



**XPRIZE**  
CARBON  
REMOVAL

MUSK FOUNDATION



**TEAM BOOK 2024**  
FINALIST ROUND

APRIL 2024

# FOREWORD:

Removing gigatonnes of carbon dioxide (CO<sub>2</sub>) from the atmosphere will be an essential part of reaching net zero and will require the deployment of a whole new trillion-dollar industry. XPRIZE Carbon Removal launched in 2021 with this ambitious goal in mind: To catalyze the global supply of high-quality, cost-effective carbon dioxide removal (CDR) solutions. Since then, over 1,300 Teams from 88 countries have taken on the challenge and joined the competition.

**XPRIZE is now pleased to announce the Top 100 most promising carbon removal innovators, after three years of the competition and several rounds of judging. The Top 100 is a collection of leading innovators from 25 countries, representing all CDR pathways: Air, Ocean, Land, Rocks. These teams have made incredible accomplishments in recent years developing new solutions and represent the future of the carbon removal industry.**

XPRIZE will be selecting 20 Finalists from the Top 100 to demonstrate and test their solutions in the final year of the competition to remove 1,000 tonnes of CO<sub>2</sub> from the air or oceans. In April 2025, XPRIZE will award \$50M to a Grand Prize Winner and the remaining \$30M will be distributed among runners-up chosen by the Judges. XPRIZE previously awarded \$5M to 23 Student Teams in 2021 and \$15M to 15 Milestone Winners in 2022.

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Thank you to all of the teams who have taken on the challenge of competing for the XPRIZE Carbon Removal.

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# AIR



# COMPANY OVERVIEW

## COMPANY NAME

8 Rivers

## HQ LOCATION

Durham, NC, USA

## FOUNDED

2008

## NUMBER OF EMPLOYEES

51 - 100

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

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# 8 RIVERS CAPITAL LLC



## COMPANY DESCRIPTION

8 Rivers will be competing with its Calcite Carbon Removal technology. 8 Rivers is a Durham, NC-based firm leading the invention and commercialization of sustainable, infrastructure-scale technologies. 8 Rivers is the inventor of the Allam-Fetvedt Cycle, a paradigm-changing net zero power solution. 8 Rivers is also developing and deploying technologies for clean hydrogen and ammonia (8RH2) and other advanced energy systems.

## CORE INNOVATION

Calcite uses a structured solid sorbent, which is unique for high temperature DAC technology. This enables active air flow, yielding a high carbonation rate and CO<sub>2</sub> loading extent, enabling cycle times of hours whereas competing technology requires days. The structured sorbent also minimizes particulate production in the contactor, minimizing the facility's PM emissions profile. Lastly, unlike most low temperature sorbents, Calcite is not susceptible to fouling due to air contamination such as pollen or dust.

## CO<sub>2</sub> CAPTURE

Calcite is a direct air capture technology which leverages the simplicity of the natural calcium cycle. An oxy-fired kiln combusts fuel and concentrated oxygen to calcine fresh and regenerated calcium carbonate to form calcium oxide, while the effluent CO<sub>2</sub> is captured for sequestration. Calcium oxide is then hydrated, which in turn carbonates with ambient air through air contactor modules. The newly formed calcium carbonate is looped back to the kiln for a new carbonation cycle.

## CO<sub>2</sub> SEQUESTRATION

CO<sub>2</sub> is durably sequestered underground in Class VI wells. Injection of CO<sub>2</sub> is typically thousands of feet below the surface into rock formations, isolated from underground sources of drinking water, and is closely regulated. The wells are designed to permanently store CO<sub>2</sub> with negligible leakage over 1,000 years. Storage volume and leakage monitoring will be implemented to ensure removals are properly accounted for.

## CO-BENEFITS OR PRODUCTS

Calcite produces a small volume of limestone as a co-product. The material can be utilized for a variety of applications. Such options include consuming the material back into a process, GCC/PCC replacement (concrete, sealants, joint compound, polymer fillers, etc.), or used in agriculture.

## LEADERSHIP TEAM

Mario Guagnelli is Calcite's VP of Product Development. Previously, Mario worked for LafargeHolcim and IMERYS developing and managing large industrial mineral operations in North and South America. Mario also has previous experience in Data Analytics Technology at MicroStrategy and has led entrepreneurial ventures. He holds a Mechanical Engineering and Administration degree from Tec de Monterrey, Mexico and has an executive education diploma at INSEAD Business School in France and an Executive MBA from Northwestern.

# COMPANY OVERVIEW

## COMPANY NAME

SilicaTech

## HQ LOCATION

Oslo, Norway

## FOUNDED

2001

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Rocks - In-situ mineralization

Rocks - In-situ storage in sedimentary reservoirs

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Government Funding

## TYPE OF INVESTOR SOUGHT

Government

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# AC CARBON CAPTURE

## COMPANY DESCRIPTION

The AC Carbon Capture Technology is a new cost efficient air carbon capture solution, designed by SilicaTech in association with Bilfinger and Denmark Technical University. The concept comprises CO<sub>2</sub> capture through ammonium bicarbonate formation and precipitation, combined with CO<sub>2</sub> regeneration by thermal decomposition of the ammonium bicarbonate solids at elevated pressure and temperature. When deployed to full scale, this process will have a capture rate of 130 tonnes of CO<sub>2</sub>/ hour (1 megatonne/year).

## CORE INNOVATION

As our technology is a newly developed technology, the process itself, together with some of the equipment, represents the main physical and chemical differences, which results in considerably better cost efficiency compared to other carbon capture approaches.

## CO<sub>2</sub> CAPTURE

The CO<sub>2</sub> is captured by the exothermic chemical reaction between NH<sub>3</sub> (ammonia), H<sub>2</sub>O (water) and CO<sub>2</sub> (airborne), forming HNH<sub>4</sub>CO<sub>3</sub> (ammonium-bicarbonate). The ammonium-bicarbonate product is converted to a solid phase, and separated out and decomposed at elevated pressure and temperature whereby CO<sub>2</sub> is regenerated and separated out from the process, as a pure CO<sub>2</sub> gas stream. The CO<sub>2</sub> gas is cooled down to liquid phase for intermediate storage before transportation to the final destination for permanent storage.

## CO<sub>2</sub> SEQUESTRATION

The liquified CO<sub>2</sub> will be transported from intermediate storage to the receiving terminal located at Kollsnes at the western coast of Norway, and transported in pipeline and injected 2600 meters below the seabed of the North Sea at the Northern Lights injection well A-7 for durable storage.

## CO-BENEFITS OR PRODUCTS

As there are no stimulus schemes for this type of technology in Europe, this unfortunately means that there will be only costs associated with this type of activity for the time being. It is assumed that co-benefits will come at a later date.

## LEADERSHIP TEAM

Experience from development of new chemical processes related to solar cell raw material and refining, along with hydrometallurgical extraction of chemical substances combined with forming new synthetic chemical substances, and last but not least, the development of the new cost efficient AC Carbon Capture Technology.

# COMPANY OVERVIEW

## COMPANY NAME

Air Company Holdings, Inc.

## HQ LOCATION

Brooklyn, NY, USA

## FOUNDED

2017

## NUMBER OF EMPLOYEES

51 - 100

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Industrial Chemicals, Liquid Fuels

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solvent based direct air capture

Air - Solid sorbent direct air capture

Air - Membrane based direct air capture

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

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# AIR COMPANY



## COMPANY DESCRIPTION

Air Company is a technology, engineering and design company in New York City. We developed a unique technology that mimics photosynthesis, that takes excess carbon dioxide from the atmosphere and transforms it to chemicals and fuels with oxygen as the only byproduct. Our technology is the most efficient and scalable yet developed to make platform chemicals from carbon dioxide. As such, we are the first to market with several carbon-negative products.

## CORE INNOVATION

Currently available CO<sub>2</sub> conversion technologies utilize multistep processes, such as reverse water-gas shift or CO<sub>2</sub> electrolysis to produce CO<sub>2</sub>, in combination with Fischer-Tropsch systems. We have demonstrated a direct approach of converting CO<sub>2</sub> to chemicals/fuels in a single step (>90% verified carbon efficiency) via direct hydrogenation at the pilot scale. Air Company's modular technology is source-agnostic for its captured CO<sub>2</sub>, enabling the use of DAC (Air) or biomass-derived CO<sub>2</sub> (Land) as atmospheric CO<sub>2</sub> sources.

## CO<sub>2</sub> CAPTURE

For this project, Air Company proposes to utilize a monoethanolamine sorbent system to capture CO<sub>2</sub> from air. Our system currently operates using biogenic CO<sub>2</sub>, while we look into constructing a DAC system to act as a long-term CO<sub>2</sub> source. We also have a DOE funded collaboration with the Center for Negative Carbon Emissions at Arizona State University who are experts in solid and membrane-based DAC who we plan to collaborate with for this module.

## CO<sub>2</sub> SEQUESTRATION

Air Company's already established pilot-scale system combines CO<sub>2</sub> with green hydrogen (derived from water electrolysis) to produce high purity alcohols; oxygen is the only byproduct of this step. The second step involves conversion of the methanol from the first step to olefin via methanol-to-olefins process using commercially available catalysts. For the last step, we aim to accomplish durable sequestration by polymerizing our CO<sub>2</sub>-derived olefin into recyclable polymers using off-the-shelf and commercially-proven Ziegler-Natta type aluminum catalysts.

## CO-BENEFITS OR PRODUCTS

Using our proprietary catalyst we have demonstrated control over the relative ratios of ethanol, methanol, and paraffin products at the pilot scale. To date our high purity ethanol has been used in consumer products (vodka, sanitizer, perfume). The paraffins are mostly n-alkanes (C8-20 range), which constitute a component of ASTM specification aviation fuel. Sale of these products can help offset the cost of carbon removal.

## LEADERSHIP TEAM

Air Company has personnel with expertise in carbon conversion, catalysis, marketing, sales, technology licensing as well as quality and regulatory experts enabling it to develop and sell CO<sub>2</sub>-derived products faster than industry projections.

Dr. Stafford Sheehan (CTO) is an electrochemist and an expert in the field of artificial photosynthesis and carbon dioxide conversion, with over 70 academic publications, 15+ patents, and several technical awards. Gregory Constantine (CEO) is an award-winning businessman, product developer and entrepreneur.

# COMPANY OVERVIEW

## COMPANY NAME

Airhive Ltd

## HQ LOCATION

London, United Kingdom

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Building materials, Other

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$1,200,000

## REVENUE RANGE

<\$1M - \$5M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Convertible Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture, Family Office

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# AIRHIVE

## COMPANY DESCRIPTION

Airhive's technology employs fluidisation to provide rapid CO<sub>2</sub> removal via our low-cost, non-toxic metal oxide-based sorbent. For the XPRIZE demonstration, Airhive is partnering with CO<sub>2</sub> storage provider Exterra, who will react Airhive's air-captured CO<sub>2</sub> with a metal oxide extracted from mine tailings through their proprietary process. The two pilot plants will provide 2,000tpa of removal in Quebec, Canada, including the Deep Sky Alpha facility, once deployed from Q3 2024.

## CORE INNOVATION

Airhive delivers a step change in DAC cost and energy requirements: we will operate our demonstration plants at <\$300/tCO<sub>2</sub> and 2.13MWh/tCO<sub>2</sub>, including storage and post-processing, with Airhive's CAPEX being <\$70/tCO<sub>2</sub> and energy requirements of only 1.4MWh/tCO<sub>2</sub>.

Airhive's technology is built around proven process equipment with excellent existing supply chains, enabling rapid manufacturing ramp up and commercial deployment, a characteristic mirrored by Exterra's technology, given it leverages well-proven large-scaling mining components.

## CO<sub>2</sub> CAPTURE

1. Adsorption. Air is pushed through a horizontal fluidised bed reactor containing mixed metal oxide-based sorbent. The air causes the sorbent to form a turbulent sandstorm, stripping >99.99% of the CO<sub>2</sub> from air passing through the reactor in <0.1s.

2. Desorption. Carbonated sorbent is transferred to an electro-calciner where it is heated, separating CO<sub>2</sub> into a high-purity stream. Regenerated particles are returned to the carbonator, although in practice adsorption and desorption operate simultaneously.

## CO<sub>2</sub> SEQUESTRATION

The CO<sub>2</sub> is combined with water and the metal oxide particles extracted from the mine tailings in a bespoke reactor vessel under controlled temperature and pressure, in order to form stable carbonate minerals. The carbonate minerals are separated from the water using a filter press. The dehydrated carbonate is recombined with the residual mine tailings to create fill material that is placed in the mining sites where Exterra operates in order to restore the landscape.

## CO-BENEFITS OR PRODUCTS

Airhive's closed system enables us to use our sorbent as thermochemical energy storage, and therefore enabling plant operation based entirely on low-capacity factor renewables. We can also sell spent sorbent in its more valuable oxide form to the cement/building industry as bulk material, reducing new carbonate mineral extraction and calcination. Exterra's technology extracts critical minerals from waste, reducing new mineral extraction and reducing the physical and environmental footprint of historic mining through site rehabilitation.

## LEADERSHIP TEAM

Rory (CEO, Airhive) has 14 years experience leading international development programmes for UK government. Masters degrees from Oxford (diplomacy) and UCL (energy and climate). Jasper (CTO, Airhive) is completing a PhD in industrial decarbonisation at Imperial College. Specialist in fluidisation, process modelling and techno-economic assessment. BEng/MEng, Cambridge. Olivier (CEO, Exterra) has experience in mine development and investment banking with BMO Capital Markets. David (CSO, Exterra) has on-site experience in all phases of large-scale mining projects.





# COMPANY OVERVIEW

## COMPANY NAME

Carbon Atlantis GmbH

## HQ LOCATION

Munich, Germany

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Building materials, Industrial gases /  
Pure CO<sub>2</sub>

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solvent based direct air capture

Air - Electromechanical direct air  
capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$8,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

Venture Capital

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# CARBON ATLANTIS



## COMPANY DESCRIPTION

Carbon Atlantis is a technology developer focused on highly cost- and energy-efficient, electrochemical acid and base regeneration. The first major deployment sector for this process is in direct air carbon capture and storage, where regeneration of CO<sub>2</sub>-absorbing fluids presents a key challenge in terms of reducing energy consumption. The company's first two commercial pilots, to be deployed in early 2025, are collaborations with mineralization partner Paebbl in Rotterdam and project developer Deep Sky in Canada.

## CORE INNOVATION

Sorbent regeneration is at the core of any DAC technology. Electrochemical regeneration is fundamentally more energy efficient as it drops the need for heat. Our core technology produces two electrolyte streams, one acidified and one basified. Our specific solution leads to a lower reversible cell potential than for conventional (PEM) electrolysis, allowing for uniquely low energy consumption. Additionally, in-built energy storage and use of off-the-shelf materials with scaled supply chains further differentiates the technology.

## CO<sub>2</sub> CAPTURE

Carbon Atlantis' novel DAC technology is based on its electrochemical cell for energy-efficient pH-swing. This continuous, closed-loop system comprises two main components: an air contactor and an electrochemical backend. Fans mobilize atmospheric air, exposing a basified liquid solvent to the air, capturing the CO<sub>2</sub> as bicarbonates. The backend liberates the CO<sub>2</sub> molecules from the solvent at low pH regimes (pH-swing), before regenerating the solvent in stacked electrochemical cells by applying an electrical current.

## CO<sub>2</sub> SEQUESTRATION

CO<sub>2</sub> is sequestered via one of three pathways. Our first pilot will mineralize CO<sub>2</sub> into supplementary cementitious material (SCM) via Paebbl's process. It uses the captured CO<sub>2</sub>, ground silicate minerals (i.e., olivine), non-toxic additives, and water. An accelerated mineralization reactor produces carbonate minerals under elevated temperature and pressure. The second and third sequestration pathways are geologic, e.g., in saline aquifers/Class VI wells and alternatively in (ultra)mafic rock formations, for which multiple LOIs are in place.

## CO-BENEFITS OR PRODUCTS

DAC's value proposition is centered around permanence and additionality. Providing unique certainty, it doesn't generate plentiful co-benefits. Community support is significant as local, well-paying jobs are created. Communities that historically relied on fossil fuel production benefit from a transition to DAC. Existing skills prove useful, minimizing job loss, preventing communities from becoming economically disadvantaged. Collaborating with Paebbl produces supplementary cementitious materials (SCMs), driving down the clinker content in cement by 0.3-0.9 tCO<sub>2</sub>/t, replacing fossil-fuel-based SCMs.

## LEADERSHIP TEAM

Malte, (CEO), holds an M.Sc. in robotics from TU Munich and has successfully bootstrapped a profitable company. Paul, (CTO), holds an M.Sc. in robotics & AI from TU Munich/Harvard and has held highly technical positions at BMW and a medical start-up. Steffen, (CSO), holds a Ph.D. in PEM electrolysis from ETH Zurich. He previously worked at Merck in fuel cell membrane development and at a leading strategy consultancy in the climate space.

# COMPANY OVERVIEW

## COMPANY NAME

Carbyon

## HQ LOCATION

Eindhoven, Netherlands

## FOUNDED

2019

## NUMBER OF EMPLOYEES

11 - 50

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Other

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series-A

## AMOUNT OF CAPITAL SOUGHT

\$15,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate equity, Government funding

## TYPE OF INVESTOR SOUGHT

Venture capital, Government

Hans De Neve

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# CARBYON



## COMPANY DESCRIPTION

Carbyon is a startup company founded in 2019 with the purpose of turning direct air capture of CO<sub>2</sub> into an affordable and scalable technology. Our ambition is to reach gigatonne scale and substantially contribute to mitigating climate change.

## CORE INNOVATION

Carbyon's DAC technology is built around a unique solid sorbent process that captures CO<sub>2</sub> in cycles of a few minutes. This fast-swing feature results in a low CAPEX/low OPEX solution that can bring total cost of DAC well below USD 100/tCO<sub>2</sub>. Our DAC machines require only an electrical power input and are built in a modular way, which facilitates automotive-style mass-manufacturing to allow for growing towards gigatonne scale.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured using a solid sorbent direct air capture technology. Both the sorbent as well as DAC machines are developed and patented by Carbyon. They take in ambient air and deliver high concentration CO<sub>2</sub> at atmospheric pressure, ready to be processed for virtually any sequestration or (re)use application.

## CO<sub>2</sub> SEQUESTRATION

Our DAC machines are "agnostic" to the type of CO<sub>2</sub> sequestration that is used, which can be either in underground rock formations, empty oil and gas fields or in building materials. For this submission, the case of sequestration in empty gas fields under the North Sea is described. This project is now ready for implementation after having passed the severest impact studies with regards to (economical) feasibility, durability, environmental and societal impacts.

## CO-BENEFITS OR PRODUCTS

Our DAC machines require only electrical power as input. Other energy sources (like waste heat) can be used, if available. The machines can be deployed in nearly any environmental condition, so ideal combinations of availability of renewable electricity and the downstream processing of CO<sub>2</sub> can be chosen. As a by-product, purified water is delivered which can be useful for applications in need for water, sequestration methods that need water and/or usage in arid areas.

## LEADERSHIP TEAM

Carbyon's leadership team is comprised of seasoned professionals with a proven track record in deep tech innovation. CEO Hans De Neve brings extensive experience in sustainable technology development. He established a leadership team that contributes expertise in R&D, strategy, business, finance and operations. Their collective vision drives the long-term preservation of Carbyon's commitment to restoring the atmospheric carbon balance for the benefit of society and the environment, as defined in Carbyon's Ethical Charter.

# COMPANY OVERVIEW

## COMPANY NAME

DeCarbon Technology (Shenzhen) CO., Ltd.

## HQ LOCATION

Shenzhen, China

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Advanced materials, Building materials, Industrial chemicals, Industrial Gases / CO<sub>2</sub>

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solvent based direct air capture

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$9,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate equity, Project equity, Government funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture capital, Private equity

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# DECARBON TECH



## COMPANY DESCRIPTION

DeCarbon Tech is a global climate governance company built on second generation CO<sub>2</sub> capture technology. We provide integrated decarbonization solutions with high-efficiency industrial source and air source CO<sub>2</sub> capture and utilization for customers across industries. We pioneer the utilization of cost-effective, widely available industrial waste to develop highly efficient, economical CO<sub>2</sub> capture materials and equipment.

## CORE INNOVATION

Our key advantage lies in our advanced solid amine preparation technology, which uses silicon-aluminum-based nano-porous materials and repurposes industrial solid waste, reducing costs without compromising performance. The optimized solid amine material efficiently captures CO<sub>2</sub> from the air, boasting fast adsorption rate, high capacity, and stability. By utilizing industrial solid waste, we create a cost-effective adsorbent. The engineered carbon capture equipment enhances the capture process, leading to reduced carbon emissions and increased energy efficiency.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by solid state amine chemisorption. The adsorption process takes place at a fixed bed. Ambient air is sucked into the fixed bed system by the adsorption fan, and the air enters the fixed bed from the bottom to contact with the adsorption materials. The basic amine functional groups present on the adsorption materials react with acidic CO<sub>2</sub> molecules to form chemical bonds, thus allowing for effective CO<sub>2</sub> adsorption from air.

## CO<sub>2</sub> SEQUESTRATION

CO<sub>2</sub> mineralizes with alkaline substances in building materials to form a stable carbonate, similar in nature to limestone, which does not decompose under normal conditions. These building materials will be used to build buildings, roads, bridges, etc., even if their useful life expires in the future, mineralized CO<sub>2</sub> will exist in the form of carbonates, and will not release CO<sub>2</sub> into the air.

## CO-BENEFITS OR PRODUCTS

Our solid amine carbon capture technology tackles climate change by removing atmospheric CO<sub>2</sub>, aiding emissions reductions goals. Integrating carbon capture with renewables ensures zero-emissions. Captured carbon can be permanently stored for negative emissions, used to produce renewable fuels, or incorporated into green building materials. This integrated solution maximizes carbon benefits, resolves solid waste issues by utilizing industrial waste in material production, and promotes sustainable development across waste reuse, renewables, and innovative CO<sub>2</sub> utilization pathways.

## LEADERSHIP TEAM

The founding team hails from prestigious universities including Tsinghua University, Peking University, the KTH Royal Institute of Technology, and the University of Copenhagen. The Chief Scientist of the company is one of the top ten investment attraction professionals in Shenzhen. CEO has nearly 10 years of experience in a state-owned environmental enterprise, and the Chief Technical Officer has accumulated several years of expertise in technical research and development.

# COMPANY OVERVIEW

## COMPANY NAME

Direct Air Capture

## HQ LOCATION

Venice, FL, USA

## FOUNDED

2020

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Advanced Materials

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Air - Membrane based direct air capture

Rocks - In-situ storage in sedimentary reservoirs

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

Karl Khalil

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# DIRECT AIR CAPTURE



## COMPANY DESCRIPTION

Carbon Corp was a finalist in the Carbon XPRIZE, capturing and converting carbon dioxide from flue streams into solid nanocarbon. Direct Air Capture LLC takes this one step further by leveraging this revolutionary technology and utilizing direct air capture as the input. This technology not only permanently removes CO<sub>2</sub> from the atmosphere but also creates a highly valuable carbon nano product, such as carbon nanotubes, nano onions, and graphene.

## CORE INNOVATION

Many direct air capture technologies focus on capturing CO<sub>2</sub>, concentrating, transporting, and sequestering underground in specific geological basins. Direct Air Capture LLC looks at not only capturing CO<sub>2</sub> but also utilizing it. CO<sub>2</sub> is the main feedstock for the production of graphene nanocarbons. These nanocarbons can then be applied to a variety of existing products to enhance their properties and ultimately reduce their carbon intensity.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is absorbed into a molten salt bath. By applying a DC current, CO<sub>2</sub> is electrochemically split into carbon, C, and Oxygen O<sub>2</sub>. The carbon is in the form of graphene nanocarbons with extraordinary downstream applications.

## CO<sub>2</sub> SEQUESTRATION

By electrochemically splitting CO<sub>2</sub>, the gaseous GHG is permanently stored in a solid form. There is no concern of underground storage that may leak over time as the CO<sub>2</sub> is removed from the gaseous phase.

## CO-BENEFITS OR PRODUCTS

The produced GNCs can be applied to existing materials to enhance properties. As an example, when adding GNCs to cement, increased strength is observed - this allows for a reduction in the amount of cement required for a given project. Cement has a carbon intensity of ~0.9kg CO<sub>2</sub>/kg cement, meaning that large CO<sub>2</sub> amplification removal is observed.

## LEADERSHIP TEAM

Prof. Licht, Founder has dedicated his career to sustainability and carbon mitigation. With over 160 patents (and patents pending) as well as 40+ high-impact papers. Prof. Licht led Carbon Corp/C2CNT through the prior Carbon XPRIZE into the finalist phase and was the recipient of the X-Factor award for the most valuable product produced from carbon dioxide.

# COMPANY OVERVIEW

## COMPANY NAME

Ecomerit Technologies Pacific Limited

## HQ LOCATION

Matakana, New Zealand

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Energy

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solvent based direct air capture

Oceans - Ocean alkalinity enhancement

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series E

## AMOUNT OF CAPITAL SOUGHT

\$30,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate equity, Project equity, Government funding, Philanthropic funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture capital, Family office, Private equity, Philanthropic, Government, Other

James G. P. Dehlsen

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[precipitor.com](http://precipitor.com)

# ECOMERIT TECHNOLOGIES OF THE PACIFIC

## COMPANY DESCRIPTION

Ocean-based mCDR via elevated reactant misting that precipitates atmospheric CO<sub>2</sub> as bicarbonate aerosols, falling into the ocean, bio-uptaken for CO<sub>2</sub> sequestration by sedimentation into the deep sea, also causing OAE, effectively 2-for-1 mCDR with sequestration. Project comprises: 1) chamber testing/verification of NaOH aerosol reaction with CO<sub>2</sub>, 2) build/field test 4m (D) Precipitor (320 tonnes/year mCDR), study plume dispersion, 3) design/construction 10m (D) Precipitor (>1000 tonnes/year mCDR) to operate in the ocean, and 4) MRV.

## CORE INNOVATION

The Precipitor technology leverages the renewable energy of the wind to produce the NaOH from seawater, power aerosolization, and bring atmospheric CO<sub>2</sub> to the reaction zone. Additionally, the approach leverages the natural biological carbon pump, amplifying the flow of CO<sub>2</sub> from the atmosphere to the deep sea, leading to durable sequestration.

## CO<sub>2</sub> CAPTURE

Dilute alkali (NaOH, water) aerosol is dispersed from the Precipitor operating on ships and offshore wind turbines. Reaction with airborne CO<sub>2</sub> forms bicarbonate droplets (mCDR 1) that fall into the ocean, buffering acidity, and is bio-uptaken with sequestration by deposition and buffering seawater nutrient balance of calcifying organisms. This unique 2-for-1 mCDR process, from the air, and by the ocean, ends as mineralized carbon sequestered in the deep ocean and ocean sediments.

## CO<sub>2</sub> SEQUESTRATION

Durable carbon sequestration to the sea, as defined by the IPCC (2007), requires removal from the atmosphere for time periods exceeding a century. This is achieved by CO<sub>2</sub> fixation by phytoplankton, zooplankton grazing, packaging of detritus, and ultimately export of matter to the deep sea (Biological Carbon Pump BCP), defined as depths below 600 m. The Biological Carbon Pump efficiency depends upon species composition, cell size, aggregate chemical composition, and factors influencing ballast.

## CO-BENEFITS OR PRODUCTS

Bicarbonate droplets buffer ocean acidification, which impairs calcifying organism development, improving phytoplankton productivity. OAE increases oceanic CO<sub>2</sub> carrying capacity, amplifying CO<sub>2</sub> sequestration. Offshore turbine powers onboard desalination, brine electrolysis produces NaOH for aerosol. Coproducts: Hydrogen, chlorine, freshwater to shore; leverages mCDR by deployment on existing infrastructure. Ship-mounted Precipitors offset carbon emissions; clean fuelled ships provide mCDR services. Offshore petrochemical platforms gain utility by mCDR, connecting pipelines are repurposed for NaOH solution delivery.

## LEADERSHIP TEAM

James Dehlsen, pioneering wind/marine renewables, sustainability technologies, and global industry development. Dr. Debora Iglesias-Rodriguez, biological oceanographer, UCSB Marine Science; ocean acidification, carbon physiology; expert for IPCC, U.K. (climate change), UNESCO and UN COP 25, 28. Dr. Ira Leifer, (BRI) developed systems for air pollutants and GHG flux derivation for NASA; for marine gas flux measurement. Dr. Grant Deane, research oceanographer, principal investigator SOARS Lab, Scripps Institute. Dr. Amir Pirooz (NIWA): NWP/CFD Modeller, mechanical, wind engineering.

# COMPANY OVERVIEW

## COMPANY NAME

EPFL Carbon Team

## HQ LOCATION

Lausanne, Switzerland

## FOUNDED

2022

## NUMBER OF EMPLOYEES

51 - 100

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Air - Membrane based direct air capture

Rocks - In-situ storage in sedimentary reservoirs

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series E

## AMOUNT OF CAPITAL SOUGHT

\$30,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate equity, Project equity, Government funding, Philanthropic funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture capital, Family office, Private equity, Philanthropic, Government, Other

James G. P. Dehlsen

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[precipitor.com](http://precipitor.com)

# EPFL CARBON TEAM

## COMPANY DESCRIPTION

We are a student team based at EPFL (École Polytechnique Fédérale de Lausanne) in Switzerland. We are developing a hybrid system for direct air capture based by combining an adsorption and graphene membrane process. Each of these two technologies has been under development in laboratories of EPFL since 2017, and with regard to the graphene membranes, a start-up called Divea has notably been created to scale up and manufacture the technology on an industrial scale.

## CORE INNOVATION

Our filters are made from a special material called Graphene. With a thickness of just 1 atom, it can lead to record breaking performances and push the boundary of what is possible to do with membrane science. After synthesizing graphene, we make tiny holes just about the size of the CO<sub>2</sub> molecule. These holes work like a sieve and only let CO<sub>2</sub> to go through which enable us to separate it from other molecules. Several tricky production steps are needed to synthesize graphene membranes and we are the only group in the world capable of doing so.

## CO<sub>2</sub> CAPTURE

Membranes can't be used on their own for direct air capture, but we can leverage their performance by combining them in a hybrid system. For example, a system based on adsorption which works well with low concentration but is energy intensive, and membranes which rather work with high concentrations but is energy efficient. This system results then in an energy optimum, thereby minimizing the associated costs.

## CO<sub>2</sub> SEQUESTRATION

The focus is on the synthesis and integration of graphene membranes with adsorption/desorption cycles, so collaborations with industrial partners for the sustainable sequestration or utilization of CO<sub>2</sub> are still under consideration. As our process is highly flexible, CO<sub>2</sub> purity can be optimized and different storage methods used.

## CO-BENEFITS OR PRODUCTS

The graphene membranes could be used as a post-combustion solution and installed at industrial facilities like cement, steel, waste, chemicals, etc. This would help to decarbonize the industrial sector whose emissions are harder to replace by other methods and help generate sufficient revenues to build DAC plants.

## LEADERSHIP TEAM

Our team is based at the heart of EPFL, one of Europe's biggest research centers and most prestigious universities. The student team is currently led by Louis Saix, a promising Chemical Engineer, and is under the supervision of Karl Khalil, CEO of Divea which aims to develop and manufacture graphene membranes on an industrial scale, and Prof. Kumar Agrawal, the world leader in graphene-based gas separation.



# COMPANY OVERVIEW

## COMPANY NAME

Global Thermostat, PBC

## HQ LOCATION

Commerce City, CO, USA

## FOUNDED

2010

## NUMBER OF EMPLOYEES

11 - 50

## TRL 8

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Industrial Gases / Pure CO<sub>2</sub>

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$50M - \$100M

## TYPE OF CAPITAL SOUGHT

Corporate Equity

## TYPE OF INVESTOR SOUGHT

None Specified

# GLOBAL THERMOSTAT



## COMPANY DESCRIPTION

Global Thermostat's mission is to design and deploy the world's best direct air capture technologies. Since 2010, we have developed a uniquely low-cost solution based on deep scientific research, secured over 100 patents, and proven our technology at multiple scales. We have operated our kilotonne-scale DAC module, one of the largest ever built, since 2022. We are now working to deploy our solutions globally to help restore Earth's climate for the benefit of all.

## CORE INNOVATION

Based on more than a decade of rigorous, molecular-level material science and systems engineering, the fundamental advantages of Global Thermostat's technology derive from efficient movement of high volumes of air, CO<sub>2</sub> selectivity, rapid regeneration, capital efficiency, and drop-in upgradability. It is also inherently scalable as it is based on fully modular, stackable contactors. Overall, we believe we have developed and patented a DAC solution that is on a fundamentally advantaged, lowest cost, broadly scalable pathway.

## CO<sub>2</sub> CAPTURE

Global Thermostat's patented Direct Air Capture solution is a solid sorbent, low Temperature-Vacuum Swing-Adsorption (TVSA) process designed to most efficiently and cost-effectively capture CO<sub>2</sub> from air. It consists of high-efficiency fans that pull air through ultra-high surface area contactors where the surface geometry and embedded solid sorbent have been custom-designed to optimize the capture of CO<sub>2</sub>. Low-temperature heat then rapidly releases the CO<sub>2</sub> for long-term storage or reuse.

## CO<sub>2</sub> SEQUESTRATION

Our business model is to sell DAC modules to carbon removal project developers and operators. We are maturing a growing number of CDR projects with leading organizations where we will provide the DAC modules and they will provide the required sequestration services, which range across Class VI geologic sequestration wells to proven mineralization approaches. The CDR projects we are working to commission in the 2025-2028 timeframe would all follow world class MRV methodologies and requirements.

## LEADERSHIP TEAM

Paul Nahi, CEO (Former CEO of Enphase, leading solar pioneer, which he took public and grew annual revenues to \$325MM). Nicholas Eisenberger, Head of Market Development (25 years in Clean Tech, 15 years in DAC; Founder & Chair, Direct Air Capture Coalition). Fred Moesler, CTO (30+ years in industry, 20+ in renewables; Former CTO, Renmatix). Kenn Kerr, SVP Commercial Development (25+ years in industry, 20+ in industrial gases; Former Director, Sales, Air Liquide).

# COMPANY OVERVIEW

## COMPANY NAME

Heirloom Carbon Technologies

## HQ LOCATION

Brisbane, CA, USA

## FOUNDED

2020

## NUMBER OF EMPLOYEES

101 - 250

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Ex-situ mineralization of mined rocks

Rocks - Calcination of minerals with CO<sub>2</sub> capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

**Max Scholten**

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[heirloomcarbon.com](http://heirloomcarbon.com)

# HEIRLOOM

## COMPANY DESCRIPTION

Heirloom builds a low-cost DAC technology that will permanently remove CO<sub>2</sub> at a billion-tonnescale. Our technology rapidly accelerates a natural process to capture CO<sub>2</sub> from the atmosphere by forming limestone on a timespan of days. Heirloom operates the first and only commercial Direct Air Capture facility in North America and its customers are the world's biggest buyers of carbon removal including Microsoft, Meta, JPMorgan, Stripe, Klarna, Shopify and more.

## CORE INNOVATION

Heirloom is one of the only companies with a real path to permanently sequestering billions of tonnes of CO<sub>2</sub> at < \$100/t. The science underpinning our technology is well-established, allowing us to focus on scaling. Our feedstock is limestone, a low cost input with a mature supply chain, allowing us to iterate and scale quickly. Last, our energy requirements are lower than other DAC pathways due to the high thermal efficiency of our electric kilns.

## CO<sub>2</sub> CAPTURE

Heirloom uses limestone (calcium carbonate, Ca(OH)<sub>2</sub>) in a cyclic process to capture CO<sub>2</sub> directly from the air. When CO<sub>2</sub> is removed from the limestone, the remaining CaO is hydrated with water to form calcium oxide Ca(OH)<sub>2</sub>. Ca(OH)<sub>2</sub> is 'thirsty' for CO<sub>2</sub> and acts like a sponge, pulling CO<sub>2</sub> from the atmosphere. Heirloom's technology accelerates this process, reducing the time it takes to absorb CO<sub>2</sub> from years to less than 3 days.

## CO<sub>2</sub> SEQUESTRATION

For the purposes of the XPRIZE demonstration, we will work with CarbonCure to inject and mineralize the CO<sub>2</sub> captured at our demonstration site in concrete. Geological storage in Class VI wells will be Heirloom's primary permanent storage method at scale. Concrete is an important and immediately-available permanent storage method that allows us to fully validate our end-to-end capture and storage process because only 1 Class VI well is permitted and operationalized today in the US.

