

20
22

CIRCULAR CARBON MARKET REPORT

2022 Research Results



Circular Carbon Network
AN XPRIZE INITIATIVE

WE GRATEFULLY ACKNOWLEDGE THE CONTRIBUTIONS OF ALL THOSE WHO MADE THIS REPORT POSSIBLE:

The Circular Carbon Network Team

Ongeleigh Underwood Director, Circular Carbon Network – Author
Henry Lewis Data Analyst, Circular Carbon Network – Analysis
Kevin Biehl Lead Fellow, Circular Carbon Network – Research
Finnie Zhao Fellow, Circular Carbon Network – Research
Aryan Kothari Fellow, Circular Carbon Network – Research

Leadership

Nicholas Eisenberger Founder, Circular Carbon Network – Advisor
Nikki Batchelor XPRIZE – Editor
Marcus Extavour XPRIZE – Editor

Index Design Reviewers

Many market participants have provided us invaluable feedback on the design of the data indexes in 2019 that form the basis of this report. Stand out contributors include: **Maurice Benning** (Shell Ventures), **Temple Fennell** (Clean Energy Ventures), **Julio Friedmann** (Columbia Center On Global Energy Policy), **Richard Jackson** (Oxy Ventures), **Richard Kauffman** (Generate Capital), **Gabriel Kra** (Prelude Ventures), **Daniel Matross** (CREO Syndicate), **Dan Miller** (Roda Group), **Adam Rein** (MissionPoint Capital), and **Johanna Wolfson** and **Matthew Nordan** (PRIME Impact Fund).

Our Sponsors

This report was funded through the generous support of our sponsors:



ABOUT THE CIRCULAR CARBON NETWORK

The Circular Carbon Network (CCN) is a nonprofit initiative of XPRIZE, catalyzing and tracking investment and commercial activity in this important emerging sector. CCN's goal is to help accelerate the sector's growth and realize its full economic and climate potential. We gather detailed information about and from the leading players in the emerging Circular Carbon economy in a series of living data indexes.

Through our data, we catalyze action by helping:

- › Investors find Circular Carbon companies that fit their thesis
- › Entrepreneurs feature their company to an investor audience
- › Corporates identify potential startup innovation partners
- › Inspire collaboration between catalysts organizations and innovators

WE BELIEVE THIS IS THE MOST COMPREHENSIVE COLLECTION OF MARKET DATA ABOUT THIS CRITICALLY IMPORTANT EMERGING SECTOR AVAILABLE ANYWHERE.

TABLE OF CONTENTS

05

Introduction

06	Overview
07	CCN Indexes
09	Data Collection and Analysis Methodology

12

Sector Dynamics

13	How many companies reported to the index in 2022? Where are they?
15	How is the sector segmented?
17	How much self-reported capital was raised in 2022?
18	What is the technological maturity of these companies?
19	How many companies make physical products? What kind?
20	What are the most targeted industry customers?
21	What do catalyst organizations tell us about the sector?

23

Innovator Guide to Investment Trends

24	What is the competitive landscape within my solution type? What do those deals look like?
25	What types of capital are companies taking on? How many are self-funded?
26	What are the average valuations reported for each solution category? What about round sizes?
27	Which solution types have the most deals? What is the most common deal stage?
28	How many investors are moving into this space in 2022?
29	What is the most sought-after type of capital?

30

Investor Guide to CCN Index Capital Trends

31	What are the total investment opportunities available in 2022 within the indexes? In what round sizes?
33	How much revenue are Circular Carbon companies generating?
34	What commercial stages are companies in?
35	What is the reported revenue per solution type? How many are pre-revenue?
36	What are the valuation trends to pay attention to?
37	What type of investors are the most active in Circular Carbon?
38	What are other commercial needs of innovators?



INTRODUCTION

OVERVIEW

The sector that we cover in the CCN indexes is defined by the term **Circular Carbon**, a vertical we break down to three main categories: **CO₂ Removal**, **CO₂ Conversion**, and **Point Source Capture**. We have an additional category, **Circular Carbon Market Infrastructure (CCMI)**, which is a new category of companies that directly support Circular Carbon solutions, such as project developers and verifiers.

It is important to highlight that we do not cover emission reduction or mitigation solutions, renewable energy, electric vehicles, renewable energy, or electric vehicles and batteries. Therefore, this report represents a view into a highly focused emergent market, one that can sometimes become engulfed within the larger “climatetech” and “carbon” narratives of other market reports and analyses.

The overall purpose of the Circular Carbon Market Report is to share an analysis of our data in a way that gives more context, character, and depth to this emergent ecosystem, increases overall interest and understanding in the sector, and facilitates informed action between innovators and capital providers.

CO₂ Removal:

approaches that remove carbon dioxide (CO₂) from the atmosphere.

- **Land Based** - Soil sequestration, biomass storage, a/reforestation.
- **Ocean Based** - algae, kelp, alkalinity, electrochemical, downwelling, deep sea storage.
- **Mineralization** - Ex Situ and In Situ.
- **Engineered Direct Air Capture**

CO₂ Conversion:

technologies that convert captured carbon oxides into economically valuable products such as chemicals, fuels, building materials, plastics, and bioproducts.

Process Types:

- Biological
- Electrochemical
- Thermochemical
- Mineralization
- Photochemical

Point Source Capture:

technologies allowing a large emissions source to capture and divert CO₂, preventing it from being emitted into the atmosphere.

Circular Carbon Market Infrastructure:

approaches that provide essential and direct support to Circular Carbon companies and the Circular Carbon marketplace.

CCN INDEXES

INNOVATOR INDEX

Number of Companies

699

Countries Represented

55

Reported Capital Raised Over Time

\$5.77B

We analyze innovators working in Circular Carbon using several criteria. First and foremost, the solution must be a Circular Carbon one—classified as either CO₂ Conversion, Point Source Capture, CO₂ Removal, or Market Infrastructure.

From there, we look for companies that are engaged at minimum in the pilot phase of their project, which can mean they have an active demonstration operating or in progress, or have secured seed or pre-seed funding. We then solicit key details about these companies and their status, pathways, and needs.

DEAL HUB

Deals Tracked in 2022

175

Total Investment Opportunities in 2022

\$2.47B

The Deal Hub is designed specifically to address the needs of capital providers. It features investor-relevant information about live investment opportunities. We seek to increase deal flow by maintaining this list of active investment opportunities, accessed by accredited and approved investor members. Only approved companies that are in the Innovator Index participate in the Deal Hub.

Deals represented here are those that had an expected closing date in 2022, or in the final month of 2021. Since the purpose of the Deal Hub is to put investment opportunities in front of accredited investors, we do not track the closing amount, actual closing date, or final investor types. Still, an analysis of the opportunities available over a given year provides an interesting angle on the robustness and overall health of this sector.

CCN INDEXES

CAPITAL INDEX

Number of Firms

256

Countries Represented

20

The CCN Capital Index tracks capital providers who are currently active or interested in Circular Carbon investment opportunities. By tracking a broad range of data about the investment profiles, preferences, and performance of capital providers active or interested in the sector, we aim to accelerate and increase the flow of capital into the Circular Carbon economy. Specifically, the Capital Index is designed to help:

- ▶ Investors build syndicates and identify potential co-investors across stages
- ▶ Investors identify potential sources of follow-on capital
- ▶ Limited Partners find active funds in the carbon sector
- ▶ Entrepreneurs find potential sources of capital across asset classes (e.g., equity, project finance, grants, etc.)
- ▶ Strategic corporate VCs identify institutional investors to collaborate with

The data for the Capital Index was compiled from a mix of direct responses by capital providers to a structured questionnaire and a review of publicly available information by our research team.

CATALYST INDEX

Number of Organizations

110

Countries Represented

9

Market catalysts can take many shapes and forms — from nonprofit advocacy organizations to industry associations. These actors both help stitch together critical supportive infrastructure, and bring a level of vision and mission that a new space needs to survive and thrive. The Catalyst Index is designed to help market participants of all

types better understand and access the services, expertise, resources, and support that the growing number of enabling organizations in and around the Circular Carbon sector offer. We report here on over 100 organizations that play a significant role in supporting the growth of the sector.

DATA COLLECTION AND ANALYSIS METHODOLOGY

ORIGIN AND EVOLUTION OF THE INDEXES

While the CCN databases were originally built in 2019 with a focus on Carbon Capture and Utilization during the NRG COSIA Carbon XPRIZE, we have expanded our focus to include CO₂ Removal since the launch of the XPRIZE Carbon Removal in 2021. This report includes data on the 287 qualified competitors from the [Milestone Round of the XPRIZE Carbon Removal](#) conducted in 2022. As part of this expansion, some of the data taxonomy has been updated including adding new CO₂Removal pathways, product categories, process types, and more. We believe this expanded effort provides a uniquely detailed resource to the marketplace.

COLLECTION METHODS

The report represents the data collected through the Circular Carbon Network by multiple methods.

- 01** Data is self-reported by market participants through surveys in response to our direct outreach, and that information is reviewed and approved by our data team for index fit. Once submitted, this self-reported data is not altered by our team.
- 02** We perform internal quantitative and qualitative research from publicly available information on innovators, deals, and capital providers. This data is added to the index directly by our team.
- 03** We work with other catalytic partners in a cross-sharing of market data for our targeted outreach.

DATA COLLECTION AND ANALYSIS METHODOLOGY

LIMITATIONS

We also recognize the limitations of our analysis. While we have supplemented self-reported data with publicly available research where possible, undoubtedly, not every company active in the space is included. There are also analytical approaches to consider when reading through the data, including:

- **Data Coverage:** Since not all questions are completed by each innovator, there is a coverage gap for each analysis point. When applicable, we display this number with the respective chart as “Data Coverage %”.
- **Multiple Category:** Over 200 of the index respondents chose to select more than one solution type (i.e., Point Source Capture and CO₂ Conversion). Where we use solution type to classify the context of another data point, we represent that data point within both of the categories that the innovator selected. We believe this provides a more accurate representation of each of the sector verticals.
- **Deal Context:** We currently have two ways of classifying capital movement: one as a question of “How much capital have you raised to date,” taking into consideration any capital raised at any time prior to filling out the survey; and the other as “total investment opportunities” listed as a deal for visibility to a capital audience. Neither of these data points cover confirmed capital raised within a given time frame.

Please note that while we endeavor to make the information up to date and verifiable, we cannot and do not guarantee the accuracy, quality or reliability of any of this information due to its self-reported nature. The information contained in this report is for informational purposes only and is not intended to be, nor should it be construed or used as, investment, tax, or legal advice. CCN does not provide services as an investment advisor, investment analysis, broker-dealer, market-maker, investment banker, or underwriter.

The Circular Carbon Network is not a commercial data research service, but a market catalytic, nonprofit initiative that relies on collaboration, data sharing, and direct outreach and surveys to improve the depth and richness of our indexes.

