

climate tech

for a Sustainable Planet

Quarterly review
N°7 — 2023

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FOR TOMORROW



The Climate Tech Startup Corner..

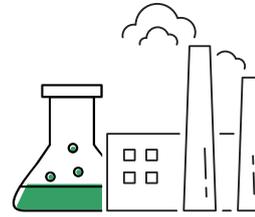
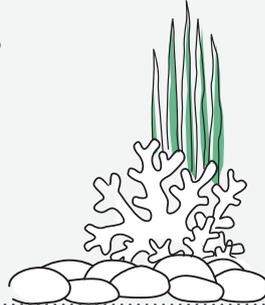
CLIMATE TECH START-UPS

CARBON CAPTURE

RUNNING TIDE

FIGHTING CLIMATE CHANGE WITH SEAWEED

- **Running Tide** is a start-up whose goal is to curb climate change by harnessing the ability of seaweed to capture carbon. The company plans to remove CO₂ from the atmosphere with the help of carbon buoys made of kelp (large brown sea algae), which then absorbs CO₂ through photosynthesis.
- After a period of capturing carbon, marine engineers sink the buoys into the depths of the ocean, where they remain, containing the captured CO₂.



TRAVERTINE

- **Travertine** is a CO₂-removal and industrial-chemical production company.
- The startup aims to capture CO₂ from the air, mineralize it, and, as a by-product of the process, produce sulfuric acid, which has significant industrial applications. Sulfuric acid is the world's most used inorganic chemical and is traditionally produced by burning a by-product of fossil-fuel production; a process which generates massive quantities of environmentally hazardous waste sulfates.
- Travertine works on eliminating that waste stream and upcycling sulfuric acid. At the same time, the company eliminates CO₂ from the atmosphere by removing carbonate minerals. This happens through water electrolysis, which produces equal quantities of acid and base.

Travertine eliminates CO₂ from the atmosphere by removing carbonate minerals.

CHARM INDUSTRIAL

PUTTING OIL BACK INTO THE UNDERGROUND TO FIGHT CLIMATE CHANGE

- **Charm** uses plants to capture CO₂ from the atmosphere; it converts inedible biomass such as corn stover recovered from agricultural operations into a stable, carbon-rich liquid, which it then pumps into EPA (Environmental Protection Agency)-permitted deep underground reservoirs where the bio-oil sinks and solidifies in place. This permanently removes CO₂ from the atmosphere, putting it out of reach of potential release by wildfires, soil erosion, or land-use change.

Cellulosic
biomass currently
captures >100 Gt
CO₂/yr.

- At a large scale of bio-oil production, Charm will use it to make carbon negative iron. The bio-oil helps transform the iron ore into metallic iron at lower temperatures than traditional fossil fuel methods. By capturing the cleaner gaseous carbon waste stream, Charm could turn the 6% of global emissions from iron-making (2x that of aviation) net negative.

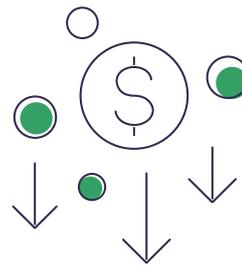


“By 2050 [humanity needs] the carbon-removal industry to grow by 2 million times, with a compound growth rate of 65%. I think it’s possible. It’s going to be very hard, but it’s also a problem that the government and a lot of people are throwing their weight behind.”

Peter Reinhardt
CEO, Charm

CARBFIX

- **Carbfix** uses its cutting-edge technology to capture CO₂ from the air and turn it into stone, which is stored underground.. The technology extracts CO₂ from emissions and dissolves it in water (effectively making carbonated water). The water is then injected into specific rock formations that react with the CO₂ and transform it into stone to form stable minerals, providing a permanent and safe carbon sink. The process takes less than two years.
- The process has a low up-front capital cost and is low-cost overall compared to other processes.
- In 2020, the company signed an agreement with Climeworks, a Swiss company that captures CO₂ from the atmosphere and then stores it at its location-independent plants. It will significantly scale up carbon removal and storage, permanently removing 4,000 t/yr of CO₂ from the air.



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Permanently removing 4,000 t/yr of CO₂ from the air.