## CO-BENEFITS OR PRODUCTS

The CO<sub>2</sub> captured by Heirloom at our XPRIZE demonstration site will be durably sequestered in concrete. The CO<sub>2</sub> improves the compressive strength of the concrete and reduces the amount of cement that needs to be used, reducing the cost and emissions footprint of the concrete. Going forward, Heirloom will permanently store CO<sub>2</sub> in Class VI wells, creating high-paying jobs and workforce skills and training programs in regions previously harmed by extractive industries.

## LEADERSHIP TEAM

Shashank Samala, CEO and co-founder, is an experienced entrepreneur in automated electronics manufacturing. Dr. Noah McQueen, co-founder and Head of Innovation, invented Heirloom's technology. His PhD centered on CDR, particularly carbon mineralization and DAC. Members of Heirloom's leadership team have led automation for Tesla's Model 3 and Model X production, secured over \$11 billion in project financing, constructed multi-billion dollar infrastructure projects, and built partnerships with communities to successfully introduce new technologies.



# COMPANY OVERVIEW

## COMPANY NAME

Holocene

## HQ LOCATION

Knoxville, TN, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 4

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solvent based direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Philanthropic, Government, Project Finance

# HOLOCENE



## COMPANY DESCRIPTION

Holocene designs and builds chemical plants that remove carbon dioxide (CO<sub>2</sub>) from the atmosphere using a novel low-temperature aqueous solvent, with the purpose of storing the CO<sub>2</sub> underground permanently. We harness the power of organic chemistry (materials made from carbon, nitrogen and hydrogen) to develop a novel DAC process that is continuous and requires only low temperature (100C) heat for CO<sub>2</sub> unloading.

## CORE INNOVATION

We are the only low-temperature (80-130C) liquid thermochemical direct air capture solution (that we know of). The other differentiating factor are the materials and supply chains we use; we make use of organic materials with high density of active sites (i.e. interacting with the CO<sub>2</sub> in the loading and unloading) process, i.e. amino acids and guanidines. We use solubility differences to drive our chemical process. These technical differentiators result in a continuous, low complexity plant design.

## CO<sub>2</sub> CAPTURE

Our system is a thermo-chemical, low-temperature aqueous process. We use two chemical loops, one containing amino acids in water to capture CO<sub>2</sub> from the air and one containing guanidines, that form an insoluble carbonate salt that will ultimately be regenerated & generate pure CO<sub>2</sub>. We make use of traditional chemical engineering processes (absorption, crystallization, liquid-solid separation).

## CO<sub>2</sub> SEQUESTRATION

We collaborate with CO<sub>2</sub> sequestration partners with access to class VI wells for CO<sub>2</sub> injection underground, in addition to exploring above-ground CO<sub>2</sub> storage in durable materials.

## CO-BENEFITS OR PRODUCTS

Our co-benefits come mostly from the low-footprint (5 tonnes removed/m<sup>2</sup>-yr), high density removal of our solution, as well as in sustainable supply chains (our materials are high impact and don't require critical materials).

## LEADERSHIP TEAM

Anca Timofte, CEO, joined Climeworks in '12 where she worked for 8y, leading the Process Eng. & designing 10 DAC plants. She got an MBA at Stanford and is a Breakthrough Energy Innovator. Tobias Rüesch, CTO, has 10y experience in leading design, FEED studies, and technology scale-up. He led R&D at Climeworks for 6y & managed 15 engineers building 5 plants. Keeton Ross created the first supply/demand model for VCMs at McKinsey, invested in DAC at Evok & led special projects at Patch.

Anca Timofte

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[theholocene.co](http://theholocene.co)

# COMPANY OVERVIEW

## COMPANY NAME

Noya

## HQ LOCATION

Oakland, CA, USA

## FOUNDED

2020

## NUMBER OF EMPLOYEES

11 - 50

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Industrial Gases/Pure CO<sub>2</sub>

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Air - Electromechanical direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

**John Greenfield**

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# NOYA

## COMPANY DESCRIPTION

Noya's unique approach to direct air capture addresses key industry challenges around cost (driving towards \$100/ton), scalability (driving towards gigaton-scale impact), and lifecycle emissions (flexing to better match intermittent and curtailed sources of renewable energy).

Josh, Daniel, and team enjoy strong support from pioneering carbon removal buyers, including Shopify, Watershed, and one of the largest university endowments, as well as leading investors including Union Square Ventures, Collaborative Fund, EQT, and Y Combinator.

## CORE INNOVATION

We combine the following characteristics: 1) abundant sorbent materials; 2) electricity-based regeneration with no need for heat; 3) fast / interruptible operating cycle; and 4) extremely modular architecture into our proprietary technology / process. Together, these key characteristics give us confidence that we'll be able to scale our process cost-effectively, and from intermittent renewable energy sources - which provides a significant advantage both in terms of cost and lifecycle emissions.

## CO<sub>2</sub> CAPTURE

Using activated carbon monoliths coated with a chemisorption agent, we capture CO<sub>2</sub> from ambient air (solid sorbent DAC approach). Our energy-efficient regeneration process operates at a low temperature (initially, approximately 100C) and employs "joule heating" (electricity-based resistive heating) to regenerate / release captured CO<sub>2</sub>. This avoids the need for additional pieces of large equipment for heating, such as an industrial furnace, kiln, or steam generator.

## CO<sub>2</sub> SEQUESTRATION

After regeneration, we compress the CO<sub>2</sub> to a supercritical state. At this stage, we hand it off to our partners: specialized CO<sub>2</sub> storage companies - which are focused on geologic storage - in order to permanently sequester (on site).

## CO-BENEFITS OR PRODUCTS

We produce a high-purity stream of CO<sub>2</sub> that can be used as a feedstock for other products (in addition to being permanently sequestered). In addition, once running, our process produces distilled water as a byproduct, which we anticipate providing to the local community as a co-benefit, especially in locations where water scarcity is an issue.

## LEADERSHIP TEAM

Josh Santos, Founder + CEO (scaled Model 3 production at Tesla); Daniel Cavero, Founder + CTO (nod labs, rloop); John Greenfield, Head of Business Development (scaling deep tech x renewable energy companies, industrial and corporate relationships: ABB, Fortive, Rockwell); Jeremy Cook, Head of Project Development (20+ years renewable energy project development, including at Engie Impact), Sylvia Spruytte, Head of Chemical and Materials Engineering (multiple world records for solar cell efficiency).



# COMPANY OVERVIEW

## COMPANY NAME

Octavia Carbon

## HQ LOCATION

Nairobi, Kenya

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Advanced Materials, Industrial Chemicals, Chemical Polymers

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - In-situ mineralization

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$2,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Project Finance

**Martin Freimüller**

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# OCTAVIA CARBON



## COMPANY DESCRIPTION

Octavia Carbon is the Global South's first Direct Air Capture (DAC) company based in Nairobi, Kenya. At the core of our operations, we design, build, and deploy highly modular machines that capture CO<sub>2</sub> directly from the atmosphere using DAC technology. By leveraging Kenya's abundant renewable energy, geological formations, and talent, we aim to deploy DAC at competitively low costs in Kenya. Currently, we are working towards Project Hummingbird, a 1000tCO<sub>2</sub>/yr DAC+Storage project by 'Q4 2024.

## CORE INNOVATION

Our sorbent regenerates at low temperatures (~80C), allowing the integration of geothermal waste heat in our DAC operations to cover >85% of our energy requirements. This key factor allows us to address the typical energy-intensive requirements of DAC and significantly cut down our DAC OPEX to ~\$66/tCO<sub>2</sub>. Additionally, our highly modular DAC machines, with the latest model capturing 10tCO<sub>2</sub>/yr, allow for fast iteration and much faster learning curves than our industry peers.

## CO<sub>2</sub> CAPTURE

Our DAC approach is a low-temperature vacuum swing adsorption(TVSA) process that uses solid-supported amines to capture carbon dioxide from the air. The DAC process occurs in two phases: adsorption and desorption. During adsorption, the sorbent isolates CO<sub>2</sub> from the atmosphere under atmospheric conditions. Once saturated, desorption begins by creating vacuum conditions(200-300mbar). Geothermal waste heat steam is used to indirectly heat the sorbent(~80C), releasing the captured CO<sub>2</sub>. Thereafter the CO<sub>2</sub> is compressed for purification and sequestration.

## CO<sub>2</sub> SEQUESTRATION

Our storage partner, Cella Mineral Storage, will inject our captured CO<sub>2</sub> underground into basalt rock formations abundant in the Kenyan Rift Valley region. The porous basaltic rocks are natural storage sites for CO<sub>2</sub> because of their ability to transform CO<sub>2</sub> into carbonate minerals, locking it away for millions of years with minimal to no leakage risk. Our DAC operations will be co-located with Cella's commercial CO<sub>2</sub> storage well, avoiding additional infrastructural costs.

## CO-BENEFITS OR PRODUCTS

Kenya's grid is 93% renewable. However, electricity costs remain high due to a lack of demand, and consequently, 1000 MWh of geothermal electricity is wasted daily. Harnessing this excess capacity will create a new industrial baseload demand that will help drive green industrialization in Kenya and enable the cross-subsidization of electricity costs for marginalized communities. Furthermore, the project has already created ~47 green jobs for Kenyan youths, and we aim to create >70 by year-end.

## LEADERSHIP TEAM

Our CEO and Founder, Martin Freimüller, sets the company's strategy and leads fundraising efforts. Duncan Kariuki, Product Lead, and Mike Bwondera, R&D lead, both founding employees, oversee the design of DAC machines and focus on developing the second-generation machine models, respectively. Our Growth and Partnership Lead, Fiona Mugambi, initiates stakeholder engagements. Diana Maranga, our Business Development Lead, unlocks new revenue streams. Notably, our Operation Lead, Mwangi Kagunyu, oversees facility maintenance and internal manufacturing capabilities.

# COMPANY OVERVIEW

## COMPANY NAME

Origen Carbon Solutions

## HQ LOCATION

Bristol, United Kingdom

## FOUNDED

2013

## NUMBER OF EMPLOYEES

11 - 50

## TRL 4

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Industrial Chemicals, Industrial Gases/  
Pure CO<sub>2</sub>

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Ex-situ mineralization of mined rocks

Rocks - Calcination of minerals with CO<sub>2</sub> capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$15,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity,  
Government Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture  
Capital, Family Office, Philanthropic,  
Government

## Dustin Pool

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[origencarbon.com](http://origencarbon.com)

# ORIGEN CARBON SOLUTIONS



## COMPANY DESCRIPTION

Origen is pioneering an approach to limestone-based direct air capture (DAC) harnessing existing supply chains, proven energy systems, and the natural properties of limestone. Origen's technology enables the conversion of limestone into the sorbent calcium oxide without the production of emissions, and puts forth a unique method to enhance calcium oxide's natural carbon removal ability.

## CORE INNOVATION

Origen has three differentiators in limestone-based DAC. First, Origen owns technology to generate calcium oxide with zero-emissions through a proprietary oxy-fuel flash calciner. This makes Origen the only limestone-based DAC company to own the full loop of calcination and carbonation. Second, Origen has patented a lime processing method that enhances materials handling ability of calcium hydroxide. Finally, Origen's contactors focus on optimizing the interaction between CO<sub>2</sub> and calcium hydroxide in low intensity, static structures.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is absorbed from ambient air through exposure to calcium hydroxide. This proven chemistry has been around for millennia and is utilized in the minerals processing industry to produce a range of carbonates. Through its proprietary low-intensity air contactor, Origen elegantly solves materials handling challenges and achieves high capture efficiency - the solution is pragmatically deployed and highly scalable.

## CO<sub>2</sub> SEQUESTRATION

CO<sub>2</sub> for this project will be durably sequestered using one of two methods (to be selected in Q1 2024). The first is onsite mineralization using waste alkali materials with a partner; the second is geologic sequestration in a Class VI well. There are several active permitted wells in North Dakota, where this demonstration will occur.

## CO-BENEFITS OR PRODUCTS

Origen's process also produces re-carbonated limestone; while the base case is to dispose of this limestone (or loop it back into our process), we are exploring potential use cases to sell precipitated calcium carbonate (PCC) and granulated calcium carbonate (GCC) into minerals processing industries for applications that would keep the CO<sub>2</sub> sequestered.

## LEADERSHIP TEAM

Origen's team combines deep technology and commercialization expertise. CEO Ben Turner spent 10+ years in finance and carbon markets. CCO Dustin Pool has 13 years of experience in energy, and wrote Origen's successful Stripe application. CTO Richard Tamblyn worked in minerals processing and limestone and leads novel contactor prototyping. Head of Engineering Jozef Kohl commissioned and operated lime kilns at one of the largest lime manufacturers in the world.

# COMPANY OVERVIEW

## COMPANY NAME

Partanna Global, Inc

## HQ LOCATION

Encino, CA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Building Materials

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Oceans - Ocean ecosystem restoration and management

Rocks - Calcination of minerals with CO<sub>2</sub> capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

Tyler Yang

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# PARTANNA GLOBAL, INC



## COMPANY DESCRIPTION

Partanna is the visionary carbon technology company responsible for the world's first carbon-negative concrete. Partanna's technology replaces the cement binder using recycled materials such as steel slag and brine along with natural ingredients to produce concrete that naturally absorbs carbon dioxide from the atmosphere. Our environmentally-friendly building materials are just as affordable, durable and versatile as traditional cement-based materials. These products find application in an expanding portfolio including construction, wastewater treatment, and coral reef infrastructure.

## CORE INNOVATION

Partanna harnesses the power of chemistry to avoid and remove carbon dioxide emissions from the atmosphere. Instead of using Portland Cement as our binder, which emits 9% of the world's CO<sub>2</sub> pollution, we take two recycled materials -brine, recycled steel slag and other natural ingredients- and mix them at room temperature. Unlike other concrete producers, Partanna does need to inject carbon dioxide or use intensive electrical or fire-based heating processes to produce clinker.

## CO<sub>2</sub> CAPTURE

Once brine is added to our special blend of natural and recycled ingredients, the reactions and curing processes create chemical compounds that react with carbon dioxide in the air. As this mixture cures at room temperature, and reacts, it creates our patented binder. These reactive compounds continue to absorb carbon dioxide throughout our building materials' lifecycle, naturally and permanently removing carbon dioxide from the atmosphere. This process can happen anywhere, including in underwater environments.

## CO<sub>2</sub> SEQUESTRATION

Partanna's binder naturally locks in carbon dioxide as the chemical compounds react with atmospheric carbon dioxide during the curing process. In order for the greenhouse gas to be released, our material would need to be heated up to extremely high temperatures (i.e. 1,000 degrees plus) to break apart the chemical compounds and release the captured carbon dioxide. This would require extreme circumstances, hence we are confident in our technology's capability to permanently remove carbon dioxide.

## CO-BENEFITS OR PRODUCTS

Partanna's products' co-benefits beyond carbon avoidance/removal include its novel ability to use any water source in the production process and act as coral reef infrastructure. Unlike typical cement, Partanna's technology can use any water source, including brine or brackish water - this is different from traditional concrete, which requires 2% of annual freshwater demand to produce. Furthermore, Partanna grows stronger with exposure to seawater and has performed exceptionally acting as infrastructure for coral reef restoration.

## LEADERSHIP TEAM

Co-Founders President Sam Marshall and CEO Rick Fox are an award-winning architect and serial entrepreneur/public figure, respectively. COO Chris Nordling and Chief Strategy Officer Jessica Nordling bring extensive experience leading billion-dollar projects. CLO Greg Nelson devises and executes Partanna's patent strategy while Chief Sustainability Officer Rebekkah Swisher is the former Editor of Chemical Engineering Magazine. CTO Kevin Pang is an award-winning materials technologist and VP of Business Development/Marketing Rory Anderson brings extensive marketing experience.

# COMPANY OVERVIEW

## COMPANY NAME

Mission Zero Technologies (MZT)

## HQ LOCATION

London, United Kingdom

## FOUNDED

2020

## NUMBER OF EMPLOYEES

11 - 50

## TRL

6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Building Materials

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solvent based direct air capture

Air - Electrochemical direct air capture

Rocks - Mineralization of mine or industrial waste

Rocks - Calcination of minerals with CO<sub>2</sub> capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

**Shiladitya Ghosh**

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# PROJECT ARROW

## COMPANY DESCRIPTION

Project ARROW is a joint project between Mission Zero Technologies and OCO. Technology. Connecting two complementary technologies to unlock the potential for gigatonnes of removal while also diverting harmful waste from landfill. The demonstration project will use MZT's electrochemical DAC technology to provide OCO with CO<sub>2</sub> that is used to stabilise hazardous waste and transforms it into a carbon negative construction aggregate (known as Manufactured LimeStone (M-LS)) and also acts as a carbon sink.

## CORE INNOVATION

The ARROW project employs technologies that primarily require electricity and water, no thermal inputs are required. This makes the process suitable for a wide range of geographies. The process can be used to treat problematic waste such as mine tailings and be deployed to areas where such waste is produced or has accumulated either to create new products or as a carbon sink, all while removing CO<sub>2</sub> from the atmosphere.

## CO<sub>2</sub> CAPTURE

Atmospheric CO<sub>2</sub> is captured in two ways in Project ARROW, firstly MZT's DAC extracts CO<sub>2</sub> from ambient air by passing the air through an air contactor where MZT's solvent selectively captures CO<sub>2</sub>, this solvent is then processed and the CO<sub>2</sub> supplied to OCO's mixing stage. Once the OCO process has taken place the product is then cured by exposing it to ambient air where the product passively absorbs CO<sub>2</sub> to form the final product.

## CO<sub>2</sub> SEQUESTRATION

The OCO process incorporates carbon mineralization steps which chemically convert carbon dioxide into stable solid carbonates. Industrial wastes provide a source of reactive calcium, which is induced to chemically react with carbon dioxide to form calcium carbonate. Calcium carbonate is the primary constituent of limestone, and thus it is completely stable; its durability is measured in equivalence with its natural analogue.

## CO-BENEFITS OR PRODUCTS

OCO's process can be used to treat any waste streams that contain free lime. The process can be used to manufacture carbon negative construction products such as in the demonstration project where Flue Gas Treatment Residues are combined with CO<sub>2</sub>, water and other reagents to form a manufactured limestone. Other co-benefits are that waste otherwise destined for landfill is treated and that the aggregate replaces virgin aggregate, reducing the need to extract natural limestone.

## LEADERSHIP TEAM

The founding team has 3 PhDs, a MBA and 22 years of carbon capture experience. The wider leadership team has 30+ years of experience in the automotive and oil and gas industries alongside capex experience in the tens of billions.

# COMPANY OVERVIEW

## COMPANY NAMES

44.01 and Air Capture

## HQ LOCATION

Muscat, Oman

## FOUNDED

2020

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - In-Situ mineralization

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

**Karan Khimji**

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# PROJECT HAJAR (44.01+AIR CAPTURE)

## COMPANY DESCRIPTION

Project Hajar is a Direct Air Capture to Mineralisation (DAC+M) joint project between AirCapture and 44.01. AirCapture is deploying its state-of-the-art modular DAC technology in Oman, positioned on 44.01's site in Hajar Mountains. Here 44.01 will take the captured CO<sub>2</sub> and turn it into rock, utilising its pioneering technology that accelerates the natural process of CO<sub>2</sub> mineralisation. Deployed at scale, DAC+M has the potential to eliminate billions of tonnes of CO<sub>2</sub> globally.

## CORE INNOVATION

Aircapture develops highly efficient small modular DAC units which are easy to ship, install, commission, operate and maintain. Aircapture's temperature swing technology enables rapid development and scale-up with very modest CAPEX requirements.

44.01's mineralisation technology provides a truly permanent way of removing CO<sub>2</sub>. Once mineralised, CO<sub>2</sub> cannot escape back into the atmosphere. This reduces the need for long-term monitoring and insurance, providing a cost-effective, scalable, global solution.

## CO<sub>2</sub> CAPTURE

The CO<sub>2</sub> is captured utilizing AirCapture's DAC units. It is collected by moving air or mixtures of air across a proprietary contactor which adsorbs CO<sub>2</sub>. The contactor is moved into a regeneration box where the CO<sub>2</sub> is released from the contactor and collected.

## CO<sub>2</sub> SEQUESTRATION

44.01 takes the CO<sub>2</sub> and dissolves it in water, then injects this fluid into peridotite formations. Initially the CO<sub>2</sub> is contained through solubility trapping, where the density of the carbonated fluid is higher than surrounding groundwater. The CO<sub>2</sub> then mineralises in under 12 months, eliminating it permanently. 44.01 uses a range of physical and chemical monitoring and verification techniques to confirm the CO<sub>2</sub> is contained in the subsurface and ultimately mineralised.

## CO-BENEFITS OR PRODUCTS

There are environmental and social co-benefits with DAC+M projects. Peridotite is not a resource that has traditionally been prized for agriculture, minerals or hydrocarbon extraction. Using peridotite for CDR unlocks new income streams for governments and communities, and enable the creation of green jobs in new areas all over the world. Finally, since mineralisation occurs in the sub-surface, the surface environment is preserved, enabling it to be used for other activities.

## LEADERSHIP TEAM

**Talal Hasan:** Extensive international experience in venture capital and climate technology, including helping to establish Oman's national venture capital fund.

**Professor Juerg Matter:** World expert in geoengineering and carbon management. Co-founded Carbfix and 44.01 and has conducted extensive research into Oman's peridotites.

**Matt Atwood:** Technologist, chemist, entrepreneur and pioneer in the DAC space. Over 20 years' experience in renewable/climate technology development, with over a decade of experience with DAC and CO<sub>2</sub> utilization technologies.

# COMPANY OVERVIEW

## COMPANY NAME

Skyrenu Technologies Inc.

## HQ LOCATION

Sherbrooke, Canada

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL

6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Industrial Gases/Pure CO<sub>2</sub>

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$2,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Project Equity, Government Funding, Philanthropic Funding, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Philanthropic, Government, Project Finance

**Martin Brouillette**

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# SKYRENU TECHNOLOGIES



## COMPANY DESCRIPTION

We combine a direct-air capture (DAC) system with a rock carbonation process to treat asbestos mine tailings in order to lock away carbon forever. Our system is installed at an abandoned asbestos mine site in the province of Quebec in Canada, where 800 MtCO<sub>2</sub> of existing mine tailings offer a CO<sub>2</sub> sequestration potential of about 200 MtCO<sub>2</sub>; the process is powered by the 100% renewable Hydro-Quebec grid.

## CORE INNOVATION

We use proprietary (patent pending) solid sorbent DAC and waste mineralization processes. Moreover, both processes are tightly integrated such that waste heat from the DAC is exploited by the mineralization process, leading to a highly energy-efficient overall process. Our system can be directly installed at mine waste sites, thereby eliminating the need to transport CO<sub>2</sub> or mineral feedstock over long distances.

## CO<sub>2</sub> CAPTURE

Our DAC device uses a proprietary continuous adsorption/regeneration process with moving bed monolith solid sorbent reactors, in a highly energy-efficient process. See Worldwide Patent Application WO2021258219A1.

## CO<sub>2</sub> SEQUESTRATION

We use a proprietary low-temperature process where magnesium present in chrysotile serpentine (asbestos) mine tailings reacts with dissolved CO<sub>2</sub> in an aqueous solution to form stable solid magnesium carbonate compounds. This operation also decontaminates the treated materials, as no hazardous asbestos residues remain after the process is complete. IP yet to be filed.

## CO-BENEFITS OR PRODUCTS

An important added co-benefit in the treatment of asbestos mine tailings is the remediation of the hazardous nature of the mining sites.

## LEADERSHIP TEAM

Experience in previous startups, raising money, created value and products commercialized worldwide in highly regulated fields such as medical devices.



# COMPANY OVERVIEW

## COMPANY NAME

Spiritus Technologies, PBC

## HQ LOCATION

Los Alamos, NM, USA

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Advanced Materials, Industrial Gases/  
Pure CO<sub>2</sub>

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

Charles Cadieu

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# SPIRITUS



## COMPANY DESCRIPTION

Spiritus is pioneering a new offering for DAC, the gold standard for high-quality CDR, that makes this gold standard accessible within all net-zero portfolios. DAC at under \$100/tonne requires a Rubik's Cube solution: all key parameters need to be optimized concurrently. Our sorbent and process optimize all major drivers of cost: energy input, sorbent cost and durability, adsorption/desorption kinetics, and facility capex. Furthermore, our DAC process runs on renewable energy sources, ensuring maximum climate benefit.

## CORE INNOVATION

Spiritus' core differentiating technology comprises a novel solid sorbent and a novel process for adsorption & desorption. The solid sorbent is exceedingly low in cost and has fast kinetics for adsorption and desorption. The accompanying process relies on passive adsorption (no fans are needed) and a non-TVSA process that greatly reduces the needed energy as compared to other approaches. Furthermore, the capital investment is reduced compared to other approaches.

## CO<sub>2</sub> CAPTURE

Spiritus has developed a novel direct-air-capture (DAC) solid sorbent material and is developing the accompanying processes for megatonne scale CO<sub>2</sub> capture and sequestration. The solid sorbent is exceedingly low in cost yet has fast kinetics for adsorption and desorption. Our DAC process has been tailored to the unique properties and performance of the solid sorbent and is energy efficient, requires minimal capex investment, and can run effectively on a variety of renewable energy sources.

## CO<sub>2</sub> SEQUESTRATION

Spiritus will sequester CO<sub>2</sub> by geological sequestration. Spiritus' process produces gaseous CO<sub>2</sub> that is compressed to a supercritical state and injected into a Class VI well for permanent geologic sequestration. This method allows low cost, massive scale, easy metering, and durable sequestration for more than 1,000 years. Captured CO<sub>2</sub> will be transported to the sequestration site via truck. Geological sequestration is the best solution for climate relevant scale.

## CO-BENEFITS OR PRODUCTS

Co-benefits include economic benefits to local community through jobs, tax revenue, and profit sharing. We will bring good-paying jobs to Wyoming, and partner with local universities and organizations to train residents for those jobs. We will engage communities to understand their biggest needs, and invest part of our profits in building up and supporting the local communities across those areas.

## LEADERSHIP TEAM

Co-founders Charles Cadieu, founded Caption Health (acquired by GE Healthcare) and IQ Engines (acquired by Yahoo/Flickr), and Los Alamos National Lab (LANL) scientist, Matt Lee. Jon Rau, VP Engineering, previously Director of \$200M/year technology program at LANL. Dan Opila, Chief Architect, products in energy (>2 GW solar inverters), consumer, automotive, and aerospace. Mindy Ren, VP of Infrastructure, projects up to \$20 billion, including battery manufacturing at Tesla, and onshore and offshore O&G projects at ExxonMobil.

# COMPANY OVERVIEW

## COMPANY NAME

Sustaera

## HQ LOCATION

Durham, NC, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital

# SUSTAERA



## COMPANY DESCRIPTION

Sustaera is developing a direct air capture of carbon dioxide (CO<sub>2</sub>) technology which employs a solid sorbent integrated with an electric heating mechanism mounted on a commercially available ceramic substrate called a Structured Material Assembly, or SMA. Integration of the sorbent and heating mechanism enables low energy usage by directly heating the sorbent to remove captured CO<sub>2</sub>, reducing energy losses, and the sorbent employed is stable and highly efficient at CO<sub>2</sub> removal from the atmosphere.

## CORE INNOVATION

The SMA (Structured Material Assembly) combines our low-cost, high performing, stable solid sorbent with an integrated, efficient heating driven by electricity on a low-pressure drop substrate. The SMA enables low capital intensity through high productivity, low specific energy usage due to low temperature and energy losses, and high net capture efficiency through the use of renewable electricity and natural materials for a low net CO<sub>2</sub> removed unit cost.

## CO<sub>2</sub> CAPTURE

Solid sorbent via chemisorption.

## CO<sub>2</sub> SEQUESTRATION

Saline aquifers, underground mineralization (basalt, peridotite), or depleted O&G wells.

## CO-BENEFITS OR PRODUCTS

Co-produce water captured from the air.

## LEADERSHIP TEAM

CEO Ben Gardner has led multiple start-up companies over the past 25 years from technology development phase to commercialization across bio-fuels, algae, power, and chemicals. VP Technology Cory Sanderson has developed and deployed novel CO<sub>2</sub> separation technologies via adsorption, membrane, and distillation at Air Products and Chemicals.

Cory Sanderson

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[sustaera.com](https://sustaera.com)

# COMPANY OVERVIEW

## COMPANY NAME

Reactive Surfaces, Ltd., LLP

## HQ LOCATION

Austin, TX, USA

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Other

Oceans - Other

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$5,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Other

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Government, Project Finance

**Beth McDaniel**

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[reactivesurfaces.com](https://reactivesurfaces.com)

# TEAM LICHEN

## COMPANY DESCRIPTION

For over two decades, Reactive Surfaces has been using bio-based additives on surfaces to derive active functionality. In the case of our CDR solution, we have added algae to a special substrate, and the functionality is photosynthesis. The special substrate and the modular embodiment of this surface technology create a beneficial environment for algal growth. Algae is harvested at an optimal time, dried and then biocharred for durable sequestration.

## CORE INNOVATION

One core differentiating aspect of our solution is that it is modular in nature, and can be implemented in a variety of environments, from fields filled with carbon capture surface modules to industrial applications that can capture point source emissions to use by individuals in their backyard! Our carbon capture surface modular technology does not require the deep well injection of captured CO<sub>2</sub>, and all associated risks thereto, as do other carbon removal solutions.

## CO<sub>2</sub> CAPTURE

Microscopic, photosynthetic algae are inoculated into a porous substrate, where it will photosynthesize, capturing CO<sub>2</sub> for a period of time. This substrate is a plant-derived Porous Cellulose Matrix (PCM) material that provides enhanced surface area, water retention, and appropriate light levels for algal cells to multiply rapidly and capture CO<sub>2</sub> during their growth.

## CO<sub>2</sub> SEQUESTRATION

The wet biomass derived from the modules is significantly dewatered and initially sequestered in a dry algal powder produced using a parabolic mirror solar oven. When sufficient dry biomass is accumulated, it is pyrolyzed to produce durably sequestered algal biochar.

## CO-BENEFITS OR PRODUCTS

One obvious co-benefit of our solution is the oxygen released as a product of the photosynthetic process. Biochar is the byproduct of the sequestration process. We intend that any purchaser of our biochar will be restricted to utilizing such biochar in a manner such that no CO<sub>2</sub> will be released.

## LEADERSHIP TEAM

Steve McDaniel, PhD, JD, brainchild of Carbon Capture Coatings and Surfaces technology (and patent attorney), serves as Chief Innovator and CEO of Reactive Surfaces, a coatings innovation company, est. 2002. Beth McDaniel, JD, president of and attorney for Reactive Surfaces, served as an activist specializing in genocide awareness and prevention, bringing this experience and intention to ensure that any climate solution has, at its heart, environmental justice and enhancement of human rights and personal livelihood.

# COMPANY OVERVIEW

## COMPANY NAME

TerraFixing

## HQ LOCATION

Ottawa, Canada

## FOUNDED

2020

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

# TERRAFIXING



## COMPANY DESCRIPTION

TerraFixing is a Canadian startup that has developed the only Direct Air Carbon Capture (DACC) process for capturing CO<sub>2</sub> in cold climates. Their innovative IP protected technology enables them to deliver very affordable and highly scalable carbon removals; <\$100/tCO<sub>2</sub> at the gigatonne scale, a real solution to climate change.

## CORE INNOVATION

TerraFixing's technology utilizes Adsorption instead of Absorption (amines and hydroxyl solutions) for CO<sub>2</sub> extraction. Uniquely designed for cold climates, it operates efficiently below 0 degrees, taking advantage of thermodynamic advantages and renewable wind energy. This innovation reduces steps, machinery, and power consumption, achieving <\$100/tCO<sub>2</sub> costs at the gigatonne scale. No other Direct Air Capture (DAC) technologies are viable in such low temperatures, making TerraFixing a more efficient and cost-effective solution.

## CO<sub>2</sub> CAPTURE

Using powerful fans, ambient air passes through two adsorbent beds. The first bed extracts water, while the second, containing our proprietary zeolite, efficiently captures CO<sub>2</sub> from dehumidified air. Once saturated, the zeolite bed is isolated and vacuumed to remove impurities. Heating the zeolite bed releases 99%+ pure CO<sub>2</sub>, compressed to 15MPa for sequestration. Air is cycled through to regenerate the water sorbent bed, utilizing heat from the zeolite bed. This process ensures a continuous cycle.

## CO<sub>2</sub> SEQUESTRATION

After compression to its supercritical state, the CO<sub>2</sub> is sent for geologic sequestration, onsite. Our partners at Geofirma are experts in CO<sub>2</sub> sequestration in the subsurface and together with the geologists from the nearby mine in Vermont, we will sequester the CO<sub>2</sub> geologically onsite.

## CO-BENEFITS OR PRODUCTS

TerraFixing enables northern indigenous and underserved communities to fully decarbonize and achieve energy independence by offering the only DAC technology designed for cold climate operation. TerraFixing's DAC technology will be a major offtaker of renewable wind power in the north which provides a robust business case for developing renewable wind power instalments for northern communities and mines, and to power a DAC technology that removes carbon dioxide from the atmosphere.

## LEADERSHIP TEAM

TerraFixing's cofounders are chemical engineering PhDs. Dr. Sean Wilson, Founder and CEO, is leading global expert in adsorption-based gas separations with a speciality in carbon capture. With over a decade of experience in atmospheric carbon removal he is the author of TerraFixing's two PCTs. Dr Vida Gabriel, Cofounder and COO, has a PhD in sustainable chemical reaction engineering and is recognized on the Forbes 30 under 30 list in North America.

**Sean Wilson**

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[terrafixing.com](https://terrafixing.com)

# COMPANY OVERVIEW

## COMPANY NAME

YOUWAN Concentrate Consultants Co., Ltd.

## HQ LOCATION

Taoyuan City, Taiwan

## FOUNDED

2010

## NUMBER OF EMPLOYEES

1 - 10

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Building Materials, Industrial Chemicals, Consumer Goods, Other

## XPRIZE TRACK

AIR

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

Slone Wang

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# YOUWAN METHOD FOR CO<sub>2</sub> REMOVAL

## COMPANY DESCRIPTION

YOUWAN Concentration Consultants is the inventing company of "YOUWAN method", focusing on providing water, metal and carbon recycling solutions, assisting customers with 100% recycling rate to achieve purification and recycling for water, metal and carbon dioxide. We can provide 150,000 times concentrating rate for DAC.

## CORE INNOVATION

We can create triple carbon reduction.

- To save electricity. Producing the CO<sub>2</sub>-free air returned to air conditioning system (HVAC system). Due to reduce 93% OA by CO<sub>2</sub>-free air, it can reduce electricity for treating humidity in air conditioning system.
- CO<sub>2</sub> removal. Resin in the adsorption tower captures CO<sub>2</sub>.
- Producing the CaCO<sub>3</sub> as Cement alternative to sequester CO<sub>2</sub> durably.

## CO<sub>2</sub> CAPTURE

Feeding the Outdoor air (OA) to the adsorbent tower. Resin in the adsorption tower captures CO<sub>2</sub> in the OA, producing the CO<sub>2</sub>-free air as by-product and then returned to air conditioning system (HVAC system) to save electricity.

## CO<sub>2</sub> SEQUESTRATION

Use YOUWAN method and recycled sodium hydroxide to elute CO<sub>2</sub> in the adsorption tower into Na<sub>2</sub>CO<sub>3</sub> concentrate (35 wt%). Mix Na<sub>2</sub>CO<sub>3</sub> concentrate (35 wt%) and Lime (CaO) to occurs caustification.  $\text{Na}_2\text{CO}_3 + \text{CaO} \rightarrow \text{NaOH} + \text{CaCO}_3$  CaCO<sub>3</sub> as by-product to replace cement and sequester CO<sub>2</sub>. Recycled NaOH can capture CO<sub>2</sub> again.

## CO-BENEFITS OR PRODUCTS

CO<sub>2</sub>-free air and CaCO<sub>3</sub> can be by-product.

## LEADERSHIP TEAM

DAIKIN INDUSTRIES, the world's No.1 air conditioning company, recommend this technology to their customer.



XPRIZE  
CARBON  
REMOVAL

MUSK FOUNDATION



# LAND



# COMPANY OVERVIEW

## COMPANY NAME

The Alaska Future Ecology Institute

## HQ LOCATION

Haines, AK, USA

## FOUNDED

2023

## NUMBER OF EMPLOYEES

1 - 10

## TRL

6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Terrestrial ecosystem restoration and management

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$30,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Philanthropic, Government

Luke Griswold-Tergis

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[alaskafutureecology.org](http://alaskafutureecology.org)



# ALASKA FUTURE ECOLOGY INSTITUTE

## COMPANY DESCRIPTION

The Alaska Future Ecology Institute is a non profit working to scientifically test and responsibly implement Arctic Rewilding as a climate solution.