DATA COLLECTION AND ANALYSIS METHODOLOGY

INDUSTRY BENCHMARK

Currently there is no existing benchmark of the number of innovators working within the Circular Carbon space. Instead, we stand by our own research method as a gauge of the size of the sector. One of our data collection methods is a quarterly review of other published lists that inform us of companies outside our database. This year alone, we inspected over 15 prominent lists* which led to sending outreach to over 950 companies that we identified as high potential to fit within our criteria. Taking into account a margin of error

for index fit and using our outreach response rate as a baseline, we estimate that our indexes represent roughly 60% of all innovators working directly in Circular Carbon.

Combined with the fact that over half (65%) of CCN innovators report having between one and 10 employees, we conclude that this data represents the most comprehensive collection of early-stage innovators working in this sector.

WE HOPE YOU FIND THIS DATA AND OUR ANALYSIS, SUMMARIZED IN THIS REPORT, TO BE USEFUL.

*Climate Tech VC, Freeing Energy, Lowercarbon Capital Portfolio, Diamond A List, C2V Initiative Cohort 1 Applicants, Climatescape, Carbon Plan - Carbon Removal Projects Index, AirMiners, Europe Clean Tech Start Up, Reuters Carbontech Breakdown, Third Derivative, Chan Zuckerberg CDR Grantees, PitchBook Climatetech Deck, Carbon Removers, Carbon Capture Coalition participants



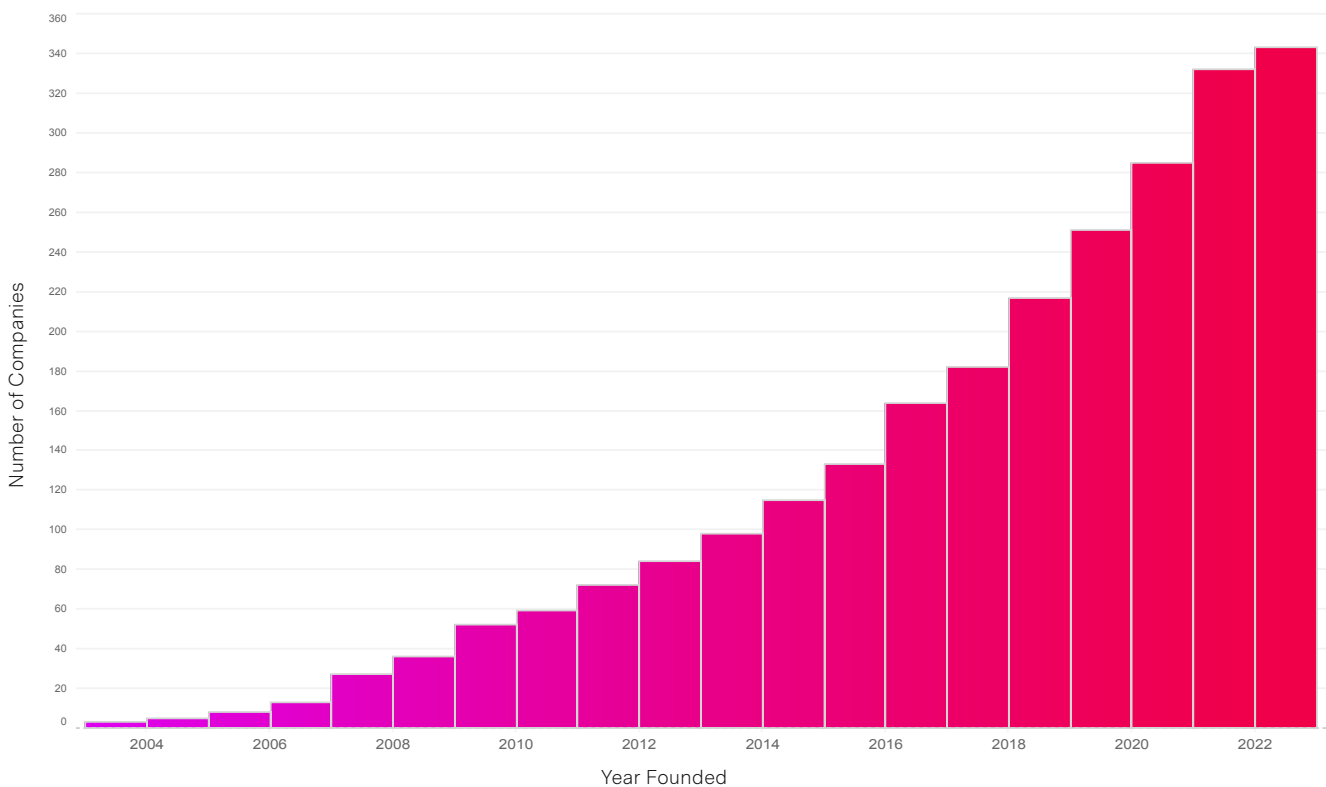
SECTOR DYNAMICS

HOW MANY COMPANIES REPORTED TO THE INDEX IN 2022? WHERE ARE THEY?

Over the past year, we have added to the index over 300 innovators that represent the full spectrum of growth stages—from pre-pilot to mature. Roughly 26% of companies have been established in the past 36 months (since 2020). Taking into account that we expect to uncover

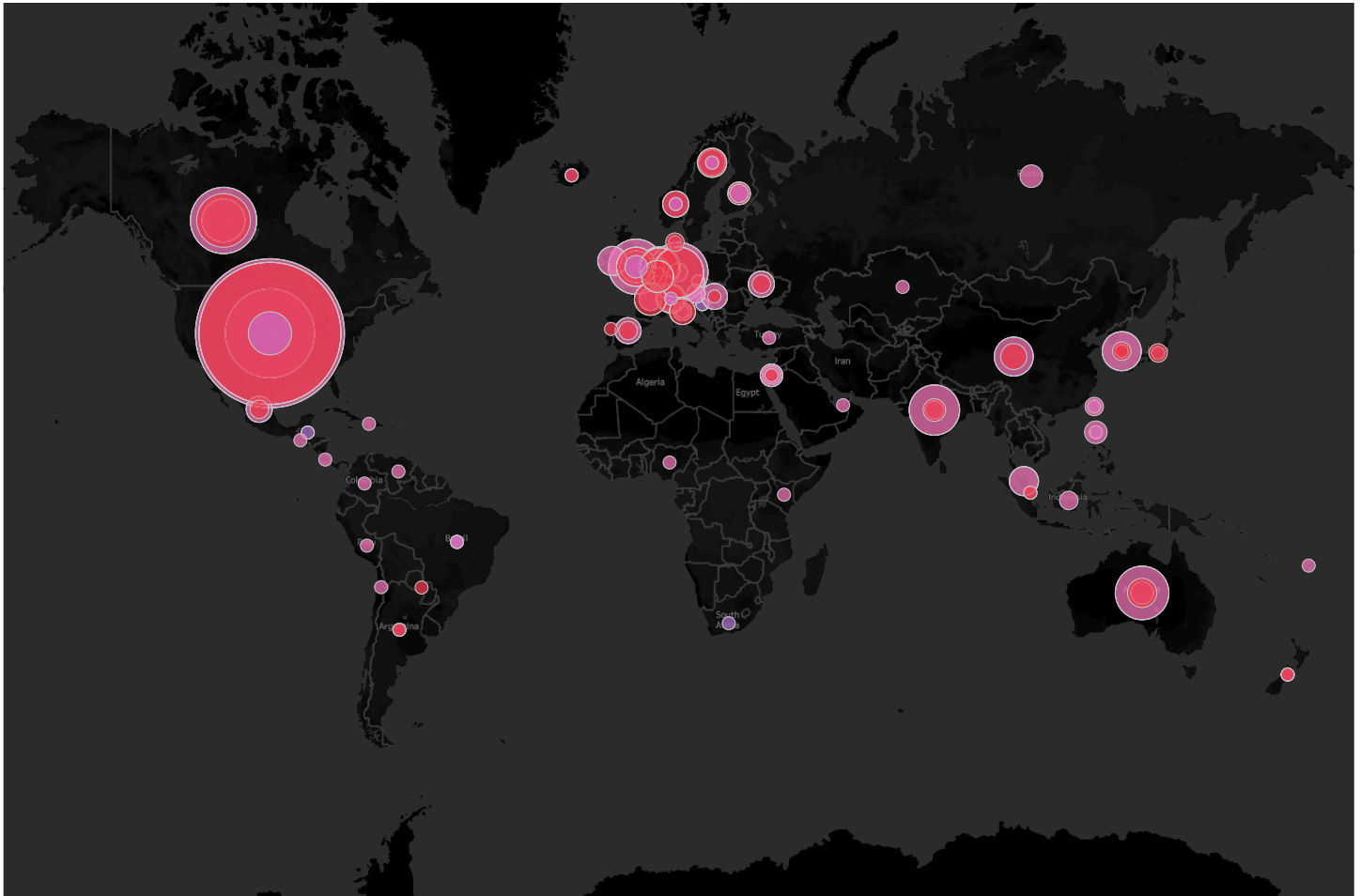
even more innovators whose companies were founded over that same time period, we see a clear upward trend of company formation in the Circular Carbon space. It is also important to remember that 39% were established prior to 2015, pointing to a significant cohort of more mature companies.

INDEX ADDITIONS BY FOUNDING YEAR:



*51% Data Coverage

HOW MANY COMPANIES REPORTED TO THE INDEX IN 2022? WHERE ARE THEY?



Global Circular Carbon Solution Types ■ CCMI ■ CO₂ Conversion ■ CO₂ Removal ■ Point Source Capture

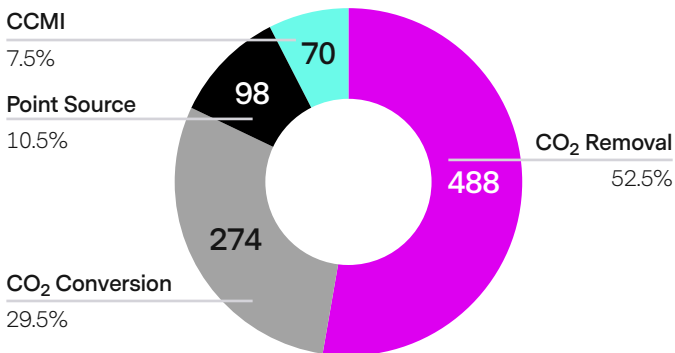
© 2023 Mapbox © OpenStreetMap

The number of countries represented in our Innovator Index increased to 55 (from 35 last year) with the additions coming from all over the globe—from Portugal to Fiji to Nigeria.

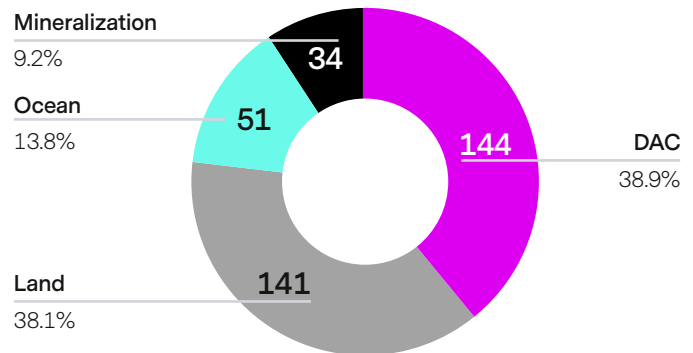
While we saw a big increase in South American companies, most of the index remains weighted toward innovators from North America and Europe, which is both a reflection of where there is significant startup activity, and where we have more on-the-ground market intelligence. We attribute this large jump in geographical representation to the considerable reach of the XPRIZE Carbon Removal, which has engaged with over 1,100 groups across 80 countries.

