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Food for Climate

The State of the Sustainable Food & AgTech Ecosystem in Europe

May 2023

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1. Introduction

Food & Climate Tech

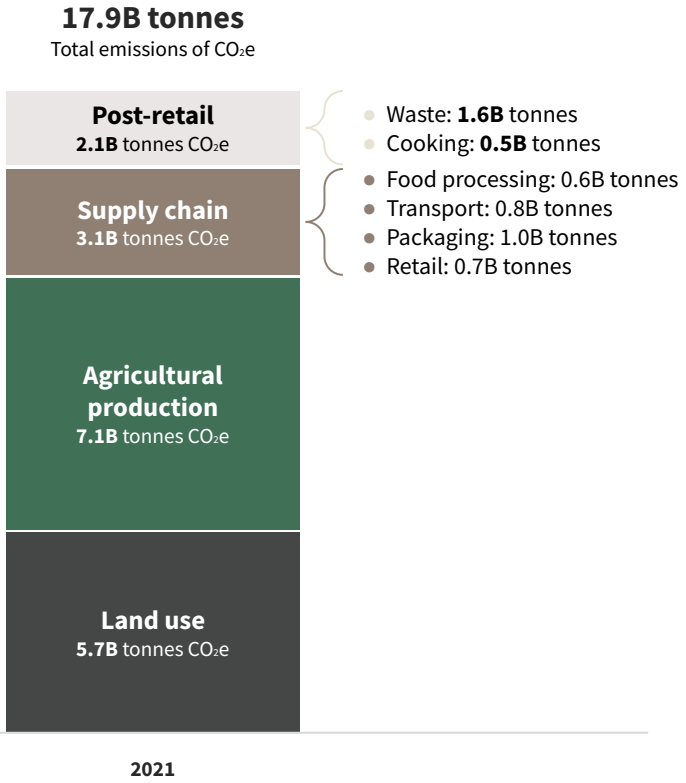
In the last decades, weather events, as well as political and financial instability have brought to the fore the vulnerability of our food system, with three food crises between 2008 and 2012.

As we look ahead to the middle of this century, the number of people which the world must feed is expected to increase by another 50%, translating into a substantial rise in the demand for agricultural production. FAO estimates the increased demand at 60% of current production.[1]

Any serious attempt to meet such a demand in a sustainable and resilient way will involve changes in the way we produce, retail and consume food. The food sector, in fact, is not only a victim but also a cause of climate change. It is estimated that it currently accounts for about one-third of global greenhouse gas emissions.[2] To compound matters, the food production puts a tremendous strain on natural resources such as land and water, ultimately affecting negatively also biodiversity.

For these reasons, food has been increasingly incorporated into climate discussions, both in the public and private space. Climate FoodTech startups started gained momentum also in the VC space. In this report, we analyze the status of the European FoodTech x climate startup scene.

Global greenhouse emissions from the food system[3]



Source:
1) https://www.un.org/en/chronicle/article/feeding-world-sustainably
2) https://news.un.org/en/story/2021/03/1086822
3) https://peakbridge.vc/feeding-the-future-the-role-of-foodtech-in-addressing-the-global-climate-crisis/

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> ***“As global warming threatens food security, the food industry plays a crucial role in climate change, contributing 30% of the world's greenhouse gas emissions. It is essential to rethink our food systems, and FoodTech and AgTech are key to solving future challenges.***

Christophe Maire & Patrick Huber
Founding & General Partner
at **FoodLabs**

The current industrial livestock production model is unsustainable due to its resource consumption and pollution. Innovative approaches such as biomass fermentation, precision fermentation, and cell cultivation are being developed to address these problems.

Biomass fermentation, using mushroom mycelium or bacteria, can produce vast amounts of healthy proteins with reduced food waste. Precision fermentation creates bioidentical food products with superior taste and texture, while cell cultivation produces genuine animal-based proteins. These new methods have the potential to be significantly more efficient, cost-effective, and environmentally friendly than traditional animal proteins.

The upcoming decade is crucial in the fight against climate change, and transforming the food industry can greatly impact our chances of success. We need collective action beyond commitments and support for innovative startups to bring about fundamental change and ensure a sustainable future for our planet.”