## CORE INNOVATION

Because plants can fix carbon at lower temperatures than microbes can effectively decompose it, Northern ecosystems have a higher carbon sequestration potential than temperate or tropical soils. The Arctic is extremely large (largest terrestrial biome on Earth) and sparsely populated resulting in a much higher potential for scaling than nature based solutions located in other places. Large herbivores self-replicate at an exponential rate. This means our solution can scale at virtually zero cost.

## CO<sub>2</sub> CAPTURE

Reintroduction of mega-herbivores to the Arctic will provoke ecological changes which dramatically increase NPP (Net Primary Productivity) -- CO<sub>2</sub> that plants pull from the air via photosynthesis.

## CO<sub>2</sub> SEQUESTRATION

In northern grassland ecosystems a portion (~25% of NPP) of this carbon captured via photosynthesis is durably sequestered in deep soil layers, due to a combination of low temperatures (underlain by permafrost) and protection through organo-mineral-association. Hence, microbial decomposition and re-release of carbon is slower than the rate of accrual resulting in a net gain of C.

## CO-BENEFITS OR PRODUCTS

- 1) Permafrost contains 1700Gt of C. It is thawing at high rates releasing CO<sub>2</sub> and CH<sub>4</sub>. Research indicates arctic rewilding could prevent up to 80% of thaw (Beer et al, SciRep 2020)
- 2) Increased albedo of rewilded tundra will directly cool the planet (Macias-Fauria et al. PRSB, 2020).
- 3) Reversal of warming-driven biodiversity loss (Post et al, Science, 2023)
- 4) Reduction in wildfire severity and size.
- 5) Improving food security and climate resilience for northern peoples.

## LEADERSHIP TEAM

Dr. Jeppe Aagaard Kristensen - Oxford University/Aarhus University

Dr. Jeff Welker - Professor at University of Alaska Anchorage, UArctic Research Chair

Nikita Zimov - Director of Pleistocene Park

Luke Griswold-Tergis - Director of Alaska Future Ecology Institute

Olya Irzak - Board member AFEI, founder Dimond list, founder Permafrost Methane Labs, former GoogleX

Dr. Kristy Ferraro - Just defended her thesis at Yale (Schmitz lab). Thesis subject: Caribou impacts on carbon cycle.

# COMPANY OVERVIEW

## COMPANY NAME

All Power Labs Inc

## HQ LOCATION

Berkeley, CA, USA

## FOUNDED

2008

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Energy

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

\$5M - \$20M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Angel, Family Office, Private Equity, Philanthropic, Government

## Jim Mason

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[allpowerlabs.com](http://allpowerlabs.com)

# ALL POWER LABS



## COMPANY DESCRIPTION

All Power Labs (APL) designs, manufactures and deploys mobile biomass gasification systems that convert waste biomass into electricity, heat, and captures carbon in the form of high-carbon and high-durability biochar. APL will demonstrate a virtual biochar carbon removal plant composed of distributed sites that use APL's next generation, high-tech, factory-assembled, mobile, Internet of Things-enabled, low-cost biomass systems including sequestration of carbon (biochar) in soil and construction materials.

## CORE INNOVATION

The core differentiating aspect of our Team's solution is the combination of a gasification process that yields the most decomposition resistant form of biochar, a controls architecture that enables interconnectivity of fleets of units and real-time data monitoring to support digital MRV platforms, a compact and modular form factor that enables factory-based manufacturing and systems configuration, and availability of technology modules to produce renewable energy in the form of renewable gas, electricity and heat.

## CO<sub>2</sub> CAPTURE

The CO<sub>2</sub> is captured by converting the fixed carbon fraction in woody biomass into biochar, which develops a graphite-like carbon microstructure that resists decomposition. Our biochar production system employs the five processes of gasification (drying, pyrolysis, combustion, tar cracking, and reduction) rather than merely employing pyrolysis. The additional processes of tar cracking and reduction results in biochar which is cleaner, with extremely low PAH levels, and the high temperatures (800°-1100°C) confer greater carbon recalcitrance.

## CO<sub>2</sub> SEQUESTRATION

Established methodologies of biochar persistence have been used to test our systems and indicate that on average 80% of biochar carbon remains in storage after 100 years. CO<sub>2</sub> is durably sequestered when biochar is incorporated into soil or industrial application such as filtration and construction materials. In soil, ideally by first being co-composted, where it abates methane and N<sub>2</sub>O emissions from the composting process. In construction materials, such as concrete, the carbon is permanently sequestered.

## CO-BENEFITS OR PRODUCTS

The co-benefits applicable to our solution includes waste diversion by using waste biomass as feedstock, additional greenhouse gas abatements of methane of N<sub>2</sub>O emissions by directing use of biochar in compost operations, improvement to soil fertility which indirectly reduces use of fertilizer and related emissions, and production of renewable energy which can be used in site operations. The biochar exhibits qualities similar to activated carbon which introduces use cases such as water filtration.

## LEADERSHIP TEAM

Jim Mason (Founder, CEO) - expert in biomass energy thermal conversion technologies and holds a dozen patents for his work in the field.

Bear Kaufmann (co-Founder, Chief Scientist) - research and data collection to support controls development, gasifier design and testing, emissions control, reliability improvement, product development and holds patents for his work in the field.

Alejandro Abalos (COO) - led start-up and expansion activities at renewable energy companies PowerLight, SunPower, and GreenVolts.



## COMPANY OVERVIEW

### COMPANY NAME

Yingna Green Carbon Technology Co., LTD

### HQ LOCATION

Shanghai, China

### FOUNDED

2022

### NUMBER OF EMPLOYEES

11 - 50

### TRL 7

### SELLING CREDITS

No

### PHYSICAL PRODUCTS

Biochar, Soil/Soil Additives

### XPRIZE TRACK

LAND

### CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Terrestrial ecosystem restoration and management

Land - Agricultural & grassland CDR

## FUNDRAISING DETAILS

### COMMERCIAL STAGE

Pre-Commercial Pilot

### CURRENT INVESTMENT STAGE

Series A

### AMOUNT OF CAPITAL SOUGHT

Prefer not to share

### REVENUE RANGE

<\$1M

### CAPITAL RAISED TO DATE

<\$1M

### TYPE OF CAPITAL SOUGHT

Project Equity, Philanthropic Funding

### TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Project Finance

Lu Zhang

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[answerofbiochar.com](http://answerofbiochar.com)

## ANSWER OF BIOCHAR (AOB)



### COMPANY DESCRIPTION

Our company is mainly engaged in the development and application of biomass low-carbon technology and biomass-based carbon materials, and has a deep accumulation in the development and utilization of biomass energy. We have participated in and undertaken 4 projects at the provincial level and above, including the project of the Ministry of Science and Technology, and participated in 1 government consulting project.

### CORE INNOVATION

We plan to build a low-cost, low-energy-consumption, and large-scale application of biochar carbon sequestration demonstration project coupled with the carbon reduction goals of steel plants.

### CO<sub>2</sub> CAPTURE

Carbon dioxide is captured by plants through photosynthesis, a steady process.

### CO<sub>2</sub> SEQUESTRATION

Through thermochemical conversion, biomass is converted into biochar, which is then applied to the soil to form a soil carbon sink and achieve persistent storage of CO<sub>2</sub>.

### CO-BENEFITS OR PRODUCTS

Biochar was mixed with common fertilizer to form carbon-based fertilizer. Wood vinegar and some chemical products can be extracted by condensable gas products (Bio-oil) from biomass pyrolysis. The non-condensable gas (Bio-gas) after reforming can be sold to steel enterprises as reducing gas to replace the traditional fossil reducing agent.

### LEADERSHIP TEAM

The leadership team has a PhD degree or above. And in the field of low-carbon technology and biomass technology has a very rich experience.

# COMPANY OVERVIEW

## COMPANY NAME

ARTi

## HQ LOCATION

Des Moines, IA, USA

## FOUNDED

2013

## NUMBER OF EMPLOYEES

51 - 100

## TRL

9

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Energy, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Angel, Private Equity, Philanthropic

**Renato Valverde**

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# ARTI

## COMPANY DESCRIPTION

ARTi is a global leader in pyrolysis technology manufacturing and development, offering lab to full-size equipment specializing in biochar production, CO<sub>2</sub> sequestration and R&D services. With over a decade of industry experience, ARTi has expanded worldwide from its HQs in Iowa-US to Ecuador and Uruguay. Our innovative, scalable, containerized Biochar Production Units (BPU) are placed worldwide. The systems are designed to efficiently pyrolyze and transform a diverse range of feedstocks into sustainable carbon products.

## CORE INNOVATION

ARTi's Biochar Production Units (BPU) are renowned for their scalability, modularity, transportability and cost-effectiveness compared to other CDR solutions. Our containerized technology integrates all the stages of the pyrolysis process needed to transform biomass into biochar. These units, based on "pyrolysis trains," come in different models with different biochar production capacities: 1-Train BPU, 3-Train, and 5-Train, all housed within a 40ft container. Equipped with automated systems, these machines simplify operation data acquisition.

## CO<sub>2</sub> CAPTURE

The carbon cycle involves plants absorbing CO<sub>2</sub> through photosynthesis. When a plant's life cycle is completed, the biomass carbon is released back into the atmosphere as CO<sub>2</sub> through microbial respiration. Pyrolysis technology disrupts this cycle by transforming the carbon in the biomass into a highly stable, recalcitrant form that is resistant to microbial and abiotic decomposition. Biochar, when applied to soils, sequesters carbon for hundreds to thousands of years while providing soil benefits.

## CO<sub>2</sub> SEQUESTRATION

Carbon is durably sequestered in biochar through a process that involves its conversion into stable carbon structures during pyrolysis. The carbon is rearranged in a highly stable form that does not break down. Biochar is able to safely store carbon in the ground and thereby remove it from the atmosphere for hundreds of years. This creates a carbon sink as more carbon is absorbed every year by the plants and is not released when pyrolyzed.

## CO-BENEFITS OR PRODUCTS

Biochar offers a multitude of benefits in soil management. Biologically, it fosters diverse microbial growth and provides shelter for microorganisms. It promotes mycorrhiza development. Chemically, biochar boosts organic matter content and moderates soil pH. It efficiently holds and slowly releases nutrients. Biochar also acts as a liming agent to counter soil acidity. Physically, it retains water, reduces compaction improving water infiltration, aeration, and oxygen levels in the soil.

## LEADERSHIP TEAM

ARTi has over 10 years of experience in pyrolysis carbon sequestration with multiple academic and cultural backgrounds, expanding internationally to Ecuador, Uruguay, and more. Bernardo del Campo, CEO since 2012, with master's in Agriculture and Ph.D degree in Biosystems and Mechanical Engineering from Iowa State University. Matthew Kieffer, with an MBA and M.S. in Mechanical Engineering from Iowa State University serves as co-founder, TEA, LCA consultant. Juan Proaño, Ph.D. experience in mechanical and agricultural systems.



# COMPANY OVERVIEW

## COMPANY NAME

Global Bamboo Technologies

## HQ LOCATION

Windsor, CA, USA

## FOUNDED

2017

## NUMBER OF EMPLOYEES

11 - 50

## TRL 8

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Building Materials

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biomass sequestration in the built environment

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$5,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Corporate Equity

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Government

**Kate Chilton**

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[bamcore.com](https://bamcore.com)

# BAMCORE



## COMPANY DESCRIPTION

BamCore harnesses nature's fastest growing (and thus fast carbon-capturing) and strongest structural fibers, timber bamboo and Eucalyptus, to capture CO<sub>2</sub> and create a new generation of high-performance building frames. Because the main carbon benefit of bio-based construction is the new plant that replaces the harvested plant and sequesters additional carbon, we are increasing the decarbonization potential by using biogenic fibers with short rotation cycles and then storing the captured carbon in high-performance, durable buildings.

## CORE INNOVATION

The Prime Wall tackles both embodied and operating carbon - this is unique because most other decarbonization solutions for building either address one of the two carbon or trade off one for the other. We're also unique in our approach towards leveraging fast-growing fibers for structural purposes, substantially improving land use efficiency in addition to carbon sequestration. Lastly, the design of the Prime Wall is unlike any other framing solution - a dual-panel, nearly studless framing system.

## CO<sub>2</sub> CAPTURE

BamCore's CO<sub>2</sub> capture methodology derives from photosynthesis. Key to the power of our solution is our use of fast-growing biogenic fibers like timber bamboo and Eucalyptus. Their rapid regeneration rates translate directly to their increased carbon removal capacities. Our CO<sub>2</sub> removal is also more land-use efficient because of bamboo and Eucalyptus's high annual productivity. The land growing area required the same amount of building material as traditionally used coniferous softwood species is significantly reduced.

## CO<sub>2</sub> SEQUESTRATION

BamCore durably sequesters CO<sub>2</sub> by transforming biogenic fibers into highly engineered, structural framing systems. Modern, high performance building frames of wood or bamboo last 100 years+, and the Prime Wall's performance exceeds the most stringent building codes in the U.S., assuring it the longest possible building lifespan. The panels also have inherent end-of-life benefits over traditional framing as they can be removed without reducing their value, able to be reused in another building.

## CO-BENEFITS OR PRODUCTS

Biochar is both an end-of-life treatment for non-reusable panels and a byproduct of our biogenic waste, providing additional CO<sub>2</sub> sequestration benefits. At the bamboo plantation level, we're building industrialized, inclusive, and resilient economies by providing the surrounding communities with employment and incoming-generating opportunities. From an ecological standpoint, bamboo is a powerful restoration and afforestation tool. BamCore buildings can also be built significantly faster, helping to address the significant housing shortages that exist globally.

## LEADERSHIP TEAM

Our CEO was selected as a Construction Visionary by the Construction Institute. He spent 22 years at Goldman Sachs, built the world's largest private electronic wholesale trading platform, and started the world's only dually certified USDA organic and CLS climate adapted vineyard. Our CCO is an experienced sustainable construction industry professional, recently named one of Autodesk's 40 Under 40. Our CSO served as the North American Go-To-Market Lead for Accenture's NetZero Cloud business unit.

# COMPANY OVERVIEW

## COMPANY NAME

BioCapture

## HQ LOCATION

Palembang, Indonesia

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biomass direct burial

Land - Biomass sequestration in the built environment

Land - Terrestrial ecosystem restoration and mangement

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

Diego Garrido  
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[bio-capture.com](https://bio-capture.com)

# BIOCAPTURE



## COMPANY DESCRIPTION

Team Wood Vault consists of 4 companies: Carbon Lockdown (US), Mast Reforestation (US), BioCapture (Indonesia), Jeyoowe (Canada). Team Wood Vault aims to demonstrate the high scalability of Wood Harvesting and Storage (WHS) via Wood Vault (WV) as a method of durable carbon removal. Independent but coordinated projects are conducted on 4 sites in key geographical regions across the world (Temperate, Tropical, and Boreal forest), with a combined removal of 10000+ tCO<sub>2</sub>e.

## CORE INNOVATION

- 1) WHS uses 'free' photosynthesis to capture carbon, with very small energy/carbon penalty (2-5%)
- 2) Direct burial has high biomass carbon use efficiency (>90%).
- 3) Wood vault creates anoxic condition with low permeability clay soil which is widely available.
- 4) Wood vault buries wood locally with minimal processing, leading to low-cost (<\$100/tonne at scale).
- 5) Uses known technology and well-established engineering practices.
- 6) Scalable worldwide now with co-benefits of fire thinning, waste utilization, etc.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by trees using the natural process of photosynthesis. We bury all the raw wood with a high carbon efficiency (>90%).

## CO<sub>2</sub> SEQUESTRATION

High durability (1000+ years) is achieved by burying coarse woody biomass (CWB) in an anoxic subterranean environment several meters below ground, away from the active biosphere (vegetation, soil, and decomposers) that's typically limited to the first meter of the soil profile. Carbon Lockdown's patent-pending WV design ensures an oxygen-depleted environment that prevents wood decomposition and initiates the re-fossilization of carbon.

## CO-BENEFITS OR PRODUCTS

Provides a very high amount of biomass back to local soil, in addition to amount added to wood burial. This allows it to regenerate post mining soil very quickly, in years rather than decades.

## LEADERSHIP TEAM

Head of Biological Research for many years in tropical countries, facilitated many large scale agricultural and ecological projects

# COMPANY OVERVIEW

## COMPANY NAME

BioCarbon Pty Ltd

## HQ LOCATION

Sydney, Australia

## FOUNDED

2013

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Advanced Materials, Biochar, Energy, Food/Feed, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Air - Other

Land - Thermal conversion of biomass (biochar)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Biomass sequestration in the built environment

Land - Agricultural & grassland CDR  
Rocks - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series C

## AMOUNT OF CAPITAL SOUGHT

\$7,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Project Equity, Government Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Government

## Chad Sheppeard

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# BIOCARBON



## COMPANY DESCRIPTION

We take waste biomass, e.g. woodchips, and create high quality biochar containing 95% carbon. We then blend the biochar with binders to make BioCarbon bricks. BioCarbon bricks have been used in two separate Electric Arc Furnaces as a 100% replacement for coke as a reductant in steel making. Over 3000 tonnes of steel have been produced using Biocarbon bricks to replace charge coke. Biochar carbon can also be sequestered in soils and improve crop yields.

## CORE INNOVATION

Pyrolysis machines in use today have issues with dirty gas emissions, expensive maintenance and operating costs, low carbon and high ash content biochar. BioCarbon has addressed all of these issues in its unique, patented pyrolysis machine that produces high quality biochar, Pyroligneous acid with low tar and a clean syngas with less than 0.5% emissions. BioCarbon has also developed a formulae for binders that can convert biochar into charge carbon for steel making.

## CO<sub>2</sub> CAPTURE

Plantation trees take CO<sub>2</sub> from the atmosphere. The carbon is stored in the woodchip. Pyrolysis combusts the woodchip in the absence of Oxygen thus preserving the carbon in a solid state. By converting biochar into BioCarbon bricks for steel making, carbon remains stored in the coal that would otherwise be used to produce steel. Alternatively the biochar is added to agricultural soil as a stable form of carbon lasting hundreds of years and improving yields.

## CO<sub>2</sub> SEQUESTRATION

By avoiding the use of coal in steel making, the CO<sub>2</sub> that is created in the steelmaking process is reabsorbed by plantation trees thus creating a renewable life cycle for the CO<sub>2</sub>. Biochar with low Hydrogen and Oxygen to Carbon ratios has conservatively been shown to last in soil for over 100 years. BioCarbon's biochar has 95% carbon and between 2-3% ash content which is superior to the biochar used in these studies.

## CO-BENEFITS OR PRODUCTS

BioCarbon also produces Pyroligneous Acid (PA) with low tar content, that is used in agriculture to reduce the reliance on synthetic fertilisers and pesticides that are major emitters of CO<sub>2</sub> in the manufacturing process. PA has been proven to increase the volume and diversity of soil microbes that are crucial for plant health and growth. At commercial scale, the syngas produced will be used in a turbine to generate clean renewable energy for local use.

## LEADERSHIP TEAM

Co-founders Chad Sheppeard (marine mechanic and engineer) and John Mellowes (engineer) have studied pyrolysis for over 10 years and together have solved the major barriers to commercialization. Willingness to challenge accepted norms have resulted in a pioneering technology that is clean, efficient and viable. Mark Wilcox established Active Tree Services that now employs over 800 people. Mark was selected as the Ernst and Young Entrepreneur of the year for the services industry in NSW.

# COMPANY OVERVIEW

## COMPANY NAME

Biochar Now

## HQ LOCATION

Loveland, CA, USA

## FOUNDED

2011

## NUMBER OF EMPLOYEES

11 - 50

## TRL

9

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

James Gaspard

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[biocharnow.com](http://biocharnow.com)

# BIOCHAR NOW



## COMPANY DESCRIPTION

We have been producing and testing out high-quality biochar with major corporations and various government agencies for over 12 years. We have been fortunate to amass a multi-billion dollar sales pipeline and we are in expansion mode to meet production requirements. Our LCA demonstrates we sequester 3.2 tonnes of CO<sub>2</sub>eq for each tonne of our biochar we produce. We will be sequestering millions of tonnes of CO<sub>2</sub>eq as we service our sales pipeline.

## CORE INNOVATION

We have 17 patents surrounding our production technology and our biochar. We keep our product exposed to the optimal conversion conditions for over 8 hours, while our competition only takes a couple of minutes at most. As a result, we have very unique properties in our patented biochar that no other competitive biochar possesses. These unique properties are capable of being profitably commercialized at a large scale in existing industrial processes.

## CO<sub>2</sub> CAPTURE

For every tonne of our high-quality biochar produced, our LCA demonstrates we sequester 3.2 tonnes of CO<sub>2</sub>eq. The LCA takes into account all transportation of the waste wood feedstock, emissions during the conversion process, etc.

## CO<sub>2</sub> SEQUESTRATION

Our biochar eventually ends up in the ground at the end of the value chain. We have data from the Pacific Northwest Lab demonstrating that our carbon has an estimated half-life of 17,000 years in the soil.

## CO-BENEFITS OR PRODUCTS

Our solution is nicely profitable as a stand alone business, so we are able to basically remove carbon from the atmosphere as a side benefit to an ongoing profitable business. We currently have over \$4 billion in sales pipeline from tested and proven applications where our biochar is the unique solution. As we continue to have built new production equipment and remove non-merchantable waste wood from landfills and forests, we create hundreds of new jobs.

## LEADERSHIP TEAM

We are considered pioneers in the current biochar industry. We have created and commercialized a unique production technology (with 17 patents) that produces a biochar with unique properties. As an example, our biochar is the only biochar known that has both positive and negative charges. It can bind molecules that no other biochar can sequester. Those properties have proven extremely valuable commercially in many different large volume remediation and industrial applications.

# COMPANY OVERVIEW

## COMPANY NAME

Bioeconomy Institute (BEI) at Iowa State University (ISU); Stine Seed Company; Rise Energy, LLC

## HQ LOCATION

Ames, IA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Building Materials, Liquid Fuels

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

**Robert C. Brown**

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# BIOECONOMY INSTITUTE CARBON REMOVAL TEAM

## COMPANY DESCRIPTION

Iowa State University (ISU) is a public land-grant university designated as a Carnegie R1 institution, which signifies “very high research activity.” The Bioeconomy Institute (BEI) was established at ISU in 2007 to advance the use of biorenewable resources in the production of low-carbon and carbon-negative fuels, energy, chemicals, and materials. The concept of process intensification through autothermal pyrolysis used in our XPRIZE application was conceived and developed at the BEI over the last eight years.

## CORE INNOVATION

Advantages of autothermal pyrolysis in production of biochar (Polin et al., Journal of Analytical and Applied Pyrolysis, 143, 104679, 2019): (1) Eliminates use of external energy for pyrolysis, which is usually supplied from fossil fuels. (2) Simplifies pyrolyzer design and operation because ancillary heat transfer equipment is eliminated. (3) Intensifies pyrolysis, allowing biomass throughput to be dramatically increased. In the case of our pilot plant, throughput increased three-fold by switching from conventional to autothermal operation.

## CO<sub>2</sub> CAPTURE

Our approach harnesses the natural power of photosynthesis to fix carbon from the atmosphere as plant material. We pyrolyze this material into biochar and bio-oil. The biochar is land applied as a carbon removal agent and soil amendment. The bio-oil is upgraded to bio-asphalt, helping make the overall process profitable even in the absence of a price for carbon. We will employ corn stover, a widely available and underutilized crop residue, as feedstock for our project.

## CO<sub>2</sub> SEQUESTRATION

We will durably sequester as much as 4500 tonnes/year of CO<sub>2</sub> equivalent in the form of biochar produced from the autothermal pyrolysis of corn stover, an underutilized crop residue. The biochar will be incorporated into farmland, building soil fertility as well as durably sequestering the carbon. Our work to date suggests that at least 85% of the carbon remains in the soil after 100 years.

## CO-BENEFITS OR PRODUCTS

In addition to biochar, our system produces bio-oil as co-product. Bio-oil is an organic liquid that is both energy-rich and carbon rich. Its energy content can be exploited for the production of drop-in biofuels: renewable diesel and sustainable aviation fuel. Its carbon content can be exploited for production of bio-asphalt, another potential carbon removal product. These value-added products make our carbon removal process more profitable than most other kinds of carbon removal technologies.

## LEADERSHIP TEAM

Dr. Robert C. Brown, internationally known in the fields of pyrolysis and biochar, is team lead. He is co-director of the Bioeconomy Institute at Iowa State University where he leads multi-disciplinary teams in bioenergy, biofuels, and carbon removal. He has recently been elected to membership of the National Academy of Inventors on the strength of his 28 patents and 300 scientific publications. Most members of his team have been collaborators for over ten years.

# COMPANY OVERVIEW

## COMPANY NAME

BIOSORRA

## HQ LOCATION

Nairobi, Kenya

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Energy

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$4,700,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Philanthropic

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# BIOSORRA



## COMPANY DESCRIPTION

BIOSORRA is a female-led climate justice company in Africa with the mission of addressing climate justice and farming resilience. Using patented tech, it provides biochar and biooil carbon removal and clean energy to self sustain operations. Its unique co-location eco-village stations in existing food producers, with given de-husking processes for steady biomass disposal, enable BIOSORRA to close carbon insetting loop while reducing cost, CO<sub>2</sub> and logistics massively to yearly achieve 1MT CO<sub>2</sub>e with 68 stations.

## CORE INNOVATION

BIOSORRA brings a best-in-class group of climate rockstars, with +50 years experience in engineering, sustainability, science, business and farming in vulnerable communities. The team's resilience is evident as they became Africa's top biochar producer, using only the \$250k student-award XPRIZE plus \$25k from MIT Solve. They've engineered patented high-technology and R&D to control biochar stability, adapt infrastructure to Africa, encourage job creation, and be strategic about biomass selection for higher carbon removal conversions.

## CO<sub>2</sub> CAPTURE

BIOSORRA's pyroreactor transforms available waste (that would be otherwise burned) from main food producer eco-village stations into biochar, biooil, bioenergy and carbon removal credits. The pyroprocess, the CO<sub>2</sub> which is in the biomass coming from photosynthesis is heated up at high temperatures with the absence of oxygen (500°C-700°C) to enable high stable form, resistant to biological decomposition, forming stable structures at high carbon content (81%). These structures persist in ecosystems, providing long-term carbon storage.

## CO<sub>2</sub> SEQUESTRATION

Biochar Carbon Removal (BCR) securely sequesters CO<sub>2</sub> by embedding biochar into stable matrices like soil or construction materials. Its durability hinges on biochar quality and usage, influenced by hydrogen-to-carbon and oxygen-to-carbon ratios. According to Puro.Earth, incumbent carbon removal accreditor, for +1000-year durability, an oxygen-to-carbon ratio below 0.20 is optimal. BIOSORRA's Eurofins lab-tested biochar, accredited by EBC, boasts an oxygen-to-carbon ratio of 0.34, ensuring enduring carbon storage.

## CO-BENEFITS OR PRODUCTS

BIOSORRA's eco-village stations foster social, climate and economic benefits. Today we have 27 BIOSORRER's and 100 farmer champion agents. 2000 farmers used our #biocharbora, yielding 27% food increase while saving 30% inputs cost. Each BIOSORRER has stock options, no matter if biomass loader, cleaner or cofounder, while Ines (cofounder) aims to pay back her studies loan, Naomi (control operator), aims to bring her kids to university, and Audrey (cleaner) wants to buy a tractor.

## LEADERSHIP TEAM

CEO: Inés-Energy Consulting at Deloitte &McKinsey. CFO: Carla- Financial Risk Management at GrupoBimbo and Investment Banking at Bank of America.Tech: Dr. Anil-PhD in Biomass Pyrolysis from Indian Institute of Technology. R&D: Isabella-BSc in Plant Sciences at Cornell University and Johannes Lehmann apprentice. Farmers Head: Purity-BSc in Agribusiness Management at Chuka University. Carbon-Credits Specialist: Jasmin Liu-Consulting at Deloitte & BA in Economics at Harvard. Business Development: Fernando - Investment Banking at DeutscheBank & Economics BsC at University of Navarra.



# COMPANY OVERVIEW

## COMPANY NAME

Bluski inc. dba BluSky

## HQ LOCATION

Old Saybrook, CT, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Building Materials, Energy, Soil/ Soil Additives, Other

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biological conversion of biomass

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Agricultural & grassland CDR

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Other

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Not Specified

## TYPE OF INVESTOR SOUGHT

Not Specified

**William Hessert**

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# BLUSKY



## COMPANY DESCRIPTION

BluSky was founded to pioneer gigatonne-scale CDR and advance climate technology. The company designed a hybrid carbon removal system that combines pyrolysis, bioenergy and carbon mineralization. BluSky's system is designed to be efficient, low-cost, and replicable so it can rapidly decarbonize human society. This hybrid approach not only removes atmospheric carbon dioxide, but it also reduces greenhouse gas emissions from a variety of industries, eliminates multiple waste streams, and produces baseload renewable energy.

## CORE INNOVATION

BluSky's technology combines high-tech pyrolysis, bioenergy, and carbon mineralization. By utilizing multiple pathways of sequestering biological carbon, BluSky maximizes the carbon removed per unit input of biomass. The integration of multiple systems overcomes limitations of any single pathway. Additionally, BluSky demonstrates unrivaled capital efficiency through critical design choices, strategic partnerships, and the ability to generate surplus renewable energy. Each component of the system is engineered to be modular and mass-produced to reach gigatonne-scale.

## CO<sub>2</sub> CAPTURE

BluSky captures CO<sub>2</sub> through the pyrolysis of wood waste yielding biochar, biocrude oil, and syngas. The syngas is combusted onsite, producing thermal energy to power biomass drying and pyrolysis. Surplus syngas is used to provide electricity to power the facility. An amine solvent captures CO<sub>2</sub> from the resultant flue gas in a packed absorption column.

## CO<sub>2</sub> SEQUESTRATION

BluSky's pyrolysis/bioenergy process yields biochar, biocrude oil, and flue gas. Biochar is used as a soil amendment, locking away its solid carbon. Biocrude oil is injected underground, sequestering its carbon on geological timescales. At demonstration-scale, flue gas CO<sub>2</sub> absorbed by an amine reacts with calcium oxide in waste concrete, forming calcium carbonate, which is stable on geological timescales. At megatonne-scale, this CO<sub>2</sub> is thermally stripped from the solvent, compressed, and injected underground for permanent sequestration.

## CO-BENEFITS OR PRODUCTS

Beyond carbon removal, BluSky addresses three critical environmental challenges. Pyrolysis eliminates organic waste streams that would otherwise contribute to air pollution and/or landfill emissions. Additionally, BluSky's biochar helps decarbonize agriculture by revitalizing farmland, reducing synthetic fertilizer usage, and boosting crop yields. BluSky also improves grid stability and expands renewable energy through the production of non-intermittent bioelectricity.

## LEADERSHIP TEAM

CEO Will Hessert has a background in applied physics and successfully ran a multi-million-dollar company. Chief Chemical Engineer Hassan Khan has experience in green hydrogen, synthetic fuels, and carbon mineralization. CCO Gregory Pakiela has more than a dozen years' experience leading the customer acquisition of Fortune 500 companies. COO Carissa Chandler managed operations at a government-contracted construction firm with over 200 employees. Chief Project Manager Stephen Chandler has over 40 years' experience in construction management.

# COMPANY OVERVIEW

## COMPANY NAME

Carba

## HQ LOCATION

Minneapolis, MN, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Advanced Materials, Biochar, Building Materials, Other

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biological direct burial

Land - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$6,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Government, Project Finance

**Andrew Jones**

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# CARBA



## COMPANY DESCRIPTION

Carba puts solid carbon back underground and into materials. The technology was developed by UMN ChemE Professor Paul Dauenhauer and UC Berkeley PhD Andrew Jones and is the most efficient (<70 kWh/tCO<sub>2e</sub>) and scalable (<\$100/tCO<sub>2e</sub> today) permanent carbon dioxide removal solution available today. They have developed a process to convert plant waste to a recalcitrant solid carbon that is buried underground in anoxic pits where it is protected from degradation mechanisms for thousands of years.

## CORE INNOVATION

Carba's differentiation is low-cost, portable, high yielding reactors combined with novel anoxic burial. Carba's founders utilized their combined 40+ years of experience in pyrolysis and reactor design to create the world's most efficient pyrolysis reactor. The reactor produces carbon yields of 60-80% (cf., 30-50% is typical), has low energy requirements (<70 kWh/tCO<sub>2e</sub>), is feedstock flexible with minimal preprocessing, and is portable. Carba also has IP on burial methodologies to maintain high permanence and low risk.

## CO<sub>2</sub> CAPTURE

Carba has developed a novel BiCRS methodology wherein biomass waste is collected, pyrolyzed, and then buried in anoxic chambers underground in a process analogous to the formation of coal 300 million years ago. CO<sub>2</sub> is removed from the atmosphere by plants using photosynthesis and free solar energy. Nearly 100 billion tonnes of CO<sub>2</sub> are removed each year by plants. We collect their waste, prevent it from being burned/decomposed, and convert it to charcoal buried underground.

## CO<sub>2</sub> SEQUESTRATION

CO<sub>2</sub> is converted into lignin, cellulose and hemicellulose in plants. We pyrolyze the plant material to convert those carbon atoms into a charcoal (highly aromatic carbon structure similar to coal). Then we bury the charcoal underground in anoxic pits, which eliminates the primary degradation pathways of charcoal (e.g., photooxidation, ozone, microbial/fungal attack, freeze/thaw cycling, mechanical attrition, radical oxidation, run-off and infiltration). The charcoal remains stable in these vaults for thousands or millions of years.

## CO-BENEFITS OR PRODUCTS

The charcoal produced acts like a filter/adsorbent due to its porosity and non-polar structure. In landfill applications (as a daily cover), it removes toxins from the landfill such as forever chemicals, reduces odors, and reduces methane production by providing a home to methanotrophs. In abandoned mines and pits, it serves to remediate the land and cleanup ground water.

## LEADERSHIP TEAM

Prof. Paul Dauenhauer is a distinguished professor of chemical engineering and MacArthur Fellow at the University of Minnesota, Twin Cities and heads a DOE EFRC center. Dr. Andrew Jones (UC Berkeley) is a Neil Armstrong Award recipient and successful serial entrepreneur. Nick Halla (former founding team at Impossible Foods) is serving as a founding advisor to the leadership team. Linda Hofflander has held senior strategic leadership roles at companies large and small (Samsung, Skykit, Agosto).

# COMPANY OVERVIEW

## COMPANY NAME

Carbo Culture Oy

## HQ LOCATION

Helsinki, Finland

## FOUNDED

2016

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Building Materials, Energy, Soil/ Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Biomass sequestration in the built environment

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

Christopher Carstens

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# CARBO CULTURE



## COMPANY DESCRIPTION

Our patented Carbolysis™ reactors take waste biomass and convert it into stable biochar, locking carbon safely away for centuries and generating renewable energy in the process. Carbolysis represents a significant evolution in the development of more efficient biochar production by overcoming the heat and mass transfer encountered in traditional pyrolysis technologies. Carbo Culture is also actively developing end use applications for its biochar product in the agricultural and built environment spaces.

## CORE INNOVATION

Carbo Culture has developed its proprietary Carbolysis process to overcome the challenges that have prevented traditional pyrolysis technologies and biochar from meeting its full potential. Carbolysis produces very high temperature biochar and energetic gas that can be used in place of fossil fuels without the production of toxic bio-oils. Carbolysis is an exothermic process that sequesters ~50% of the original biomass carbon for millenia while releasing ~50% of the energy in the original biomass.

## CO<sub>2</sub> CAPTURE

Like other biochar and BiCR pathways, Carbo Culture relies on photosynthesis to capture CO<sub>2</sub> in the form of biomass that is then converted into durable carbon in our Carbolysis process.

## CO<sub>2</sub> SEQUESTRATION

The Carbolysis process operates at significantly higher temperatures compared to traditional pyrolysis technologies. The resulting high temperature biochar has been shown to be particularly recalcitrant with a durability of millennia to eons.

## CO-BENEFITS OR PRODUCTS

The primary co-benefit of the Carbolysis process is the generation of a significant amount of energy in the form of a liquid and tar free stream of syngas. The generated syngas typically contains roughly 50% of energy in the original biomass. Carbo Culture is also developing further technologies for separating and upgrading this gas. The exothermic nature of Carbo Culture's solution eliminates one of the major drawbacks of many CDR technologies.