HOW IS THE SECTOR SEGMENTED?

SOLUTION TYPES



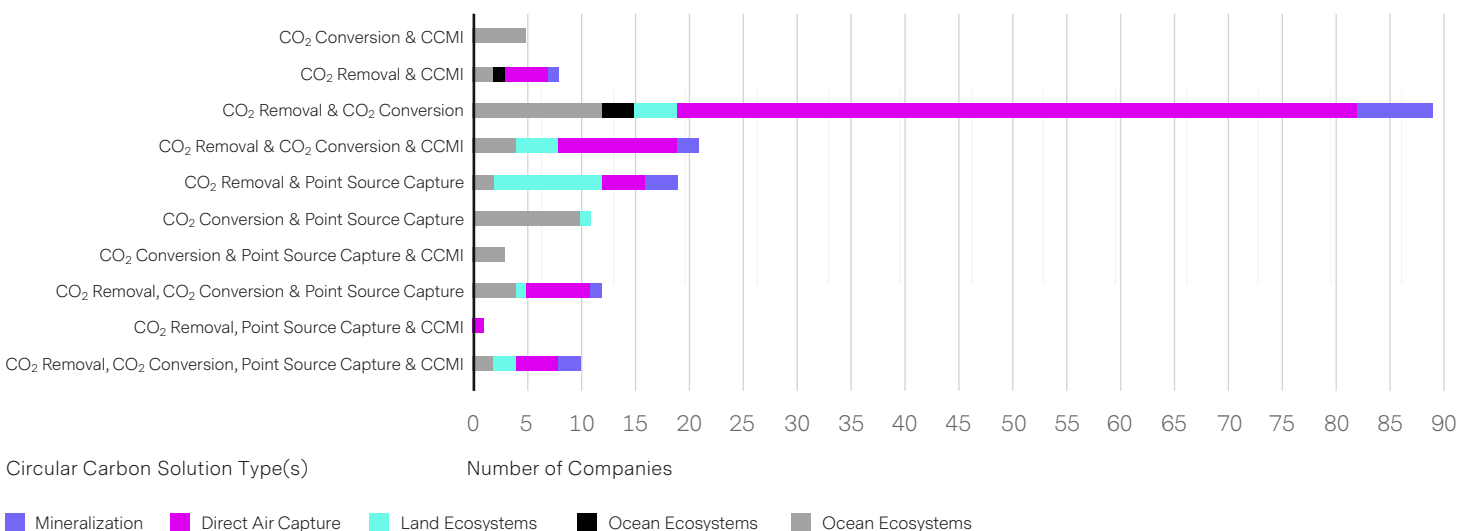
CO₂ REMOVAL TYPES



This year, we have updated our existing category solution options to include the pathways outlined in the XPRIZE Carbon Removal. While we continue to show a wide range of solution types, over half of innovators in the index are pursuing CO₂ Removal. Within that, we see Direct Air Capture (DAC) and Land Ecosystems as the most dominant.

Additionally, we observed 179 innovators that selected two or more solution types. CO₂ Removal + Conversion (132) is the most common Circular Carbon category combination that we noticed, with many companies planning to use DAC to extract CO₂ and convert it into products such as building materials, fibers, industrial chemicals, and more.

SOLUTION TYPE COMBINATIONS



HOW IS THE SECTOR SEGMENTED?

Among the CO₂ Removal-only companies, 28% indicated a combination of approaches. Land and Ocean Ecosystems are the most commonly combined categories, with 39 companies. Land Ecosystems solutions are the most commonly combined and offered overall, while DAC solutions stand alone the most often.

Land + Ocean + Mineralization

Inplanet, a Germany-based company, is developing a software platform to achieve a reduction in conventional chemicals and at the same time sequester CO₂ from the atmosphere through the use of enhanced rock weathering in tropical agriculture.

CROPS, a US-based innovator proposing the sequestering of crop residues to capture fossil fuel carbon through disposal in deep oceans below the thermocline or in river deltas.

Point Source + Removal

Carbfix, an Iceland-based company founded in 2007, developed the Carbfix mineral storage technology. It imitates and accelerates natural processes, where carbon dioxide is dissolved in water and interacts with reactive rock formations to form stable minerals and provide a permanent and safe carbon sink.

Conversion + Removal

Wakefield BioChar, headquartered in Valdosta, Georgia (US), is developing carbon-focused products that enhance soil health, replace carbon black and other polymer fillers, and change how post-industrial waste is managed. Additionally, for every ton of Wakefield biochar material manufactured, approximately 3 tons of CO₂ are removed from the atmosphere.

Whiterock AG, a German company, has developed HYDROGENATE, a technology to transform atmospheric CO₂ into a new carbon-negative resource: solid carbon with oxidation level 0 called Carbon Zero.

Direct Air Capture (DAC) + Mineralization

TerraFixing is a Canadian DAC company with a low-cost absorption technology. The working material zeolites physically absorb the CO₂ quickly, with very high CO₂ loadings in cold climates.

HOW MUCH CAPITAL HAS BEEN RAISED TO DATE? IN 2022?

The cumulative amount of capital raised to date by all companies listed on the Innovator Index is \$5.77B. This capital spans philanthropic to venture to founder funding. (For more on funding types, see Innovator Guide.) In terms of trends, we were able to track a significant increase in total capital raised to date since the last report, totaling an increase of \$2.69B.

It is important to note that these numbers are self-reported and are not easily verified. However, because of the sensitivity and visibility of the CCN indexes, we expect high reliability from companies whose intentions are to go through the rigorous process of raising capital.

Cumulative Capital Raised to Date

\$5.77B

2022 Reported Capital Raised to Date

\$2.69B

Weighted Average

\$20MM

*40% Data Coverage

WHAT IS THE TECHNOLOGICAL MATURITY OF THESE COMPANIES?

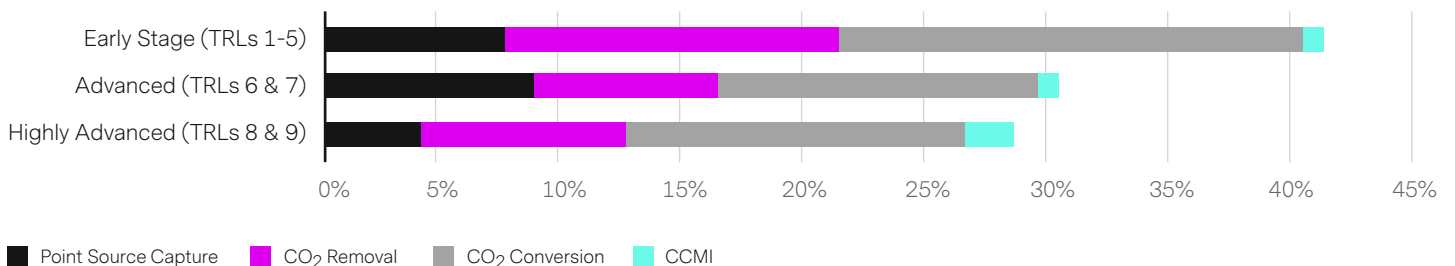
Each year that we analyze the index data, we see a significant increase in the number of companies reporting their [U.S. D.O.E Technology Readiness Levels \(TRL\)](#). Interestingly, however, TRL distribution in 2022 was essentially unchanged from 2021 and 2020.

As one might expect for a rapidly growing sector, 41% of the reporting companies classified themselves as early stage (TRL of 1-5).

However, even more (59%) classify themselves as somewhat advanced with a TRL of 6 or greater, and nearly half of those are highly advanced (TRL 8-9). With the important caveat that this data is self-reported, it suggests that the Circular Carbon market has a significant segment of companies that are already more technologically advanced than may be commonly assumed.

TECHNOLOGY READINESS LEVELS, BY SOLUTION TYPE

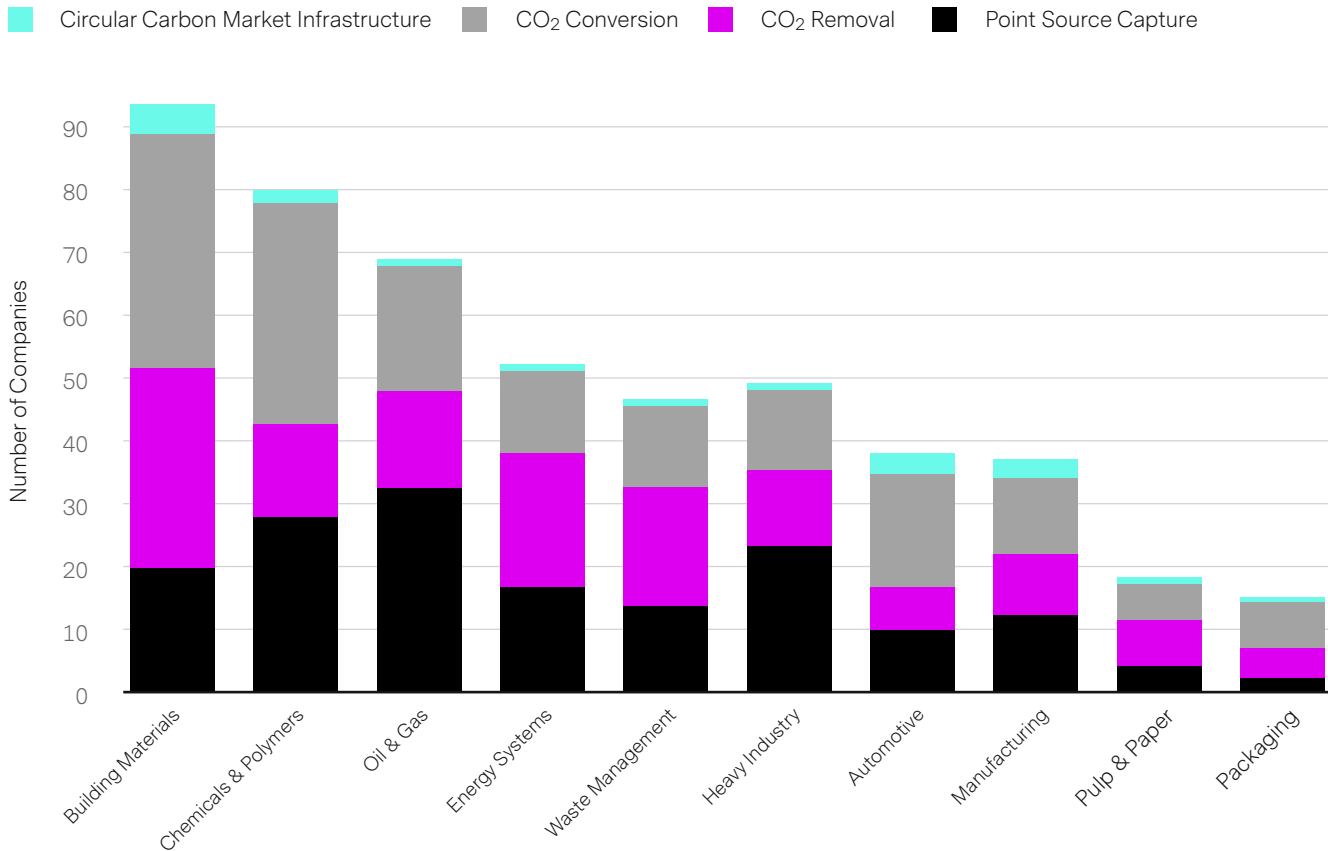
Estimated Technological Readiness Levels



*42% Data Coverage

HOW MANY COMPANIES MAKE PHYSICAL PRODUCTS? WHAT KIND?

