Solar-powered freezers and refrigeration technologies.	France	2018
3	Lovely Day Foods	Plant-based egg alternative.	Germany	2021
4	opalia™	Animal-free dairy products cultivated from mammary cells.	Canada	2020
5	PES TECHNOLOGIES	Designer of a portable soil health testing device.	United Kingdom	2019
6	Symbiomics	Biological crop inputs using naturally-occurring microbes.	Brazil	2021
7	treetoscope	Irrigation management platform using AI to sense the internal water flow of a plant.	Israel	2020

**KEY:** ↑ Increase on 2022 list   ↓ Decrease on 2022 list   ↔ Same as 2022 list

Source: Cleantech Group



## ENERGY & POWER

15 COMPANIES ↑

8 COUNTRIES ↑

No.	Company	Description	Country	Founded
8	<b>Bedrock Energy</b>	Turnkey ground source heat pump.	United States	2022
9	<b>Earthbond</b> The power of the collective	Carbon accounting and group guarantees to connect electricity buyers with the best quality solar and financing that they can actually afford.	Nigeria	2022
10	<b>EVÖLOH</b>	AEM electrolyzer technology targeting \$1/kg green hydrogen.	United States	2019
11	<b>harvest thermal</b>	Smart heat pump system that reduces emissions by 90% and bills by 40%.	United States	2019
12	<b>HEATRIX</b> DECARBONIZING INDUSTRY	Renewable energy solutions for hard-to-decarbonize sectors and industrial heat.	Germany	2021
13	<b>INLYTE ENERGY</b>	Iron- and salt-based grid energy storage batteries.	United States	2021
14	<b>INNOVIA GEO</b>	Ground source heat pumps using existing steel piles in a building foundation.	Canada	2018
15	<b>Kanin Energy</b>	Project development services, helping industrial partners monetize waste heat resources by installing waste heat-to-power facilities.	Canada	2020

KEY: ↑ Increase on 2022 list ↓ Decrease on 2022 list ↔ Same as 2022 list

Source: Cleantech Group



## ENERGY & POWER

15 COMPANIES ↑

8 COUNTRIES ↑

No.	Company	Description	Country	Founded
16	MGA THERMAL	Thermal storage material, miscibility gap alloys.	Australia	2018
17	OFFGRID ENERGY LABS	Zinc-gel batteries, using zinc and manganese-dioxide chemistry.	India	2018
18	12 Point Twelve	SaaS platform that enables energy-intensive goods producers to easily certify their green production.	Germany	2022
19	QD-SOL™	Hydrogen from water and direct sunlight using nanoparticles.	Israel	2021
20	RENEWELL	Zero-self-discharge renewable energy storage technology that will be implemented in inactive oil and gas wells.	United States	2020
21	Solaires™	Perovskite thin-film solar technology.	Canada	2020
22	sungreen™	Green hydrogen using electrolysis.	Singapore	2020

**KEY:** ↑ Increase on 2022 list ↓ Decrease on 2022 list ↔ Same as 2022 list

Source: Cleantech Group





## MATERIALS & CHEMICALS

14 COMPANIES ↓

10 COUNTRIES ↑

No.	Company	Description	Country	Founded
23	<b>adept</b> MATERIALS	A proprietary two-layer system that endows materials with advanced moisture management capabilities.	United States	2018
24	<b>bspkl.</b>	A catalyst-coated electrolyzer membrane for hydrogen production.	New Zealand	2021
25	<b>B'ZEOS</b> GREEN TECH	Bio-based and fully home-compostable single-use packaging utilizing seaweed as a feedstock.	Norway	2017
26	<b>concrete</b> 4change	Technology to reduce embodied carbon and permanently store and mineralise CO <sub>2</sub> in concrete.	United Kingdom	2021
27	<b>Dimensional</b> Energy	Reactor which uses carbon dioxide and concentrated sunlight to build energy-dense hydrocarbons.	United States	2016
28	<b>HERTHA</b> METALS	Alternative hydrogen-electric steelmaking process that aims to decarbonize traditional methods.	United States	2022
29	<b>KOKO</b>	Bioethanol for cooking fuel made from molasses-based ethanol plants, a waste product from sugar refineries.	Kenya	2015