## LEADERSHIP TEAM

Carbo Culture was co-founded by Henrietta Moon and Christopher Carstens in 2016, and initially conceived during Singularity University in 2013, years before the "Carbon Removal" label had been coined. Henrietta and Chris have successfully fundraised through a recent Series A during trying times and under difficult circumstances. The fact that the company has not pivoted from its initial mission and technology after more than 10 years is a testament to Carbo Cultures leadership team.

# COMPANY OVERVIEW

## COMPANY NAME

Titan Clean Energy Projects Corp.

## HQ LOCATION

Craik, Canada

## FOUNDED

2006

## NUMBER OF EMPLOYEES

11 - 50

## TRL

9

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Advanced Materials, Biochar, Building Materials, Industrial Chemicals, Consumer Goods, Energy, Liquid Fuels, Chemical Polymers, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Private Equity, Philanthropic, Government

**Jamie Bakos**

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[carbon4climate.org](http://carbon4climate.org)

# CARBON4CLIMATE



## COMPANY DESCRIPTION

Titan is a project and technology developer that owns and operates a biomass waste conversion facility in Craik, SK, Canada. The project uses Titan's autothermal slow pyrolysis technology that converts biomass waste into sequestered carbon and environmentally-friendly products, including activated carbon and bio-oil. The technology sequesters approximately three tonnes of carbon dioxide for every tonne of carbon production from waste biomass.

## CORE INNOVATION

Our core technology is able to operate fully off-grid and fully autothermal 24/7 year-round on waste biomass. The solution has a low cost of production, low environmental footprint and manufactures advanced carbon materials for sustainable applications that generate positive cash flow.

Titan is the only company that is able to derive 100% of the energy for its processes from biomass waste and thus can deliver mobile technology around the world.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured through pyrogenic carbon capture. Waste biomass including urban waste wood (construction wood, power poles and rail ties), and agricultural waste biomass non-food residues (flax, hemp, canola, oat hulls) is heated in an oxygen free environment and biocarbon (biochar) and bio-oil are produced from the waste. The carbon is initially removed from the atmosphere through photosynthesis during the growth of plants and trees and the carbon is thermally stabilized by heat.

## CO<sub>2</sub> SEQUESTRATION

Waste biomass containing approximately 50% carbon is heated in an oxygen free environment at 650 C using the syngas generated during the pyrolysis process. The biocarbon is pelletized using the bio-oil as a binder and then heated to 850 C to form highly durable and stabilized pellets with a carbon concentration greater than 90%. The carbon is then used in water purification or sustainable agriculture and can also be stored above or below ground.

## CO-BENEFITS OR PRODUCTS

Waste reduction: The technology allows the diversion of waste from landfill or biomass burning where the biomass would otherwise decompose, potentially leading to air pollution, GHG emissions, and water impacts. Beneficial products: These include biocarbon pellets for water and wastewater purification, animal nutrition, and sustainable agriculture as a soil enhancer. Renewable Energy Production: Waste heat from the process can be used to displace fossil fuels.

## LEADERSHIP TEAM

Jamie Bakos is a professional engineer and specialist in clean technology and has provided leadership in delivering clean technology projects in Canada and internationally for over 25 years. Michele Kiss has a long history of project management, marketing, administration in USA and Canada. Maurice Tuchelt has several patents and constructed numerous thermochemical, electrical, optical, mechanical robotic and software systems. Dr. Acharya is Saskatchewan's Ministry of Agriculture Chair in Bioprocess Engineering.

# COMPANY OVERVIEW

## COMPANY NAME

NA

## HQ LOCATION

Easthampton, MA, USA

## FOUNDED

2018

## NUMBER OF EMPLOYEES

1 - 10

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Building Materials, Energy, Food/Feed, Industrial Gases/Pure CO<sub>2</sub>, Liquid Fuels, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

Michael Garjian

mg@carbonstar.systems

[carbonstar.systems](https://carbonstar.systems)

# CARBONSTAR SYSTEMS



## COMPANY DESCRIPTION

CarbonStar Systems Inc. is a Massachusetts domestic benefit corporation (B Corp) formed for the purpose of designing, producing, operating, manufacturing, and selling CDR systems. Our patented catalytic vacuum pyrolysis process converts any form of biomass or waste streams into carbon negative biochar, three fractions of carbon neutral or negative bio-oils, high BTU carbon neutral biogas, and wood vinegar while sequestering significant amounts of CO<sub>2</sub> from the atmosphere.

## CORE INNOVATION

Our patented mobile system and computerized process is carbon negative sequestering 550% more CO<sub>2</sub> than it emits based on initial LCA. We operate under high vacuum vaporizing all biomass volatiles; then condense them producing carbon negative/neutral bio-oils and biogases which may be compressed to eliminate all system emissions. Computer control of residence time, temperature, and vacuum levels enables repeatable biochar characterization in transition from field trials to macro scale. System produces heat and hot water.

## CO<sub>2</sub> CAPTURE

Biomass is exposed to heat in a vacuum chamber to create biochar. Vapors produced in the vacuum chamber are further fractionally condensed to produce three fractions of liquid bio-oils as well as biogas and wood vinegar.

## CO<sub>2</sub> SEQUESTRATION

Biochar may be added to soils, concrete, asphalt or used in building materials for long duration sequestration. Studies show sequestration is durable for 1,000 years or more. Bio-oils may be used in asphalt roadways or buried for long term sequestration. Biogas may be compressed and stored in concrete chambers or pumped into mines or depleted oil wells similar to those used for CO<sub>2</sub> storage type.

## CO-BENEFITS OR PRODUCTS

We may use seaweed as the biomass in order to sequester CO<sub>2</sub> from the ocean as well as atmosphere. Bio-oils may be further distilled to produce many valuable bio-fractions including sustainable aircraft fuels.

## LEADERSHIP TEAM

As a lone inventor, I designed the CarbonStar process then hired engineers to produce drawings of system and process flow diagrams, then electrical contractors, mechanical engineering firms, and other independent contractors to fabricate and/or assemble those components of the system which I did not do myself.

# COMPANY OVERVIEW

## COMPANY NAME

Charm Industrial

## HQ LOCATION

San Francisco, CA, USA

## FOUNDED

2018

## NUMBER OF EMPLOYEES

51 - 100

## TRL

TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Other

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biological conversion of biomass

Land - Agricultural & grassland CDR

Land - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

>\$100M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

# CHARM INDUSTRIAL



## COMPANY DESCRIPTION

Charm Industrial puts carbon rich bio-oil made from corn stalks and forestry residues back underground, permanently removing the carbon from the atmosphere.

## CORE INNOVATION

Charm combines the low cost features of nature based solutions with the high-permanence and measurability of engineered approaches. Because pyrolyzers are modular, produced via repetitive manufacturing, Charm can iterate, scale, and drive down costs much faster than large centralized CDR projects pulling in the time horizon to \$100/tonneCDR. Permanent sequestration is done in widely available existing orphaned oil wells - reducing long term cost.

## CO<sub>2</sub> CAPTURE

Plants naturally capture CO<sub>2</sub> via photosynthesis, but release that carbon when they decompose or burn. Charm converts biomass that would have otherwise released carbon into bio-oil via fast pyrolysis, which is performed by heating the biomass in a low oxygen environment.

## CO<sub>2</sub> SEQUESTRATION

Bio-oil is injected into geological storage and a network of existing EPA- and state-regulated injection wells, where the bio-oil is pumped underground for permanent storage. This sequesters the carbon for 10,000 years or more. Bio-oil is heavier than other subsurface liquids so it sinks, and over time the bio-oil becomes a solid - both of these properties ensure durable sequestration.

## CO-BENEFITS OR PRODUCTS

Charm reduces wildfires and air pollution by processing risky forestry biomass, creates new jobs for agricultural and rural communities, addresses leaking/orphaned wells by using them for bio-oil injection. Charm will return biochar to the field as a soil amendment maximizing the total carbon utilized per tonne of input biomass. Fossil-free ironmaking will additionally generate economic benefits and reduce air quality problems in historically disadvantaged communities while making a crucial, hard-to-decarbonize commodity while removing CO<sub>2</sub>.

## LEADERSHIP TEAM

Peter Reinhardt; co-founder and CEO, was previously a co-founder and CEO at Segment, which he grew to \$250M in annual revenue and 600 people before selling the company in 2020. Katie Holligan; Head of Operations, worked as a drilling engineer and drill site manager for Chevron on unconventional assets in the Permian Basin before pivoting to a career in climate.

Harris Cohn

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# COMPANY OVERVIEW

## COMPANY NAME

Climate Robotics

## HQ LOCATION

Houston, TX, USA

## FOUNDED

2020

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Advanced Materials, Biochar, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt, Other

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Government, Project Finance, Other

## Jason Aramburu

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# CLIMATE ROBOTICS



## COMPANY DESCRIPTION

Climate Robotics enables broad-scale agriculture adoption of biochar which builds soil health and removes excess carbon from the atmosphere. The company's mobile technology converts crop residues into durable biochar on the fly and in the field, making the economics work for farmers and our ecosystems. Climate Robotics is the largest supplier of biochar carbon removal to leading carbon removal buyers like Microsoft and is headquartered in Houston, Texas.

## CORE INNOVATION

Climate Robotics has developed the world's first mobile waste-to-value platform. This mobile technology is unique in its ability to convert agricultural crop residues into durable biochar in the field, on the move, and with one pass. While competitors have developed technologies capable of carbon removal from residues and even edge-of-field production, these processes still rely on expensive collection and bulk transport of both biomass and resulting products, dramatically increasing costs and resulting in unnecessary emissions.

## CO<sub>2</sub> CAPTURE

Plants are made of carbon and grow by absorbing CO<sub>2</sub> from the atmosphere. Instead of letting plants' carbon go back into the short-term carbon cycle, Climate Robotics uses a thermal process to convert this transient plant carbon into a durable, stable carbon called biochar. The magic behind unlocking broad-scale farmer adoption is the dramatic cost-savings enabled by Climate Robotics' mobile technology for CO<sub>2</sub> removal via biochar production and soil application.

## CO<sub>2</sub> SEQUESTRATION

Climate Robotics uses a, low-oxygen, thermal decomposition process (pyrolysis) to convert transient plant carbon into a durable, stable carbon called biochar. Applying quality biochar to soils durably sequesters carbon out of the atmosphere long term. Climate Robotics' biochar meets lab-tested metrics that peer-reviewed research has supported lasting 1000+ years in soils.

## CO-BENEFITS OR PRODUCTS

Not only does Climate Robotics' mobile technology durably remove and store atmospheric CO<sub>2</sub> long term, according to the latest peer-reviewed research and Climate Robotics' field trials, quality biochar applied to agricultural soils also helps build soil health and decarbonize farming. Research shows that biochar in soil builds soil health resulting in higher yields and productivity due to improved pH, nutrient retention, and water retention while also reducing agricultural greenhouse gas emissions.

## LEADERSHIP TEAM

Jason Aramburu (CEO), over 15 years between biochar projects and VC investing. Morgan Williams (CSO), PhD in soil science from UC Berkeley, over 15 years generating biochar systems, large field trials, and MRV protocols. Daniel Mulqueen (CTO), PhD in mechanical engineering, over 15 years of experience in biomass pyrolysis. Larry Dodson (Engineering), leading engineering teams for over 35 years, including at HP and recently SpaceX. Matt Wilson Plasek (Carbon) leadership in multiple startups including Carbonfuture.

# COMPANY OVERVIEW

## COMPANY NAME

CarStorCon Technologies GmbH

## HQ LOCATION

Marienhäfe, Germany

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Building Materials, Energy

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Biomass sequestration in the built environment

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

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# CLIMATEADD



## COMPANY DESCRIPTION

We aim at decarbonizing the construction industry by leveraging BCR Biochar Carbon Removal technologies for industrial use. We develop economically viable, quickly implementable and customer tailored technical long-term solutions to convert building materials (concrete) into long-term carbon sinks. While at the same time leveraging the co-benefits of biochar for the construction industry such as reduction of cement and enhanced material properties in the final product.

## CORE INNOVATION

Traditionally, biochar is only used in agriculture as a feed or soil additive. Biochar in cementitious building materials not only offers permanent carbon removal but also improves concrete properties. For building materials, the mineral content, present already in the feedstock; can be "activated". This plays an important role in concrete strengthening. Incorporating Biochar in Industrial applications not only allows a broader range of feedstocks but also adds additional impact to the entire biochar industry.

## CO<sub>2</sub> CAPTURE

Plants convert atmospheric CO<sub>2</sub> into biomass through photosynthesis, temporarily sequestering CO<sub>2</sub>. At the end of life this biomass is often disposed of or incinerated. As a result, the temporarily sequestered CO<sub>2</sub> re-enters the atmosphere. If the biomass is instead pyrolysed, a porous solid called biochar is produced, in which carbon is bound and thus removed from the carbon cycle. The carbon obtained is considered harmless, is chemically stable, and can be reintegrated into new material cycles.

## CO<sub>2</sub> SEQUESTRATION

Permanent, secure sequestering is ensured by mixing the biochar into building materials like concrete. Permanence of BCR in general has been once more proven through recent studies. In addition, in our case the carbon gets chemically bound in the building material matrix and remains over the building's lifetime, securely stored even at the end-of-life point or after recycling. 1 t of our biochar can store up to 2.5 t of CO<sub>2</sub>.

## CO-BENEFITS OR PRODUCTS

With huge volumes, high emissions and raw material scarcity the construction industry is under pressure for greener solutions. Biochar Carbon Removal is the answer to their challenges as it is not only a durable carbon sink, can lower the use of resource intense raw materials, ex. cement and improve the material properties but is compatible with other sustainable efforts (recycling concrete, modular concrete, CO<sub>2</sub> reduces cements) and doesn't need additional infrastructure or change in processes.

## LEADERSHIP TEAM

Our core team consists of powerplant manufacturer that builds unique, patented power plants that produce biochar as a third product (beside renewable energy) and a concrete development company, that invented an additive based on this biochar, called Clim@Add. We combine + 25 years of building industry background with biochar treatment expertise and close collaboration with research institutes. Our larger team consists of a marketing senior, a plant technologist and a law and operations specialist.



# COMPANY OVERVIEW

## COMPANY NAME

Consolidated Carbon

## HQ LOCATION

Austin, TX, USA

## FOUNDED

2023

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Building Materials, Consumer Goods, Energy, Food/Feed, Industrial Gases/Pure CO<sub>2</sub>

## XPRIZE TRACK

### LAND

### CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biological conversion of biomass

Land - Biomass direct burial

Land - Biomass sequestration in the built environment

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series C

## AMOUNT OF CAPITAL SOUGHT

\$50,000,000

## REVENUE RANGE

\$20M - \$50M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Private Equity, Philanthropic, Government, Project Finance

Jona Williams

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# CONSOLIDATED CARBON



## COMPANY DESCRIPTION

Consolidated Carbon is an industrial hemp regenerative agriculture company that utilizes photosynthesis to sequester the maximum amount of carbon using agricultural commodities for injection wells. At Consolidated Carbon, we believe in simplifying the carbon sequestration process for maximum permanent sequestration while being the most cost-efficient process to do so. Consolidated Carbon extracts all the valuable constituents of the hemp plant to create alternative products. These products range from building materials to food supplements to biodiesel.

## CORE INNOVATION

Currently, companies are using Direct Air Capture (DAC) across the globe. These solutions are expensive and are not scalable. Our company uses the same injection wells that DAC uses, but we use regenerative agriculture. Industrial hemp is a crop that has the fastest growing cycle, sequesters more carbon, and can be used on marginal lands, for our carbon capture material (bioslurry) while still having the maximum amount of permanent sequestration.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by utilizing photosynthesis. We cultivate industrial hemp, a miracle crop that can be grown multiple times per year, to maximize the carbon weight on a per acre basis compared to any other alternative crop or direct air capture sources. Using regenerative agriculture, carbon is captured and sequestered in both the soil and the hemp biomass through the cultivation of the plant. The amount of soil carbon, is not calculated in the plan.

## CO<sub>2</sub> SEQUESTRATION

The CO<sub>2</sub> is sequestered by making a hemp bioslurry from the biomass cultivated through farming. The biomass that is harvested is then processed to a fine material and made in to a bioslurry. This bioslurry is then injected down a class II or class VI injection well using a hydraulic pump for permanent sequestration.

## CO-BENEFITS OR PRODUCTS

We are able to use phytoremediation, as well as assist with PFAS due to the root system that the industrial hemp plant has. Hemp can assist with water quality and quantity through the reduction of fertilizer, chemical usage, and overall reduction of water usage for the plant. Through the use of regenerative agriculture, we see an increase in overall soil biology and wildlife.

## LEADERSHIP TEAM

Our leadership team consists of four partners. This team is the recipient of a USDA climate-smart commodities grant, the first and largest for industrial hemp. We also feature the largest hemp farmers in the country with a combined 30+ years of farming, processing, and supply chain experience in the industry. Managing farms and facilities across the country gives the operational expertise required. The team is dedicated to creating opportunities for the underserved communities.

# COMPANY OVERVIEW

## COMPANY NAME

Cowboy Clean Fuels

## HQ LOCATION

Denver, CO, USA

## FOUNDED

2020

## NUMBER OF EMPLOYEES

11 - 50

## TRL

8

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Rocks - In-situ storage in sedimentary reservoirs

Rocks - Calcination of minerals with CO<sub>2</sub> capture

Rocks - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate equity, Project Equity, Government Funding, Corporate Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Venture capital, Angel, Family Office, Government

**Ryan Waddington**

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# COWBOY CLEAN FUELS



## COMPANY DESCRIPTION

Founded in 2020, CCF has evolved from 15 years of research and thousands of lab tests conducted at the University of Wyoming. Specializing in Carbon Dioxide Removal (CDR), CCF's patented process effectively sequesters CO<sub>2</sub> from the atmosphere. Boasting significant assets in Wyoming, CCF is strategically positioned to sequester over 250 MT of CO<sub>2</sub> annually at full scale. This innovative approach positions CCF at the forefront of addressing climate change by actively reducing atmospheric CO<sub>2</sub> levels.

## CORE INNOVATION

The core differentiating aspect of the CCF technology is that it can be used to produce carbon-negative renewable natural gas (RNG) and sequester CO<sub>2</sub>. The methanogens, which are indigenous to the coal seam, produce CO<sub>2</sub> and CH<sub>4</sub> in equimolar amounts. Coal has a greater affinity to adsorb CO<sub>2</sub> over CH<sub>4</sub>. Consequently, the CH<sub>4</sub> can be produced as RNG and brought to market using the existing natural gas infrastructure at the site.

## CO<sub>2</sub> CAPTURE

CCF employs a Biomass Carbon Removal and Storage (BiCRS) hybrid approach which captures atmospheric CO<sub>2</sub> in sugar beet-derived feedstock (i.e., molasses). This feedstock, which is rich in carbon derived from atmospheric CO<sub>2</sub>, is introduced into subsurface geologic formations where indigenous microorganisms convert the carbon into CO<sub>2</sub>, CH<sub>4</sub>, and microbial biomass. CO<sub>2</sub> and CH<sub>4</sub> are adsorbed onto the coal surface, where it is permanently sequestered due to the hydrostatic properties of the formation.

## CO<sub>2</sub> SEQUESTRATION

The CCF process ensures durable CO<sub>2</sub> sequestration for over 1000 years in deep geological formations. The process is more durable than other types of geologic sequestration because it involves adsorption of the CO<sub>2</sub> molecules. The durability of the sequestration is supported by the fact that coalbed methane has existed in these reservoirs for millions of years and that the coal has an even greater affinity to adsorb CO<sub>2</sub> (3 -5 times) than CH<sub>4</sub>.

## CO-BENEFITS OR PRODUCTS

A key co-benefit of CCF's technology is the production of carbon-negative RNG. Since the RNG is continuously produced, CCF can choose to produce and market the RNG at any time. The RNG can be differentiated from existing fossil fuels using precise carbon-14 dating techniques. The technique can also be used to differentiate the CO<sub>2</sub>, ensuring the permanent sequestration of carbon. In addition, the alternative use for molasses reduces enteric methane emissions from cattle.

## LEADERSHIP TEAM

Led by Ryan Waddington, an energy investor and entrepreneur focused on climate and new energy technologies for the last 25+ years, and Dr. Michael Urynowicz, a Professor at the University of Wyoming's College of Engineering and Physical Sciences and Director for the Center for Biogenic Natural Gas Research, CCF's management team is rounded out by traditional energy and financial executives, with complementary skillsets and a deep passion for commercializing advanced energy technologies and climate solutions.

# COMPANY OVERVIEW

## COMPANY NAME

Gigafex

## HQ LOCATION

Boston, MA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Building Materials, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

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# GIGAFEX



## COMPANY DESCRIPTION

Gigafex, formerly 1point8, introduces an innovative, low-cost pyrolysis unit for global rural deployment, transforming biomass into biochar at scale. Our technology is adept at processing diverse biomass, including high-moisture content waste. We're initiating our pilot with palm oil biomass, showcasing our unit's versatility and efficiency. This strategic approach not only mitigates waste but also significantly contributes to carbon sequestration, highlighting Gigafex's commitment to sustainable development and environmental restoration through advanced carbon removal solutions.

## CORE INNOVATION

Our novel pyrolysis unit sets us apart by exclusively producing biochar, eliminating oils and tars and significantly cutting maintenance and operation costs. Unlike traditional units focused solely on wood, ours efficiently processes diverse biomass types, accommodating varying properties and moisture levels. In contrast to other pyrolysis plants that use separate combustion and pyrolysis chambers we have combined the pyrolysis and combustion of the pyrolysis gasses in one chamber cutting investment costs drastically.

## CO<sub>2</sub> CAPTURE

Our process captures CO<sub>2</sub> by converting biomass waste from palm oil production into biochar through pyrolysis. This transformation permanently sequesters carbon, preventing its release into the atmosphere and effectively reducing atmospheric CO<sub>2</sub> levels. The biochar, once mixed with compost and applied to soil, not only enriches agricultural lands but also locks away carbon for centuries, showcasing a sustainable approach to carbon capture.

## CO<sub>2</sub> SEQUESTRATION

The biochar produced from biomass waste is durably sequestered by being incorporated into the soil of palm oil plantations. This application enhances soil fertility and structure, allowing the carbon contained in the biochar to be locked within the soil matrix for centuries. This method of carbon sequestration ensures a long-term removal of CO<sub>2</sub> from the atmosphere, contributing to climate change mitigation by storing carbon in a stable, solid form that does not readily decompose or re-enter the atmospheric cycle.

## CO-BENEFITS OR PRODUCTS

Our biochar production from biomass waste not only addresses disposal and transportation challenges by creating a product with lower moisture content and higher bulk density, reducing transportation costs, but also significantly enhances agricultural productivity. Tests done by Del Monte demonstrated that applying our biochar to pineapple fields in Costa Rica increased plant growth by 20%. This approach provides a sustainable solution to waste management while boosting agricultural yields, showcasing the multifaceted benefits of our technology.

## LEADERSHIP TEAM

Our founders team, including Sofia Ramirez, Tim Simon Klose, and Joachim Sturm, boasts a proven track record of innovation, having won the SpaceX Hyperloop Pod Competition four times as founders and core members of the TUM Hyperloop team and designed a 24m full-scale Hyperloop test track. Uli P. Mittermaier, a seasoned entrepreneur with multiple successful software company exits, complements the team as our CEO and investor, bringing valuable business acumen and experience to steer 1point8 toward global impact.

# COMPANY OVERVIEW

## COMPANY NAME

Global Algae Innovations, Inc

## HQ LOCATION

San Diego, CA, USA

## FOUNDED

2012

## NUMBER OF EMPLOYEES

11 - 50

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Algae for Use, Food/Feed, Liquid Fuels, Chemical Polymers

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Air - Other

Land - Biological conversion of biomass

Land - Terrestrial ecosystem restoration and management

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

\$300,000,000

## REVENUE RANGE

\$5M - \$20M

## CAPITAL RAISED TO DATE

\$50M - \$100M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Angel, Private Equity, Philanthropic, Government, Project Finance

**David Hazlebeck**

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# GLOBAL ALGAE INNOVATIONS



## COMPANY DESCRIPTION

Global Algae's vision is to harness the unparalleled productivity of algae to provide food and fuel for the world, dramatically improving the environment, economy, and quality of life for all people. This project will utilize algae farms to capture CO<sub>2</sub> directly from the air. It will sequester CO<sub>2</sub> in two ways: (1) produce consumer plastics from the algae oil and (2) address the massive economic forces that drive deforestation, i.e., protein and palm oil production.

## CORE INNOVATION

As a result of our dozens of innovations and breakthroughs in algae farming, the revenue from algal oil and protein is high enough to make the projects profitable, so megatonnes of carbon dioxide are captured and sequestered without any carbon credit or subsidy - enabling rapid buildout. Additionally, all IPCC pathways require reversing deforestation. Our solution is essential because it offers the only viable path to overcome the massive societal and economic forces driving deforestation.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by absorption directly into algae cultivation raceways at a rate of up to 175 metric tonnes of CO<sub>2</sub> per hectare per year. Algae fix the absorbed CO<sub>2</sub> via photosynthesis. The algae oil and protein provide alternatives for palm oil and protein meal in Southeast Asia and South America with 30x less land use. This enables restoration of the rainforest, and growing trees capture CO<sub>2</sub> from the air and fix it via photosynthesis.

## CO<sub>2</sub> SEQUESTRATION

Firstly, a portion of the algal oil is converted into polymer products which results long-term sequestration of the carbon. Secondly, the rainforest regrowth stores the carbon in both above ground and below ground biomass. Our technology licenses for algae farms will require purchase and restoration of deforested rainforest area equal to at least half of the area no longer needed to grow the palm oil and soy replaced by algae oil and protein.

## CO-BENEFITS OR PRODUCTS

The high productivity algae farms will (1) create an economic boon with many high-quality jobs; (2) reduce water use by 30-fold, enabling restoration of rivers, lakes, and aquifers; (3) produce aquaculture feed with omega-3 oil, enabling increased fish production and restoration of ocean ecosystems; (4) produce oil for low-carbon fuels; and (5) provide a complete protein source very high in vitamins, minerals, and anti-oxidants. The restored rainforests will provide biodiversity and help reduce species loss.

## LEADERSHIP TEAM

Dr. David Hazlebeck, founder and CEO of Global Algae, has a Ph.D. in Chemical Engineering and over 35 years of industrial experience in process research and development including over 15 years of R&D on algae production. Under his leadership, Global Algae has developed a suite of radical advances in open pond algae cultivation, harvesting and down-stream processing. Prior to GAI, Dr. Hazlebeck lead a consortium of over 20 companies developing algae technology for renewable fuel.

# COMPANY OVERVIEW

## COMPANY NAME

Hago Energetics Benefit Corporation

## HQ LOCATION

Camarillo, CA, USA

## FOUNDED

2017

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Energy, Industrial Gases/Pure CO<sub>2</sub>, Other

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biological to energy with CO<sub>2</sub> capture and storage

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Angel, Family Office, Private Equity, Philanthropic, Government, Project Finance

**Wilson Hago**

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# HAGO ENERGETICS



## COMPANY DESCRIPTION

We lower carbon emissions by capturing methane and converting to hydrogen using biochar.

## CORE INNOVATION

The core differentiating aspect of the Company's solution is the use of biochar as a medium for capturing carbon from methane. This biochar is usable as a soil amendment at the end of the process, representing a durable way for sequestering carbon. Our solution focuses on double or triple sequestration approaches as energy solutions that benefit the environment and society. Our solution prioritizes social impact initiatives, such as community engagement, job creation for underserved populations.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured via a double sequestration approach. First, we form biochar from cellulosic matter. This is the first sequestration. The second sequestration occurs when we separate carbon from methane and deposit it into the biochar for durable sequestration.

## CO<sub>2</sub> SEQUESTRATION

The CO<sub>2</sub> is durably sequestered as biochar and as a carbon within the biochar. Biochar is known to persist in the soil for hundreds, if not thousands of years, hence the durable sequestration.

## CO-BENEFITS OR PRODUCTS

Some of these may include: 1) Energy Storage Solutions: Hago Energetics provides energy storage systems, such as batteries or pumped hydro storage, to store excess energy generated from renewable sources for use during periods of high demand or when renewable generation is low. 2) Soil Carbon Sequestration: By promoting biochar in agricultural practices, Hago Energetics contributes to soil health, helping mitigate climate change by removing CO<sub>2</sub> and storing it in the soil for long periods.

## LEADERSHIP TEAM

Won NASA CO<sub>2</sub> Conversion Challenge Award. Won Frost and Sullivan Gold Edison Award in Agriculture for Biochar Development. Over 20 years in renewable energy field. Won \$1M in awards from the California Energy Commission and \$250k Verification Award from DOE. Was a semi-finalist in the NRG COSIA Carbon XPRIZE.

# COMPANY OVERVIEW

## COMPANY NAME

Tao Climate Limited

## HQ LOCATION

Dublin, Ireland

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Building Materials

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biomass sequestration in the built environment

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$1,200,002

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Government, Project Finance

Gary Byrnes

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# HEMPOFFSET - TAO CLIMATE



## COMPANY DESCRIPTION

We are committed to using our technology to enable the planting of industrial hemp at scale, and to using the captured carbon to build sustainable housing. Our science-based and data-driven approach is based on the principles of a circular economy, with zero waste, where resources are optimized, and carbon is captured and reused for the benefit of people and the planet.

## CORE INNOVATION

We are the first company in the world to bring together hemp's incredible carbon removal capabilities and hempcrete's remarkable carbon sequestration powers, combining the activities with housing construction to produce the world's fastest, most effective Carbon Credit product, one which actually makes the physical world a better place for people, through the provision of sustainable housing.

## CO<sub>2</sub> CAPTURE

Photosynthesis in the hemp plant leaves absorbs CO<sub>2</sub>, combines the Carbon with water to make biomass and releases the Oxygen back into the air. During the growth phase, hemp plants absorb CO<sub>2</sub> from the atmosphere as they photosynthesize, converting it into organic carbon compounds within their biomass, a natural carbon sink effectively removing CO<sub>2</sub> from the air. Through sustainable farming practices and careful land management, we cultivate hemp at scale, capturing large quantities of CO<sub>2</sub>.

## CO<sub>2</sub> SEQUESTRATION

The Carbon is trapped in the hemp plant Dry Stalk Fibre (DSF), at a benchmark level of 44% (confirmed with Carbon tests). We separate the Carbon-rich inner core (shiv) from the outer stem. The shiv is broken up, and mixed with lime and water to make hempcrete, which is used to make buildings, as a sustainable replacement for concrete. The outer part of the stem can be used to make thermal insulation, biocomposites, or textiles.

## CO-BENEFITS OR PRODUCTS

Hemp is a remarkably beneficial plant, with multiple co-benefits including: Less demand for electricity to remove CO<sub>2</sub>. Carbon removal is fully considered, fast, and scalable (unlike DAC). Captured carbon is recycled into sustainable housing and infrastructure. We're changing behaviours in agriculture by helping farmers move away from livestock and dairy. We're changing behaviours in construction, by moving builders away from cement and concrete. Hemp doesn't require pesticides or herbicides. Hemp benefits bees and other pollinators.

## LEADERSHIP TEAM

Gary Byrnes, Tao Climate, is a sustainability leader and hemp visionary. Having worked in the tech sector for many years, Gary founded Tao Climate for the XPRIZE Carbon Removal competition. The business vision connects hemp growing to remove CO<sub>2</sub> and hempcrete construction to sequester CO<sub>2</sub>, creating a new category of Hemp Carbon Credit, which can be measured and verified, delivering sustainable housing and multiple co-benefits. The business participates in Google's Startups for Sustainable Development program.

# COMPANY OVERVIEW

## COMPANY NAME

Loam Bio

## HQ LOCATION

Orange, Australia

## FOUNDED

2019

## NUMBER OF EMPLOYEES

101 - 250

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$50M - \$100M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

Jaime Painter

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# LOAM BIO



## COMPANY DESCRIPTION

Loam partners with farmers to remove carbon from the atmosphere and store it in agricultural soils, increasing the productivity and resilience of broadacre cropping systems. CarbonBuilder is Loam's microbial seed treatment for broadacre crops, designed to increase stable soil carbon whilst also improving plant yields. SecondCrop is Loam's soil carbon project program, helping farmers to sell their carbon credits and thus future-proofing their assets above and below ground.

## CORE INNOVATION

CarbonBuilder is unique compared to other SOC methods: it has high carbon build rates, requires minimal practice change by farmers and builds the most stable forms of soil organic carbon. The product requires dose rates of grams per acre (enhanced rock weathering requires 100s to 1000s kgs per hectare), making it inherently scalable from a production and logistics perspective. It uses existing infrastructure (operational broadacre farms) and does not require extractive or environmentally damaging processes.

## CO<sub>2</sub> CAPTURE

Loam's new biological product class is a significant innovation for carbon sequestration in agriculture. Our CarbonBuilder seed treatments enhance natural microbial mechanisms of carbon transfer from plant sources into stable carbon sinks deep in the soil. Through symbiotic relationships with plant roots, CarbonBuilder creates and enhances mycorrhizal networks, enhancing carbon deposition in soils. CarbonBuilder reintroduces the fungal mechanism of carbon deposition into stable aggregates and mineral surfaces, leading to stable carbon sequestration in cropping soils.

## CO<sub>2</sub> SEQUESTRATION

Not all soil carbon is created equally; there is plant-derived fast-cycling carbon, carbon physically entrapped in aggregates, and slow-cycling mineral-associated carbon. CarbonBuilder specifically increases aggregate and mineral-associated carbon. Carbon compounds released by our fungi can form stable bonds with soil minerals, protecting the carbon from decomposition and ensuring its long-term storage (Koechli, 2019). The mycelium of fungi can stabilize soil aggregates, further trapping and protecting carbon within these structures (Mayer et al., 2021).

## CO-BENEFITS OR PRODUCTS

Loam enables farmers to manage their production risk through the co-benefits that result from increased levels of soil carbon (increased yield, increased nutritional uptake, potential to reduce inputs, increased system resilience) & market access risk (by creating a scientifically robust baseline measurement of on-farm emissions), allowing them to fulfill demand for carbon neutral produce, as well as access new market opportunities to trade new commodities through carbon markets.

## LEADERSHIP TEAM

Guy Hudson: Co-Founder & CEO specializes in cleantech, sustainability & carbon markets. He's run climate change initiatives with organizations such as the UN, World Bank & WEF. Tegan Knock: Co-Founder & COO has extensive experience in government policy, agricultural R&D & communications. Robbie Oppenheimer: Chief Product Officer. Joined in Oct'22, PhD in Synthetic Biology from the University of Oxford plus BSc in Biotech. Expert in economics, synthetic biology, programming, data analysis & product development.

# COMPANY OVERVIEW

## COMPANY NAME

MASH Makes

## HQ LOCATION

Copenhagen, Denmark

## FOUNDED

2015

## NUMBER OF EMPLOYEES

51 - 100

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Liquid Fuels

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

\$11,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Project Equity, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Private Equity, Government, Project Finance

**Nabina Ganguly**

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# MASH MAKES



## COMPANY DESCRIPTION

Established in 2015 as a spin-out from the Technical University of Denmark, MASH Makes A/S pioneers pyrolysis and gasification technology. Transforming agricultural waste into carbon-negative energy and producing biochar for soil amendment, MASH actively combats carbon emissions. Currently, with 11 employees in Denmark and 49 in India, the company operates in Udupi, Karnataka, and aims to expand commercial operations from two to 30 sites in India and the region by 2027.

## CORE INNOVATION

MASH's solution is unique due to our ability to scale our biochar production to the gigatonne level based on our expansion strategy via decentralized biochar production plants. We also produce a marine-grade biofuel as one of the co-products from pyrolysis, which further adds to our approach towards sustainability. Finally, we deploy our projects in developing countries, where there is the maximum impact from the use of biochar and the social cost of carbon is highest.

## CO<sub>2</sub> CAPTURE

Under normal circumstances, green plants remove CO<sub>2</sub> from the atmosphere via photosynthesis and convert it into biomass. Almost all of this carbon is returned to the atmosphere when plants die and decay or if the biomass is burned for use as a fossil fuel substitute. When this biomass is pyrolyzed, it is converted to biochar which is a stable form of carbon that won't be released back into the atmosphere.

## CO<sub>2</sub> SEQUESTRATION

Once CO<sub>2</sub> has been captured in the biochar, it has to be used in an application where it can form a long-term sink. This is done by mixing it with a nutrient-rich medium such as compost or an organic fertilizer and then applying it to the soil as an additive. It is recalcitrant to biodegradation and is known to last for thousands of years in the soil, making it an excellent option for carbon sequestration.