TOP 10 PHYSICAL PRODUCTS MADE BY SOLUTION TYPE



*51% Data Coverage

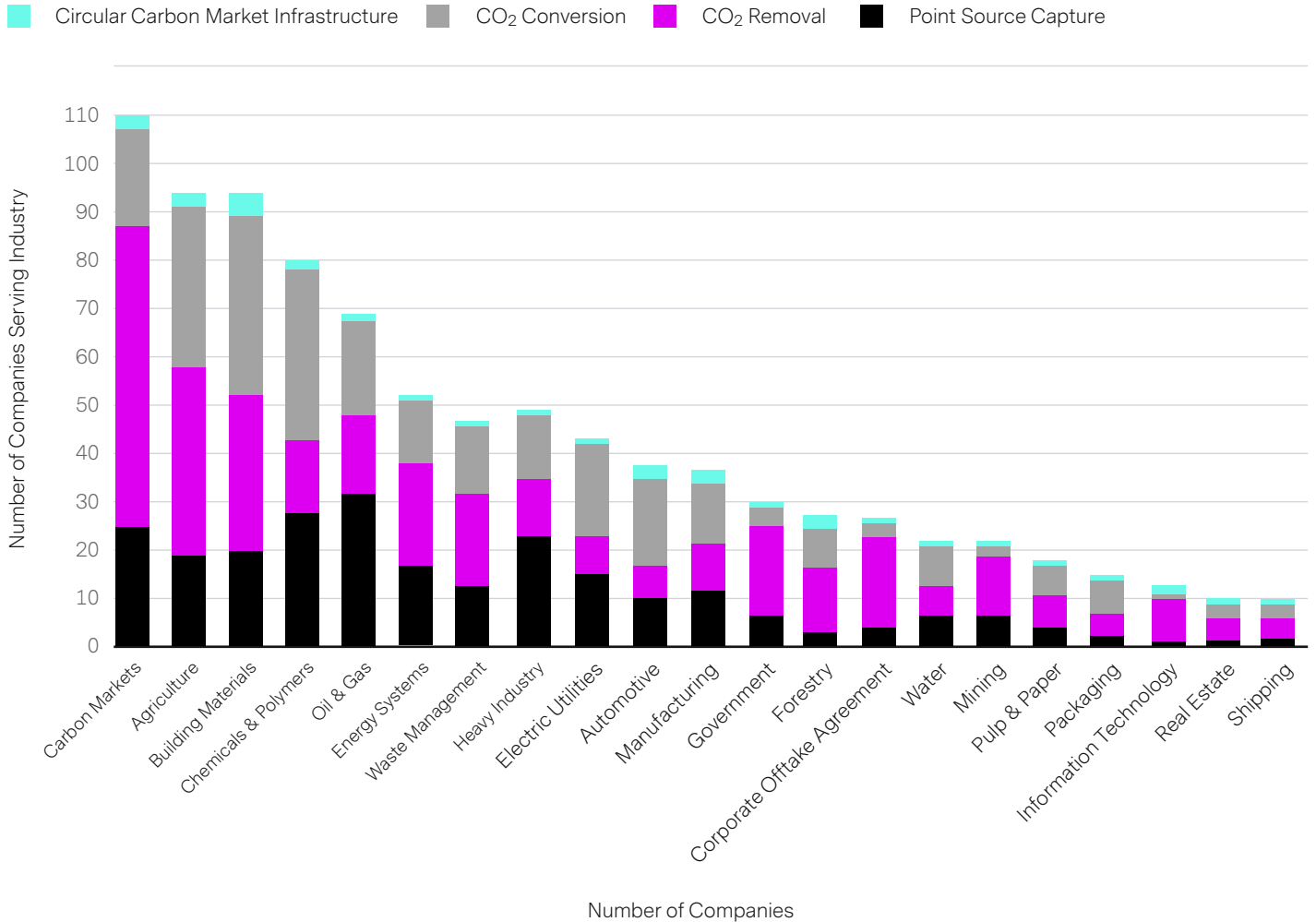
Over half of all companies (52%) within the index report make a physical product, either in combination with offset sales and tax incentives or as the single revenue driver.

The larger ranges of this data continue to align with hard-to-decarbonize- sectors such as Building

Materials, Industrial Chemicals, and Liquid Fuels being the most common product category types. The Industrial Gasses, Consumer Goods, and Biochar categories have more than doubled in size since 2021, potentially suggesting larger investment or demand for these categories.

WHAT ARE THE MOST TARGETED INDUSTRY CUSTOMERS?

TARGET CUSTOMER INDUSTRIES BY SOLUTION TYPE



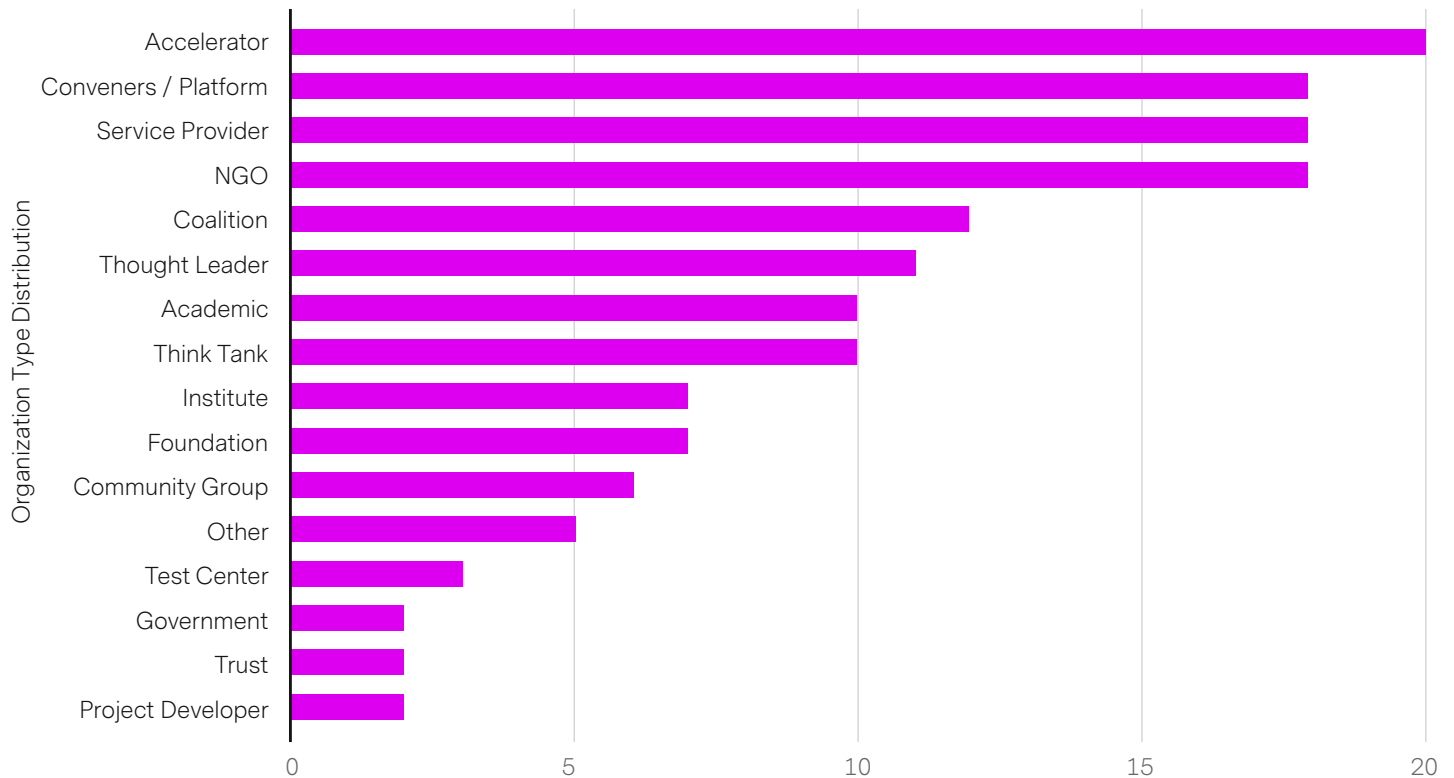
*41% Data Coverage

We survey companies about their target customer industry to further understand the potential customer bases of solution providers in the index. This year, companies targeting Carbon Markets as a revenue stream made a huge jump to the top of the list as target customers for Circular Carbon startups, increasing 160% in responses.

Agriculture and Chemical/Polymers represent the second and third largest target customers in 2022. Many categories at least doubled in size including Waste Management, Forestry, Aviation, Pulp & Paper, and Mining; they contribute to a growing dynamic of solution types being integrated across many diverse industry verticals.

WHAT DO CATALYST ORGANIZATIONS TELL US ABOUT THE SECTOR?

CATALYST TYPE



Last year, our data tracked a more even distribution of support organization types, with an upwards spike in organizations specifically focused on policy. This trend continues with organizations added in 2022, but with a significant leap in accelerators.

When we asked catalysts which organizations they seek to pair themselves with, the biggest spike we saw was in targeting innovators. This is an encouraging sign that there are both the innovators available and the organizations growing to support the transition from concept to pilot and growth stages.

WHAT DO CATALYST ORGANIZATIONS TELL US ABOUT THE SECTOR?

TOP 10 CORE SUPPORT ACTIVITIES



Since the core goal of the Catalyst Index is to help participants in the Circular Carbon economy find the specific types of support they need to advance their respective work, we track the type of core services or activities that each of the organizations undertake.

This year, we saw an increase in organizations focused on Technology Research and Development & Demonstration, and the number of Monitoring & Reporting-focused organizations have doubled since 2020. This is aligned with the industry demand for higher standardizations and monitoring across all Circular Carbon solutions.

CALL TO ACTION

- > [Submit Your Company and Deal to the Innovator Index](#)

- > [Explore the Innovator Index](#)

- > [Access the Deal Hub \(for Accredited Investors\)](#)

- > [Join Our Network](#)

- > [Contact Us](#)



INNOVATOR GUIDE TO INVESTMENT TRENDS

In addition to the above, this section is meant to inform innovator's fundraising strategy by offering benchmarks and trends. The analysis considers deal dynamics, segmented by funding and solution category, which can be useful in understanding the funding landscape for specific innovation types.

