Capgemini
RESEARCH INSTITUTE

climate tech

for a Sustainable Planet

Quarterly review
N°7 — 2023

Conversations
FOR TOMORROW

The Climate Tech Startup Corner...

Conversations FOR TOMORROW

The Climate Tech Startup Corner

HOW CLIMATE TECH STARTUPS CAN HELP US TRANSITION TO A CARBON-FREE WORLD

LUCIA SINAPI
EVP and MD,
Capgemini Ventures

THE KEY TO OUR FIGHT AGAINST CLIMATE CHANGE

Capgemini

Over the past two decades, startups have become a critical source of innovation as a perfect blend of technology and talent, supported by unprecedent private capital funding: since 2015 the Venture Capital industry (VC) investments into startups amount to $2.6 trillion[1] globally. This has been, and still is, the era of cloud, data and software, contributing to the digital transformation of the economy and disrupting nearly every industry.

The changes required to achieve 2050 Net Zero target and return to pre-industrial C02 levels in the atmosphere go beyond digital and will require massive investments to transition to clean energy, transform our production and consumption models, or minimize our use of natural resources.

Interestingly, Venture Capital industry is now also directing investments into promising startup solutions active at building our future carbon-free world. After a record 2021 year, VC funding was not immune from the geopolitical context in 2022 and is taking a more conservative stance post recent negative newsflow, however the climate tech segment is showing some resilience.

We believe there are fundamental factors supporting startups engaging in sustainability and climate tech moving forward. And this is why.

Lucia Sinapi,
EVP and MD,
Capgemini Ventures

OVER THE PAST TWO DECADES, STARTUPS HAVE BECOME A CRITICAL SOURCE OF INNOVATION.

Re-imagining energy is on the critical path, as it contributes to 34%[2] of global carbon emissions.

VC industry is currently backing about 38%[3] of startups engaged in the race for clean energy supply (also referred to as Energy Tech)[4], which received $26 billion[5] funding in 2022, a 40% CAGR over 2018 - 2022[6] (4 times the global VC funding growth over that period). Renewables, energy storage[7] and management[8] still receive the lion's share, but VC industry is also fostering emergence of Green Hydrogen and New Generation nuclear energy (including fusion) breakthrough solutions.

According to International Renewable Energy Agency recent report, investment into climate tech would need to annually quadruple until 2050, while current pledges and plans lead to an emission gap of 16 GT.

Carbon Capture Utilization & Storage solutions are expected to address close to 15%[9] of total CO2 reduction by 2050

Startups focusing on direct carbon capture and/or storage solutions from the air[10] or at industrial sites[11] are attracting major funding for their projects by corporates[12], on top of VC funding, which accounts in 2022 for $3.3B[13].

1 CB Insights data

2 Les Echos, March 19th, 2023
lesechos.fr/monde/enjeux-internationaux/climat-ce-quil-faut-retenir-des-six-derniers-rapports-du-giec-1917145

3 Traxcn data

4 Energy Tech top-funded sub-sectors are: energy storage tech (Energy Storage Systems, Battery Systems, Charging Solutions), energy efficiency tech (Energy Management Systems, Utility Bill Management), smart grid (Advanced Metering Infrastructure, Green Utilities), renewable energy tech (Horizontal Software, Solar Energy, Bioenergy)

5 Traxcn data

6 Traxcn data

7 In 2022 the top-funded startup was Northvolt, Sweden

8 Form Energy, US (low-cost battery system to store and supply renewable energy for long duration); Hydrostor, Canada (Advanced Compressed Air Energy Storage solution for smart grid energy storage)

9 International Energy Agency
iea.org/data-and-statistics/charts/global-energy-sector-co2-emissions-reductions-by-measure-in-the-sustainable-development-scenario-relative-to-the-stated-policies-scenario

10 Climeworks, Switzerland, devices for extracting CO2 from ambient air

11 Svante, Canada, technology that traps carbon produced from industries such as cement and steel

12 Microsoft announced in July 2022 a 10 year carbon removal agreement with Climeworks

13 CB Insights

Another area of high potential is carbon-recycling technologies[14], carbon transformation[15] or even carbon sequestration solutions[16].