## CO-BENEFITS OR PRODUCTS

We produce a marine-grade biofuel as a co-product from our production process. Since we operate in developing countries and work with marginalized communities, we have a lot of co-benefits to our solution beyond carbon removal. Additionally, as described in section 11, we actively work towards the UN SDG goals 2, 8, 9, 11, 12 and 15.

## LEADERSHIP TEAM

Leadership team is composed of entrepreneurs and technologists with extensive education in mechanical and environmental engineering, chemistry, biotechnology, business administration and international development. The total years of experience in the executive team is more than 100 years. with a mix of PhDs, MBAs and MSc profiles. MASH's advisory board comprises academic excellence tech entrepreneurship, advanced energy technology and geoscience associated with DTU, Aarhus University and the University of Edinburgh.



# COMPANY OVERVIEW

## COMPANY NAME

Mercurius Biorefining

## HQ LOCATION

Ferndale, WA, USA

## FOUNDED

2009

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Building Materials, Industrial Chemicals, Liquid Fuels, Chemical Polymers

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Biological conversion of biomass

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$5,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Government

**Eric Seck**

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# MERCURIUS RISING



## COMPANY DESCRIPTION

Mercurius Biorefining has piloted and is developing and scaling up technology to produce carbon negative drop in fuels and chemicals using its patented REACH™ process. REACH™ uses a liquid phase catalytic approach to produce fuels and chemicals from lignocellulosic feedstocks such as agricultural and forestry residuals (stover, bagasse, rice or wheat straw, wood chips or sawdust) or MSW.

## CORE INNOVATION

The liquid phase catalytic nature of our process allows for low volumes when compared to technologies such as pyrolysis. This ultimately means lower capital costs.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> captured by photosynthesis creates biomass feedstocks to our process, which can process any lignocellulosic biomass as a feedstock. 50% of the original biogenic carbon in the feedstock is converted to a biochar, and the remaining converted to monomer materials and fuels.

## CO<sub>2</sub> SEQUESTRATION

The carbon in the biochar is then sequestered for more than 100 years in biochar in the soil, with a portion of carbon re-released as renewable fuel.

## CO-BENEFITS OR PRODUCTS

High value monomers, such as FDCA, which is a precursor to the next generation polymer PEF. Carbon negative sustainable aviation fuel and renewable diesel that can also abate emissions from combustion of fossil fuels.

## LEADERSHIP TEAM

Karl Seck, CEO, has 30+ years of experience in operations management and business planning in refining. Michael Vevera, CFO, has started several successful businesses in Japan and Australia. Eric Seck, VP Project Development has 10+ project management and engineering experience in the refining, lube oil recovery, district energy and building energy systems.

# COMPANY OVERVIEW

## COMPANY NAME

NetZero

## HQ LOCATION

Paris, France

## FOUNDED

2021

## NUMBER OF EMPLOYEES

101 - 250

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Energy

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Private Equity, Project Finance

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# NETZERO



## COMPANY DESCRIPTION

NetZero's mission is to bring at scale biochar as both a climate and agricultural solution. We focus exclusively on the immense volumes of unused crop residues available in the tropics, and leverage our own technology of mid-size, automated, highly optimized, and easily replicable pyrolysis plants. We operate an end-to-end model based on a fully circular approach, with local farmers being both our suppliers of biomass and clients of biochar, facilitating logistics, traceability, and local buy-in.

## CORE INNOVATION

We are one of the very few integrated biochar players, controlling all project steps: from biomass collection to biochar distribution, from equipment design to factory assembly, along a highly cost-efficient model. We operate a decentralized model in the tropics, going close to biomass sources and exclusively using crop residues as feedstock. We process this biomass in mid-size, automated, and remotely monitored facilities, then returning the biochar to the same farmers who supply us the feedstock.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured as hydrocarbons through photosynthesis in crop residues.

## CO<sub>2</sub> SEQUESTRATION

We extract and stabilize the carbon contained in the crop residues through pyrolysis, with average heating temperature above 600°C, forming biochar. The biochar is then applied as a soil amendment to nearby agricultural fields, thus sequestering the carbon over geological timescales.

## CO-BENEFITS OR PRODUCTS

Our model is designed to maximize co-benefits beyond carbon removal. By using our biochar as a soil amendment in the tropics, where it is most efficient, we significantly improve farmers' standard of living, bringing higher yields, lower expenses on fertilizers, and better resilience of crop to extreme weather events. We also create well-paid industrial jobs in rural areas of developing countries and co-generate renewable energy usable locally. At a global level, our model allows to reduce the carbon footprint of crop farming through lower use of fertilizers – a key challenge in decarbonizing agri-supply chains.

## LEADERSHIP TEAM

We have a very senior leadership team, with most people having over 20 years of professional experience, covering pyrolysis, industrialization, production, finance, and strategy. Our team is multicultural from day-1, with co-founders from France, Brazil and Cameroon. As a result, we are capable of developing all our IP internally and have been able to attract high-profile investors, partners, and employees.

# COMPANY OVERVIEW

## COMPANY NAME

NForests

## HQ LOCATION

Gravataí, Brazil

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 4

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biomass sequestration in the built environment

Land - Terrestrial ecosystem restoration and management

Land - Agricultural & grassland CDR (crops; soils etc.)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$120,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Philanthropic Funding, Convertible Debt

## TYPE OF INVESTOR SOUGHT

Angel, Philanthropic, Government

Clara Johannpeter

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# NFORESTS



## COMPANY DESCRIPTION

We assembled a team comprising experts in various fields: carbon management, finance, legal frameworks, and agroforestry. Our goal was to demonstrate that trees hold greater value when left standing rather than cut down. We recognized carbon as an asset, capable of generating additional income to those engaged in regeneration or seeking to transition. By incentivizing the restoration, we aim to contribute to the stabilization of the planet's biosphere, mitigating temperature rise and effectively capturing carbon.

## CORE INNOVATION

Integration of agroforestry with existing land use. Tailored planting plans for optimal carbon sequestration. Multi-disciplinary team expertise for holistic approach. Emphasis on community engagement and education. Utilization of blockchain for transparent carbon accounting. Fair distribution of value generation.

## CO<sub>2</sub> CAPTURE

Planting agroforests in degraded land with small and medium farmers and the growing trees capture carbon dioxide from the atmosphere and transforming it into biomass through photosynthesis.

## CO<sub>2</sub> SEQUESTRATION

Sequestered carbon is then accumulated in the form of biomass, deadwood, litter and in forest soils.

## CO-BENEFITS OR PRODUCTS

Decreases local temperature, improves soil health, enhances biodiversity, boosts ecosystem resilience, enhances agricultural productivity, generates complementary income, provides sustainable livelihoods, preserves biodiversity, improves water quality, improve water absorption, supports rural economies, reduces erosion, enhances food security, mitigates natural disasters, fosters community resilience, enhances landscape aesthetics, creates wildlife habitat, increases property values, provides shade and windbreaks, promotes cultural heritage, reduces air pollution, enhances recreational opportunities, supports eco-tourism, improves mental health, encourages sustainable land use.

## LEADERSHIP TEAM

Clara Johannpeter Experienced in strategic planning and business development. Jefferson Mota Expert in agroforestry. Renzo Solari Highly experienced in carbon capture methodologies and forest management. Great knowledge of the carbon market and expertise in maximizing carbon sequestration. Rodrigo Borges Skilled in navigating regulatory frameworks and ensuring compliance in innovative projects. Arthur Venturella: Leader in regenerative agriculture and nature-based solutions. Implementing agroforestry practices and fostering community engagement. Liriane Petry High skills in community and environmental management.

# COMPANY OVERVIEW

## COMPANY NAME

Plantd, Inc.

## HQ LOCATION

Oxford, MI, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

51 - 100

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Building Materials

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biomass sequestration in the built environment

Land - Agricultrual & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$6,000,000

## REVENUE RANGE

\$5M - \$20M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Corporate Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Government

Huade Tan

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# PLANTD



## COMPANY DESCRIPTION

Plantd is on a mission to remove carbon dioxide from the atmosphere quickly, efficiently, and profitably. Our process is straightforward:

- 1) Cultivate the fastest-growing perennial grasses on earth.
- 2) Build a more efficient production process to transform grass into affordable, durable building materials.
- 3) Sell these superior materials to homebuilders, locking away atmospheric carbon in the walls, floors, and roofs of new homes.

## CORE INNOVATION

Plantd core differentiating solution is our in-house designed and built electric-powered production technology. This technology enables approximately 70% of the atmospheric CO<sub>2</sub> sequestered in the plant fibers to remain in the end product.

## CO<sub>2</sub> CAPTURE

Plantd is establishing a new agriculture supply chain of a fast-growing perennial grass. The grass naturally sequesters atmospheric carbon into the plant fibers as it grows, resulting in a low-cost and nature-based carbon capture solution.

## CO<sub>2</sub> SEQUESTRATION

Plantd harvests the grass and processes it in our novel electric-powered production technology, transforming the plant fibers into a durable building material used in the construction industry. The CO<sub>2</sub> in the plant fibers remains sequestered for the lifecycle of the building or structure.

## CO-BENEFITS OR PRODUCTS

Plantd's grass is perennial, which means it grows back year after year. Plants naturally sequester CO<sub>2</sub> in the root systems and soil as well. When harvesting the grass stalks, we do not disrupt the root system like annual crops. Plantd has not included the CO<sub>2</sub> sequestered in the soil in our life cycle calculation, which makes it an added benefit to our solution.

## LEADERSHIP TEAM

Huade Tan and Nathan Silvernail, Plantd's Co-Founders, both have nearly a decade of experience designing and building rocketships at SpaceX. Their experience helps inform the methodology of how Plantd designs and builds our electric-powered equipment. Additionally, Dr. Janel Ohletz, has been foundational in developing the strategy to establish Plantd's supply chain. With a PhD in Soil Science and a background in agriculture, she brings a wealth of knowledge to the team.

# COMPANY OVERVIEW

## COMPANY NAME

PlantVillage+

## HQ LOCATION

State College, PA, USA

## FOUNDED

2012

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Building Materials, Food/Feed, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

Land - Agricultural & grassland CDR

Rocks - Calcination of minerals with CO<sub>2</sub> capture

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Other

## AMOUNT OF CAPITAL SOUGHT

\$3,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Government Funding

## TYPE OF INVESTOR SOUGHT

Family Office, Philanthropic, Government, Project Finance

David Hughes

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[plantvillageplus.com](http://plantvillageplus.com)

# PLANTVILLAGE



## COMPANY DESCRIPTION

PlantVillage+ is a spin out from Penn State where PlantVillage, a two-time XPRIZE winner, exists. We capture CO<sub>2</sub> by increasing crop production in our AI Powered Carbon Capture Cubes that work year round across the tropics. Waste biomass is converted to biochar (geological storage as inertinite). We make and sell biochar fertilizer increasing crop production/carbon removal. Modular pyrolysis units capture waste heat and CO<sub>2</sub> for farm services (food processing and eco-concrete via our partner, MAA'VA™).

## CORE INNOVATION

Our unique mix of digital technology, system innovation and grassroots engagement offers the lowest cost pathway for land-neutral, calorie-positive, equitable, transparent and permanent carbon removal (</= \$50/tCO<sub>2</sub>). Our AI-Powered Carbon Capture Cubes, youth-led service provider squads, and partnerships with international and national authorities, research centers and donors give us the edge to scale the bottom-up biochar production model. Most importantly we possess an unshakeable social license with trust from both farmers and carbon credit buyers.

## CO<sub>2</sub> CAPTURE

PlantVillage+ leverages the massive carbon pool of non-consumed crop residues, diseased plant material, invasive species, and agroforestry resources on farms and communal lands in Africa and Asia. Through our pioneering approach of 'AI-Powered Carbon Capture Cubes' we manage the supply chain of feedstock from these distributed pools and create reliable, year-round operations, achieving unparalleled potential. By recirculating biochar-based fertilizers and providing AI-powered agronomic advisories we incrementally enhance the rates of carbon capture in each Cube.

## CO<sub>2</sub> SEQUESTRATION

Biomass resources are converted into biochar at or near each Cube with mobile semi-automated rigs or small-industrial generator systems. Peer-reviewed research now recognizes biochar as inertinite, meaning a carbon sink on geological time scales. Biochar flows back to farmer fields through a commercial route by mixing it with animal manure to sell as fertilizers or using it for tree seedlings. Biomass carbon will also be sequestered in green building materials by forming carbonates in concrete.

## CO-BENEFITS OR PRODUCTS

We turn trash into treasure. Biomass from infected plant material, weeds or waste biomass is converted to biochar. This reduces methane emissions (from open burning/decomposition) and increases healthy crop production. By mixing biochar with manure we reduce manure methane by 50%. 5T Biochar fertilizer/hectare reduces synthetic nitrogen by 70%, linearly reducing nitrous oxide production. It also improves African soils and increases water holding capacity providing drought tolerance. And our work creates hundreds of local jobs.

## LEADERSHIP TEAM

Hughes has degrees from Glasgow (Zoology) and Oxford (Entomology) and held prestigious EU fellowships at Copenhagen and Harvard. His research on rainforest ecology made him well known and inspired Last of Us (Playstation/HBO). He gave that up to work on food security and climate change landing him positions on Newsweek's Top Disruptors in America and Fast Company's Most Innovative List. McCloskey worked with Hughes for 7 years as Operations Director, helping raise >\$37m for PlantVillage.

# COMPANY OVERVIEW

## COMPANY NAME

PyroCCS GmbH

## HQ LOCATION

Cologne, Germany

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Energy, Chemical Polymers, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$2,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Project Finance

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# PYROCCS



## COMPANY DESCRIPTION

PyroCCS is a developer and technology supplier for biochar carbon removal (BCR) projects in the Global South. The company's mission is to provide the right biochar solution for every waste biomass stream - from crop residues from smallholder farmers to high-volume waste biomass streams from the food industry. To this end, PyroCCS is developing the appropriate pyrolysis technologies and a proprietary dMRV. The strategy is to enable the most cost-effective and fastest possible BCR scaling.

## CORE INNOVATION

PyroCCS does not rely on one solution, but develops the economically and ecologically ideal strategy for the respective biomass stream, local laws and local conditions. Whether biomass streams from arid areas affected by scrub encroachment or crop residues from smallholder farmers (SHF) or industrial biomass waste, specific BCR strategies are always required. Both in the thermolysis technology, pre-treatment of the biomass, sequestration of the biochar and the choice of desired residual products (thermal energy, bio-oil).

## CO<sub>2</sub> CAPTURE

Approximately 50% of the carbon bound in the plant biomass through photosynthesis is converted into very stable biochar through thermolysis at over 400°C. Only waste biomass such as crop residues, waste from the wood industry and sustainably sourced biomass from certified positive lists is used to avoid land pressure. The biomass stream is tracked from the source through conversion to biochar and up to sequestration using proprietary and certified software to document all relevant emissions.

## CO<sub>2</sub> SEQUESTRATION

Sequestration of the carbon bound in the biochar is preferably carried out in local agricultural soils to promote humus formation. Sequestration can and should take a detour as filter, feed, cooling, bedding or compost carbon. Additions to roads, concrete, plastics, other products or geological deposits are also practicable. The company's own certified software registers every quantity and type of sequestration and calculates the different decomposition rates and risks of premature release of sequestered C.

## CO-BENEFITS OR PRODUCTS

Due to its high porosity, electrical conductivity and ion storage capacity, biochar has soil-improving, detoxifying and storage properties that make it a valuable additive in animal feed, compost, liquid manure, concrete, asphalt and other products. Depending on the design of the plant, pyrogases can be thermally utilized or partially condensed, e.g. to produce wood tar and wood vinegar, which can be further processed into valuable products. In the Global South, PyroCCS strategy supports numerous SDGs.

## LEADERSHIP TEAM

Christopher was a senior engineer at the world market leader for pyrolysis equipment, the German company Pyreg GmbH. There he developed their flagship machine PX1500. Timo is a serial entrepreneur who took his first venture in the real estate sector to the stock market and into the MDAX. He has experience in building and managing companies. Tameca and Eck have extensive experience in the implementation of biochar projects involving the local population in Namibia.

# COMPANY OVERVIEW

## COMPANY NAME

Bamboo Ecologic Corporation dba RIZOME

## HQ LOCATION

Sarasota, FL, USA

## FOUNDED

2013

## NUMBER OF EMPLOYEES

501 - 1000

## TRL

9

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar, Building Materials, Energy, Industrial Gases/Pure CO<sub>2</sub>, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Air - Other

Land - Thermal conversion of biomass (biochar)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Biomass sequestration in the built environment

Land - Terrestrial ecosystem restoration and management

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$3,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Convertible Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Family Office, Private Equity, Philanthropic, Government, Project Finance, Other

David E Sands

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# RIZOME



## COMPANY DESCRIPTION

RIZOME was founded to address the climate crisis. RIZOME's mission is to remove gigatonnes of CO<sub>2</sub> from the atmosphere through large scale reforestation efforts using noninvasive timber bamboos, the fastest growing woody plants on earth, and in the process develop bamboo into a primary global building material, biochar, and biofuel source.

## CORE INNOVATION

Our solution is affordable and scalable biogenic direct air capture with verifiable storage mechanisms that creates a circular value chain around it. It is unique in several ways as we have multiple avenues for carbon storage and multiple economic drivers to drive adoption and implementation. The carbon is stored in building materials, biochar, the bamboo plants, soil carbon, and phytoliths. The economic drivers include revenue from carbon credit sales, building materials, electricity, and biochar.

## CO<sub>2</sub> CAPTURE

We reforest land with noninvasive timber bamboos, the fastest growing woody plants on Earth that can live 120 years and be sustainably harvested annually. Bamboo rapidly turns atmospheric CO<sub>2</sub> into above and below-ground biomass while building up soil carbon stock. Our solution can capture carbon at \$2.88/t CO<sub>2</sub>e which is orders of magnitude cheaper than mechanical direct air capture (\$100-600/t CO<sub>2</sub>e) and generates revenue from the sale of carbon credits, building products, biochar, and electricity.

## CO<sub>2</sub> SEQUESTRATION

We annually sustainably harvest bamboo plants to maximize CO<sub>2</sub> drawdown converting bamboo fiber into building materials and biochar to durably sequester CO<sub>2</sub>. The plants themselves durably store carbon in the living biomass for its up to 120yr life. The above-ground biomass of the plants reaches a steady state once harvest begins the below-ground biomass and soil carbon continues to accumulate. The bamboo leaf litter includes phytoliths of silica-occluded carbon for additional long-term durable carbon storage.

## CO-BENEFITS OR PRODUCTS

Our co-benefits are extensive. Our Philippines project addresses all 17 United Nations SDGs. Former insurgents supply us with bamboo promoting peace in a previously strife-torn region. Organized by a young woman, another of our supplier groups will drive over US \$100,000 into her remote community. Our indigenous planting partners are creating a multigenerational asset with an annual source of income with bamboo plantings on their tribal land and being paid by carbon credits to plant bamboo.

## LEADERSHIP TEAM

Developed first US building code standard for structural bamboo in 2004. Developed and presented a bamboo based carbon removal strategy in 2009. Designed and manufactured bamboo buildings since 1995. World Bamboo Organization Ambassador. Former VP of 2 Fortune 500 companies in energy and logistics. Legal expertise. Energy industry analysis and carbon modeling expertise. Former secretary of agriculture for the Philippines. Regenerative agriculture and permaculture expertise. GIS expertise. Software development. Company development, funding, and scaling expertise.

# COMPANY OVERVIEW

## COMPANY NAME

Sonnenerde GmbH

## HQ LOCATION

Riedlingsdorf, Austria

## FOUNDED

Pre-2000

## NUMBER OF EMPLOYEES

11 - 50

## TRL 9

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Mature (already have a large mature business)

## CURRENT INVESTMENT STAGE

Other

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

Gerald Dunst

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# SONNENERDE



## COMPANY DESCRIPTION

Sonnenerde is a compost and soil producing company. 30 different soil were developed in the past 25 years. Since 12 years we operate one of the first biochar plants in Europe. For this project we developed a completely new biochar unit, which is optimized for a composting company and can use all the organic residues from the process. Its combined with a sewage sludge drying system to optimize the use of heat.

## CORE INNOVATION

- 1) Developing a new and very simple stove for the pyrolysing process itself, which can use every kind of organic feedstock and waste.
- 2) Found a perfect combination with sewage sludge drying system to clean the exhaust gas and use heat energy very efficient.
- 3) Found a solution to bring heat energy back again to dry our feedstock. Emissions are not possible in this new combination.

## CO<sub>2</sub> CAPTURE

Biochar production out of waste and using it in soils.

## CO<sub>2</sub> SEQUESTRATION

Biochar is stable for thousands of years in accordance with the new scientific paper from Hamed Sanai.

## CO-BENEFITS OR PRODUCTS

Produce a very high value product - its biochar. By using in soils, the so called Terra Preta effect starts and start fixing additional CO<sub>2</sub> from the air because of the humus building effect. A lot of problems in agriculture can be solved with biochar - it's a perfect feed amendment for more healthy animals and can fix a lot of nitrogen and smells.

## LEADERSHIP TEAM

Winner of the Energy Globe Award 2023 in Austria for this project, Winner of the Innovation Award in Burgenland. Our new facility operates continuous since December 2023.



# COMPANY OVERVIEW

## COMPANY NAME

SPSC GmbH

## HQ LOCATION

Ottobrunn, Germany

## FOUNDED

2016

## NUMBER OF EMPLOYEES

1 - 10

## TRL 8

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Oceans - Nutrient fertilization

Land - Thermal conversion of biomass (biochar)

Land - Biological conversion of biomass

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Biomass sequestration in the built environment

Land - Terrestrial ecosystem restoration and management

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Project Debt

## TYPE OF INVESTOR SOUGHT

Project Finance

**Serguei Panine**

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# SPSC GMBH



## COMPANY DESCRIPTION

SPSC GmbH is a technology provider for the biochar and energy production by utilization of different kinds of biomass. Innovative design guarantees the highest efficiency for pure carbon and energy generation by biomasses/wastes processing. The final products find a wide range of applications enabling CO<sub>2</sub>-sink opportunities to achieve global climate goals. Biochar is a product of the future and makes an important contribution on the way to climate neutrality and CO<sub>2</sub> reduction.

## CORE INNOVATION

System for the pyrolytic conversion of biomass with the vertically oriented reactor without any moving parts inside. In this process, the energy of the generated synthesis gas is used without any external energy sources, indirectly and controlled, to achieve the highest quality and quantity. SPSC patent DE 10 2022 102 135 A1.

## CO<sub>2</sub> CAPTURE

Innovative design guarantees the highest efficiency for pure carbon and energy generation by biomass/waste processing: instead of classic biomass burning process, SPSC GmbH uses advanced pyrolysis technology for solid carbon (biochar) generation and therefore CO<sub>2</sub> capture.

## CO<sub>2</sub> SEQUESTRATION

The captured CO<sub>2</sub> in the form of solid carbon (biochar) will be used in: soil improvement applications (e.g. terra preta), animal feed, building materials etc. and therefore durable CO<sub>2</sub> sequestration (>1000 years) is guaranteed.

## CO-BENEFITS OR PRODUCTS

Biochar, thermal and/or electrical energy, biofuel etc.

## LEADERSHIP TEAM

Highly educated and qualified, with long-term experience in the field of chemical plant design, especially in reactor construction, primarily for energy-saving technologies such as polysilicon for the solar industry, as well as biomass-to-energy conversion.

# COMPANY OVERVIEW

## COMPANY NAME

Takachar Limited

## HQ LOCATION

New Delhi, India; Mwea, Kenya; San Francisco, CA, USA; Vancouver, Canada

## FOUNDED

2015

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Advanced Materials, Biochar, Energy, Soil/Soil Additives

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Project Equity, Government Funding, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Philanthropic, Government, Project Finance

**Kevin Yung**

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# TAKACHAR



## COMPANY DESCRIPTION

We use MIT technology to build a decentralized internet-of-things-enabled reactor network to rapidly and profitably scale biochar deployment without being dependent on carbon offset credits. Our patent-pending, low-cost, and portable hardware and control systems enable village-based production of customizable biochar-based fertilizers using locally available crop residues and labor. The resultant standalone, government-certified fertilizer blend helps farmers improve their yield by up to 30% and net income by 50%, thereby uniquely advancing climate justice simultaneously.

## CORE INNOVATION

Most crop/forest (biomass) residues are loose, wet, bulky, and too expensive to collect/transport to centralized, one-size-fits-all biochar facilities. Our differentiation is that we make biomass technology small-scale, portable, and flexible in terms of biomass and output bioproducts. This allows us unique access to rural, decentralized, small pockets of biomass for localized utilization that larger technologies cannot reach. Furthermore, our tunable control system allows for placed-based customization of biochar produced to optimize to local soil/crop needs.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by growing plants (crops and trees). In the baseline, after harvest, the non-merchantable residues are typically burned in open air, which releases the same CO<sub>2</sub> back into the atmosphere (and in some cases methane from anaerobic decomposition). Our thermochemical process intercepts this CO<sub>2</sub> cycle by turning the carbon-based plant matter into a more recalcitrant composition with persistence when applied into the soil from thousands to millions of years (Schimdt et al., 2022).

## CO<sub>2</sub> SEQUESTRATION

The primary method of sequestration is that, after rendering the biochar non-combustible by blending it with water and nutrient, the mixture is then applied to the soil as a government-certified fertilizer blend on farms and forested lands. Mainstream methodologies, however, tend not to care about the application boundary. For example, if certain fraction of the biochar ended up in a landfill or river, then generally the biochar remains inert, and CO<sub>2</sub> is still considered sequestered.

## CO-BENEFITS OR PRODUCTS

Each tonne of carbon removed from our process is inextricably linked with other social/environmental impacts overwhelmingly benefiting rural, underserved communities. Our 14,000 customers range from the poorest smallholder farmers in Kenya/India to the most remote First Nations communities in Canada. We have created >\$1.5 million in unskilled rural job opportunities, enabling these communities to depend less on expensive, imported, and carbon-intensive chemical fertilizers. By utilizing high-risk residues, we also reduce the risk of catastrophic wildfires.

## LEADERSHIP TEAM

Our leadership team uniquely combines the intimate, lived experience of underserved communities with cutting-edge MIT technology. Samuel and Joyce grew up as smallholder farmers in rural Kenya. Vidyut earned his Master's from TU Delft in Renewable Energy, and ran a biofuel company in the Himalayas. Kevin has been developing the core technology since 2012, initially as his MIT PhD thesis. The team co-founded a previous startup that sold more than one million low-toxin mosquito coils.

# COMPANY OVERVIEW

## COMPANY NAME

Carbon Tierra Prieta SA de CV

## HQ LOCATION

Monterrey, Mexico

## FOUNDED

2016

## NUMBER OF EMPLOYEES

11 - 50

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Biochar

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Thermal conversion of biomass (biochar)

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

**Adres Chapa**

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# TIERRA PRIETA

## COMPANY DESCRIPTION

Tierra Prieta is a biochar company specialized in pecan nutshell pyrolysis in Parras, Mexico. We have a long term agreement for both biomass sourcing and biochar sales, normally the most common barriers for biochar startups. We currently have a 1,000 CO<sub>2</sub> removal tonne capacity per year, and will expand to 5,000 within six months once our expansion facility is finished.

## CORE INNOVATION

Partnered with a large pecan processing facility, which ensures access to suitable biomass long term. Pecan shell biochar “flakes” are easier to use than other biochar “powders” in farm equipment. Signed a 5 year sales agreement with Wonderchar, as our product has had much success in the USA. Intentionally simple kiln design, we do not allow biooil to condense so it does not clog any pipes. Fully compliant with Puro.earth’s Biochar Methodology.

## CO<sub>2</sub> CAPTURE

Tierra Prieta captures CO<sub>2</sub> indirectly by converting pecan shells into biochar through pyrolysis. This process begins with atmospheric CO<sub>2</sub>, captured by pecan trees through photosynthesis and deposited in their nutshells, which is then locked into a stable form within the biochar, preventing its re-release as CO<sub>2</sub>.

## CO<sub>2</sub> SEQUESTRATION

Tierra Prieta durably sequesters CO<sub>2</sub> by incorporating the produced biochar into agricultural soils. The carbon in agricultural biochar is shielded from fire, solid, stable and immune to decomposition, effectively locking CO<sub>2</sub> in the soil for at least centuries. This long-term storage in agricultural land ensures the captured carbon remains sequestered and does not re-enter the atmosphere.

## CO-BENEFITS OR PRODUCTS

Agricultural: Biochar improves soil fertility, water retention, nutrient efficiency and micro-biological function, enhancing crop yields. It also reduces the need for chemical fertilizers, promoting healthier, more sustainable agriculture. Composting Improvement: In collaboration with Zero Foodprint and regional composters, we will distribute biochar to composters for incorporation during composting, which improves its quality, accelerates the process, and increases its effectiveness as a soil amendment while reducing emissions. Waste and methane emission reductions in pecan supply chain.

## LEADERSHIP TEAM

Andres and Alejandro have worked with biochar since 2014. The team has been recognized by Heineken Green Challenge, Tanmiah Food Corporation, CFA (UK Embassy Mexico City), INC Mty, Airminers, and many more prestigious institutions.

Anthony Myint is an award-winning chef, winner of the Basque Culinary World Prize and named Humanitarian of the Year by the James Beard Foundation, as well as Co-Founder of Mission Chinese Food.

# COMPANY OVERVIEW

## COMPANY NAME

Vaulted Deep

## HQ LOCATION

Houston, TX, USA

## FOUNDED

2023

## NUMBER OF EMPLOYEES

11 - 50

## TRL

9

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biomass direct burial

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

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# VAULTED DEEP

## COMPANY DESCRIPTION

Vaulted delivers scalable, permanent, carbon removal by geologically sequestering carbon-filled organic wastes. Our patented slurry sequestration technology allows us to geologically inject minimally processed wastes for permanent (10,000+ year) carbon removal. Vaulted delivers affordable, high-quality CDR at scale by designing into our approach cost and volume efficiencies at every stage. Our carbon removal activities help reduce the significant adverse effects caused by legacy waste systems, improving local environmental and human health and advancing environmental justice.

## CORE INNOVATION

Vaulted uses a suite of patented geologic slurry sequestration technologies that leverage geomechanics science to sequester solid-heavy slurries deep underground. This technology enables sequestration of sludgy organic waste (waste that is not otherwise usable and can pose major risks to human health and local ecosystems) with minimal processing (reducing operating costs). Vaulted spun out of Advantek Waste Management Systems, which developed the IP and has safely operated the technology at 7 sites.

## CO<sub>2</sub> CAPTURE

Vaulted relies on the natural processes of plants for CO<sub>2</sub> capture - photosynthesis. Once the plants have been as useful as possible in the economy, we take the resulting sludgy organic wastes that today are sent to a landfill, dumped into oceans or rivers, land applied, or otherwise left to decompose. Vaulted sources waste aggregated by legacy waste management systems. These sludgy wastes are difficult for others to use productively, limiting competition for target biomass.

## CO<sub>2</sub> SEQUESTRATION

Waste biomass is collected and delivered to the well site. Waste is minimally processed, without combustion, into a solids-laden slurry. The slurry is injected into the well. At the end of the injection cycle, solids are permanently vaulted by a layer of impermeable rock - the same formations that have kept hydrocarbons underground for millions of years. Monitoring confirms containment of the formation, and the resulting permanent carbon sequestration.

## CO-BENEFITS OR PRODUCTS

By taking waste that otherwise would have decomposed, Vaulted avoids significant methane generation (not included in CDR credit calculations). These wastes are often pathogenic or contain harmful chemicals (like PFAS). Research shows that residents near landfills are more likely to experience negative health consequences; decades of research have found that waste sites are disproportionately located in BIPOC and low-income communities. By sequestering these wastes, Vaulted reduces local environmental harm and advances environmental justice.

## LEADERSHIP TEAM

Omar Abou-Sayed (Exec. Chairman): Founder and CEO of Advantek for 12 years, managing six slurry injection wells. Omar has 20+ years of experience scaling cleantech and heavy industry companies. Julia Reichelstein (CEO): Expert in CDR through investing as climate tech VC, with start-up scaling experience. Adriana Ovalle (VP Engineering): 25+ years in engineering, geomechanics. Led slurry injection for 7 years and field operations for 6 years at Schlumberger. Led geoscience for 6 years at Halliburton.

# COMPANY OVERVIEW

## COMPANY NAME

Carbon Lockdown

## HQ LOCATION

Silver Spring, MD, USA

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

LAND

## CDR PATHWAY(S)

Land - Biomass direct burial

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

**Ning Zeng**

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[carbonlockdown.net](https://carbonlockdown.net)

# WOOD VAULT



## COMPANY DESCRIPTION

Carbon Lockdown is a public benefit company dedicated to the advancement of Wood Harvesting and Storage (WHS) via Wood Vault for durable carbon removal. Team Wood Vault aims to demonstrate the high scalability of WHS in key geographical regions across the world (Temperate, Tropical, and Boreal forest). Four independent but coordinated projects are conducted by 4 partner companies in the US, Indonesia, and Canada, with a combined removal of 10000+ tCO<sub>2</sub>e.

## CORE INNOVATION

- 1) WHS uses 'free' photosynthesis to capture carbon, with very small energy/carbon penalty (2-5%).
- 2) Direct burial has high biomass carbon use efficiency (>90%).
- 3) Wood vault creates anoxic condition with low permeability clay soil which is widely available.
- 4) Wood vault buries wood locally with minimal processing, leading to low-cost (<\$100/tonne at scale).
- 5) Uses known technology and well-established engineering practices.
- 6) Scalable worldwide now with co-benefits of fire thinning, waste utilization, etc.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by trees using the natural process of photosynthesis.

## CO<sub>2</sub> SEQUESTRATION

High durability (1000+ years) is achieved by burying coarse woody biomass (CWB) in an anoxic subterranean environment several meters below ground, away from the active biosphere (vegetation, soil, and decomposers) that's typically limited to the first meter of the soil profile. We bury all the raw wood with a high carbon efficiency (>90%). Carbon Lockdown's patent-pending WV design ensures an oxygen-depleted environment that prevents wood decomposition and initiates the re-fossilization of carbon.

## CO-BENEFITS OR PRODUCTS

Wood Vault co-benefits include: Beneficial valorization of un-merchantable woody biomass residues (waste) from fire thinning and other forest management; reduce fire risk, air pollution, biodiversity enhancement, mine remediation; creation of good green jobs and support for rural and indigenous development, with largest potential in the Global South.

## LEADERSHIP TEAM

- 1) Carbon Lockdown: Ning Zeng, Co-founder, inventor of WHS and WV technology, Professor at University of Maryland and Toby Bryce, Commercialization Lead, co-host of OpenAir's This Is CDR, advisor to Carbon Business Council.
- 2) Mast Reforestation: Grant Canary, Founder and CEO and Lisa Gonzales-Kramer: Director of the Montana Project.
- 3) BioCapture: Diego Corrido: Co-founder and CEO.
- 4) Jaeyoowe: Liam Parfitt: Co-founder and CEO; founder of Freya Logging Inc. and Joe Kenny: Co-founder; Principle Engineer.



XPRIZE  
CARBON  
REMOVAL

MUSK FOUNDATION



# OCEANS



# COMPANY OVERVIEW

## COMPANY NAME

Butterfly Carbon Company

## HQ LOCATION

Paranaque City, Philippines

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Algae for Use, Soil/Soil Additives

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Macroalgae cultivation

Oceans - Biomass sinking or ocean burial

Oceans - Artificial upwelling and downwelling

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$1,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Philanthropic, Government, Project Finance

Mr. Arwin J. Abaigar

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[butterflycarbon.org](https://butterflycarbon.org)

# BUTTERFLY CARBON



## COMPANY DESCRIPTION

Butterfly Carbon Company will cultivate Sargassum seaweeds on floating platforms and will harvest, bale, and sink the seaweeds into the ocean floor 1-5 km depth or even greater to sequester carbon greater than 100-1,000 years and beyond. Currently, the company is searching for any type of investors who will help in the development of its main goal which is carbon capture and sequestration from megaton to gigaton scales, using the cultivation of Sargassum seaweeds for carbon capture and carbon sequestration by safely sinking them into the ocean floor.

## CORE INNOVATION

Our core innovation is the building of offshore floating farms for the Sargassum seaweeds supported by the near-shore floating Sargassum seaweed (nursery/cultivation) farms, the hybrid PV biogas-electric ships for harvest and transport, and the electricity generating gravity winches for charging our ship batteries and the sinking of megatonnes/gigatons of baled Sargassum seaweeds. The main difference between the cultivation and offshore floating farms is the potential for exponential growth from megatonnes to gigatonnes levels. Since the areas covered by the open-oceans are larger than those available near-shore, which are competing with commercial shipping lanes or tourist areas operating on island properties.