WHAT IS THE COMPETITIVE LANDSCAPE WITHIN MY SOLUTION TYPE? WHAT DO THOSE DEALS LOOK LIKE?

While the total value of deals posted to the Deal Hub with a closing date in 2022 was \$2.47B, below is a breakdown by solution type. The sum of deals across categories is greater than the number of deals listed due to companies with solutions spanning more than one category.

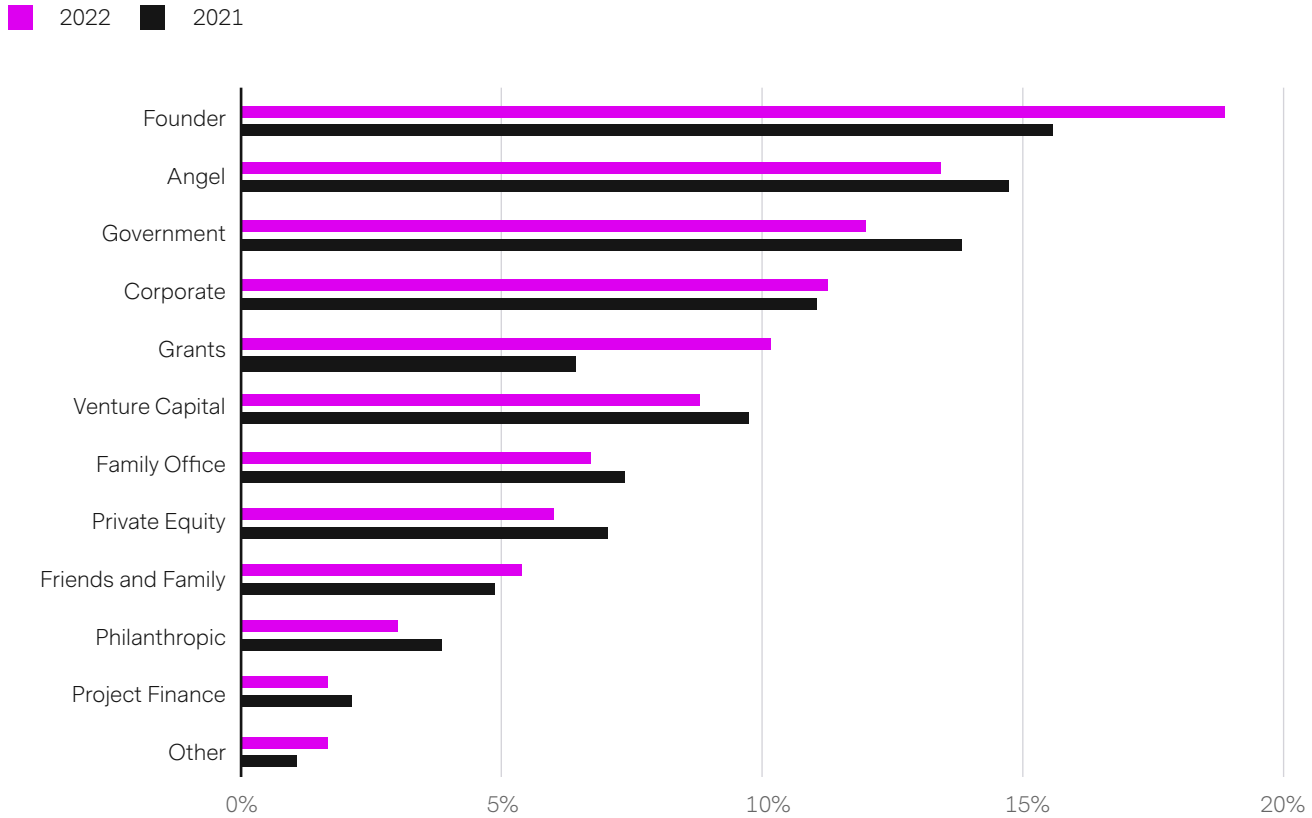
Solution Type	Number of Deals	Total Deal Value
Removal - DAC	44	\$1,190,312,000
Point Source Capture	36	\$747,158,000
Circular Carbon Market Infrastructure (CCMI)	8	\$509,547,000
CO ₂ Conversion	58	\$499,142,000
Removal - Land	29	\$265,046,000
Removal - Ocean	9	\$155,250,000
Removal - Mineralization	15	\$56,457,000

Within the 152 total companies actively raising money in 2022, we saw that DAC and CO₂ Conversion lead the way in number of active deals. Unsurprisingly, DAC topped the list of total amount of capital being raised. Market Infrastructure shows the highest deal value in the lowest number of deals. Ocean and Mineralization both have the lowest total value and number of deals available, indicating the earlier stage of innovation in these categories.

This data comes from two sources: companies in our index that are reporting open deals in the Deal Hub and publicly available deals across the carbontech and CO₂ removal sectors compiled by our internal research team. While we cannot claim to represent all available deals in 2022, we have covered a wide range through these efforts.

WHAT TYPES OF CAPITAL ARE COMPANIES TAKING ON? HOW MANY ARE SELF-FUNDED?

SOURCES OF CAPITAL



*40% Data Coverage

Capital sources continue to broaden in Circular Carbon, indicated by a more diverse mix of funding types. Specifically, Founder funding rose to the top (from No. 3 last year), and along with Grants, showed the greatest YoY growth. Overall, Founder capital represents 19% of all reported capital sources.

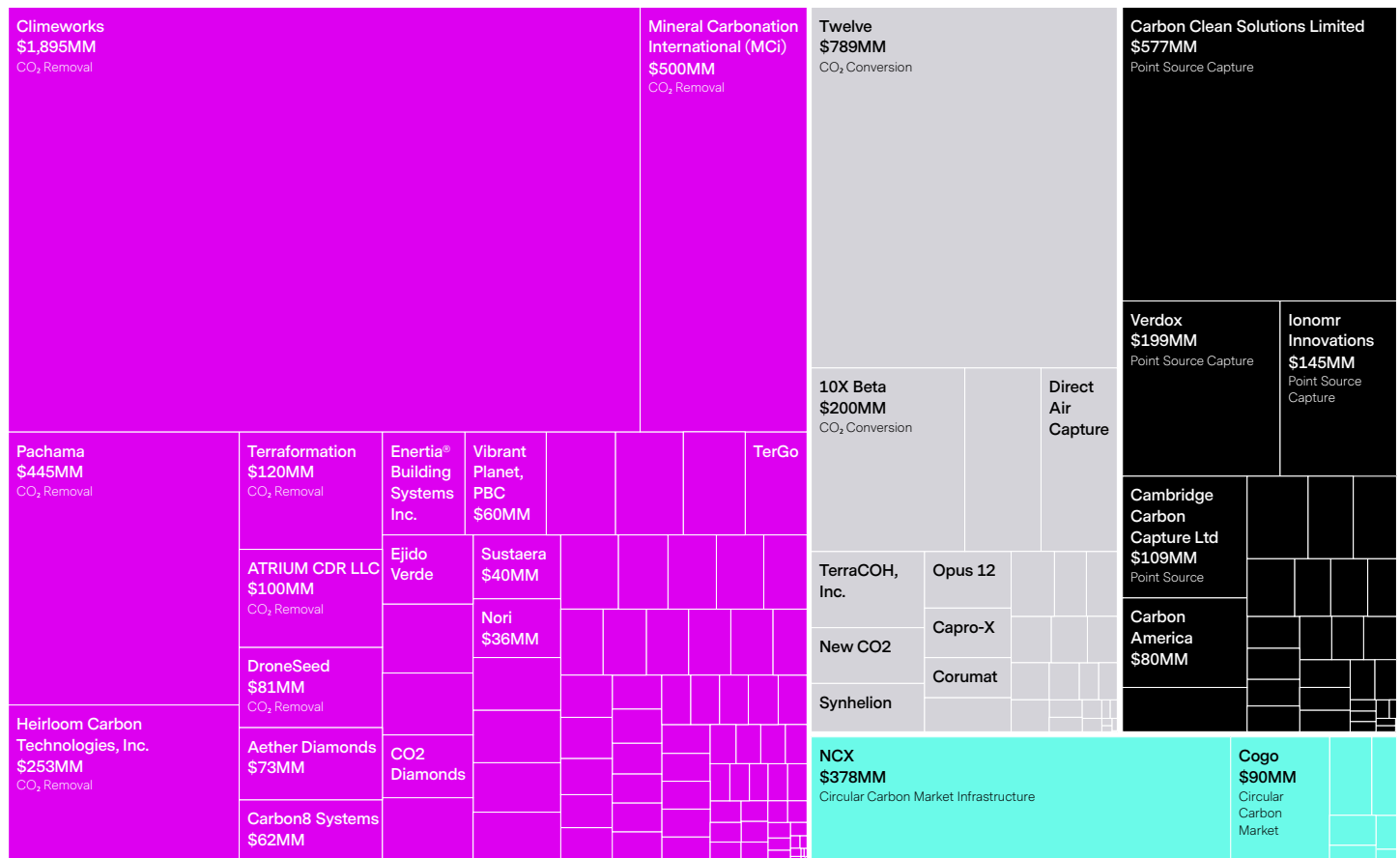
These are strong signs that companies are both gaining more confidence in the market for their solutions by pushing ahead with alternative capital and facing increasing competition for institutional capital.

WHAT ARE THE AVERAGE VALUATIONS REPORTED FOR EACH SOLUTION CATEGORY? WHAT ABOUT ROUND SIZES?