SMART IRRIGATION

LUMO

- Agriculture accounts for 70% of global water use and Lumo provides a solution to enable farmers to reduce water consumption by as much as 50%.
- Lumo is a California-based irrigation technology company obsessed with helping growers conserve their most precious resources – time, money, and water.
- Built alongside some of the best growers in the world, Lumo's smart irrigation valve is wireless, cloud-managed, and contains an embedded flow meter to track water consumption and detect leaks – the first of its kind in the industry.
- Presently, Lumo's smart irrigation solution is being used by 15 growers in California, including Wente Vineyards and Driscoll's



Lumo provides a solution to enable farmers to **reduce water consumption by as much as 50%.**



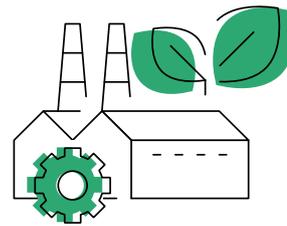
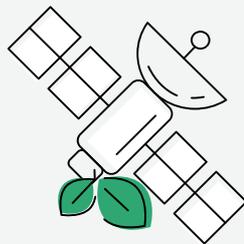
“Imagine a device that is located permanently in the fields, providing real-time visibility of systemic health, and that can be controlled remotely to deliver the exact amount of water, not a drop more or less.”

Devon Wright
CEO & Co-Founder, Lumo

IN-SPACE MANUFACTURING

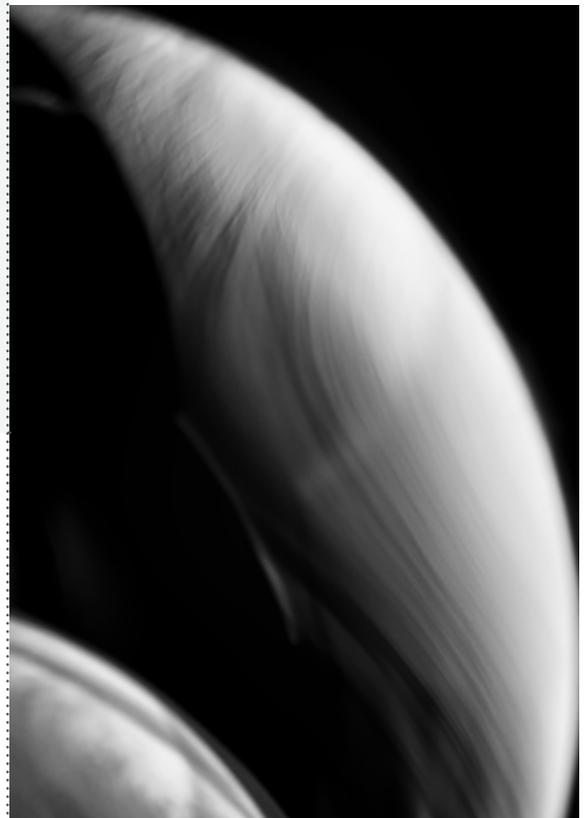
SPACE FORGE

- **Space Forge** is a UK start-up that is leading the clean industrial revolution by harnessing the benefits of manufacturing in space. It is developing fully reusable satellites capable of manufacturing the next-gen supermaterials in space for a return to Earth as part of the move to low-carbon technologies.
- Space Forge focuses on developing technologies that enable in-space manufacturing and resource utilization, which can reduce the need for resource-intensive launches and enable more sustainable space activities.



Leading the
clean industrial
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Enable
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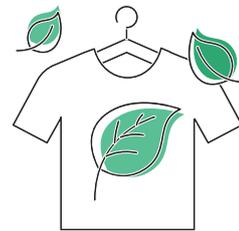
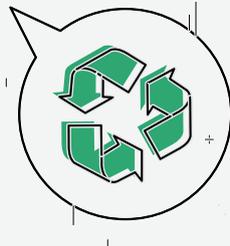


SYNTHETIC BIOLOGY

HYDGENE RENEWABLES

CONVERTING BIOMASS INTO HYDROGEN

- **Hydgene Renewables** reprograms bacterial microbes by using synthetic biology techniques to produce clean, renewable hydrogen gas from feedstock.
- The company is developing a hydrogen solution that is produced on-site on farms, from renewable plant-based feedstock, which removes the high costs of transport and storage associated with hydrogen.
- In 2022, the company won Australia's climate tech award in the Newcomer category.