## CO<sub>2</sub> CAPTURE

Sargassum fixes carbon dioxide into its biomass as it grows exponentially, doubling its mass after every 10-18 days. This growth has the effect of unbalancing the amount of carbon dioxide contained in the surrounding ocean areas. This will allow the surrounding ocean waters where the Sargassum grows to eventually absorb more carbon dioxide from the surrounding atmosphere into the ocean waters thereby decreasing the overall carbon dioxide in the Earth's atmosphere.

## CO<sub>2</sub> SEQUESTRATION

If the ocean currents at the ocean floors at depths of 1-5 km and greater will just fluctuate from near zero to a very low value, the sunk Sargassum seaweeds we will stay there undisturbed, and will eventually pile up and naturally mix with sediments or sands of the ocean floor sequestering carbon dioxide from the oceans and ultimately from the atmosphere. We will build a digital monitoring system by constantly measuring the current conditions at the seafloor levels to ensure that the megatons to gigatons of Sargassum seaweeds we will sink at these oceans depths will stay there for at least 100 up to 1,000 years and even beyond to help in the sequestration of carbon dioxide of the Earth's atmosphere.

## CO-BENEFITS OR PRODUCTS

The Earth will benefit with our natural and organic approach to carbon capture and sequestration for animal and plant biodiversity protection (including butterflies, bees, other insects and micro-organisms), ocean healing, prevention of ocean acidification, production of bio-stimulants for our agricultural lands, plus the additional megatons up to gigatons of fresh oxygen gas for the whole world to breathe-in.

## LEADERSHIP TEAM

Butterfly Carbon Company is a start-up founded in 2021 by Mr. Arwin J. Abaigar, a Computer Engineer and a Filipino citizen, for the purpose of joining in the XPRIZE Carbon Removal competition sponsored by the Musk Foundation. This is the first time he entered an XPRIZE competition and was encouraged by a fellow Herox competitor to enter an XPRIZE competition. He already won other innovation projects in Herox like in the Control the Flow Challenge, Cubesat Challenge and Veterans Online Memorial Challenge.

# COMPANY OVERVIEW

## COMPANY NAME

Captura

## HQ LOCATION

Los Angeles, CA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Industrial Gases/Pure CO<sub>2</sub>

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Electromechanical CO<sub>2</sub> separation from seawater

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Private Equity, Philanthropic, Government, Project Finance

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Private Equity, Philanthropic, Government, Project Finance

Steve Oldham

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# CAPTURA



## COMPANY DESCRIPTION

Captura provides a scalable, low-cost Direct Ocean Capture (DOC) carbon removal solution, producing a measurable stream of CO<sub>2</sub> for sequestration, using only seawater and renewable energy, with no other external additives or by-products produced. DOC requires no freshwater, has a minimal land footprint and can operate with intermittent power. The technology has been fully demonstrated at 100-tonne scale since November 2023. Captura is deploying a 1,000-tonne system in late 2024 while designing larger-scale commercial plants.

## CORE INNOVATION

1) Lower Cost: No purpose-built air contactors or absorbents, widespread use of standard industrial equipment and ability to leverage off-peak/intermittent renewable electricity lowers costs. No disposal costs since no by-products generated. 2) Scalability: Use of oceans makes DOC deployable globally. Only inputs are renewable energy and seawater - no supply chain constraints. No temperature or humidity restrictions. No freshwater or material land use. 3) Ocean Health: Closed-loop process adds nothing to oceans. Potential co-benefit of ocean acidification mitigation.

## CO<sub>2</sub> CAPTURE

Captura's Direct Ocean Capture (DOC) technology harnesses the ocean's natural carbon removal powers to drawdown atmospheric CO<sub>2</sub>, using just renewable energy and seawater as inputs, with no ocean additives. DOC captures CO<sub>2</sub> from surface oceans utilizing closed-loop electrodialysis, effectively making "more room" for oceans to draw down the same amount of CO<sub>2</sub> from the atmosphere. In this way, removal of CO<sub>2</sub> from the ocean results in subsequent removal of CO<sub>2</sub> from the atmosphere.

## CO<sub>2</sub> SEQUESTRATION

Captura produces a measurable stream of CO<sub>2</sub>, compatible with multiple sequestration solutions worldwide. The CO<sub>2</sub> from the 1,000-tonne system will be transported and durably stored at Northern Lights, a pioneering storage facility located in Oygarden, Norway with capacity for up to 5 million tonnes of CO<sub>2</sub> annually. The CO<sub>2</sub> is injected in a saline aquifer 2,600m under the seabed. Extensive testing and exploration confirmed the suitability of the reservoir for safe and durable CO<sub>2</sub> storage.

## CO-BENEFITS OR PRODUCTS

Captura DOC removes CO<sub>2</sub> from oceans faster than the ocean can replace it with atmospheric CO<sub>2</sub>, resulting in less CO<sub>2</sub> in oceans. This effect could help to mitigate ocean acidification and support ocean-dependent communities. The stream of CO<sub>2</sub> that Captura produces can be durably and safely sequestered to generate high-quality carbon credits to help corporations reach critical Net Zero targets, or re-used to create low-carbon products such as green fuels, facilitating the energy transition.

## LEADERSHIP TEAM

Steve Oldham, proven entrepreneur and advocate in CDR, and former CEO of leading DAC pioneer Carbon Engineering, heads Captura. CTO Dr. Chengxiang "CX" Xiang and CSO Dr. Harry Atwater are Captura Co-Founders and Research Professors of Applied Physics and Materials Science at Caltech. Dr. Xiang has over a decade of experience in electrochemical renewable hydrogen generation and carbon capture. Dr. Atwater is an experienced technology entrepreneur, photovoltaics pioneer and Director of DOE's Energy Innovation Hub.



# COMPANY OVERVIEW

## COMPANY NAME

Valley Christian Schools

## HQ LOCATION

San Jose, USA

## FOUNDED

2020

## NUMBER OF EMPLOYEES

11 - 50

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Industrial Chemicals, Consumer Goods, Food/Feed

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Electrochemical CO<sub>2</sub> separation from seawater and/or water splitting

Oceans - Ocean ecosystem restoration and management

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

R&D

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

Danny Kim  
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# CARBONQUESTX



## COMPANY DESCRIPTION

Valley Christian is a K-12 school located in the heart of Silicon Valley that has partnered with schools across the globe. Our international team of high school students, led by industry professionals, has the purpose of inspiring the next generation to solve the world's biggest challenges. Our goal is to develop a two part solution that captures and sequesters carbon in both long-term and short-term means that can be implemented all around the globe.

## CORE INNOVATION

We utilize both chemical reactions and sustainable agriculture on the aquaponics side, which can be used to support areas with people that have little to no access to food.

## CO<sub>2</sub> CAPTURE

Through a chemical reaction involving a Group 2A element of the alkaline earth metals and water with carbonic acid. The mixture automatically reacts to create a pure water solution as well as a compound of the associated metal with the carbon dioxide removed from the carbonic acid-induced water. This new compound is in a solid form and has been proven through research and practice to not leak carbon dioxide.

## CO<sub>2</sub> SEQUESTRATION

The solid precipitate (MgCO<sub>3</sub>) is removed after the reaction is run for some time and stored in a safe facility, being able to be used for different purposes after. MgCO<sub>3</sub> is stable and will not release carbon into the environment

## CO-BENEFITS OR PRODUCTS

The excess water is used in an aquaponics farm that produces consumer vegetables and fish that can be resold to produce a profit and repay the materials used in the earlier reaction.

## LEADERSHIP TEAM

The leadership team has past experience in other programs at and outside of our school, such as FRC, DECA, and more. We are experienced students with very specialized backgrounds taking high-level courses.

# COMPANY OVERVIEW

## COMPANY NAME

Ebb Carbon

## HQ LOCATION

San Carlos, CA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Other

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Ocean alkalinity enhancement

Oceans - Electrochemical CO<sub>2</sub> separation from seawater and/or water splitting

Rocks - Ex-situ mineralization of mined rocks

Rocks - In-situ mineralization

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

**Ben Tarbell**

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[ebbcarbon.com](https://ebbcarbon.com)

# EBB CARBON

## COMPANY DESCRIPTION

Ebb Carbon is pioneering a new carbon removal solution by enhancing the ocean's natural ability to safely store CO<sub>2</sub>. This electrochemical ocean alkalinity enhancement method has the potential to be one of the largest scale and lowest cost approaches to removing excess CO<sub>2</sub>, while reducing ocean acidity.

## CORE INNOVATION

Electrochemical OAE is among the most durable of all CDR methods, has among the greatest potential to scale, and is headed to be less than \$100/tonne (NASEM 2021; NOAA 2023). Compared to other OAE methods, Ebb's approach has many advantages: simplified distribution of a liquid product to the ocean, avoidance of mining and transportation of the alkalinity source as well as potentially harmful impurities present in mined alkalinity sources.

## CO<sub>2</sub> CAPTURE

The electrochemical ocean alkalinity enhancement (OAE) process uses low-carbon electricity and ion-selective membranes to separate the NaCl in seawater into dilute HCl and NaOH. The base stream is returned to the ocean to safely enhance ocean alkalinity, which in turn pulls atmospheric CO<sub>2</sub> from the atmosphere and transforms it into bicarbonate and carbonate ions, accelerating the oceans' natural carbon cycle.

## CO<sub>2</sub> SEQUESTRATION

The conversion of atmospheric CO<sub>2</sub> to bicarbonate and carbonate ions accelerates the natural carbon cycle, specifically the long term cycling of carbon weathered from land and removed to the seafloor. Once in the ocean, bicarbonate is a stable form of carbon storage for 10,000+ years. Electrochemical OAE is expected to be among the most durable methods of carbon removal.

## CO-BENEFITS OR PRODUCTS

Ocean alkalinity enhancement can help reduce the acidity of seawater locally. After alkalization and equilibration by CO<sub>2</sub> absorbed from the atmosphere ocean pH will be slightly higher. Locally OAE can restore ecosystems where ocean acidification and natural low pH events harm shellfish. Other local restorative effects may include the amelioration of the low pH of treated wastewater. Potential uses for the acid product include cement neutralization and enhanced weathering to sequester additional CO<sub>2</sub>.

## LEADERSHIP TEAM

The founding team has launched multiple billion dollar businesses commercializing cutting edge hardware-based technologies. The founding leadership team consists of Ben Tarbell, CEO, Co-Founder, Formerly IDEO, Google X, SolarCity (Stanford and Cornell); Matt Eisaman, Chief Scientist, Co-Founder, Yale University, Formerly Google X, Xerox PARC, Brookhaven National Lab; Dave Hegeman, VP Engineering, co-Founder, Formerly Tesla, MariPro; Todd Pelman, Chief Engineer, Co-Founder, Formerly Manufactory, Blue Green Pacific, IDEO.



# COMPANY OVERVIEW

## COMPANY NAME

Gigablue

## HQ LOCATION

Caesarea, Israel

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Microalgae cultivation

Oceans - Biomass sinking or ocean burial

Oceans - Nutrient fertilization

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

**Dotan Levy**

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# GIGABBLUE



## COMPANY DESCRIPTION

GigaBlue's mCDR technology is a game-changer in the fight against climate change, providing an environmentally friendly, affordable solution that scales carbon dioxide removal to unprecedented levels. Through a unique geo-targeted particle that stimulates phytoplankton growth for carbon fixation, and a controlled gravity core for deep ocean sequestration, GigaBlue leads the charge in nature-inspired, scalable, and cost-effective carbon capture methods.

## CORE INNOVATION

Gigablue's solution is unique in its use of phytoplankton, its ability to fix it on a particle that naturally sinks without leaking, and its geo-targeting model that optimizes both the carbon fixation potential and the durability of the sequestration.

## CO<sub>2</sub> CAPTURE

Gigablue's unique, geo-targeted particle stimulates the growth and photosynthesis of phytoplankton, absorbing CO<sub>2</sub> from the air and fixing it into the micro-algae.

## CO<sub>2</sub> SEQUESTRATION

Gigablue's unique, geo-targeted particle stimulates the growth and photosynthesis of phytoplankton, absorbing CO<sub>2</sub> from the air and fixing it into the micro-algae.

## CO-BENEFITS OR PRODUCTS

Gigablue's solution does not generate any co-benefits or products besides carbon capture and sequestration.

## LEADERSHIP TEAM

Gigablue's co-founders come from a diverse background of environmental science, special intelligence operations and technologies, innovation and entrepreneurship. Our team is comprised of experienced marine biologists and ecologists, materials scientists and environmental engineers.

# COMPANY OVERVIEW

## COMPANY NAME

Kelp Blue

## HQ LOCATION

Amsterdam, Netherlands

## FOUNDED

2020

## NUMBER OF EMPLOYEES

51 - 100

## TRL 4

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Algae for Use, Soil/Soil Additives

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Microalgae cultivation

Land - Agricultural & grassland CDR

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

\$80,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$50M - \$100M

## TYPE OF CAPITAL SOUGHT

Corporate Debt

## TYPE OF INVESTOR SOUGHT

Other

**Daniel Hoof**

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# KELP BLUE

## COMPANY DESCRIPTION

Kelp Blue cultivates giant kelp (*Macrocystis pyrifera*) off the coast of Namibia, New Zealand, and soon Alaska. Our offshore farms overcome scaling limits of sheltered water, whilst benefiting from local nutrient upwelling systems. The kelp grows on our innovative submerged structures, ultimately forming a canopy at the surface. The canopy biomass is trimmed and processed into sustainable products for agriculture and packaging. The remaining biomass sequesters carbon naturally, supports biodiversity and provides other ecological benefits.

## CORE INNOVATION

Kelp Blue's off-shore farming method unlocks large-scale kelp cultivation, supporting carbon sequestration at significant scale without intentionally sinking biomass. The submerged structures mimic natural forest growth, from which just the canopy is harvested. The remaining forest continues to provide ecosystem services such as carbon sequestration while structuring a marine habitat with enhanced biodiversity. The environmental benefit of the kelp does not end there. Products made from the harvested canopy help other industries to move away from environmentally damaging practices. For example, our kelp biostimulant reduces the need for chemical fertilisers and pesticides and we are using alginates and fucoidan to create sustainable alternatives for the packaging and nutraceutical industries. This approach is unique in that it does not rely on carbon credits for financial support.

## CO<sub>2</sub> CAPTURE

Kelp, like land plants, draws down carbon through photosynthesis, converting dissolved CO<sub>2</sub> and bicarbonic acid from surrounding waters into biomass and oxygen. This process impacts atmospheric stock carbon by allowing the ocean to absorb more of it, while countering ocean acidification. Kelp also absorbs naturally occurring nutrients from the water, thereby supporting nutrient cycling. The standing stock of the biomass, (the Net Primary Production (NPP)) can be considered a temporarily captured stock of CO<sub>2</sub>.

## CO<sub>2</sub> SEQUESTRATION

We harvest the canopy 4 times annually - trimming only a fraction of the annually produced biomass. The remaining biomass follows natural dispersal pathways in the ocean, as outlined by the work of, among others, Carlos Duarte. Around 90% of the carbon undergoes grazing, remineralization, or deposition in low-durability sites. The remaining ~10% will be exported to the deep sea and buried in the shelf, forming highly durable sequestration forms lasting well over 100 years.

## CO-BENEFITS OR PRODUCTS

Kelp forests provide crucial ecological benefits to the marine environment. They serve as marine habitats, nurturing a diverse range of species by improving water quality and providing food to a dynamic and interconnected web of marine life. By absorbing carbon (in the form of carbonic acid) from surrounding waters, kelp regulates pH levels, counteracting ocean acidification while replenishing oxygen. Our kelp forests are nurseries and spawning grounds for fish and help replenish local fish stocks crucial to coastal economies. Kelp also aids in regulating nutrients, combating eutrophication, and providing shoreline protection from strong waves and storms. Furthermore, kelp-derived products offer sustainable alternatives across industries, including agriculture, packaging, nutraceuticals, and more.

## LEADERSHIP TEAM

Daniel Hoof, CEO - 20y field and senior leadership at Shell in 7 different countries, including Nigeria, Gabon. Caroline Slootweg - CCO/Co-Founder - 20y experience as start-up, communication, digital transformation specialist - Unilever and WPP. Elianne Oei - Interim CFO - 20y experience in finance and accounting across many continents. Cayne Moffat - Acting CFO - Experienced corporate finance advisor raising USD 200m+ in food & agri-business. Winner climate category Sheikh Zayed Sustainability Prize 2023.

# COMPANY OVERVIEW

## COMPANY NAME

Kepler ReCapture Inc.

## HQ LOCATION

Lake Arrowhead, CA, USA

## FOUNDED

2023

## NUMBER OF EMPLOYEES

1 - 10

## TRL 4

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Advanced Materials, Building materials, Industrial Chemicals, Energy, Industrial Gases/Pure CO, Chemical Polymers, Other

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$2,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt, Other

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Government, Project Finance, Other

**Debi-Lee Wilkinson**

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# KEPLER CARBON RECAPTURE



## COMPANY DESCRIPTION

Our visionary carbon removal employs self-powered offshore ocean facilities (physical platforms), inspired by an aerospace physics approach, to capture excess CO<sub>2</sub> from air and oceans. Through innovative sea water processing, we sequester the CO<sub>2</sub> into valuable resources like building materials. All powered by emissions free marine energy. Our scalable design aims to achieve the IPCC's gigaton-scale target by 2035 through global installations, adapting to various locations for efficient and widespread impact on Earth's carbon cycle.

## CORE INNOVATION

We developed a novel direct ocean capture method supporting the natural carbon cycle overcoming scalability limits. It utilizes emissions-free energy, lacks membranes or filters, additives or catalysts, and is unrestricted by acreage or feedstock. Operating solely on seawater and marine energy, this modular system is replicable to achieve gigatonnescale profitability (monetizing the carbon captured). It requires no external consumable resources or power. The process is not only ecologically safe but also ecologically advantageous.

## CO<sub>2</sub> CAPTURE

Seawater undergoes flash-evaporation, depleting dissolved CO<sub>2</sub> (captured as a gas to be sequestered) from the seawater's natural CO<sub>2</sub>-bicarbonate buffer system. The carbon from CO<sub>2</sub> that has already been captured by the CO<sub>2</sub>-bicarbonate buffer system exists dynamically and in flux as carbonic acid and bicarbonates/carbonates which is captured in a brine. This brine, as a byproduct of initial flash evaporation, is subjected to further evaporation steps to yield CaCO<sub>3</sub> and MgCO<sub>3</sub> (the same chemistry as electrolysis).

## CO<sub>2</sub> SEQUESTRATION

The collected gaseous CO<sub>2</sub>, along with calcium and magnesium carbonates, will be converted into source material with multiple potential uses. These applications aim to sequester carbon, preventing re-emission for at least 100 years. Potential uses include incorporation into concrete, marine-stable substitutes and conversion into chemical intermediates for other value-added products such as ethylene, graphites, and other commercially important feedstocks. Use of these materials for future spar platforms is crucial to our self-replicating sustainable production strategy.

## CO-BENEFITS OR PRODUCTS

The process produces desalinated water and transforms gaseous CO<sub>2</sub> from seawater into marine carbonates for building products. Rather than discarding CaCO<sub>3</sub>, we treat carbonates as valuable mineral extraction to prevent potential environmental impacts, such as disrupting seabed ecosystems. We also extract high-value materials, including lithium carbonate, from the remaining brine. Not only do we supply emissions-free energy for facility operations, but the process also yields surplus electricity. Moreover, it contributes to housing and job opportunities.

## LEADERSHIP TEAM

Our team of 4 co-founders are Aerospace and Marine seasoned professionals habitually developing unique solutions to intractable problems. Led by a Physicist, Innovative Engineer, Carbon Cycle Expert and Marine Engineer and shipbuilder.

# COMPANY OVERVIEW

## COMPANY NAME

KFC (KelpFarmCareer)

## HQ LOCATION

Non-Jin, China

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Algae for Use, Biochar

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Macroalgae cultivation

Oceans - Artificial upwelling and downwelling

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$1M

## REVENUE RANGE

\$20M - \$50M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Government

# KFC (KELPFARMCAREER)



## COMPANY DESCRIPTION

To solve the global climate change problem, KFC has formed an ocean-based carbon removal solution by utilizing anchor mooring technology, seaweed aquaculture technology, CO<sub>2</sub> monitoring technology, and high-value utilization technology of seaweed biochar. In addition, we developed high-yield, high-temperature, and wave-resistance kelp cultivars, a new type of buoy that can adjust the depth of cultivating kelps, a nutrient-providing system. With these technological revolutions, kelp cultivation can be extended to large offshore areas.

## CORE INNOVATION

To solve the global climate change problem, a series of nature-based solution technologies have been developed, including anchor mooring technology, seaweed aquaculture technology, CO<sub>2</sub> monitoring technology, and high-value utilization technology of seaweed biochar. In addition, to extend kelp cultivation to large offshore deep-water areas, high-yield, high-temperature, and wave-resistance kelp cultivars, a new type of buoy that can adjust the depth of cultivating kelps, and a nutrient-providing system have been developed.

## CO<sub>2</sub> CAPTURE

Seaweed efficiently photosynthesizes, absorbing oceanic CO<sub>2</sub> and storing it. Growing seaweed generates detritus through factors like wind and decay. Some detritus, in the form of organic carbon, is transported to nearby ecosystems, converting into recalcitrant dissolved organic carbon (RDOC) stored in the ocean. Another part becomes sedimentary carbon in the deep sea, both considered long-term sequestration methods. Mature seaweed also holds substantial biomass carbon.

## CO<sub>2</sub> SEQUESTRATION

Carbon sequestration of kelp farms can be described in three parts, including recalcitrant dissolved organic carbon (DOC) of cultivated large-scale kelp farms, sedimentary carbon sequestration in large-scale kelp farms, and the large amount of biomass carbon sequestration of kelp harvested from large-scale kelp farms. Mature kelps are processed into seaweed fertilizers and biochar.

## CO-BENEFITS OR PRODUCTS

Our method produces seaweed fertilizer, biochar, food, and feed material. Kelp farms also help to revive ocean ecology and restore marine environments. At the same time, the technology of anchor mooring and the technology of ocean-based carbon removal have been maturing.

## LEADERSHIP TEAM

Members of the KFC teams are thrilled to be among the Top 60 Carbon Removal Finalists. We have won the third prize at the 2022 China-ASEAN Innovation and Entrepreneurship Competition, co-hosted by the Ministry of Science and Technology of the People's Republic of China and the ASEAN Secretariat. Our team member, Prof. Liu Fu-Lin, developed a new high-yield, high-temperature, and wave-resistance kelp cultivar.

Yushun Lian

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[kelpfarmcareer.com](http://kelpfarmcareer.com)

# COMPANY OVERVIEW

## COMPANY NAME

Climate Foundation

## HQ LOCATION

Compostela, Philippines

## FOUNDED

2007

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Algae for Use, Food/Feed

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Macroalgae cultivation

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$5,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Government, Project Finance

**Brian von Herzen**

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[climatefoundation.org](https://climatefoundation.org)

# MARINE PERMACULTURE SEAFORESTATION

## COMPANY DESCRIPTION

The Climate Foundation transforms humanity's interactions with the oceans from extraction to regeneration: delivering sustainable revenue. At its main deployment site in the Philippines active since 2019, the Climate Foundation has built, deployed, tested and scaled Marine Permaculture platforms capable of deepwater irrigation to 1,000m<sup>2</sup>, thereby enabling robust seaweed growth in offshore conditions where seaweeds ordinarily struggle to grow.

## CORE INNOVATION

Marine Permaculture not only helps recover the economies of coastal communities, it also enables fishers to establish regenerative, resilient livelihoods. These regenerative interventions can be applied across the globe, especially coastal communities living in extreme poverty. Just as climate change disproportionately affects these communities, MP will disproportionately benefit them. Our MP platforms have proven resilient to even Category 5 typhoons. We believe that our platforms are the world's only proven hurricane-resistant submersible mariculture platforms.

## CO<sub>2</sub> CAPTURE

Each hectare of Marine Permaculture has the potential to sequester 80 tonnes of CO<sub>2</sub> per year from the atmosphere in subtropical oceans. Research has confirmed that carbon fixation in kelp forests can exceed the carbon fixation per hectare of terrestrial forests. Terrestrial plants photosynthesize at 0.2-2% efficiency, whereas seaweed can exceed 8% efficiency. With far more open ocean available than the area available for terrestrial cultivation and rewilding, Marine Permaculture has advantages of scalability.

## CO<sub>2</sub> SEQUESTRATION

Seaweed fragments (20-40% of the harvest) that naturally fall off during growth sink 800m/day, reaching the seabed within hours. Marine fauna ingest these fragments at the seafloor and then gets respired back into abyssal CO<sub>2</sub>. This CO<sub>2</sub> reacts with calcium carbonate, forming buffered calcium bicarbonate and mitigating ocean acidification. The stable CO<sub>2</sub> is kept at depth for a century near our deployment site in Cebu, Philippines.

## CO-BENEFITS OR PRODUCTS

Marine Permaculture scales well with deepwater irrigation, providing food security concurrently with carbon sequestration. Products are generated from the seaweed biomass generating revenues and facilitating scaling to gigatonne levels. Techno-economics validate seaweed biostimulant markets. Other value chains are already within sight.

## LEADERSHIP TEAM

Spanning the globe, CF's management, planning and engineering team works locally and remotely with staff on the ground. We were initially invited to the Philippines by a deployment site manager and local seaweed expert, Mr. Perfecto Tubal, who recognized the potential of our technology for the Philippines. Our Filipino-led deployment team is made up of Filipinos and an international team from countries such as India, the United States and Australia.



# COMPANY OVERVIEW

## COMPANY NAME

Ocean Nourishment Corporation

## HQ LOCATION

Sydney, Australia

## FOUNDED

2004

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Other

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Microalgae cultivation

Oceans - Nutrient fertilization

Oceans - Ocean ecosystem restoration and management

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$2,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate Equity

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Government

## Edwina Tanner

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[oceannourishment.com](https://www.oceannourishment.com)

# OCEAN NOURISHMENT



## COMPANY DESCRIPTION

Ocean Nourishment addresses the dual challenges of climate stabilisation and a shortage of wild capture fisheries. Our project team WhaleX propose to manage ocean spaces with precision nutrient addition, matching ocean plants with their specific nutrient requirements for optimal growth. By mimicking whale action at the base of the marine food chain the process can regenerate ocean ecology, restore fisheries and remove carbon dioxide from the atmosphere at Gt scale.

## CORE INNOVATION

WhaleX measure nutrient limitations in the surface ocean and prescription fertilising to lift the population of microscopic ocean plants. We have designed an AquaFood Product that contains macro and micro nutrients with the formula is adjusted for any given area of the ocean. WhaleX use a holistic approach that can be delivered by ship, robot or floating platform. The use of a Carbon Capture BioPod ensures that the MRV can be developed safely.

## CO<sub>2</sub> CAPTURE

ONC is unique is working with phytoplanktonneand the oceans biological pump. Our focus is based on balancing macro and micro nutrients in the surface ocean to enhance plant numbers at defined chlorophyll levels. We are stimulating the natural photosynthetic process undertaken at the base of the marine foodchain, resulting in the adsorption of carbon from both the atmosphere and surface ocean into living organic plant material. We are therefore harnessing nature to capture carbon.

## CO<sub>2</sub> SEQUESTRATION

WhaleX have designed a two stage process to examine the issue of durable carbon sequestration. Firstly an enclosed bio-pod structure to grow phytoplanktonnein a controlled ocean environment and accurately measure the carbon sequestered, before exporting directly via downwelling pipes to the ocean depths. This work will inform the MRV for open ocean growth of phytoplanktonneand modeled calculations on carbon that is durably sequestered in the ocean depths, away from contact with the atmosphere.

## CO-BENEFITS OR PRODUCTS

WhaleX is uniquely working at the base of the marine foodchain, enhancing ocean productivity of phytoplankton, zooplanktonneand fisheries. At scale we have modeled the potential increase in wild fisheries from the process and this could give impoverished nations and communities access to high quality protein at known locations, with a lower cost to catch. We have the potential to harvest phytoplanktonneand zooplankton, extract omega 3 oils, and produce macroalgae on our floating structures.

## LEADERSHIP TEAM

Dr Edwina Tanner: WhaleX Project Manager, Senior Oceanographer, CEO WhaleX Foundation.

Dr Samantha Lavender: Outstanding Scientist, Hon. Reader (Geomatics) Plymouth University, Satellite Earth Observation.

Jill Storey: Former Partner Deloitte, Ocean CO Removal Adviser to World Ocean Council.

Peter Wheen: Senior Engineer, Technical Director Transport for NSW, Founding Chairman Ocean Nourishment Corporation

John Ridley: Environmental Scientist, Board Member World Ocean Council, Founding MD Ocean Nourishment Corporation.

Prof. Rob Wheen, Engineering Innovation Manager for WhaleX.



# COMPANY OVERVIEW

## COMPANY NAME

Planetary Technologies Inc.

## HQ LOCATION

Dartmouth, Canada

## FOUNDED

2019

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Ocean alkalinity enhancement

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$20,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Philanthropic, Funding, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Philanthropic, Government, Project Finance

Michael Kelland

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# PLANETARY

## COMPANY DESCRIPTION

Planetary enhances the ocean's natural ability to fight climate change through Ocean Alkalinity Enhancement (OAE). Working collaboratively with all our stakeholders, we are developing a number of ocean carbon removal projects worldwide. At the heart of our projects is our Ocean Carbon Platform (OCP), which provides a cost effective and sustainable set of tools for use in qualifying alkalinity sources, automating alkalinity addition operations, monitoring ocean safety, and measuring and monetizing ocean carbon removals.

## CORE INNOVATION

Planetary is the cheapest CDR process at scale. Using existing byproducts and infrastructure, our process requires negligible energy and capex. With alkaline byproducts set to grow from 1Gt/y CDR potential to as high as 8.5Gt/y by 2100, and scale estimates for OAE of > 100Gt/y, the process costs will remain low even as other CDRs run out of room. This is strengthened by Planetary's unique set of IP, products, systems and partnerships.

## CO<sub>2</sub> CAPTURE

We add low carbon alkalinity to existing coastal outfalls. The most common alkalinity examples include magnesium hydroxide or calcium hydroxide. This alkalinity neutralizes acidic CO<sub>2</sub> that is present in seawater by converting it into carbonate and bicarbonate ions that are already abundant in the ocean. As ocean CO<sub>2</sub> is chemically consumed by this process, the ocean absorbs CO<sub>2</sub> from the atmosphere to bring the air and ocean back into CO<sub>2</sub> equilibrium.

## CO<sub>2</sub> SEQUESTRATION

The mean seawater residence time of alkaline dissolved carbon (bicarbonate and carbonate ions (charged-balanced by cations other than H<sup>+</sup>)) is about 100,000 yrs, based on the annual input of alkaline carbon from rivers (0.3 GtC/yr), the alkaline pool of dissolved alkaline carbon resident in the ocean (about 34,000 GtC), and assuming steady state (Middelburg et al. 2020). Any additional alkaline carbon added should behave in the same way.

## CO-BENEFITS OR PRODUCTS

The project provides significant ecological co-benefits due to de-acidification at the outfall, improving the marine environment and benefiting fishing and shellfish industries. Local communities gain employment, an increase in CDR research funding, educational opportunities, talent attraction, economic development, and an increased international profile. Finally, the use of byproducts remediates and returns land to local communities.

## LEADERSHIP TEAM

Michael Kelland, CEO, a veteran entrepreneur, founded Planetary with Brock Battochio and Dr. Greg Rau who has 40+ years of experience in basic and applied carbon cycle research. This team is supported by Kelly Wachowicz, who has experience in raising public, private, and philanthropic capital for companies. Our leadership team also comprises experience in scaling metallurgical projects to commercialization, operations, marine carbon cycling and ocean acidification, marketing, partnerships and business development.



# COMPANY OVERVIEW

## COMPANY NAME

PRONOE

## HQ LOCATION

Paris, France

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 4

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Ocean alkalinity enhancement

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government Funding, Philanthropic Funding, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Project Finance

Juan Buceta

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# PRONOE

## COMPANY DESCRIPTION

PRONOE is a CO<sub>2</sub> removal project via ocean alkalinity enhancement. We develop industrial systems that co-locate with existing coastal industries (water treatment, desalination, and power plants) and turn their effluents into an alkaline flow that locally reverses surface water acidification and increases CO<sub>2</sub> capture capacity. PRONOE's alkalinity production requires electricity and unground minerals that are naturally abundant and without heavy metals (like nickel); without producing waste or by-products for profitability, which would limit our scalability.

## CORE INNOVATION

Ocean alkalinity enhancement is commonly mentioned as realistically scalable regarding CO<sub>2</sub> capture AND storage. Unlike other projects: (i) our process does not produce waste or by-products so that other markets would limit the scaling of our process; (ii) the mineral involved is abundant and does not carry heavy metals, unlike olivine or serpentine; (iii) the alkalinity type obtained has a mild impact on pH to maximize site productivity.

## CO<sub>2</sub> CAPTURE

PRONOE produces an alkaline flow that is dispersed in coastal areas. The existing effluent discharge infrastructure favors mixing the alkaline flux with seawater, especially in the ocean's upper layers. The addition of alkalinity restores seawater chemistry and shifts the carbonate balance, consuming (some) of the dissolved CO<sub>2</sub>. Ultimately, the decrease in dissolved CO<sub>2</sub> affects the air-seawater equilibrium, which involves the passage of additional CO<sub>2</sub> from the air (capture) (DOI: 10.1002/102.10330).

## CO<sub>2</sub> SEQUESTRATION

As PRONOE introduces alkalinity into the environment, the carbonate equilibrium shifts and the CO<sub>2</sub> remains stored in the seawater as bicarbonates. These bicarbonates are highly stable, remaining in solution for over 10,000 years (DOI: 10.1002/2016RG000533). Note that the bicarbonates added due to our activities (carbon stored) do not represent a significant addition, considering seawater's (initial) bicarbonate concentration (DOI: 10.5194/egusphere-2023-2409).

## CO-BENEFITS OR PRODUCTS

Ocean acidification is the next planetary boundary that will be exceeded, endangering ecosystems and food sources for over 1 billion of the poorest people on Earth (oceana.org). PRONOE locally fights ocean acidification, contributing to the protection of coastal ecosystems. Although we do not consider the generation of by-products in our process design at scale, PRONOE can generate chemical products of value to surrounding industries, being this a process synergy.

## LEADERSHIP TEAM

Nicolas Sdez and Dr. Juan Buceta co-founded PRONOE, blending Nicolas' entrepreneurial experience and Juan's background in wastewater treatment. Nicolas, a fluid mechanics engineer and INSEAD MBA graduate, previously co-invented OceanWings (from scratch to TRL 7) and co-founded AYRO to decarbonize maritime shipping, securing multimillion contracts and a €10.5 million seed round. Juan, a chemical engineer with a Ph.D., specializes in upscaling industrial processes from laboratory to industry while reducing costs by optimizing operating conditions.



# COMPANY OVERVIEW

## COMPANY NAME

Pull To Refresh

## HQ LOCATION

Sunnyvale, CA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Air - Other

Oceans - Macroalgae cultivation

Oceans - Biomass sinking or ocean burial

Oceans - Ocean ecosystem restoration and management

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

R&D

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$1,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Government, Project Finance

**Arin Crumley**

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# PULL TO REFRESH



## COMPANY DESCRIPTION

Pull To Refresh is focused on reducing atmospheric CO<sub>2</sub> levels & regenerating oceanic ecosystems by verifiably sinking invasive Sargassum macroalgae in the deep sea.

We are building & deploying a fleet of semi-autonomous, solar-powered vessels to search for, gather, & sink the seaweed to depths where its embodied carbon will be sequestered for 100+ years. Founded in 2021, we are a global team of engineers, makers, entrepreneurs, & artists committed to combating climate change.

## CORE INNOVATION

Unlike other Sargassum sinking companies, we do not lower the entire vessel, only the net, and there are no active onboard systems, creating a more automated system with longer lifespan. Our MRV differs as we measure every batch we sink using an onboard digital scale, track the GPS location, and take seasonal samples of the seaweed's carbon content. Furthermore, we do not grow seaweed; we simply seek and sink it, reducing complexities and costs.

## CO<sub>2</sub> CAPTURE

The CO<sub>2</sub> is captured by invasive Sargassum, which proliferates across the Caribbean region, through the process of photosynthesis. As the Sargassum grows, it absorbs CO<sub>2</sub> from the air and water, effectively reducing the parts per million of CO<sub>2</sub> in the atmosphere. Sargassum grows rapidly, capturing significant amounts of CO<sub>2</sub> within its lifespan.