INNOVATOR VALUATIONS

Circular Carbon Solution Category

■ Circular Carbon Market Infrastructure
 ■ CO₂ Conversion
 ■ CO₂ Removal
 ■ Point Source Capture



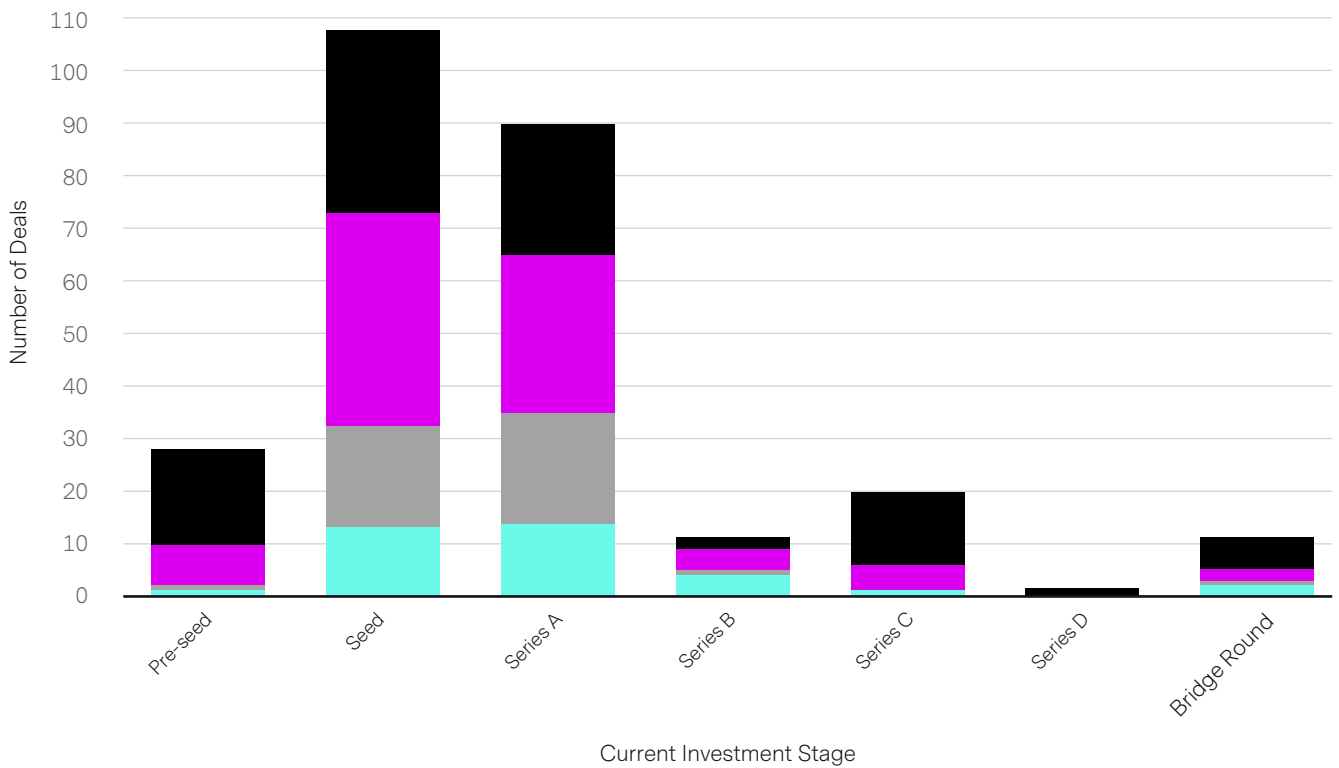
The total valuation for all the companies with a deal in the Deal Hub in 2022 is over \$7.36B. CO₂ Removal companies account for over half of these valuation numbers. This is a slight increase over

2021 valuations despite a year of high interest rates and cooling investment trends across the broader economy. Further, this figure is likely an understatement due to only 53% data coverage.

WHICH SOLUTION TYPES HAVE THE MOST DEALS? WHAT IS THE MOST COMMON DEAL STAGE?

INVESTMENT STAGE

■ Circular Carbon Market Infrastructure
 ■ CO₂ Conversion
 ■ CO₂ Removal
 ■ Point Source Capture



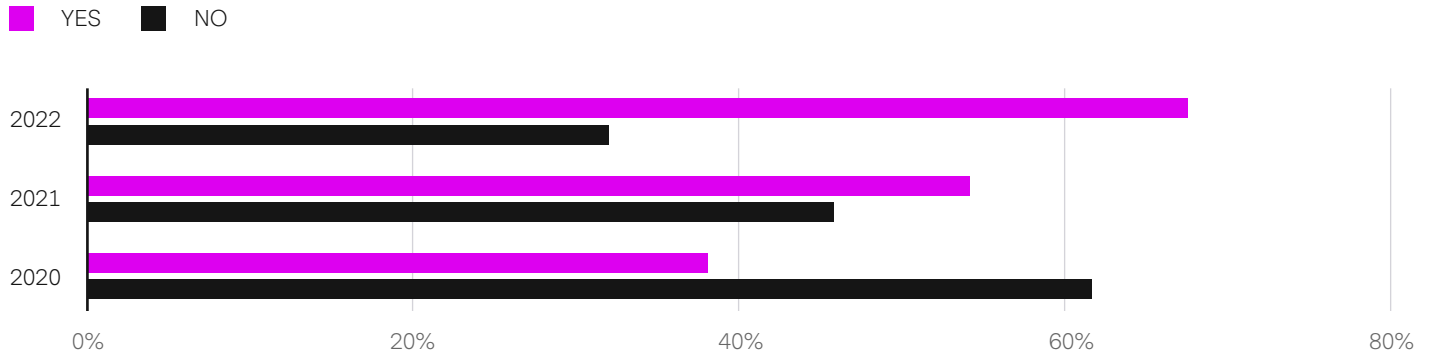
*98% Data Coverage

This year there was an even greater increase in the dollar amount of early-stage investment opportunities, with the large majority of those seeking Seed funding. All early-stage categories (Pre-Seed through Series A) represent 86% of the

Deal Hub, but we also saw an interestingly high number of Series A deals (13) for over \$10MM. Twelve percent of deals we track are later stage—Series B+ and including SPACs, Mezzanine and Bridge funding rounds.

HOW MANY INVESTORS ARE MOVING INTO THIS SPACE IN 2022?

PERCENT OF INVESTORS DEPLOYING CAPITAL

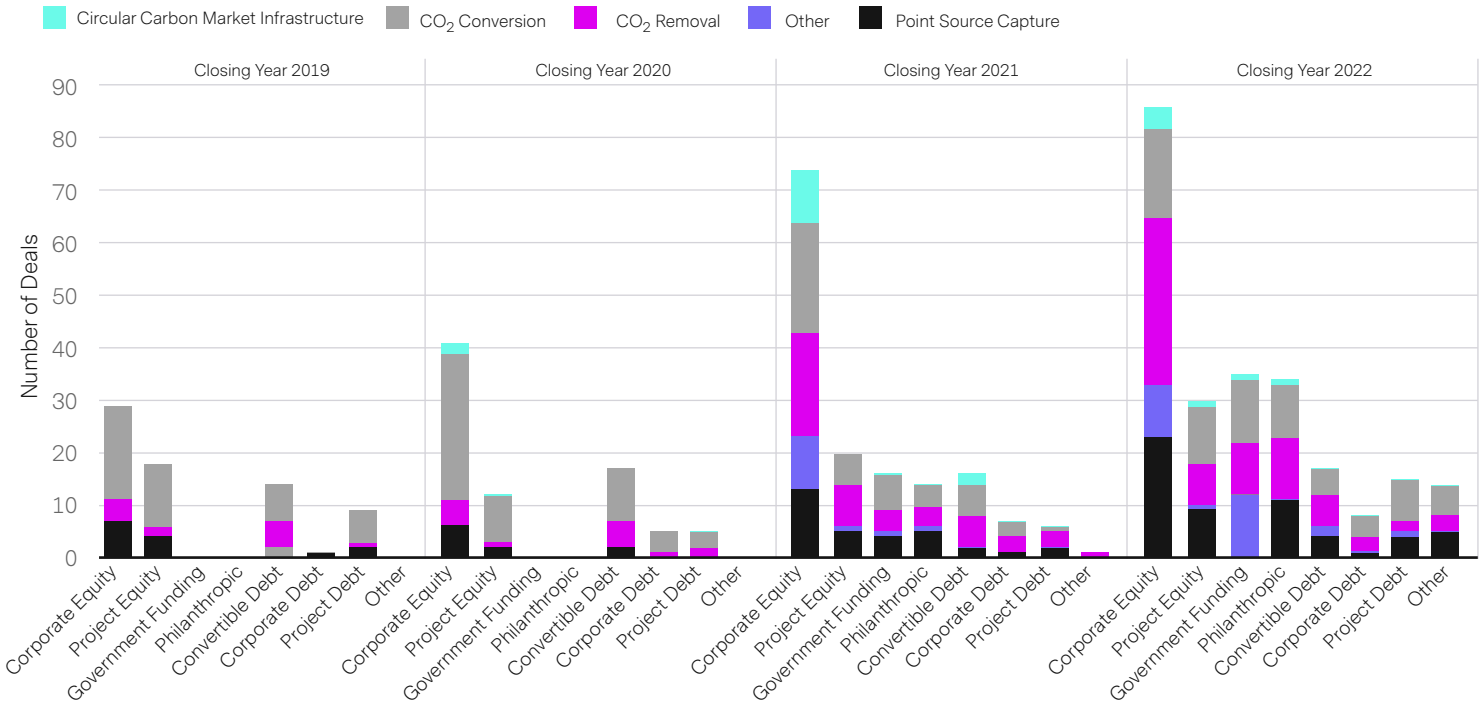


As our index tracks and collects data from investors that are both interested in and active in the Circular Carbon space, we are able to see trends in the deployment of capital into Circular Carbon. Since

we began collecting data in 2020, we see a positive trend toward increased investment, with almost double the percentage of investors we track deploying capital since 2020.

WHAT IS THE MOST SOUGHT-AFTER TYPE OF CAPITAL?

CAPITAL SOUGHT BY SOLUTION TYPE



*34% Data Coverage

We asked innovators which type of capital they are seeking and would therefore prefer. We continue to see a typical range of types of capital sought for an emerging sector, with Corporate Equity remaining the most common and growing its proportion from 2021. However, there is a noticeable increase in companies seeking Philanthropic funding, which when combined with Government funding, represents 26% of all capital sought.

The increase in Philanthropic and Government funding seems to represent a growing interest in non-commercial sources of capital.

CALL TO ACTION

- > [Submit Your Company and Deal to the Innovator Index](#)

- > [Access the Deal Hub](#)
(for Accredited Investors)

- > [Join Our Network](#)

- > [Contact Us](#)



INVESTOR GUIDE TO CCN INDEX CAPITAL TRENDS

In addition to the other sections in this report, this analysis is meant to showcase some of the trends we see over time within the Circular Carbon sector as it specifically relates to capital and commercialization dimensions.

Disclaimer | Data Accuracy: Please note that the information in this report is compiled from a variety of public and non-public sources, including self-reported data from the companies referenced on the site. While we endeavor to make the information up to date and verifiable, we cannot and do not guarantee the accuracy, quality, or reliability of any of this information. Please verify any and all data before using it for any purpose.

No Investment Advice: The information contained on this website is for informational purposes only and does not recommend the purchase or sale of any security, nor is it an offer to sell or a solicitation of an offer to buy any security. Furthermore, the information contained in this report is not intended to be, nor should it be construed or used as, investment, tax, or legal advice. CCN is not and does not provide services as an investment advisor, investment analyst, broker-dealer, market-maker, investment banker, or underwriter.

WHAT ARE THE TOTAL INVESTMENT OPPORTUNITIES AVAILABLE IN 2022 WITHIN THE INDEXES? IN WHAT ROUND SIZES?

Our Deal Hub tracked 152 companies looking for over \$2.47B in capital in 2022. CO₂ Removal companies are posting the most deals over time and currently have the greatest number of open deals as of the publishing of this report.

This data comes from two sources: innovators in our index that are reporting open deals in the Deal Hub and publicly available deals across the carbontech and carbon removal sectors compiled by our internal research team. While we cannot claim to represent all available deals in 2022, we have covered a wide range through these efforts.