BOLT THREADS

FASHION FROM MUSHROOMS

- **Bolt Threads** is a start-up that uses synthetic biology to develop sustainable materials to supply to the apparel industry. One such material is the synthetic spider silk called Microsilk, which replicates properties of a silk fibre produced by a spider. Their newly launched product Mylo is derived from mushrooms.
- The company's technology helps reduce the environmental impact of the textile industry, which is known for its heavy use of water and chemicals.
- In October 2022, the company launched a multi-project in collaboration with Ginkgo Bioworks to increase production efficiency and enhance performance.

The company's technology helps **reduce the environmental impact of the textile industry.**

BIODIVERSITY FINTECH

TREECARD

WOODEN DEBIT CARD THAT PLANTS TREES

- Founded in 2019, TreeCard is a climate tech start-up that has developed a debit card that uses the revenue generated from merchant fees to fund reforestation projects around the world.
- When customers use their treecards to make purchases, a portion of the merchant fees generated from the transactions is automatically donated to reforestation projects.
- In addition to funding reforestation projects, TreeCard also aims to reduce the carbon footprint of its customers. The company has developed a carbon-tracking feature that allows customers to track their carbon emissions and offset them through the purchase of carbon credits.



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BIODIVERSITY MONITORING

SPOOR

- Founded in 2020 in Oslo, Norway, Spoor uses computer vision and AI to detect, track, and classify birds in wind farms to help developers and operators gain insights and guide mitigation measures.
- It has developed AI-powered software for bird monitoring on wind farms. It uses machine vision for monitoring, managing, and reporting environmental impacts.



“We use artificial intelligence to monitor bird activity around wind turbines both onshore

and offshore. By focusing on highly advanced software over cumbersome traditional hardware, we are able to build a comprehensive global database as part of our detection and monitoring work, which to date has successfully tracked over 126,000 birds in about 18,562 hours.”

Ask Helseth
CEO, Spoor

NATUREMETRICS

- **NatureMetrics** is a technology start-up that uses genetic techniques to monitor biodiversity. The company uses spatial intelligence technology that taps into information derived from environmental DNA (eDNA).
- Each species carries a unique genetic signature in all cells. When an organism's cells are shed into the environment, its genetic signature is also released. NatureMetrics isolates these signatures from water or sediment samples and uses them to determine which species are present.
- The startup offers a subscription service that allows companies to gain insights into the biodiversity impact of their operations.



CLIMATE INTELLIGENCE

CERVEST

- **Cervest's** Unified Climate Intelligence™ (UCI) platform is enabling enterprises, public bodies, and financial institutions to measure interconnected climate risks and opportunities on built and natural capital assets – across physical and transition risk.
- Powered by cutting-edge Earth Science AIM and globally comparable climate risk ratings, Cervest's flagship product EarthScan provides UCI-driven insights that Chief Risk & Sustainability Officers use to increase asset resilience and meet climate-related financial disclosure requirements.
- By connecting and de-risking decisions on every built and natural asset through UCI, Cervest is powering a Climate Intelligence Network™ whose climate-aligned decisions will drive a chain reaction of adaptation actions to build a more resilient world



Unified climate intelligence is the **new decision-making superpower of the 21st century.**



“We are now in the era of climate volatility, where decision-makers will need access to a unified picture of climate risk that encompasses physical and transition risk, and attributes value to natural capital assets alongside net-zero targets.

From climate-aligning critical infrastructure development to supporting national renewable energy schemes, establishing sustainable supply chains to protecting and restoring environment ecosystems and their vital services, unified climate intelligence is the new decision-making superpower of the 21st century.”

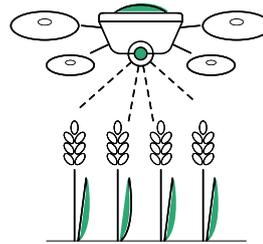
Iggy Bassi,
Founder & CEO of Cervest

SPECIAL INTELLIGENCE

AGROSCOUT

- **Agroscout** uses drone and satellite technology to help farmers monitor crop health and optimize irrigation and fertilizer use. The company's goal is to improve yields while reducing environmental impact.
- The platform collects data to create powerful analytics for actionable insights into crop management. AgroScout monitors the crop size from emergence stand count through canopy coverage estimates and plant biomass.