## CO<sub>2</sub> SEQUESTRATION

Our vessels gather the seaweed and mechanically lower it to depths exceeding 135m. At this depth, the water pressure bursts the seaweed's air-filled vesicles, rendering it negatively buoyant and causing it to sink to the ocean floor. Once there, the sequestered carbon is effectively removed from the carbon cycle and stored for a minimum of 100 years when sunk to depths greater than 3,000m and 1000 years at depths greater than 5,000m.

## CO-BENEFITS OR PRODUCTS

Our solution offers several co-benefits. It mitigates the invasive Sargassum seaweed crisis, preserving the health of coral reefs and preventing the disruption of turtle nesting sites. By removing Sargassum, we restore coastal aesthetics, improving the experience for tourists and residents, and safeguard the tourism industry's economic viability. Our solution helps communities impacted by the seaweed, which harms local health, and it also reduces ocean acidification.

## LEADERSHIP TEAM

CEO Arin Crumley, a serial entrepreneur & filmmaker, has expertise in EVs & supply chain from working in China, experience in ocean-based dwellings & self-driving solar vessels. Co-Founder Laurel Tincher, serial entrepreneur, has 7 years experience as an executive in marine infrastructure, an MA in sustainability, & launches products in emerging industries. Head of Engineering Thomas Waters is a mechanical engineer specializing in 3D modeling & fabrication. His background is in designing for manufacturing.

# COMPANY OVERVIEW

## COMPANY NAME

C Sink LTD

## HQ LOCATION

Haifa & Tel Aviv, Israel

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Biomass sinking or ocean burial

Land - Biomass direct burial

Land - Terrestrial ecosystem restoration and management

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

R&D

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

Ram Amar  
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[rewind.earth](https://rewind.earth)

# REWIND

## COMPANY DESCRIPTION

Rewind cleans CO<sub>2</sub> from the atmosphere by relocating residual plants to the deep Black Sea. This is a nature-based approach, as all rivers wash organic carbon out to sea, and the Black Sea is the world's largest anoxic basin, naturally preserving carbon for thousands of years. Rewind is developing the science, certification, licensing policy, and MRV technology to allow existing supply chains to transport and lock away gigaton-scale carbon within this decade.

## CORE INNOVATION

The core differentiators of our solution are scale (gigatonnes of biomass around the Black Sea), energy efficiency (less than 10% of sequestered mass is emitted in the process), cost (shipping & processing under \$100/t), permanence (thousands of years), and resemblance to nature (rivers carry biomass out to sea). Our technology is the MRV and is differentiated by accuracy (relying on sampling, not modeling) and comprehensiveness (cradle to grave).

## CO<sub>2</sub> CAPTURE

Plants capture the CO<sub>2</sub> via photosynthesis, which turns the CO<sub>2</sub> along with water and nutrients into plant matter or biomass. Rewind collects residual woody biomass from agriculture, forestry, and timber industries.

## CO<sub>2</sub> SEQUESTRATION

The CO<sub>2</sub> embodied in plant biomass is shredded and packaged, then transported via trucks and ships for durable storage on the bottom of the Black Sea. The Black Sea is a 500,000 gigatonne body of water, naturally and permanently lacking oxygen and saturated with toxic sulfide. Such aquatic environments are called euxinic, and they preserve plant biomass for thousands of years.

## CO-BENEFITS OR PRODUCTS

Our solution offers multiple benefits, both socially and environmentally. From promoting regenerative agriculture and sustainable reforestation to wildfire prevention and marine ecosystem conservation, all while fostering job creation and new income opportunities. We actively collaborate with social and environmental NGOs to enhance climate action. A cornerstone of our initiative is the Black Sea Climate Roundtable, which is dedicated to facilitating research and policy dialogue among top scientists in the field.

## LEADERSHIP TEAM

Our leadership team includes two marine biologists, Prof. Angel and Dr. Krost, a space engineer, CTO Kobi Kaminitz, an experienced operations leader (state-level waste collection & maritime aquaculture), COO Eitan Brettler, a sustainability business leader, CSO Noa Olenik, geopolitical strategic advisor (former Director General of Israel's Foreign Ministry), Mr. Alon Ushpiz, and an experienced company builder (exited a big data startup), CEO Ram Amar.



# COMPANY OVERVIEW

## COMPANY NAME

ROCS International Inc. (Restore Oysters for Climate Sustainability, Inc.)

## HQ LOCATION

DeSoto, TX, USA

## FOUNDED

2022

## NUMBER OF EMPLOYEES

1 - 10

## TRL 8

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Building Materials, Food/Feed

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Ocean ecosystem restoration and management

Oceans - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$1,000,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Philanthropic Funding, Other

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Private Equity, Philanthropic, Project Finance, Other

Angelo Depaola

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[rocsinternational.com](http://rocsinternational.com) & [shellelevator.com](http://shellelevator.com)

# ROCS (RESTORE OYSTERS FOR CLIMATE SUSTAINABILITY)

## COMPANY DESCRIPTION

We grow half shell market oysters for profit. CO<sub>2</sub> is sequestered by shell formation as calcium carbonate as a by-product at no additional cost. We have acquired several patents for a submersible aquaculture apparatus that uses compressed air to automate ascent and descent through the water column. Our technology transforms shellfish aquaculture at a scale to feed the planet while decarbonizing the ocean with durable and mobile factory farming ships.

## CORE INNOVATION

Our intellectual property "Shellelevator" automates aquaculture practices using durable, resilient and scalable watercraft capable of increasing yields exponentially by utilizing the entire water column and are readily mobilized to facilitate harvest, avoid harm, improve growth quality and safety.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by microalgae from the ocean by photosynthesis and consumed by oysters filter feeding. Much of the carbon is reemitted into the short-term carbon cycle through respiration and tissue growth the remainder of the carbon is sequestered as calcium carbonate by shell formation and transferred to the long-term carbon cycle.

## CO<sub>2</sub> SEQUESTRATION

Once shell is produced, the carbon dioxide is sequestered for thousands to millions of years.

## CO-BENEFITS OR PRODUCTS

Co-benefits include food security, feedstock for fish farms and protein for supplements and other farmed animals. Restoration of oyster will provide the foundation by filtering water, removing waste and allowing the re-introduction of entire coastal ecosystems including fish. They also will protect the coast from the winds and waves of storms and prevent coastal erosion. Eaten raw, fried, smoked, added to seafood gumbo or sandwiches, baked, canned, and stewed, a 108-billion-dollar industry.

## LEADERSHIP TEAM

Oyster farmers, scientists, inventors, environmental journalists, and business owners.



# COMPANY OVERVIEW

## COMPANY NAME

RUBISCO2, LLC

## HQ LOCATION

Mexico City, Mexico

## FOUNDED

2023

## NUMBER OF EMPLOYEES

1 - 10

## TRL

6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Biochar, Energy

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Macroalgae cultivation

Land - Thermal conversion of biomass (biochar)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Biomass sequestration in the built environment

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$9,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Convertible Debt, Project Debt, Other

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Private Equity, Government, Project Finance, Other

**Pablo Navarro Maldonado**

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[rubisco2.com](https://rubisco2.com)

# RUBISCO2



## COMPANY DESCRIPTION

We are creating an exponentially scalable system to turn increasing algae waste into biochar. We have a modular, flexible, simple yet efficient scalable pyrolysis system specialized in algal feedstock. Furthermore, we have a sustainable business model designed to enable this goal. We are laying the foundations; the scale-up will start this year.

## CORE INNOVATION

Our reactors are specialized in algal feedstock. We have innovative components that increase efficiency but are also simple to ease mass production. They are modular and flexible, with a small minimum size, so they can easily morph into a perfect fit for any algae bloom's location. Our systems are designed to share syngas and heat with each other, further increasing efficiency with scale. Transparency: Measurements are uploaded online autonomously and minted on the blockchain.

## CO<sub>2</sub> CAPTURE

Capturing carbon dioxide from the atmosphere is an energy-intensive process. Instead, we extract carbon from another step in the cycle, generating energy in the process. We do this by harnessing the CO<sub>2</sub> that algae blooms capture. Algae blooms are increasing worldwide, like an ever-growing sponge of CO<sub>2</sub>. As these decay, however, their carbon returns to the atmosphere. We stop this decay from happening and store the carbon permanently by turning it into biochar.

## CO<sub>2</sub> SEQUESTRATION

We will produce biochar, a stable form of carbon. According to the latest literature, if biochar has a reflectance rate higher than 2%, it is pure inertinite, stable for millions of years. We are optimizing our reactors to surpass this value. See ("Assessing biochar's permanence: An inertinite benchmark" Hamed Sanei et al. 2024) ("Carbon stability and morphotype composition of biochars from feedstocks in the Mekong Delta, H. I Petersen et al 2024).

## CO-BENEFITS OR PRODUCTS

Algal waste currently decomposes, returning the removed carbon to the atmosphere as CO<sub>2</sub> and CH<sub>4</sub>, enhancing climate change. It also contaminates freshwater reservoirs with leachate. We will stop these problems by using algae as our input. We produce biochar, which is a valuable product. For our beachhead strategy, we will sell it as an additive to cement so that it will avoid emissions. We also produce energy.

## LEADERSHIP TEAM

Andreas Mirlach, CTO, Bachelor of Environmental Engineering at TUM (Munich); Masters of Civil Engineering at TUM (Munich). Work experience: BIM Objekt; Wacker Chemie AG; Kreisjugendring. Pablo Navarro, CEO and Founder, Physics LMU (currently paused studies for the project). Programmer Polyglot has lived in the US, Mexico, and Germany and envisioned the project.

# COMPANY OVERVIEW

## COMPANY NAME

Running Tide Technologies

## HQ LOCATION

Portland, ME, USA

## FOUNDED

2017

## NUMBER OF EMPLOYEES

51 - 100

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Macroalgae cultivation

Oceans - Biomass sinking or ocean burial

Oceans - Ocean alkalinity enhancement

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

\$30,000,000

## REVENUE RANGE

\$5M - \$20M

## CAPITAL RAISED TO DATE

\$50M - \$100M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Philanthropic, Government Project Finance

**Marty Odlin**

marty@runningtide.com

[runningtide.com](https://runningtide.com)

# RUNNING TIDE TECHNOLOGIES



## COMPANY DESCRIPTION

Running Tide is the world leader in ocean carbon removal. We design interventions that amplify natural processes of carbon removal - including biomass sinking and ocean alkalinity enhancement - and the tools to measure the impact of our work. Running Tide was founded in 2017 in Portland Maine, and we delivered 20,000 carbon removal credits to customers from 2023 operations out of Iceland.

## CORE INNOVATION

Running Tide is uniquely capable of quantifying the impact of mCDR spanning physical, chemical, and biological pathways. We have invested 6 years and \$70m in models, sensors, laboratories, intervention design, and governance in order to produce the highest quality environmental data-product (carbon credit). We have delivered ~20,000 credits to customers, and due to the nature of our CDR solution, the pace and volume of our scale will only be limited by demand.

## CO<sub>2</sub> CAPTURE

Photosynthesis in both terrestrial and marine plants captures CO<sub>2</sub> for biomass sinking. Photosynthesis is a natural process refined over eons that is likely the most efficient mechanisms for transforming atmospheric CO<sub>2</sub> into a state that can be transported to long-term storage. Adding alkalinity to surface waters increases their carrying capacity for dissolved inorganic carbon (DIC), which creates a differential at the air <> water boundary, causing additional atmospheric CO<sub>2</sub> to transform into stable DIC.

## CO<sub>2</sub> SEQUESTRATION

Biomass sinking transports carbon into deep strata of water that overturn very slowly. Given the material Running Tide sinks, sequestration timelines will span a minimum of multiple centuries, up to millenia for the portion of material buried in deep-ocean sediment.

A significant percentage of DIC is bi-carbonate, which is a form of carbon that is stable for thousands of years. In the transition of atmospheric CO<sub>2</sub> to bicarbonate, CO<sub>2</sub> is both captured and sequestered.

## CO-BENEFITS OR PRODUCTS

Running Tide's work positively impacts the ocean ecosystem through the restoration of natural dynamics broadly disrupted by industrial exploitation. This transformation positively impacts biodiversity across the marine food-web, as well as all other ecosystems that depend on it. The ocean is the center of the Earth system. Our work also provides meaningful paths to climate equity for communities directly impacted by climate change, such as island states, coastal communities, and blue-collar workforces around the globe.

## LEADERSHIP TEAM

Marty Odlin is Running Tide's Founder/CEO. He's a systems engineer and member of a 4th generation fishing family. Justine Simon is Running Tide's Co-founder, leading supply chain development. Dr. Justin Reis is Running Tide's Senior Scientific Advisor, and a professor of Oceanography and Global Oceanic Change at Northeastern, conducting research on ocean acidification, carbonate biogeochemistry, and biomineralization. Running Tide has much more relevant leadership experience guiding 80 engineers, scientists, ocean operators, and market makers.

# COMPANY OVERVIEW

## COMPANY NAME

Seafields Solution Limited

## HQ LOCATION

Stockport, United Kingdom

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Other

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Macroalgae cultivation

Oceans - Biomass sinking or ocean burial

Oceans - Artificial upwelling and downwelling

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$5,610,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Venture Capital, Angel, Private Equity, Philanthropic

Franziska Elmer

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# SEAFIELDS

## COMPANY DESCRIPTION

Seafields is a science-driven start up at the forefront of environmental innovation. Specializing in carbon dioxide removal and tackling the Sargassum issue, we develop technology that works with nature to heal the climate and restore the oceans. Our CDR solution focusses on catching wild nuisance Sargassum macroalgae as well as growing additional Sargassum and sink its carbon rich biomass to the deep sea for long term sequestration.

## CO<sub>2</sub> CAPTURE

The pelagic macroalgae *Sargassum fluitans* and *natans* capture CO<sub>2</sub> into its biomass via photosynthesis.

## CO<sub>2</sub> SEQUESTRATION

Non-decomposed (dried or fresh) biomass of Sargassum is sunk to the deep sea (>1800 m). To decrease decomposition at depth, we removed nutrients via screwpress. Furthermore we compress the Sargassum into bales which decreases surface area that can be reached by animals and therefore slows down the decomposition rate at depth even further. With this processing done before sinking we are slowing down the already slow natural decomposition of Sargassum in the deep sea.

Unlike other macroalgae, pelagic Sargassum floats at the surface of the ocean and propagates solely via fragmentation. Furthermore it is a nuisance algae in the Caribbean and West Africa, providing lots of algae that needs removal and that cannot be used for human consumption. This gives Sargassum an advantage over other macroalgae. Seafields is the only Sargassum CDR company that removes nutrients and compresses the algae into bales before sinking leading to longer sequestration rates.

## CO-BENEFITS OR PRODUCTS

The economic co-benefit from biostimulants will be shared by Caribbean SIDS. The market could be >\$200bn for Sargassum-derived biostimulants, giving the Caribbean region large export revenues. The tourism industry will benefit from less impact of Sargassum beaching, as will the fisherfolk that are experiencing industry decline, who can retrain as aquafarmers - which we're already seeing signs of. Furthermore, Our Sargassum aquafarms act as nurseries for juvenile fish, attracting predators and bolstering local fish stocks.

## LEADERSHIP TEAM

Our directors are comprised of several serial entrepreneurs with extensive fundraising, scale up and executive experience, an innovative organic farmer and a well-connected climate and environmental policy specialists that worked for the UN and world bank. Our head of science is a marine biologist who is an international expert on Sargassum, and our general manager has UN and start up experience and has written a master thesis on how Sargassum affects people's livelihoods.



# COMPANY OVERVIEW

## COMPANY NAME

SeaO2

## HQ LOCATION

Amsterdam, Netherlands

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Industrial Gases/Pure CO<sub>2</sub>

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Electrochemical CO<sub>2</sub> separation from seawater

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$1,500,000

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Philanthropic Funding, Convertible Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Philanthropic, Government

Ruben Brands

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[seao2.nl](http://seao2.nl)

# SEA02

## COMPANY DESCRIPTION

SeaO2 is a Dutch Ocean Carbon Removal company developing a technology to remove CO<sub>2</sub> from the atmosphere at gigaton-scale, harnessing the potential of the oceans. SeaO2's solution, Direct Ocean Capture, relies solely on renewable electricity and seawater to extract CO<sub>2</sub> from the ocean's surface and consequently from the atmosphere. The process uses electrochemistry and vacuum to transform the dissolved inorganic carbon in water into gaseous CO<sub>2</sub>, which is extracted and stored permanently with third-party providers.

## CO<sub>2</sub> CAPTURE

The process uses electrochemistry to produce an acid and a base stream using bipolar membranes. The acid is used to shift the carbonate equilibrium of seawater to transform dissolved (bi)carbonate ions into CO<sub>2</sub> and enable its extraction in gas form with the help of vacuum. After restoring the pH with the base stream, the decarbonized water is returned to the ocean, where it re-equilibrates from the atmosphere, effectively reabsorbing an equivalent amount of CO<sub>2</sub>.

Leveraging the ocean's vast potential, our technology can be applied cost-effectively and at-scale with minimal environmental impact:

- Compact plug-and-play design allows for retrofitting into existing marine infrastructure and minimal land use.
- No need for feedstock or by-products generation, simplifying operations.
- Fully electrical and heat-free, can operate intermittently, leveraging the cleanest and most cost-effective energy sources.
- Introduces no chemicals and minimally affects alkalinity, mitigating potential environmental uncertainties and paving the way for pioneering scientifically-endorsed robust MRV.

The extracted gaseous CO<sub>2</sub> is then compressed and transported for storage with third parties. In our demonstration site, the CO<sub>2</sub> will be permanently stored into concrete with our mineralization partner, Paebbl, also based in the Netherlands. Paebbl uses an accelerated silicate carbonation reaction that focuses on Mg- and Ca-bearing silicates to produce concrete. They use olivine as feedstock due to its high CO<sub>2</sub> uptake capacity and abundant reserves.

## CO-BENEFITS OR PRODUCTS

SeaO2's solution has several non-Carbon Benefits:

- Ecosystem De-acidification: Since our process involves discharging CO<sub>2</sub>-depleted water with a slightly higher pH, our project can help mitigate ocean acidification, benefiting local marine ecosystems and livelihoods.
- Enhanced Ocean Monitoring: Given our MRV requirements, our activity can increase monitoring in areas with limited oversight, fostering better understanding and protection of marine environments.
- Blue Economy & Jobs: The project offers economic opportunities and job creation in the blue economy.

## LEADERSHIP TEAM

Ruben Brands: With a background in business administration and law, Ruben has driven innovation and entrepreneurship in major corporations, startups and Venture Builders.

Dr. Rose Sharifian: An expert in chemical engineering and membrane-based electrochemical processes, Rose's pioneering research in oceanic carbon capture earned her a Ph.D. at TU Delft.

Dr. David A. Vermaas: As an Associate Professor at TU Delft, David specializes in electrochemical flow cells and membrane science.

# COMPANY OVERVIEW

## COMPANY NAME

Sinkco Labs

## HQ LOCATION

Boston, MA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Consumer Goods

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$3,500,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Philanthropic

# SINKCO LABS



## COMPANY DESCRIPTION

Sinkco Labs is a climate and biotech startup that leverages the power of oceans to sequester carbon permanently while producing essential carbon negative compounds used in a vast range of consumer products.

## CORE INNOVATION

We unlock the potential for safe marine carbon storage in the seafloor by mimicking the environmental conditions that prevent biomass degradation - limited oxygen exposure time and compaction. We avoid biological impacts and oxygen depletion by bypassing water column exposure. Our patent-pending micro-injections leverage off-the-shelf parts and existing infrastructure, unlocking a rapid pathway to scale. We are positioned to be one of the most efficient CDR with respect to emissions to removal ratio, 0.07.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is captured by photosynthesis. We utilize the 140 billion tonnes annually produced agricultural waste, using waste streams that are not currently re-purposed and emit CO<sub>2</sub> back into the atmosphere via biomass burning or decomposition. Our approach works on a variety of biomass streams, but our current pilots use sawdust, 50% organic carbon, which is currently burned for disposal.

## CO<sub>2</sub> SEQUESTRATION

Waste biomass is collected, extracted and transported to operational ports. Waste is mixed into a paste and injected into anoxic sub-sediments offshore, utilizing a modified sediment gravity corer. The injected biomass displaces sediment to create a compacted zone of organic matter, mimicking the natural process that effectively stores un-degraded biomass in marine sediments for millenia. Sensors in the injection field confirm permanent storage of biomass and monitor fluxes out of the sediment-water interface.

## CO-BENEFITS OR PRODUCTS

Our solution does more than remove carbon, we integrate carbon removal with decarbonizing consumer goods. Sinkco Labs produces carbon negative ingredients before carbon storage using a patented low-energy, low-yield extraction process. Our carbon storage can also be applied to existing bio-waste streams, decarbonizing supply chains and providing value beyond carbon storage. Monitoring of carbon storage also has the co-benefit of ocean monitoring as an ecosystem service, with integration into existing ocean monitoring networks.

## LEADERSHIP TEAM

Our team combines academic and research expertise at top international universities with practical experience in the field and delivering value to customers. Brenna & Victor both have MSc. degrees with overlapping expertise in marine science, chemistry and engineering, and Brenna is currently a PhD Candidate at MIT & WHOI, USA. Viji is a BMW Responsible Leader and has 7 years experience in food & beverage consulting, bringing expertise in networking, execution and customer interaction.

Viji Thomas

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[sinkcolabs.com](https://sinkcolabs.com)

# COMPANY OVERVIEW

## COMPANY NAME

Project Vesta, PBC

## HQ LOCATION

San Francisco, CA, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

OCEAN

## CDR PATHWAY(S)

Oceans - Ocean alkalinity enhancement

Oceans - Ocean ecosystem restoration and management

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

Kelly Erhart

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[vesta.earth](https://vesta.earth)

# VESTA



## COMPANY DESCRIPTION

Vesta is a Delaware public benefit corporation whose mission is to further the science of Coastal Carbon Capture™ (CCC™) and galvanize global deployment. Given the availability of necessary feedstock and suitable locations for CCC™, it is one of the most scalable solutions for CO<sub>2</sub> sequestration. It is also highly cost-competitive and energy efficient at scale. It has valuable, unique co-benefits of locally reducing ocean acidification and helping protect coastal areas from sea-level rise and erosion.

## CORE INNOVATION

CCC™ is extremely scalable, sustainable, cost competitive at scale (<\$50 per tonne), and durable. Given the abundance of feedstocks and ample coastal areas suitable for CCC™ deployment, CCC™ could permanently sequester a significant portion of atmospheric CO<sub>2</sub>. CCC™ does not require energy, land, freshwater resources, or technological breakthroughs to scale. It is extremely efficient, removing 20+ tonnes of CO<sub>2</sub> from the atmosphere for every tonne of CO<sub>2</sub> emitted across the supply chain.

## CO<sub>2</sub> CAPTURE

CCC™ accelerates mineral weathering by adding olivine sand to coastal environments. Olivine sand captures CO<sub>2</sub> through a three-step chemical reaction, storing CO<sub>2</sub> as bicarbonate (HCO<sub>3</sub><sup>-</sup>), or alkalinity, in the ocean for 10,000-100,000 years (1).

Dissolved CO<sub>2</sub> + water → carbonic acid : CO<sub>2</sub>(aq) + H<sub>2</sub>O → H<sub>2</sub>CO<sub>3</sub>

Carbonic acid + olivine → magnesium + alkalinity + dissolved silica: 4H<sub>2</sub>CO<sub>3</sub> + Mg<sub>2</sub>SiO<sub>4</sub> → 2Mg<sup>2+</sup> + 4HCO<sub>3</sub><sup>-</sup> + H<sub>4</sub>SiO<sub>4</sub>

Atmospheric CO<sub>2</sub> influxes to seawater: CO<sub>2</sub>(g) → CO<sub>2</sub>(aq)

## CO<sub>2</sub> SEQUESTRATION

Captured CO<sub>2</sub> is stored as bicarbonate, or alkalinity, in the ocean. The durability of CCC™ is the residence time of dissolved inorganic carbon in seawater, estimated to be between 10,000 and 100,000 years (2, 3). Due to the high scientific confidence in the long timescale of Ocean Alkalinity Enhancement (OAE) carbon removal, we assume CDR from CCC™ projects is effectively permanent.

## CO-BENEFITS OR PRODUCTS

CCC™ has unique co-benefits of locally reducing ocean acidification by increasing the alkalinity of ocean water at project sites. It also helps protect coastal areas from erosion and sea-level rise by adding material to the coast and near-shore environment.

## LEADERSHIP TEAM

Tom Green, CEO, MBA, with 20 years in corporate leadership; Kelly Erhart, President, specializes in commercializing sustainability and CDR approaches; Douglas Edwards, Head of Operations, specializes in complex transactions and joint ventures; Dr Stephen Romaniello, Director of Geochemistry, specializes in marine biogeochemistry and enhanced weathering; Dr Just Cebrian, Director of Ecology, specializes in coastal ecosystem diversity and functionality. Tim Dierze, Vice President of Finance, specializes in corporate and project capital strategy; financial planning and analysis.



XPRIZE  
CARBON  
REMOVAL

MUSK FOUNDATION



# ROCKS



# COMPANY OVERVIEW

## COMPANY NAME

Arca Climate Technologies

## HQ LOCATION

Vancouver, Canada

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

Venture Capital

# ARCA



## COMPANY DESCRIPTION

Our technology delivers industrial-scale durable carbon dioxide removal by significantly accelerating the natural process of carbon mineralization in mine tailings and waste rock. Building upon decades of research, our patented technologies activate magnesium silicate minerals, increasing reactivity to transform ultramafic mine waste into a massive carbon sink. This presents an unprecedented opportunity for permanent carbon dioxide removal on a gigatonne scale. Annual megatonne scale can be achieved at our first project site.

## CORE INNOVATION

Arca's patented mineral activation technology selectively targets specific molecular bonds in magnesium silicate minerals, efficiently liberating magnesium. We provide economic incentives to mobilize the global mining industry to deliver gigatonne scale carbon dioxide removal. Leveraging an otherwise problematic waste stream, we provide CDR that is highly durable, sustainable and massively scalable. For an industry that annually processes billions of tonnes of material, Arca's technology unlocks new value streams, particularly for producers of critical minerals.

## CO<sub>2</sub> CAPTURE

Our patented mineral activation technology uses microwave energy to selectively target specific molecular bonds in magnesium silicate minerals, liberating reactive magnesium. Arca Smart Churning increases the exposure of CO<sub>2</sub> in air to magnesium rich mine waste in the tailings storage facilities. Due to the alkaline nature of the mine waste the pore water attains a high pH thereby causing atmospheric CO<sub>2</sub> to spontaneously enter the pore water and convert to bicarbonate ions.

## CO<sub>2</sub> SEQUESTRATION

Reaction of bicarbonate ions with dissolved magnesium, sourced from the mine waste, produces magnesium carbonate minerals. Arca has developed the capability to monitor multiple rate-controlling physical and chemical properties, then manipulate the surface of the mine tailings to control and optimize these parameters, accelerating the rate and increasing the capacity for CO<sub>2</sub> capture and mineralization. These carbonate minerals are thermodynamically stable and will retain the sequestered carbon for more than 1000 years.

## CO-BENEFITS OR PRODUCTS

Mineralizing CO<sub>2</sub> into mine tailings increases their stability, reducing environmental and financial risks of tailings dam breakage. Arca's mineral activation process, which maximizes the reactivity of tailings with CO<sub>2</sub> may improve comminution, reducing the cost of production of critical metals. Arca's focus on mines that support transition to clean energy systems further enhances the environmental benefits of these systems.

## LEADERSHIP TEAM

Greg Dipple, co-founder and Head of Science, is the global leader in the field of carbon mineralization in mine tailings with 20+ years of research, 78 publications, multiple field trials and a dozen mining industry collaborations. Paul Needham, CEO, built an 850+ person solar energy company in India and founded an early adtech company (later acquired by Microsoft). Peter Scheuermann, Bethany Ladd and Sean Lowrie bring many decades of scientific, operational and commercial leadership experience.

**Greg Dipple**  
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[arcaclimate.com](https://arcaclimate.com)



# COMPANY OVERVIEW

## COMPANY NAME

Aspiring Materials

## HQ LOCATION

Christchurch, New Zealand

## FOUNDED

2019

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Advanced Materials, Building materials, Industrial Chemicals, Energy, Industrial Gases/Pure CO<sub>2</sub>, Soil/Soil Additives

## XPRIZE TRACK

### ROCKS

### CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Ex-situ mineralization of mined rocks

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$10,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Project Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Government

# ASPIRING MATERIALS

## COMPANY DESCRIPTION

We need sustainable development. The problem is how to sustain that development without the emissions or further harm to the planet. We've taken that challenge on, creating essential ingredients that will make industrial decarbonisation achievable. Our carbon-capture technology is permanent and safe and can be used for direct air or point-source capture. Our low-emissions materials are targeted to displace emissions-intensive commodities and reduce the overall industrial carbon footprint. All using a rock.

## CORE INNOVATION

For us, zero-waste is non-negotiable. When we work with nature to solve the climate emergency, we do it with the utmost respect for the planet. So, the top priority in our approach is to do no further harm to the planet. Our process to unlock these essential ingredients from rock also ensures any heavy metals present are removed safely and never released into the environment.

## CO<sub>2</sub> CAPTURE

Years of research led us to create a solution inspired by nature's ability to mineralize and store CO<sub>2</sub>, permanently. The result is a simple, elegant solution to a complicated problem. Our process begins with the most common rock on the planet. These rocks have a simple composition: mainly magnesium, silica and iron. We isolate and use the magnesium to rapidly change carbon dioxide into a mineral. This is nature working at the speed of humanity.

## CO<sub>2</sub> SEQUESTRATION

Atmospheric and/or industrial/point source CO<sub>2</sub> reacts with our patent-pending Mg(OH)<sub>2</sub> to form a stable carbonate (MgCO<sub>2</sub>). In the MgCO<sub>2</sub> form the CO<sub>2</sub> is locked away & will only release the CO<sub>2</sub> under extreme conditions: highly acidic or extremely high temperatures >>1200 C.

## CO-BENEFITS OR PRODUCTS

Through the same process, iron, silica, nickel:cobalt (MHP) and hydrogen are made available, creating low-emissions ingredients so essential to the world's continued progress. By selling these products, the costs of production are completely offset, meaning Mg(OH)<sub>2</sub> can be offered at no cost. We offer something that no other company/technology can do, rapid direct air capture of atmospheric CO<sub>2</sub> to form a geologically stable rock for free.

## LEADERSHIP TEAM

Chris Oze (Co-Founder and Director) and Mark Chadderton (CEO - BE (Chem & Process, 1st Class Honours), MBA, CEng) are both Breakthrough Energy Innovator Fellows.

**Mark Chadderton**

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[aspiringmaterials.com](https://www.aspiringmaterials.com)



# COMPANY OVERVIEW

## COMPANY NAME

Carbfix hf., Carbon CO<sub>2</sub>ncepts GmbH, Landwärme GmbH, Reverion GmbH

## HQ LOCATION

Munich, Germany

## FOUNDED

2007

## NUMBER OF EMPLOYEES

101 - 250

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Energy, Industrial Gases/Pure CO<sub>2</sub>, Soil/Soil Additives

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Land - Biological conversion of biomass

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Land - Other

Rocks - In-situ mineralization

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series A

## AMOUNT OF CAPITAL SOUGHT

\$50,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$5M - \$20M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt, Other

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Family Office, Private Equity, Philanthropic, Government, Project Finance

# BE CDR - BIOENERGY X STONE STORAGE

## COMPANY DESCRIPTION

Bioenergy x Stone Storage pioneers carbon removal from biomethane production, combined with an innovative approach to carbon storage. We provide a fast scaling solution by capturing CO<sub>2</sub> from existing biomethane production at very low cost. Taking this one step further, we employ innovative technology capturing carbon while using the biomethane, creating renewable power in a highly efficient, flexibly reversible fuel cell. Our storage uses mineralization technology that minimizes leakage risk by accelerating CO<sub>2</sub> immobilization underground.

## CORE INNOVATION

Our key differentiation lies in the efficiency and decentral scalability of CO<sub>2</sub> capture and sequestration methods. The integration of capture into biomethane production and utilization, makes our approach the most efficient technological removal solution available. Biomethane use in the Reverion technology maximizes the amount of CO<sub>2</sub> we capture from our value chain while increasing cost efficiency by creating new revenue streams. Our storage solution is decentralized and comes with unmatched durability and leakage risk reduction.

## CO<sub>2</sub> CAPTURE

We think the key to scaling carbon removal lies in employing cost-efficient and available technology for carbon capture. We capture CO<sub>2</sub> from highly concentrated streams in the biomethane value chain: From a biogas upgrading off-gas stream and by using the biomethane in our flexible solid oxide fuel cell, capturing CO<sub>2</sub> through oxidation while producing power. CO<sub>2</sub> Concentrations in these streams are >90% making this solution extremely energy- and cost efficient compared to other removal solutions.

## CO<sub>2</sub> SEQUESTRATION

Both CO<sub>2</sub> streams are jointly liquefied for transport. Upon arrival at the storage site site in Hellisheiði, Iceland, it is regasified and dissolved in water. Subsequently, this CO<sub>2</sub>-charged water is injected into the subsurface, where it reacts with favorable rock formations, in this case basaltic stone. The injection in liquid form and the mineralization underground significantly lower any risk of leakage. Durability and immobilization are verified in monitoring wells.

## CO-BENEFITS OR PRODUCTS

Our integration of carbon capture makes biogas upgrading more efficient by decreasing the specific energy consumption and eliminating methane slip. Reverion achieves a 80% power generation efficiency using biomethane, a significant increase compared to conventional CHP-plants. Additionally, we can produce hydrogen whenever there is surplus electricity, boosting revenue and supporting a renewable future. This empowers producers to engage in defossilization and carbon removal, fosters decentralized energy production, strengthens rural economies, and promotes self-reliance and sustainability.

## LEADERSHIP TEAM

We combine science with entrepreneurship. Edda Aradóttir, Carbfix CEO and TIME-recognized Climate Innovator, holds a PhD in Theoretical Chemistry and is a highly respected voice for carbon removal globally. Stephan Herrmann, Reverions co-founder and -inventor, holds a PhD in mechanical engineering and headed a research group at TU Munich. Zoltan Elek, Landwärme founder and shareholder in Carbon CO<sub>2</sub>ncepts, is shaping the biomethane market since 2007, combining engineering- and business expertise (TU Munich, UC Berkeley, HBS).

**Sarah-Luise Grimm**

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[carbfix.com](http://carbfix.com)

# COMPANY OVERVIEW

## COMPANY NAME

Landwärme GmbH, MVV Umwelt GmbH, Neustark AG

## HQ LOCATION

Munich, Germany

## FOUNDED

2007

## NUMBER OF EMPLOYEES

101 - 250

## TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Building Materials, Energy, Soil/Soil Additives

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Land - Biological conversion of biomass

Land - Other

Rocks - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Other

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

>\$100M

## CAPITAL RAISED TO DATE

>\$100M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

John Cosmo Dwelle

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# BICOS - BIOGENIC CARBON TO CONCRETE



## COMPANY DESCRIPTION

Our carbon removal method captures CO<sub>2</sub> from biogenic sources and stores it in demolition concrete for negative emissions. Operational since June 2023, the Dresden plant liquefies offgas CO<sub>2</sub> from biogas upgrading. Thereafter it is injected into concrete granulate in Berlin, initiating a reaction that forms limestone. Each tonne of recycled concrete securely stores 10 kg of CO<sub>2</sub>, contributing to an annual storage capacity of 1,000 to 1,500 tonnes.

## CORE INNOVATION

Pioneering in Germany, our project seamlessly integrates waste management, recycling, and carbon removal into a cohesive value chain. By optimizing the utilization of organic waste, essential for a circular economy, it tackles the climate impact of CO<sub>2</sub>-intensive products such as concrete. The synergies among these processes propel us towards a gigatonne scale. Neustark's concrete granulate processing method and its associated technology are currently pending patent approval, solidifying our commitment to innovative and sustainable solutions.

## CO<sub>2</sub> CAPTURE

We initiate with a batch fermentation process, transforming municipal organic waste into biogas rich in biomethane and CO<sub>2</sub>. After separation, upgraded biomethane is injected into the grid. We capture and compress the offgas CO<sub>2</sub> stream, removing condensates, and redirect them for further upgrading. The gas undergoes drying and filtration, resulting in pure liquid CO<sub>2</sub> fed into a 33-tonne vacuum-insulated storage tank, optimized for efficient transportation.