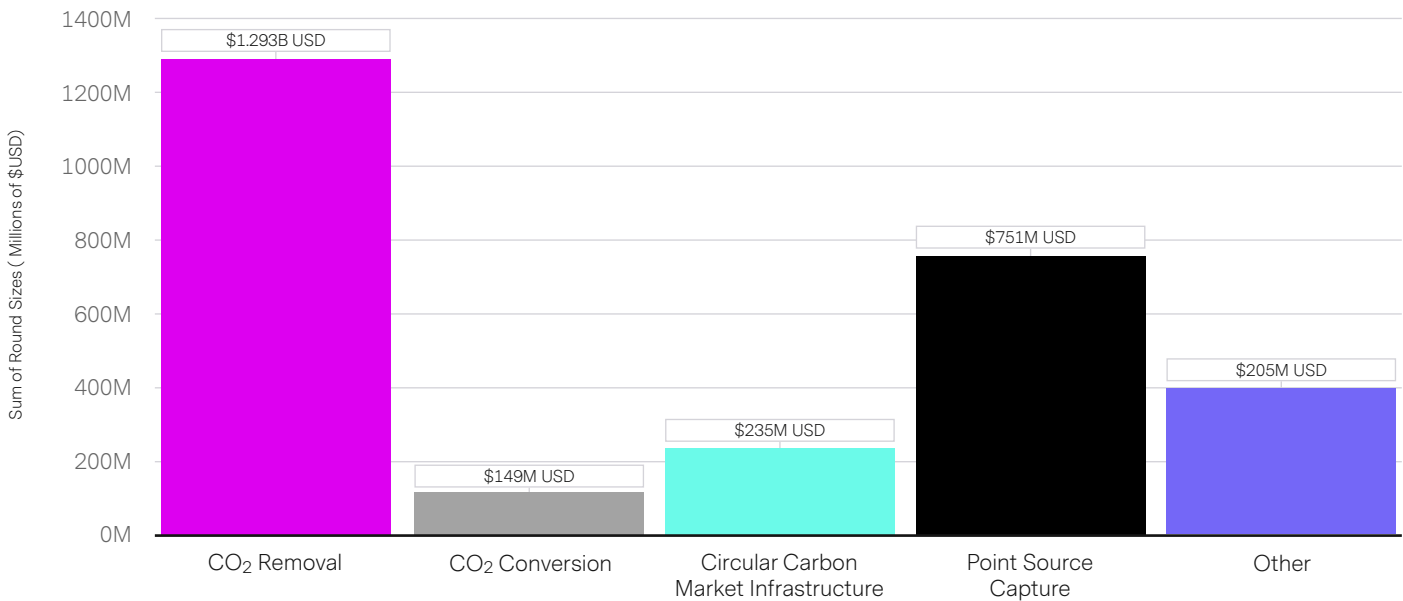
Total Available Deals in 2022

\$2.47B

Number of Companies

152

TOTAL DEAL VALUE BY SOLUTION TYPE





WHAT WERE THE TOTAL INVESTMENT OPPORTUNITIES IN 2022 ON THE DEAL HUB? IN WHAT ROUND SIZES?

In 2022, 43% of the deals we tracked were under \$2MM. We also report 13 deals seeking more than \$50MM. The rest land between \$2MM-\$49MM. This spread of available deals represents opportunities for a broad range of investor types. Overall, there is still an increasing pace and larger round sizes in the live investment opportunities we track.

ROUND SIZES



*92% Data Coverage

HOW MUCH REVENUE ARE CIRCULAR CARBON COMPANIES GENERATING?

TOTAL REPORTED REVENUE RANGE

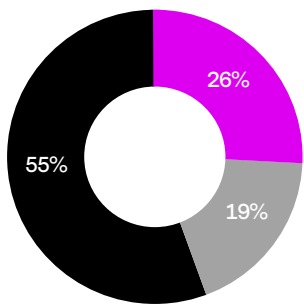
\$971MM - \$2.46B

When you break down the revenue range by founding year, there is a somewhat expected trendline of more revenue generation from older companies and less revenue generation from younger companies. However, it is interesting to note that over 30% of companies founded since 2020 are generating revenue, and 25% of companies (or initiatives of larger companies) founded prior to 2010 are still pre-revenue.

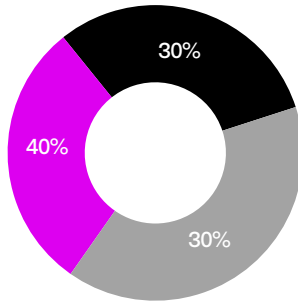
When this data is averaged over the entire index, over half of Circular Carbon companies are already generating revenue. Of those, half (30% overall) are generating over \$1MM. At the same time, 44% are pre-revenue. Remembering that our data is self-reported, this is a significant trend in considering the maturity and financial viability of this emerging sector.

REVENUE RANGES BY FOUNDING YEAR

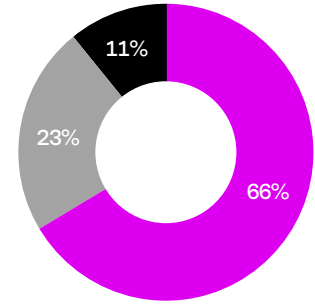
Founded Before 2010



Founded 2010 - 2019



Founded Since 2020

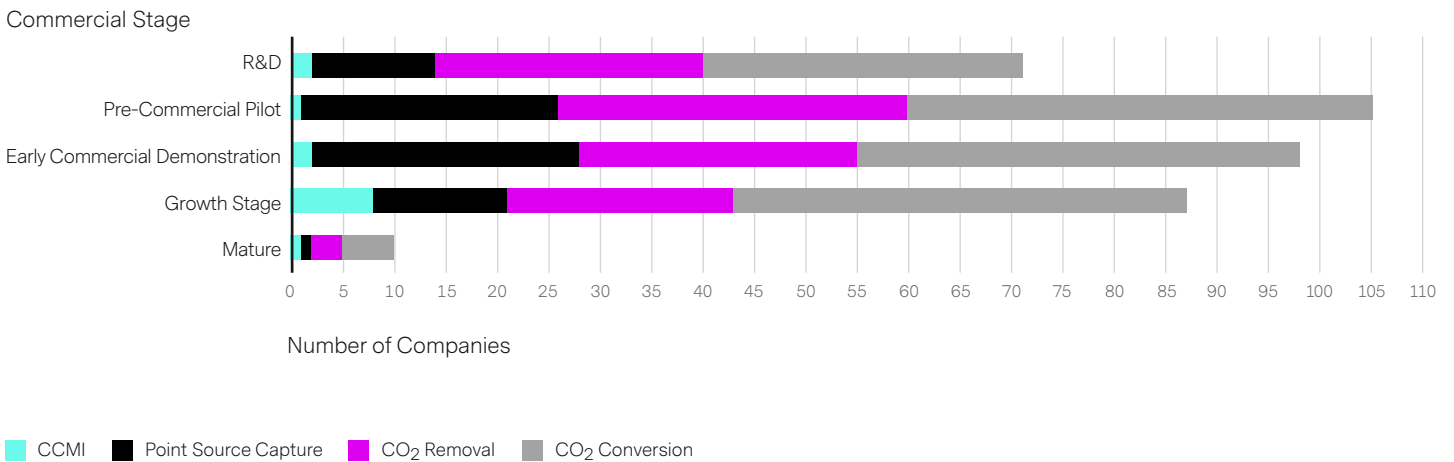


Generating Less than \$1M USD
 Generating More than \$1M USD
 Pre-Revenue

*42% Data Coverage

WHAT COMMERCIAL STAGES ARE COMPANIES IN?

COMMERCIAL STAGE PER SOLUTION TYPE



*43% Data Coverage

Currently, the most common commercial stage in the Innovator Index is the Pilot phase, with slightly fewer in the Commercial Demo stage. We see a modest year-over-year increase from companies in the R&D and Pilot phases, representative of both industry growth (more companies coming online) and a desire to fundraise by joining the Circular Carbon Network.

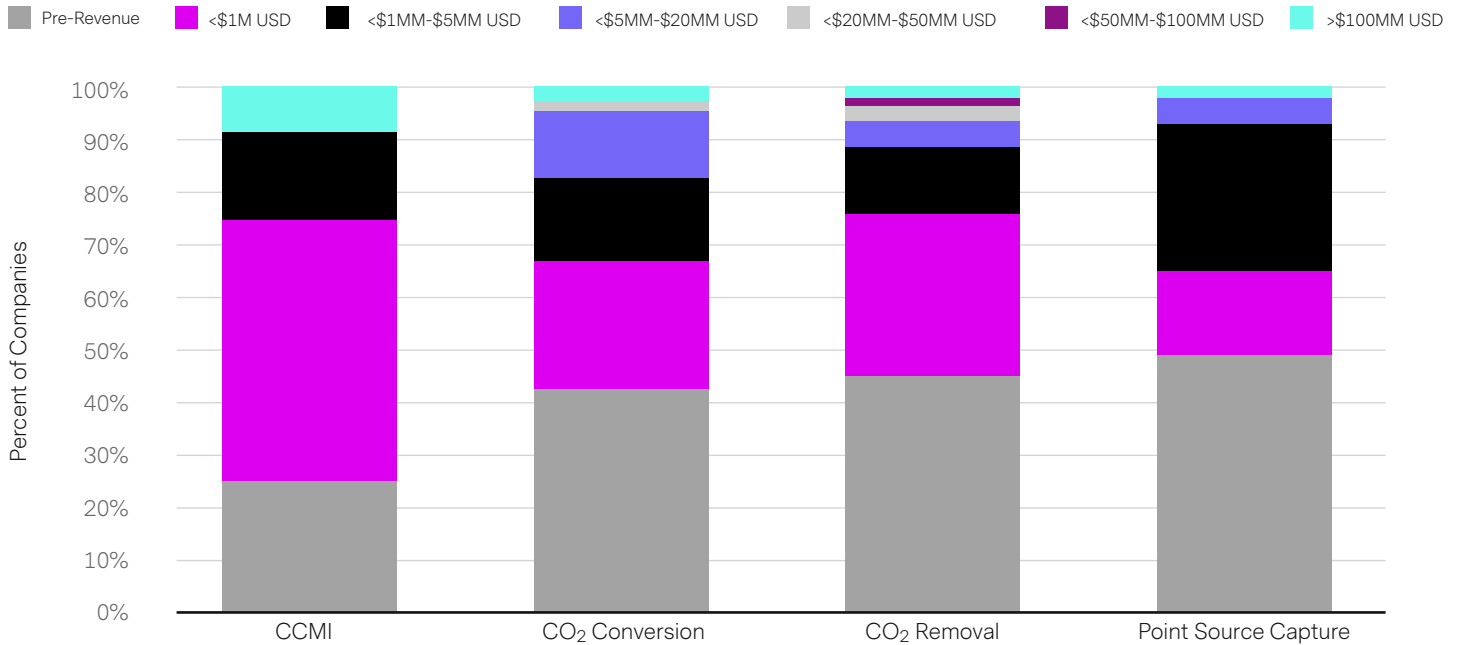
We also looked at the commercial stages over each of the solution types and found that they are relatively equally distributed, perhaps even slightly skewed toward later commercial stages; Demo, Growth, Mature stages combined represent 63%. This indicates a more mature cohort of companies than may be assumed of such a nascent sector.

WHAT IS THE REPORTED REVENUE PER SOLUTION TYPE? HOW MANY ARE PRE-REVENUE?