**KEY:** ↑ Increase on 2022 list   ↓ Decrease on 2022 list   ↔ Same as 2022 list

Source: Cleantech Group



## MATERIALS & CHEMICALS

14 COMPANIES ↓

10 COUNTRIES ↑

No.	Company	Description	Country	Founded
30	nium	Nanotechnology enabling low-pressure, low-temperature on-site production of ammonia.	United Kingdom	2022
31	metafuels	Sustainable aviation fuel made from green methanol using their proprietary aerobrew technology.	Switzerland	2021
32	NEOCRETE	Pozzolanic additive to strengthen cement and concrete.	New Zealand	2018
33	PJP Eye LTD.	Battery cells with cathode structures that utilize organic cotton materials.	Japan	2018
34	POLYBION	Biotechnology designed to use living organisms' metabolic processes as industrial production platforms to make consumer goods.	Mexico	2015
35	STRAWCTURE ECO EMPOWERING SUSTAINABLE CONSTRUCTION	Low-carbon building materials which sequester carbon and agriculture waste.	India	2018
36	strong by form	Bio-composite materials from unfeasible wood and timber which are designed to replace steel and concrete.	Chile	2018

**KEY:** ↑ Increase on 2022 list   ↓ Decrease on 2022 list   ↔ Same as 2022 list









Source: Cleantech Group



## RESOURCES & ENVIRONMENT

**13 COMPANIES** ↓

**9 COUNTRIES** ↓

No.	Company	Description	Country	Founded
37	 <b>ARCA</b>	Carbon removal solutions for mine waste via enhanced weathering for sale on carbon markets.	Canada	2021
38	 <b>bluemethane</b>	Methane capture from water technology.	United Kingdom	2021
39	 <b>blusink</b>	Blue carbon removals through technologies that initiate coralline crustose algae formations to build on local biodiversity and restore marine ecosystems.	United Kingdom	2021
40	 <b>CYCLIZE</b>	Plasma-based process to produce synthesis gas with plastic waste and exhaust gas CO <sub>2</sub> .	Germany	2022
41	 <b>eWasteAfrica</b>	End-to-end recycling services for lighting and consumer electronics.	South Africa	2014
42	 <b>Funga</b>	Forest fungal microbiome to improve forestry outcomes and address the climate crisis while enhancing beneficial microbial biodiversity.	United States	2021
43	 <b>MISSION ZERO TECHNOLOGIES</b>	Direct air capture and point source carbon capture technologies.	United Kingdom	2020
44	 <b>NILUS</b>	Nature-based solution to store water and protect resources that sustainably manage and restore foothill ecosystems.	Chile	2020

**KEY:** ↑ Increase on 2022 list   ↓ Decrease on 2022 list   ↔ Same as 2022 list

Source:  Cleantech Group

		<h2>RESOURCES &amp; ENVIRONMENT</h2>			<b>13 COMPANIES</b> ↓
					<b>9 COUNTRIES</b> ↓
No.	Company	Description	Country	Founded	
45	<b>ocean oasis</b>	Desalination device producing fresh water without electricity emissions.	Norway	2020	
46	<b>OCTAVIA CARBON</b>	Direct Air Carbon Capture (DACC) systems that filter carbon dioxide for underground storage or reuse as alternative fuels.	Kenya	2022	
47	<b>OLOKUN MINERALS</b>	Recycler of brine water from mining and desalination, extracting minerals such as sodium, magnesium, calcium and potassium.	United States	2021	
48	<b>TECTONUS</b> <small>resilient seismic solutions</small>	Earthquake protection devices for buildings and storage tanks.	New Zealand	2016	
49	<b>VESTA</b>	Enhanced weathering projects to capture carbon and generate carbon offsets.	United States	2019	

Source: Cleantech Group

		<h2>TRANSPORTATION &amp; LOGISTICS</h2>			<b>1 COMPANY</b> ↓
					<b>1 COUNTRY</b> ↓
No.	Company	Description	Country	Founded	
50	<b>fast trek</b>	Optimization tool for long-haul road logistics to reduce emissions and costs.	Sweden	2022	

Source: Cleantech Group

**KEY:** ↑ Increase on 2022 list   ↓ Decrease on 2022 list   ↔ Same as 2022 list



# About Cleantech Group

Cleantech® Group is the leading authority on global cleantech innovation. Since 2002, our research, consulting and events have catalyzed opportunities for sustainable growth powered by innovation. At every stage from initial strategy to final deals, we bring our clients the access and customized support they need to thrive in a more digitized, de-carbonized and resource-efficient future.