## CO<sub>2</sub> SEQUESTRATION

Following transportation to Berlin, CO<sub>2</sub> undergoes regasification and is introduced into storage tanks containing demolished concrete aggregates. The pressurized interaction between calcium hydroxides in the concrete and CO<sub>2</sub> initiates a mineralization reaction, enabling the permanent storage of carbon as calcium carbonate. This method ensures reliable sequestration, as the CO<sub>2</sub> remains locked unless the resulting carbonated granulate reaches temperatures exceeding 900°C. This carbonated granulate retains its usability as a building material, unaffected by the carbonation process.

## CO-BENEFITS OR PRODUCTS

Integrating carbon capture into the biogas upgrading unit enhances the efficiency of renewable energy production (biomethane). Simultaneously, the mineralization of recycled concrete aggregates improves the properties of the resulting concrete, including increased compressive strength, thus reducing the need for cement. Beyond offering Carbon Dioxide Removal, our solution fosters a circular economy, reduces fossil fuel dependency and mitigates emissions linked to cement - the most environmentally impactful component in a more sustainable concrete production.

## LEADERSHIP TEAM

Valentin and Johannes, Neustark's co-CEOs and founders, pioneered their technology at ETH Zurich. Blending business management and engineering expertise, they propel innovation to position their CDR solution globally. Zoltan, Landwärme's CEO and co-founder, has shaped the biomethane market since 2007, leveraging engineering and business skills (TU Munich, UC Berkeley, HBS). Koray, Head of Biogas Business at MVV and an alumnus of RWTH Aachen and EPFL, boasts fifteen years of experience in the energy sector.



# COMPANY OVERVIEW

## COMPANY NAME

Carbonaught Pty, Ltd

## HQ LOCATION

Brisbane, Australia

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

Soil/Soil Additives

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Ex-situ mineralization of mined rocks

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$7

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding, Corporate Debt, Philanthropic Funding, Convertible Debt, Project Debt

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Family Office, Private Equity, Philanthropic, Government, Project Finance

Andrew Pedley

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# CARBONAUGHT



## COMPANY DESCRIPTION

Carbonaught uses basalt as a synthetic fertiliser replacement to grow more food, on less land at lower cost with lower emissions. This allows farmers to reduce fertiliser costs up to 50% and reduce their emission intensity up to 80% all while maintaining or improving production. More than a modern fertiliser company, Carbonaught wants to rewire the global food system by being a dominant player in the next great critical mineral.

## CORE INNOVATION

Firstly, our patent-pending core measurement methodology, crucial for enhanced weathering is being unwittingly used by both our competitors and verification agencies, highlighting its significance. Secondly, while other carbon removal methods rely on cost reduction or mandated carbon prices, our approach uniquely integrates carbon removal with low-emission food production. By converting carbon removal to a by-product, we sidestep reliance on carbon credit demand, this provides a viable pathway for scalability and sustainability at a gigatonne scale.

## CO<sub>2</sub> CAPTURE

The capture of CO<sub>2</sub> through our enhanced weathering approach primarily occurs in the soil. We start by mining high-quality basalt rock, which is then crushed into 4-5mm particles. These are distributed across agricultural lands, where they undergo a series of natural chemical reactions. As rainwater percolates through the soil, it dissolves CO<sub>2</sub> from the atmosphere, forming a weak carbonic acid. This acid reacts with the basalt, forming bicarbonate, a stable form of carbon storage.

## CO<sub>2</sub> SEQUESTRATION

The sequestration process in enhanced weathering is a gradual but highly effective mechanism. The bicarbonate formed in soil is a mobile form of carbon that is transported through waterways and ultimately ends up in the ocean. Here, it contributes to the ocean's alkalinity, enhancing its capacity to store carbon in the form of dissolved bicarbonate. This process not only removes CO<sub>2</sub> from the atmosphere but also helps in mitigating ocean acidification, a significant environmental concern.

## CO-BENEFITS OR PRODUCTS

The co-benefits of our solution are pivotal drivers of scaled adoption of our carbon removal solution: 1) Up to a 150 basis points reduction in farm loan capital costs through the physical building of new soils. 2) Farmers receive a fertilizer payload that delivers P, K, Ca, Mg, and nitrogen efficiencies, resulting in up to 20% improvements in NPV per hectare for cropping operations.

## LEADERSHIP TEAM

XPRIZE Milestone Round - Rank 24th - Only one of 9 rock based finalists and the only one moving rock around. Prof Balz Kamber is a renowned figure in the realm of earth sciences and geochemistry. Currently serving as the Professor of Petrology at Queensland University of Technology (QUT). Previously Chair of Geology at Trinity College Dublin, he was editor-in-chief of the Chemical Geology journal from 2018-2023. Balz is engaged with NASA's Perseverance Rover program.



# COMPANY OVERVIEW

## COMPANY NAME

Korea Institute of Geoscience and Mineral Resource (KIGAM)

## HQ LOCATION

Daejeon, South Korea

## FOUNDED

2017

## NUMBER OF EMPLOYEES

1 - 10

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Advanced Materials, Building materials, Industrial Chemicals, Industrial Gases/ Pure CO<sub>2</sub>, Soil/Soil Additives

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Ex-situ mineralization of mined rocks

Rocks - Mineralization of mine or industrial waste

Rocks - In-situ mineralization

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

\$2,996,975

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Project Equity, Government Funding

## TYPE OF INVESTOR SOUGHT

Private Equity, Government, Project Finance, Other

# K - CARBON MINERALIZATION FLAGSHIP CENTER

## COMPANY DESCRIPTION

The KIGAM Carbon Mineralization Flagship Center, founded in 2017, pioneers sustainable solutions in mineralization and carbon utilization. Specializing in projects like rare earth extraction from coal ash and CSA cement production, they repurpose industrial waste for valuable applications. With a focus on eco-friendly technologies and circular economy principles, they address environmental challenges while advancing industry practices for a sustainable future.

## CORE INNOVATION

the core differentiating aspect of a company's carbon mineralization technology lies in its ability to efficiently convert CO<sub>2</sub> into stable mineral forms while addressing scalability, cost-effectiveness, versatility, environmental considerations, and regulatory requirements. Innovations in mineralization pathways, reactivity, scalability, and environmental benefits can set a company's technology apart in the rapidly evolving landscape of carbon capture and storage solutions.

## CO<sub>2</sub> CAPTURE

Direct Air Capture (DAC) systems are used to remove CO<sub>2</sub> directly from the atmosphere. Once the air is taken in, it passes through zeolites that have a high affinity for CO<sub>2</sub>. After the CO<sub>2</sub> is captured, it needs to be separated from the adsorbent material. This is typically done by changing the temperature and pressure to release the CO<sub>2</sub> from the zeolites. The released CO<sub>2</sub> is then concentrated to increase its purity.

## CO<sub>2</sub> SEQUESTRATION

CO<sub>2</sub> is durably sequestered in coal by-products. Accelerated carbonation is used for the recovery of rare earth elements from coal by-products. Since the content of free calcium is high in coal by-products, CO<sub>2</sub> can sequester durably in the waste.

## CO-BENEFITS OR PRODUCTS

Carbon mineralization for reducing CO<sub>2</sub> offers several co-benefits and potential products beyond simply sequestering carbon dioxide. Some of these co-benefits and products applicable to carbon mineralization solutions include: Mineral Products, Alkalinity Generation, Waste Utilization, CO<sub>2</sub> Utilization, Carbon Offsetting, and Climate Resilience.

## LEADERSHIP TEAM

Our team is a world-class carbon mineralization technology starting from carbon capture through its application. Our technologies have been approved by UNFCCC. We also have both national and international collaborations and applications of our technologies in other countries such as in Vietnam

Ahn Jiwhan

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# COMPANY OVERVIEW

## COMPANY NAME

Lithos Carbon, Inc

## HQ LOCATION

San Francisco, CA, USA

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Land - Agricultural & grassland CDR

Rocks - Ex-situ mineralization of mined rocks

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

# LITHOS CARBON

## COMPANY DESCRIPTION

Lithos Carbon accelerates Earth's natural carbon cycle to permanently remove CO<sub>2</sub> from the air. Leveraging a decade of research, we deploy enhanced rock weathering in agriculture while simultaneously improving crop yields and soil health for farmers. We provide farmers with organic-grade volcanic basalt dust and empirically measure each tonne of CO<sub>2</sub> removed with state-of-the-art science. Join our mission to decarbonize our food system, which is responsible for 25% of worldwide anthropogenic greenhouse gas emissions.

## CORE INNOVATION

Lithos has carefully curated its feedstock sources, seeking superfine basalt that optimizes simultaneously for high carbon capture potential and low lifecycle emissions contribution. We've also pioneered an approach to MRV, historically a challenge in the ERW space. Lithos's cost-effective empirical attribution was developed by our founding team (professors / collaborators at Yale and Georgia Tech) to operationalize redundant and cradle-to-grave MRV.

## CO<sub>2</sub> CAPTURE

Silicate rocks exposed to acidic rain will dissolve through a chemical weathering reaction, which simultaneously turns CO<sub>2</sub> in the rain into stable bicarbonate. This slow but powerful biogeochemical process effectively "locks up," carbon for tens of thousands of years, acting as a climate stabilizer. Lithos accelerates natural weathering by spreading fine basalt rock dust onto farmland. Very high porewater CO<sub>2</sub> concentrations help the soil environment function as a powerful natural weathering reactor.

## CO<sub>2</sub> SEQUESTRATION

The dissolved bicarbonate formed through chemical weathering is transferred by rivers and streams to the coastal ocean, where it remains for thousands of years. Over time, the bicarbonate is biomineralized into calcium carbonate, which supports marine life and counteracts ocean acidification. Eventually, the calcium carbonate sinks to the ocean floor and becomes solid limestone.

## CO-BENEFITS OR PRODUCTS

Lithos has carefully curated its feedstock sources, seeking superfine basalt that optimizes simultaneously for high carbon capture potential and low lifecycle emissions contribution. We've also pioneered an approach to MRV, historically a challenge in the ERW space. Lithos's cost-effective empirical attribution was developed by our founding team (professors / collaborators at Yale and Georgia Tech) to operationalize redundant and cradle-to-grave MRV.

## LEADERSHIP TEAM

Founder Mary Yap is a former tech entrepreneur with experience deploying software at global scale. She holds a B.S. in Earth and Planetary Sciences from Yale University, where she won the department's top student prize. She's published research on the development of climate models and hydrology, and conducted urban field research on environmental sustainability, systems of waste, and networked energy usage.

Mary Yap  
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[lithoscarbon.com](https://lithoscarbon.com)



# COMPANY OVERVIEW

## COMPANY NAME

Mati Carbon

## HQ LOCATION

Houston, TX, USA

## FOUNDED

2022

## NUMBER OF EMPLOYEES

11 - 50

## TRL

TRL 8

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Ex-situ mineralization of mined rocks

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Other

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

# MATI CARBON

## COMPANY DESCRIPTION

Mati Carbon is a project execution entity of the Swaniti Initiative, a US 501(c)3 non-profit. Mati durably removes carbon from the atmosphere using basalt based Enhanced Rock Weathering (ERW) in smallholder rice paddy farms. This process removes atmospheric CO<sub>2</sub> while adding key nutrients in the soil helping to restore degraded soils to benefit smallholder farmers. Mati has developed robust carbon accounting processes by partnering with Yale University to quantify and validate carbon removal through ERW.

## CORE INNOVATION

Mati has developed a software platform to handle the logistical complexities of working with large numbers of smallholder farmers in remote areas of India. Mati's relationship with the non-profit Swaniti provides inroads with local government and stakeholders in remote farming regions of India. Additionally, Mati providing best-in-class Monitoring Reporting and Verification (MRV) for ERW. Our MRV tech-stack includes novel methods for soil monitoring coupled with sophisticated mass-balance and interpolation calculations to determine bulk CO<sub>2</sub> removal.

## CO<sub>2</sub> CAPTURE

ERW is the practice of applying crushed rocks and minerals to agricultural land. Mati uses basalt as a mineral feedstock for this process. When the dissolution of Mati's feedstock occurs, base-cations liberated from the basalt react with carbonic acid (CO<sub>2</sub> dissolved in water) from rainwater and root respiration. This converts atmospheric CO<sub>2</sub> to bicarbonate. Effectively, ERW stoichiometrically rearranges the dominant dissolved species of carbon to a new form that does not revert to CO<sub>2</sub>.

## CO<sub>2</sub> SEQUESTRATION

Once bicarbonate is formed by ERW reactions, conversion to carbonic acid (dissolved CO<sub>2</sub>) is not chemically favoured because the porewater must maintain charge balance with base-cations released by basalt feedstock. The bicarbonate ions then percolate into streams and rivers, and then to oceans. Bicarbonate ions may reside in groundwater within the soil column for decades to centuries. The eventual transport of these bicarbonate ions to oceans sequesters the carbon for >10,000 years.

## CO-BENEFITS OR PRODUCTS

Mati's mission is to enable climate resilience for millions of smallholder farmers in the global south. Basalt dust enriches soil with macro-nutrients like silicon, calcium, and magnesium essential for plant structure and growth, and micro-nutrients like manganese and zinc for enzyme function and disease resistance in crops. As per our initial trials results, adding basalt dust to rice paddies has led to ~20% improvement in crop productivity, lowered diseases and increased water retention capacity.

## LEADERSHIP TEAM

Mati Carbon was founded by two-time climate-tech entrepreneur Shantanu Agrawal (Chem Engg. IIT & MBA, Harvard- 22 years of experience) and Rwitwika Bhattacharya (MPP, Harvard, Founder- Swaniti Initiative). Mati's science is led by Dr. Jacob Jordan (PhD University of Texas at Austin) who has developed core technology for numerous CDR institutions including Yale Carbon Containment Lab and Lithos Carbon. Our operations is led by Lt.Col Bhawesh Malhotra who has 30 years of field management experience.

Shantanu Agrawal

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[mati.earth](https://www.mati.earth)



# COMPANY OVERVIEW

## COMPANY NAME

Mineral Carbonation International Pty Ltd and Carbon Collect Limited

## HQ LOCATION

Canberra, Australia and Dublin, Ireland

## FOUNDED

2013

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Advanced Materials, Building materials, Industrial Chemicals, Other

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Air - Solid sorbent direct air capture

Rocks - Ex-situ mineralization of mined rocks

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Series B

## AMOUNT OF CAPITAL SOUGHT

\$30,000,000

## REVENUE RANGE

\$1M - \$5M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Government

# MCI CARBON X CARBON COLLECT

## COMPANY DESCRIPTION

MCI Carbon(MCi) is an Australian CCU company using mineral carbonation to permanently transform CO<sub>2</sub> into solid products. MCI is partnering with Carbon Collect (CC) whose passive CO<sub>2</sub> capture methodology solves many of the limitations of traditional DAC, including high energy and water consumption. The CC capture and the MCI utilisation can be considered as plug-ins to each other and that is how this entry is formulated.

## CORE INNOVATION

MCI's CCU technology provides permanence, scalability and profitability. CO<sub>2</sub> gas is turned into benign, thermodynamically stable solids, obviating long term monitoring. Gigatonne mineable deposits of feedstock have been identified. It creates valuable materials that make the overall process profitable. The MechanicalTree™ passive capture methodology eliminates forced convection. It is water and energy efficient for DAC and benefits from natural environmental conditions including wind, ambient temperature, and relative humidity. Suited to a wide range of climates.

## CO<sub>2</sub> CAPTURE

Carbon Collect's Passive DAC technology MechanicalTree™ includes a passive collector that absorbs wind-delivered CO<sub>2</sub> and an integrated regenerator that releases CO<sub>2</sub> into a confined chamber. The collector utilizes natural air movement to skim carbon dioxide directly from ambient air onto leaf-like sorbent structures. The system's vertical column incorporates a stack of disks, forming a column above a regenerator chamber. Wind flows freely through gaps between the disks while CO<sub>2</sub> is skimmed from the air stream.

## CO<sub>2</sub> SEQUESTRATION

CO<sub>2</sub> captured directly from the atmosphere by CC MechanicalTree is fed to the MCI plant where it is reacted with activated minerals to yield stable carbonates and silicas. The feedstock with the highest scalability is the mineral serpentinite, a hydroxylated magnesium silicate that is abundant and widespread globally. The activated mineral reacts with CO<sub>2</sub> in water to form magnesium carbonate and silica products which are thermodynamically stable and benign to people and the environment.

## CO-BENEFITS OR PRODUCTS

MCI transforms CO<sub>2</sub> into valuable materials, enabling a circular economy where CO<sub>2</sub> is no longer a waste but a resource. This is transformative for industries moving to net zero, providing profitable pathways to decarbonisation with a value-based solution. Valuable products include cement alternatives and carbonate products such as whiteners, plasterboard, fire retardants and zero-CO<sub>2</sub> magnesia. In some cases, the avoided CO<sub>2</sub> in these applications can double or quadruple the original CO<sub>2</sub> stored in carbonates.

## LEADERSHIP TEAM

MCI has world leading, published researchers in the field, including Mark Rayson, Jason Mann and Geoff Brent. COO Sophia HamblinWang has been chosen as WEF Young Global Leader. CEO Marcus Dawe is a successful serial entrepreneur.

Carbon Collect is one of the top DAC innovator teams globally. This includes global leaders in energy and chemicals, the original inventor of DAC, expertise in machine learning, leading experts in CCS. [tinyurl.com/CCMT-Team](https://tinyurl.com/CCMT-Team)

## Dr. Geoff Brent

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[mccarbon.com](https://mccarbon.com) & [carboncollect.com](https://carboncollect.com)

# COMPANY OVERVIEW

## COMPANY NAME

Metalplant

## HQ LOCATION

Wilmington, DE, USA

## FOUNDED

2021

## NUMBER OF EMPLOYEES

11 - 50

## TRL 7

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Other

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Ex-situ mineralization of mined rocks

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Pre-Commercial Pilot

## CURRENT INVESTMENT STAGE

Pre-Seed

## AMOUNT OF CAPITAL SOUGHT

\$7,000,000

## REVENUE RANGE

Pre-Revenue

## CAPITAL RAISED TO DATE

\$1M - \$5M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Venture Capital, Angel, Family Office, Private Equity, Philanthropic, Government, Project Finance

**Eric Matzner**

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# METALPLANT



## COMPANY DESCRIPTION

Metalplant combines enhanced rock weathering and nickel phytomining, to carry out CDR while producing nickel. Using nickel hyperaccumulating plants in their native serpentine soils, we are able to overcome limitations on the use of olivine minerals. We turn the weakness of nickel in ERW into a strength, using the economic value of the metal to drive upscaling of our process and lower all-in cost. Vertically integrated, we control gigatonnes of minerals and directly operate farms.

## CORE INNOVATION

The synergy of combining ERW with nickel phytomining makes both processes economically viable. We are vertically integrated, controlling our own minerals and operating our own farms. A major innovation is that instead of bringing the rock to the farms, we bring the farm to the rocks. This led to breeding the world's first dedicated ERW crop, which can handle high pH and therefore higher application rates and CDR/Ha than has previously been thought achievable.

## CO<sub>2</sub> CAPTURE

CO<sub>2</sub> is removed from the atmosphere via enhanced weathering of ultramafic rocks spread on agricultural land. Carbonic acid is formed when CO<sub>2</sub> dissolves in rain and groundwater. When this water reacts with the magnesium-silicate minerals added to the farm, this reaction consumes acidity and fixes CO<sub>2</sub> in groundwater as bicarbonate anions charge-balanced against magnesium cations. These ions eventually run off to the ocean where most of the CO<sub>2</sub> will remain captured for thousands of years.

## CO<sub>2</sub> SEQUESTRATION

Mirroring the natural carbonate-silicate geochemical cycle, bicarbonate anions charge-balanced by magnesium cations migrate from the soil into terrestrial watercourses and, ultimately, into the ocean where the ions increase the total alkalinity of the ocean, resulting in greater than 80% of the sequestered carbon being stored as stable bicarbonate for millennia.

## CO-BENEFITS OR PRODUCTS

We produce intermediate nickel products through our CDR strategy by using the nickel hyperaccumulator plant, *Odontarrhena decipiens*, which actively extracts nickel from the soil. After harvesting the crop, we recover high-purity nickel salts from the plant biomass. Selling this recovered nickel (valued at ~\$20,000/tonne) significantly offsets our CDR costs. Notably, this carbon-negative nickel directly supports the green energy transition, as it is integral to critical components like electric vehicle batteries and wind turbines.

## LEADERSHIP TEAM

Eric Matzner has been working on ERW and CDR since 2017. He founded the think tank Climitigation, from which he started the coastal ERW CDR non-profit Project Vesta. There, Eric led the development and sale of the world's first coastal ERW as part of Stripe's first round of CDR purchases. Metalplant co-founder Sam Muja is an experienced executive in mineral exploration and development; through his family-owned companies in Albania, he secured multiple gigatonnes of olivine.

# COMPANY OVERVIEW

## COMPANY NAME

Neustark AG

## HQ LOCATION

Bern, Switzerland

## FOUNDED

2019

## NUMBER OF EMPLOYEES

51 - 100

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Land - Biomass to energy with CO<sub>2</sub> capture and storage

Rocks - In-situ mineralization

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

Jeanne Wittwer

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[neustark.com](https://neustark.com) & [carbfix.com](https://carbfix.com)

# NEUSTARK X CARBFIX



## COMPANY DESCRIPTION

Neustark and Carbfix have joined forces to establish a Bioenergy with Carbon Capture and Storage (BECCS) value chain. Together, our mission is to deliver effective carbon dioxide removal by capturing biogenic CO<sub>2</sub> from point-source emitters (e.g., biogas facilities using sustainable biomass), establishing an efficient international transport corridor, and securely sequestering the captured CO<sub>2</sub> through permanent mineralization in the Icelandic underground.

## CORE INNOVATION

Our solution sources biogenic CO<sub>2</sub>, a by-product of biogas production from sustainable biomass and, after cross-border transportation, stores it via subsurface mineralization. This approach is safer and more cost-effective than conventional CO<sub>2</sub> storage methods since it does not depend on cap rock to prevent leakages: the injected carbonated water, given its higher density, tends to sink in the highly porous basaltic rocks. The project uses seawater for injection, an approach first field-tested in fall 2023.

## CO<sub>2</sub> CAPTURE

The high purity biogenic CO<sub>2</sub> used for the demonstration scale results from biogas upgrading, produced by a Swiss wastewater treatment plant. The CO<sub>2</sub> separation (i.e., capture) from the biomethane was already being done by the treatment plant, via an absorption process. The CO<sub>2</sub> is then liquefied in a unit managed and operated by neustark. At large scale, biogenic CO<sub>2</sub> will be captured from other point-source emitters, such as waste-to-energy plants or wood-based power plants.

## CO<sub>2</sub> SEQUESTRATION

Vast quantities of carbon are naturally stored in rocks. Our solution imitates and accelerates these natural processes, as CO<sub>2</sub> dissolved in water - a sparkling water of sorts - is injected into the subsurface where it reacts with favorable rock formations to form solid carbonate minerals in about 2 years.

## CO-BENEFITS OR PRODUCTS

Our storage solution handles H<sub>2</sub>S from geothermal plants, which have demonstrated faster mineralization than CO<sub>2</sub>, i.e., within four months of injection. H<sub>2</sub>S emissions, prevalent in geothermal energy, pulp and paper production, and fossil fuel use, require reduction for environmental reasons. The injection method could also be used to concurrently store diverse acid gases, like SO<sub>2</sub>, as sulphide minerals, enhancing its environmental advantages.

## LEADERSHIP TEAM

Valentin Gutknecht and Johannes Tiefenthaler, co-CEOs and founders of neustark, developed a CDR technology storing CO<sub>2</sub> in demolition concrete at ETH Zurich. Their backgrounds combine business management and engineering expertise. Sandra Ó. Snæbjörnsdóttir serves as Chief Scientist at Carbfix. Her PhD studies evolved around the world, Ås first injection of CO<sub>2</sub> in basalts, carried out by Carbfix in 2012, and she has been working on the development of this carbon storage method ever since.



# COMPANY OVERVIEW

## COMPANY NAME

Silicate Carbon Ltd.

## HQ LOCATION

Dublin, Ireland

## FOUNDED

2021

## NUMBER OF EMPLOYEES

1 - 10

## TRL 5

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Ex-situ mineralization of mined rocks

Rocks - Mineralization of mine or industrial waste

Rocks - Other

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Seed

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

<\$1M

## CAPITAL RAISED TO DATE

<\$1M

## TYPE OF CAPITAL SOUGHT

Corporate Equity, Government Funding, Philanthropic Funding

## TYPE OF INVESTOR SOUGHT

Corporate/Strategic, Venture Capital, Philanthropic, Government

# SILICATE CARBON

## COMPANY DESCRIPTION

Harnessing a natural geochemical process, Silicate Carbon permanently removes carbon dioxide from the atmosphere via the acceleration of mineral weathering. Silicate Carbon applies milled surplus concrete from the building industry to agricultural land. While simultaneously amending soil pH, it boosts crop productivity, reduces the need for pesticides/fertilisers, and - most importantly - permanently removes excess carbon dioxide from the atmosphere.

## CORE INNOVATION

Silicate Carbon's climate solution lets the rocks do the work. The chemical weathering of minerals is a natural carbon sink. Silicate Carbon accelerates this natural process, so that it can be added to the toolkit of climate change mitigation solutions. This process tackles three problems in one: (i) it re-purposes a waste material, (ii) improves soil pH for plant growth and (iii) durably sequesters carbon dioxide.

## CO<sub>2</sub> CAPTURE

The team is focused on enhancing the chemical weathering of milled returned concrete (MRC). Silicate Carbon spreads MRC on agricultural land and allows it to weather. The weathering reaction takes carbon from the atmosphere and stores it as soluble bicarbonate ions (HCO<sub>3</sub><sup>-</sup>). This is a natural reaction that occurs every day. By spreading milled material, the surface area available for weathering is increased and CO<sub>2</sub> capture is accelerated.

## CO<sub>2</sub> SEQUESTRATION

The bicarbonate ions flow to the ocean via surface and ground waters. The residence time of bicarbonate in the oceans is ~80,000 years (Berner and Berner, 1987). It is this ocean residence time which ensures that the carbon dioxide is durably sequestered well beyond a 100-year timescale. After ~80,000 years, negatively charged bicarbonate ions bond with positively charged calcium ions, forming CaCO<sub>2</sub> (limestone).

## CO-BENEFITS OR PRODUCTS

MRC can be used as an aglime substitute, helping to bolster crop growth by increasing soil pH, which in turn can reduce N<sub>2</sub>O fluxes. The addition of silicon to soil from the MRC will strengthen crop roots and increase resistance to herbivory (Ahmed et al., 2023). Another widely discussed co-benefit of EW is that once the dissolved bicarbonate makes its way to the ocean, it can facilitate the remediation of ocean acidification.

## LEADERSHIP TEAM

Maurice Bryson (Founder) is a Breakthrough Energy Innovator's Fellow and has a Master of Science in carbon finance from the University of Edinburgh Business School. Professor Frank McDermott (Science Lead) is the director of the National Centre for Isotope Geochemistry. A geologist and geochemist with more than 30 years' experience, he is an associate editor with the scientific journal, *Geochimica et Cosmochimica Acta* and a member of the Royal Irish Academy.

**Maurice Bryson**

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[silicatecarbon.com](https://silicatecarbon.com)





# COMPANY OVERVIEW

## COMPANY NAME

UNDO Carbon Ltd.

## HQ LOCATION

London, United Kingdom

## FOUNDED

2022

## NUMBER OF EMPLOYEES

51 - 100

## TRL 7

## SELLING CREDITS

Yes

## PHYSICAL PRODUCTS

None

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Ex-situ mineralization of mined rocks

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Growth Stage

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

# UNDO CARBON

## COMPANY DESCRIPTION

With nature-enabled enhanced rock weathering technology, UNDO generates permanent, high-quality carbon removal credits with added co-benefits to support businesses on their pathway to net zero. UNDO aims to spread enough rock by 2030 to remove one million tonnes of CO<sub>2</sub>, a first step towards gigatonne-scale operations.

## CORE INNOVATION

We built our own tech platform, have world-leading scientific R&D and have written the partnership playbook to harness global networks on scaling carbon removal globally. We've spread more silicate rock than any other ERW developer and are using our operational, scientific and commercial knowledge to drive down the cost of high-quality carbon removal. Critically our MRV encompass a multi-proxy approach across solid, aqueous and gaseous measurements combined with the best geochemical model in class.

## CO<sub>2</sub> CAPTURE

For millions of years, CO<sub>2</sub> has combined with rainwater to form carbonic acid. When this dilute acid falls, the CO<sub>2</sub> interacts with rocks and soil, mineralises and is safely stored as solid carbon for hundreds of thousands of years.

UNDO does enhanced rock weathering, accelerating this natural weathering process by spreading crushed silicate rock such as basalt on agricultural land, vastly increasing the surface area of the rock and therefore its contact with CO<sub>2</sub>.

## CO<sub>2</sub> SEQUESTRATION

When carbonic acid rainwater falls and contacts our crushed silicate rock, weathering occurs. This releases solutes, including bicarbonate ions (HCO<sub>3</sub><sup>-</sup>) which chemically mineralise atmospheric CO<sub>2</sub> into a stable solid. These bicarbonates drain into surface waters or are transported via rivers to the oceans, where they are locked away for tens of thousands of years.

## CO-BENEFITS OR PRODUCTS

ERW releases calcium, magnesium, silicon, and other macro and micronutrients into the soil and acts as a natural fertiliser. This results in greater crop yields, increased pest resistance, improvement to the pH of soils and a reduced need for CO<sub>2</sub>-emitting lime inputs. We provide our product to farmers for free, they are saving money on inputs and reaping more during harvest time. On a UK crop trial we saw 16% increase on spring oats.

## LEADERSHIP TEAM

Our founder, Jim Mann, has founded 4 companies and been featured on 10+ business and climate podcasts. Our CFO, Rachel Kentleton, is former EasyJet Strategy Director, a Former Finance Director at PayPoint. CCO, Ryan King, is former Rocket Internet UK and a HelloFresh UK co-founder. Our Head of Carbon, Simon Manley, has 15 years as a VCM expert and our Head of Enhanced Weathering, Ben Westcott, is the former Head of Sustainability at Planted.

**Stephen Spencer Chapman**  
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# COMPANY OVERVIEW

## COMPANY NAME

Verde Agritech, Ltd.

## HQ LOCATION

Sao Gotardo, Brazil

## FOUNDED

2005

## NUMBER OF EMPLOYEES

101 - 250

## TRL 5

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Soil/Soil Additives

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Ex-situ mineralization of mined rocks

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Other

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

\$20M - \$50M

## CAPITAL RAISED TO DATE

\$20M - \$50M

## TYPE OF CAPITAL SOUGHT

None Specified

## TYPE OF INVESTOR SOUGHT

None Specified

# VERDE AGRITECH

## COMPANY DESCRIPTION

Verde Agritech is an agricultural technology company with the purpose of improving the health of all people and the Planet. We drive sustainable and regenerative agriculture through the production of multi-nutrient potash fertilizers free from salinity, essential in promoting decarbonization in the agricultural sector. Located in Brazil, our operations are underpinned by the country's largest confirmed potassium reserves. Our installed production capacity is 3 million tonnes per year, with no requirement for additional CAPEX.

## CORE INNOVATION

Our project is the first use of glauconitic siltstone for carbon capture via ERW. Our raw material stands out due to its higher fixed carbon volume and superior weathering rate, and devoid of toxic contaminants like nickel and chromium, common in other ERW projects. Additionally, we own and are fully licensed to operate the largest proven potassium reserves in Brazil -within a strategic location near key food-producing regions- giving us a real potential to scale-up.

## CO<sub>2</sub> CAPTURE

Our raw material is a naturally occurring silicate mineral - Glauconite, and our products serve as a source of potassium for plants. Using technology developed in-house, we finely grind our raw material to achieve the ideal particle size for enhanced weathering and optimized nutrient release. These finely ground particles are then applied to farmlands. Once applied to soils, they initiate the enhanced weathering process, capturing CO<sub>2</sub> from the atmosphere.

## CO<sub>2</sub> SEQUESTRATION

Our raw material is a phyllosilicate mineral. Its weathering process utilizes atmospheric CO<sub>2</sub> and transforms it into HCO<sub>3</sub><sup>-</sup> (bicarbonate ion). The durability of our CO<sub>2</sub> sequestration is demonstrated through the production of bicarbonate, which removes carbon from the biological cycle and mineralizes it, locking the CO<sub>2</sub> away for over 1,000 years.

## CO-BENEFITS OR PRODUCTS

Our product is a non-chemical potassium fertilizer registered in Brazil. It has passed rigorous agronomic validation and holds organic certification from governmental and non-governmental organizations. Its attributes not only support the preservation of soil health but also contribute to the enhancement of soil microbiome. Our product provides a gradual nutrient release into the soil, effectively preventing nutrient loss through leaching. Unlike conventional fertilizers, this product is a multi-nutrient source, supplying potassium, silicon, magnesium, and manganese.

## LEADERSHIP TEAM

Verde's leadership team comprises multi-sector specialists with decades of experience in geology, mining, agriculture, agronomy, marketing, sales, finance, and public relations. Founder and CEO, Cristiano Veloso, has hand-picked the company's executives based on the company's core values of sustainable agriculture and ESG. Verde also comprises over a dozen employees with PhD and Master's degrees, leading the three laboratories and the company's scientific research.

Lucas Brown

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# COMPANY OVERVIEW

## COMPANY NAME

Yuanchu Technology (Beijing) CO., Ltd.

## HQ LOCATION

Beijing, China

## FOUNDED

2014

## NUMBER OF EMPLOYEES

11 - 50

## TRL 6

## SELLING CREDITS

No

## PHYSICAL PRODUCTS

Building Materials, Other

## XPRIZE TRACK

ROCKS

## CDR PATHWAY(S)

Rocks - Mineralization of mine or industrial waste

# FUNDRAISING DETAILS

## COMMERCIAL STAGE

Early Commercial Demonstration

## CURRENT INVESTMENT STAGE

Prefer not to share

## AMOUNT OF CAPITAL SOUGHT

Prefer not to share

## REVENUE RANGE

Prefer not to share

## CAPITAL RAISED TO DATE

Prefer not to share

## TYPE OF CAPITAL SOUGHT

Prefer not to share

## TYPE OF INVESTOR SOUGHT

Prefer not to share

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# YUANCHU

## COMPANY DESCRIPTION

Yuanchu, is a leading start-up dedicated to developing disruptive direct air mineralization (DAM) technology for removing CO<sub>2</sub> from air and permanently sequestering it into solid carbonated material at gigatonne scale. The cost of our demo project is lower than \$200/t CO<sub>2</sub>(<300kwh/tCO<sub>2</sub> electricity) and the mineralization products keep stable for 1000 years. The estimated cost of megatonne is lower than \$100/ tCO<sub>2</sub> with 150 kwh/tCO<sub>2</sub>.

## CORE INNOVATION

There are four main differentials with our technology:

1. Capture and sequestration of carbon dioxide are completed in one step;
2. High reaction efficiency(>90%);
3. Low energy consumption, less than 300 kwh/t CO<sub>2</sub>;
4. Low capital cost, less than \$100 per tonne CO<sub>2</sub> when scaling up to the megatonne level or gigatonne level.

## CO<sub>2</sub> CAPTURE

The CO<sub>2</sub> in the air flows into the YAM mineralization reactor and reacts with Ca<sup>2+</sup> from the feedstock (natural minerals, industry waste) to directly form calcium carbonate. It combines the carbon capture and mineralization into one step, which significantly reduces the CapEx and OpEx.

## CO<sub>2</sub> SEQUESTRATION

Calcium carbonate, as the main reaction product, is the most stable chemical form of carbon and can stably sequester carbon dioxide for over thousands of years.

## CO-BENEFITS OR PRODUCTS

We are utilizing the calcium resource from either industrial waste or natural ores. Once we use the industrial waste as the feedstock to form carbonates, it can be used as mine fillers, bulk building materials aggregates or road materials, forming a circular economy to recycle industrial waste materials.

## LEADERSHIP TEAM

Wei Wei (Founder) has MS in Environmental Engineering from University of Texas at Austin, and MBA from the University of Southern California. He Won the EY Entrepreneur of The Year 2016 China. Dr. Qi Wang (CTO) earned PhD degree in Chemical Engineering from University of Texas at Austin. He is also the President of US-China Green Energy Council (Silicon Valley). Guoqiang Jiang (Chief Scientist) is an associate professor of Chemical Engineering department of Tsinghua University.