Every solution type of Circular Carbon, from Oceans to Mineralization to Point Source Capture, has an immensely different and dynamic set of costs, capital, and resources required. To understand more fully what the financial landscape of each solution type is, we looked at the revenue traction against each solution type.

REVENUE RANGE BY SOLUTION TYPE

Estimated Revenue Range



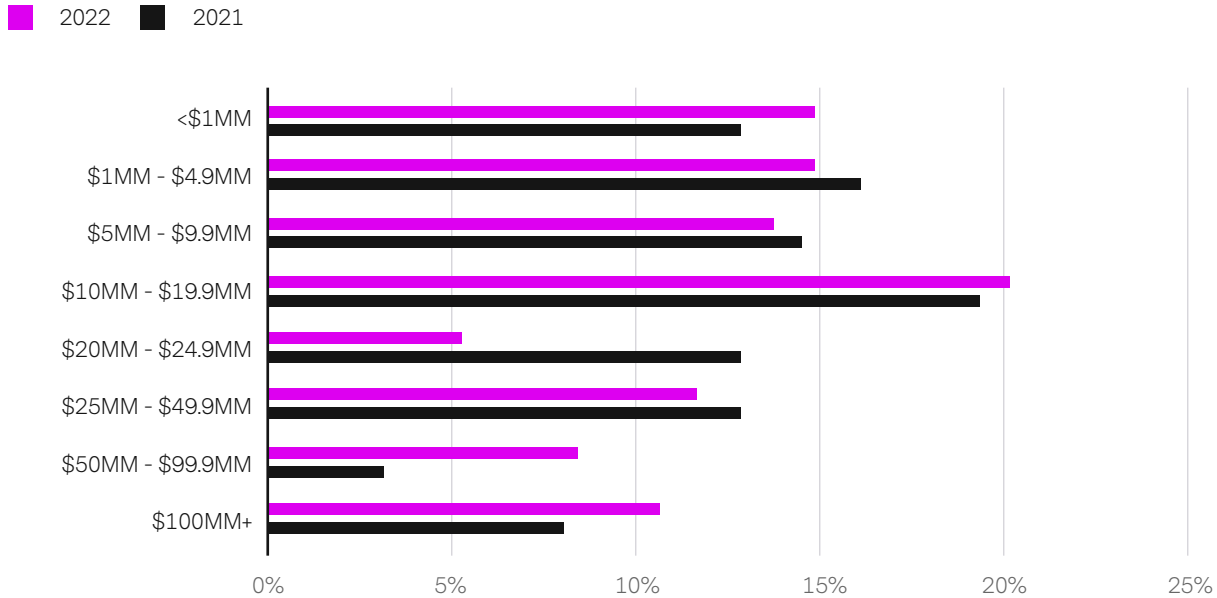
*40% Data Coverage

As revenue is reported in ranges (and because this data point is highly confidential), it is hard to pinpoint an exact number on revenue traction per solution type. Overall, Point Source and Removal solutions like Oceans or Mineralization

are showing the highest percentages of companies in the pre-revenue stage. The distribution of companies making over \$1MM is quite evenly distributed across solution types.

WHAT ARE THE VALUATION TRENDS TO PAY ATTENTION TO?

VALUATION RANGES



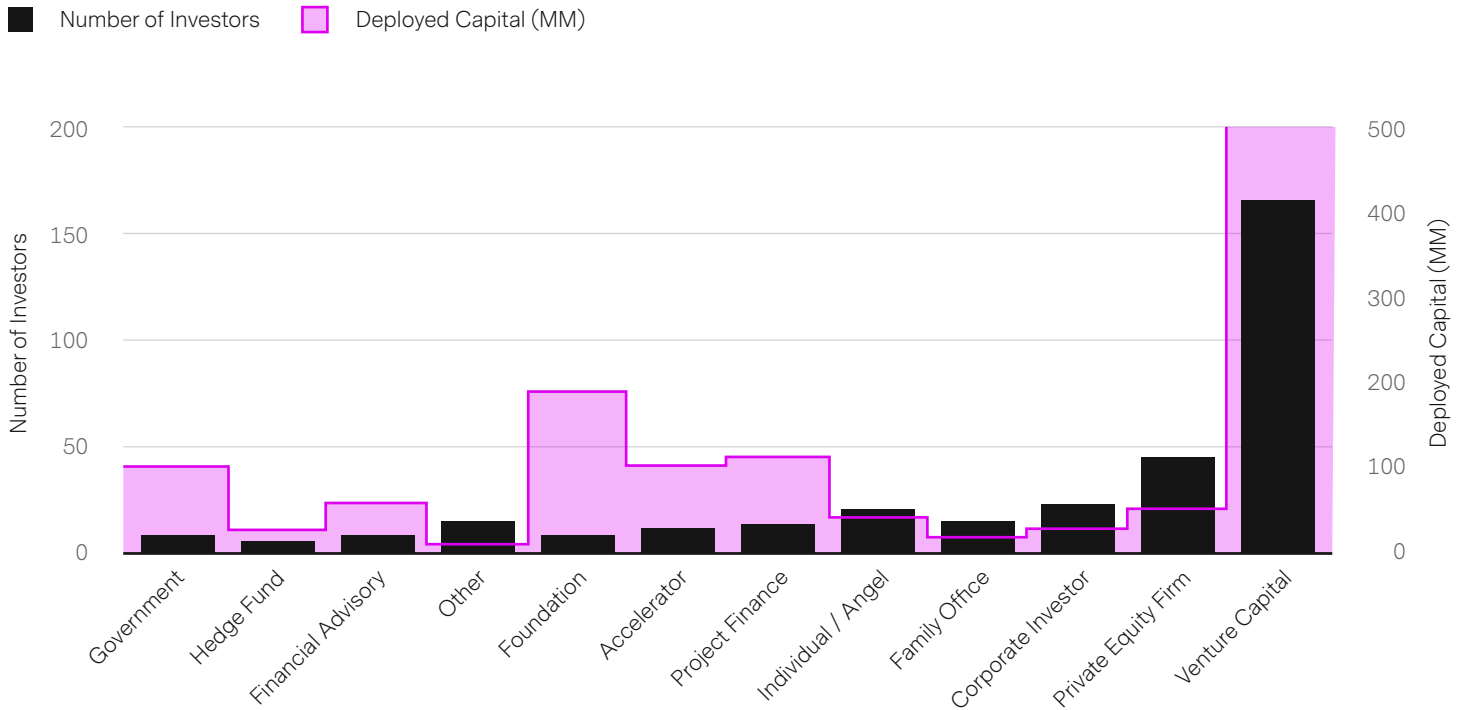
*56% Data Coverage

Most of the increases we saw on valuations were on either ends of the spectrum; the number of <\$1MM valuations grew by 41%, and \$50MM-plus valuations grew by 189%. There wasn't much change in valuations reported between \$1MM-

\$49MM, and even a slight decline in proportion overall in these ranges. In terms of overall distribution, 66% of companies (64) in the Deal Hub report a valuation of \$20MM and under, with the rest (35) reporting valuations over \$20MM.

WHAT TYPE OF INVESTORS ARE MOST ACTIVE IN CIRCULAR CARBON?

NUMBER OF INVESTORS AND DEPLOYED CAPITAL (MM)



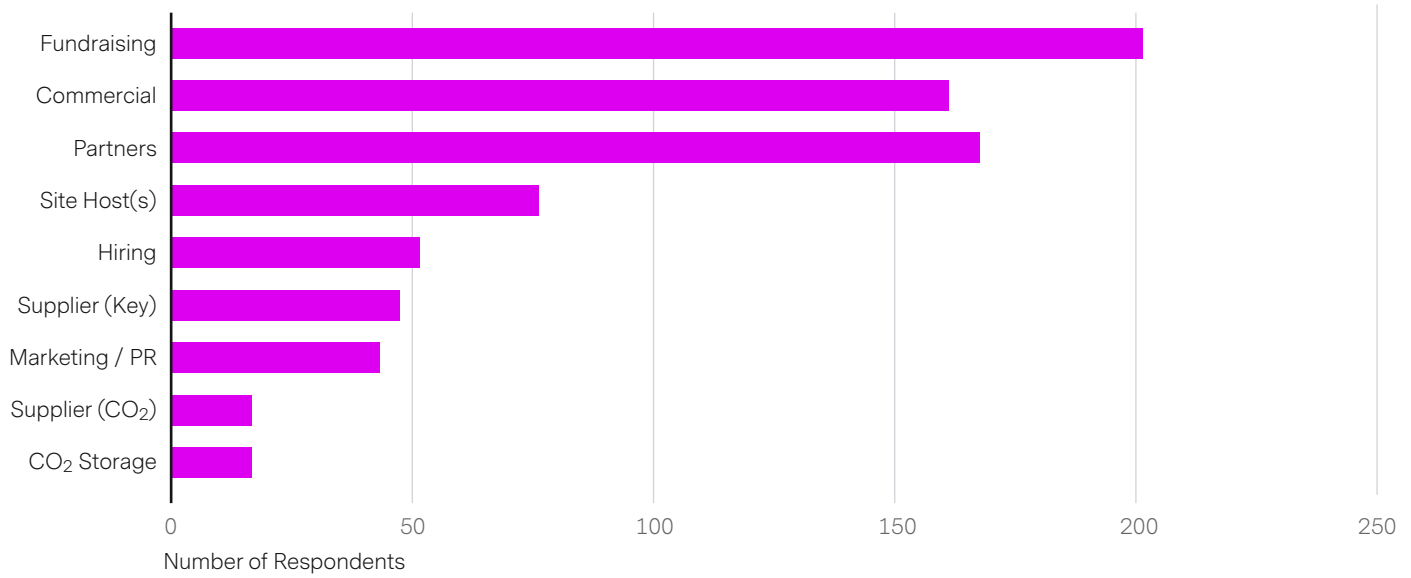
Over half of the firms in our Capital Index are venture capital firms, which together have deployed over \$571MM into Circular Carbon. Angel investors also showed a slight increase in the amount of capital deployed, although still far behind the number of Private Equity firms interested in or deploying capital. Accelerators

and Foundations both show a large increase in the amount of capital deployed in 2022.

Overall, 60% of capital providers in our index are early stage and have reported close to \$1B deployed, 20% are distinctly later stage, and the rest indistinct.

WHAT ARE THE OTHER COMMERCIAL NEEDS OF INNOVATORS?

COMMERCIAL NEEDS



To better understand where potential partnership opportunities lie, we asked innovators for their current top commercial needs. There are strong needs for Commercial

customers, Fundraising, and strategic Partners. This should come as no surprise. More tactical needs also topped the list with Hiring and Marketing/PR nearly doubling in responses.

CALL TO ACTION

› [Submit Your Company and Deal to the Innovator Index](#)

› Access the [Deal Hub](#)
(for Accredited Investors)

› Add your firm's data to the
[Capital Index](#)

› [Join Our Network](#)

› [Contact Us](#)

CIRCULAR CARBON MARKET REPORT

2022 Research Results



Circular Carbon Network
AN XPRIZE INITIATIVE