The company's goal is to **improve yields while reducing environmental impact.**



PLANET LABS

- **Planet Labs** owns and operates a fleet of 200 satellites that image the entire Earth landmass daily. The company's satellite-imagery data helps companies and governments to map and understand the agricultural evolution of Earth.
- On an average, Planet Labs has 1,700 images across every location.

The company's satellite-imagery data helps companies and governments to **map and understand the agricultural evolution of Earth.**

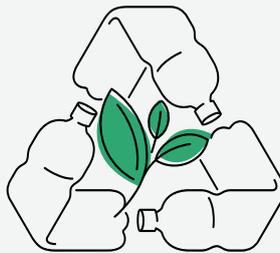


WASTE MANAGEMENT

GLACIER

FIGHTING CLIMATE CHANGE WITH WASTE RECYCLING

- Only 5% of plastic in the US is recycled today.
- Conventional recycling facilities rely significantly on manual labor, which is being heavily hit by a labor shortage. Glacier provides a low-cost, high-performance sorting robot to superpower these facilities.
- Founded in 2019, Glacier uses AI-enabled robots to identify and sort recyclables in these facilities. Their robots can distinguish between different recyclable materials such as cartons, plastic bottles, and containers. These robots are already being adopted by facilities across the country and have diverted millions of recyclables from landfill to date.



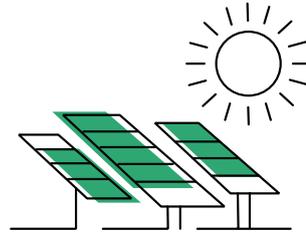
“We as a society have become really good at producing and consuming, but we haven't figured out what to do with all our stuff when we're done with it. Glacier exists to solve that problem, to solve the circular economy.”

Areeb Malik,
Co-Founder, Glacier

Glacier provides a low-cost, high-performance **sorting robot to superpower conventional recycling facilities.**

CARBON CURE

- **Carbon Cure** uses technology to reduce carbon emissions in the construction industry. It has developed a process that injects CO₂ into concrete, reducing the amount of cement needed and lowering levels of carbon emissions.
- Implementing Carbon Cure's model globally could reduce CO₂ emissions by 700 Mt annually – equivalent to the emissions of 150 million internal combustion engine vehicles.



SUNFUNDER

- **SunFunder** is the leading debt-financing provider for distributed solar power in Africa and other emerging regions, bringing access to energy and long-term climate investments.
- It has issued over \$150 million in loans to 57 solar companies working in off-grid solar, mini-grids, agri-solar, and other commercial and industrial (C&I) solar projects. These investments mitigate carbon emissions by replacing fossil fuels, and also help communities adapt to climate change by increasing the resilience of local economies and food systems.
- SunFunder's investments have directly resulted in over 750,000 t/yr of CO₂e mitigation.

KEBONY

BUILDING A GREENER FUTURE WITH FOOD WASTE

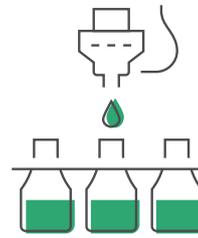
- **Kebony** focuses on using food waste to produce sustainable softwood.
- The company uses technology that uses food waste and modifies it to reproduce the qualities of tropical hardwood.
- Kebony's technology permanently modifies the wood by enhancing the properties of sustainable softwood to mirror premium hardwood characteristics.



SunFunder is the leading debt-financing provider for distributed solar power in Africa.

CARBON EQUITY

- Founded in 2021, Carbon Equity enables people to invest more easily in climate funds. Carbon Equity makes it possible to invest in small ticket sizes, starting from €100k.
- As of 2023, the company had sourced more than 800 climate private equity funds, including venture capital, growth equity, and buyouts.



SOLAR FOODS

RELIEVING AGRICULTURE OF THE BURDEN OF FOOD PRODUCTION

- Food production requires significant land use and negatively impacts the environment. Solar Foods aims to liberate protein production from the challenges of agricultural production methods.
- Solein – the company’s sustainable alternative to animal-derived proteins – is an edible bacterium: a single-cell microbe that is grown using gas fermentation. Producing Solein requires only air, water, and energy, without taking up vast tracts of land.

You can listen to many of these exciting startups on the Hardware to Save a Planet podcast from Synapse, Part of Capgemini Invent at www.hardwaretosaveplanet.com