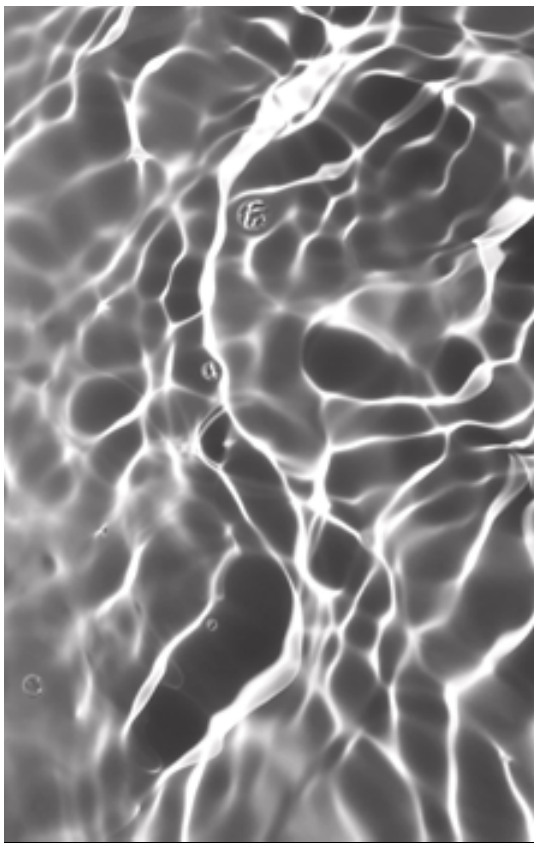
VC backed innovation can be adjacent but critical to climate tech and sustainability agenda

New space-based Earth observation imaging systems and AI allow for natural resources monitoring and climate intelligence[17], as well as biodiversity monitoring[18].

Pending the promises of Quantum Computing, synthetic biology is already opening new frontiers when it comes to the development of new materials[19], or enabling biodegradable plastics to be created from waste recycled using enzymatic bioprocesses[20]. Innovation can also be inspired by nature, as reflected by bio-mimetic solutions, while sustainable product design and manufacturing is already made possible by 3D printing technology[21].

Public research, policy and carbon markets provide the tailwind for climate tech…

Climate tech development is enjoying a unique combination of levers, among which the ability to leverage IP from academic and public research : UK based Mimicrete



"synthetic biology is already opening new frontiers when it comes to the development of new materials."

14 LanzaTech, US, bioprocessing technology to capture and recycle industrial emissions
15 Carbix, US, carbon-enriched concrete
16 Carbfix, Iceland, converts carbon captured from the atmosphere into underground rock
17 Prométhée, France, New Space operator of nanosatellite constellations for earth observation ; Agroscout, Israel, crop scouting solutions ; Cervest, UK, climate intelligence platform
18 Nature Metrics, UK, molecular methods for biodiversity assessment ; Spoor, Norway, cloud and AI-driven biodiversity monitoring solutionss
19 Bolt Threads, US, protein-based silk fibers ; Spiber, Japan, protein-based yarn
20 Carbios, France, enzymatic recycling
21 Aeditive, Germany, ready-to-use precast concrete

INNOVATION CAN ALSO BE INSPIRED BY NATURE, AS REFLECTED BY BIO-MIMETIC SOLUTIONS.

comes out of Cambridge University research, US based Verdox's CO2 removal technology was developed at MIT[22]. Similarly, in the nuclear field, startups Hexana and Stellaria developing fourth-generation small AMRs[23] are stemming from France's CEA Research labs[24].

Public policies and regulation mandating change towards energy transition (alike EU Green Deal) or funding climate projects through tax credits (alike US IRA[25]) foster investments into new infrastructure, as reflected by the Gigafactories for batteries being currently built in Europe and North America. They also pave the way to bankable business cases for entrepreneurs in Deep Tech, who consequently are more likely to be eligible for VC funding, despite climate deep tech being more capital intensive and longer horizon ROI compared to software.

Last, but not least, offset mechanisms provide eligible startups with an additional funding source, as corporates investing into their projects to fast track their NetZero targets can benefit from offset credits. On that front, digital marketplace solutions are aiming at making the carbon credit markets more efficient[26], some being blockchain technology based[27]. No doubt that quality of carbon credits and transparency in trading are prerequisites for an efficient carbon credit market that will further back the climate tech expansion.

22 Business Wire, April 2022, "Verdox Wins $1M XPRIZE Carbon Removal Award Together with Partner Carbfix"

23 AMR : Advanced Modular Reactors

24 CEA : Commissariat à l'Energie Atomique et aux Energies Alternatives – French Atomic Energy and Alternative Energy commission

25 IRA : Inflation Reduction Act

26 Aspiration, US, tech platform to source high-quality nature-based carbon projects

27 AirCarbon, Singapore, blockchain-based carbon credits trading exchange

… as well as sense of purpose!

Every day I meet talented startup founders fully determined to bring their solutions to market, enthused and energized by the unique confluence of public and private interests in preserving the planet. This fuels my confidence about our collective ability to embark on this new industrial revolution and address the existential challenge of our age.

Lucia Sinapi,
EVP and MD,
Capgemini Ventures

"Offset mechanisms provide eligible startups with an additional funding source.www"

www.capgemini.com