We help corporate strategy, investors, government and policy professionals, and innovators catalyze sustainable innovation opportunities. We have people around the globe in North America, Europe, and Asia.

Contact us anytime, [info@cleantech.com](mailto:info@cleantech.com).



RESEARCH

The solution to information overload, our research cuts through the noise to monitor the market and deliver the insight you need on the themes central to your goals on markets, innovators, investments, trends, and the future.

CONSULTING

To de-risk the future and seize opportunities, leaders need to understand the impact the emerging future might have – only when you clearly see what’s coming can you plan for the future.

EVENTS

Cleantech Forums empower corporate change makers, investors, entrepreneurs, and innovative stakeholders to forge connections, change the narrative, make deals, and be part of an unforgettable experience.

# Expert Panelists

32 leading specialists from across the world provided their inputs into the process.



**Laurie Menoud**  
Founding Partner

AT ONE VENTURES



**Iris Jensen**  
Senior Associate

BAYWA R.E. ENERGY VENTURES



**Bennet Barth**  
Managing Director, RESPOND

BMW FOUNDATION



**Ashley Grosh**  
Vice President

BREAKTHROUGH  
ENERGY FELLOWS



**Jonathan Cumming**  
Director & CFO

CARBON 13



**Iain Meager**  
Director, Innovation

CARBON TRUST



**Lou Schick**  
Director of Investments

CLEAN ENERGY VENTURES



**Anthony DeOrsey**  
Research Manager

CLEANTECH GROUP



**Jason Anderson**  
President & CEO

CLEANTECH SAN DIEGO



**Daniel Matross**  
Global Head of Research

CREO SYNDICATE



**Adam Tomassi-Russell**  
Director of Climate

DEEP SCIENCE VENTURES



**Olivier Bordelanne**  
Partner

DEMETER IM



**Eric Turner**  
Managing Director

DRAWDOWN FUND



**Sara Chamberlain**  
Co-Founder & Managing Director

ENERGY FOUNDRY



**Yoachim Haynes**  
Vice President of Strategy, Europe

ENERGY IMPACT PARTNERS



**Natharoun Ngo Son**  
Country Director

ENERGYLAB





**Jeanette Jackson**  
Chief Executive Officer

FORESIGHT CAC



**Tomas Haglund-Flemström**  
Head of Impact and Innovation

FORMICA CAPITAL



**Alyssa Gilbert**  
Director of Innovation

GRANTHAM INSTITUTE,  
IMPERIAL COLLEGE LONDON



**Tyler Hamilton**  
Senior Director, Climate

MARS



**Monali Mujumdar**  
Startup Engagement Lead  
and Program Operations

NATIONAL RENEWABLE  
ENERGY LABORATORY



**Pat Sapinsley**  
Managing Director  
Cleantech Initiatives

NYU URBAN FUTURE LAB



**Dr. Ashwath Sundaresan**  
Investment Manager

PACIFIC CHANNEL



**Gabriel VanLoozen**  
Senior Associate

POWERHOUSE VENTURES



**Max ter Horst**  
Managing Partner Energy

ROCKSTART ACCELERATOR



**Erki Ani**  
Partner

SFV



**Victoria Smaniotto**  
Managing Director - Alliance  
& Stakeholders Engagement

SOLAR IMPULSE FOUNDATION



**Demetrius Yuen**  
Director of Programs

SOW ASIA



**Karl Liapunov**  
Head of Energy

STARTUP LAB



**Alexander Langguth**  
Managing Partner

UBERMORGAN VENTURES



**Sunyoung Suh**  
Sustainable Energy Expert

UNIDO



**Pippa Gawley**  
Founding Partner

ZERO CARBON CAPITAL



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North America | Europe | Asia

Contact us  
info@cleantech.com



cleantech.com