We identified over 340 startups across 16 segments supporting the transition to a sustainable food system.

Foodtech

Alternative proteins
Alternative proteins are plant-based and food-technology alternatives to animal protein

Molecular farming

Cell-based
Meatable

Precision fermentation
Formo

Plant-based
PROJECT EADEN

Mycelium-based
Mushlabs

Post-retail sustainability
Processes and technologies to improve the sustainability of the post-retail phase

Food waste & circular economy
PeelPioneers
rice house
Too Good To Go

Sustainable Packaging
Searo
NOTPLA

Agtech

Precision Farming
Farming management strategy based on observing, measuring and responding to temporal and spatial variability to improve agricultural production sustainability and efficiency.

Geospatial Intelligence
XFARM

Crop & Soil Analytics
CropSafe

Sustainable Irrigation
IRRIOT AB

Regenerative agriculture
Systems that restores soil health while protecting biodiversity and sequestering carbon.
klim

Vertical farming
System of growing crops by artificially stacking plants vertically to optimize land usage
infarm

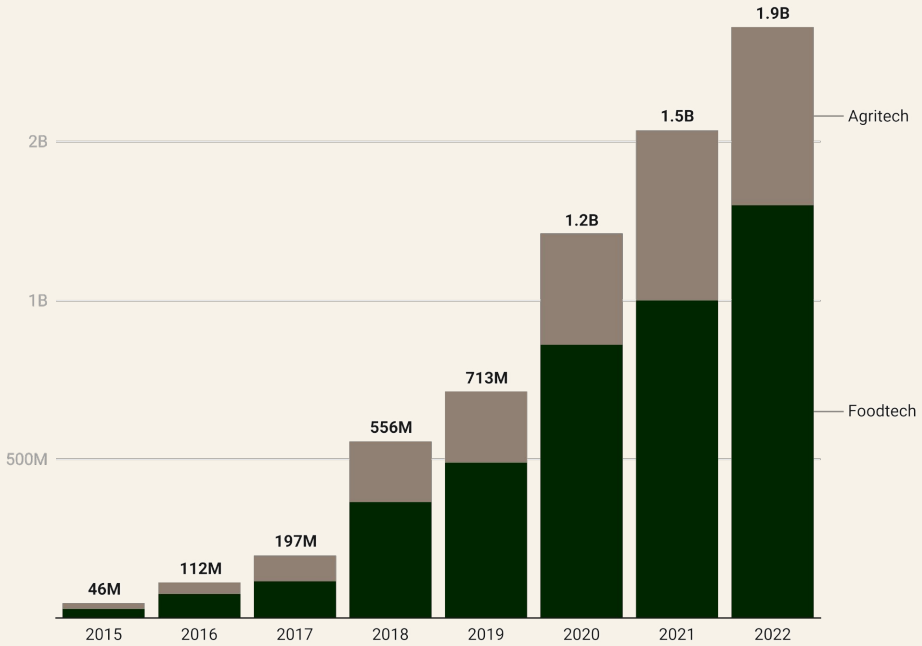
Sustainable Fertilizers & Inoculants
toopi organics
loam

Sustainable Aquaculture
Practice which focuses on ensuring ocean health & biodiversity protection
oceanofresco

NB. This does not cover the entire alternative protein landscape. Insect-derived protein has not been included in this report as it can't be considered a plant-based/vegan alternative. For more on other alt proteins including insects see our landscape.

European sustainable food startups attracted $1.9B in 2022, the most active year ever and 20% more than in 2021. Foodtech startups led the growth with a 30% growth year on year.

European investment in sustainable FoodTech & AgTech startups



1200+
startups

1200+ startups with a combined enterprise value of **$27B, up 2x since 2020**.

3 Unicorns
in Europe

As of today, there are **3 food x climate unicorns** in Europe.

Most funded European FoodTech X Climate
by VC investment in 2022-2023

INNOVAFEED · growUP · CHOCO · modern milkman · planted. · PROTIX

» Explore all European **foodTech x climate** startups

Explore landscape

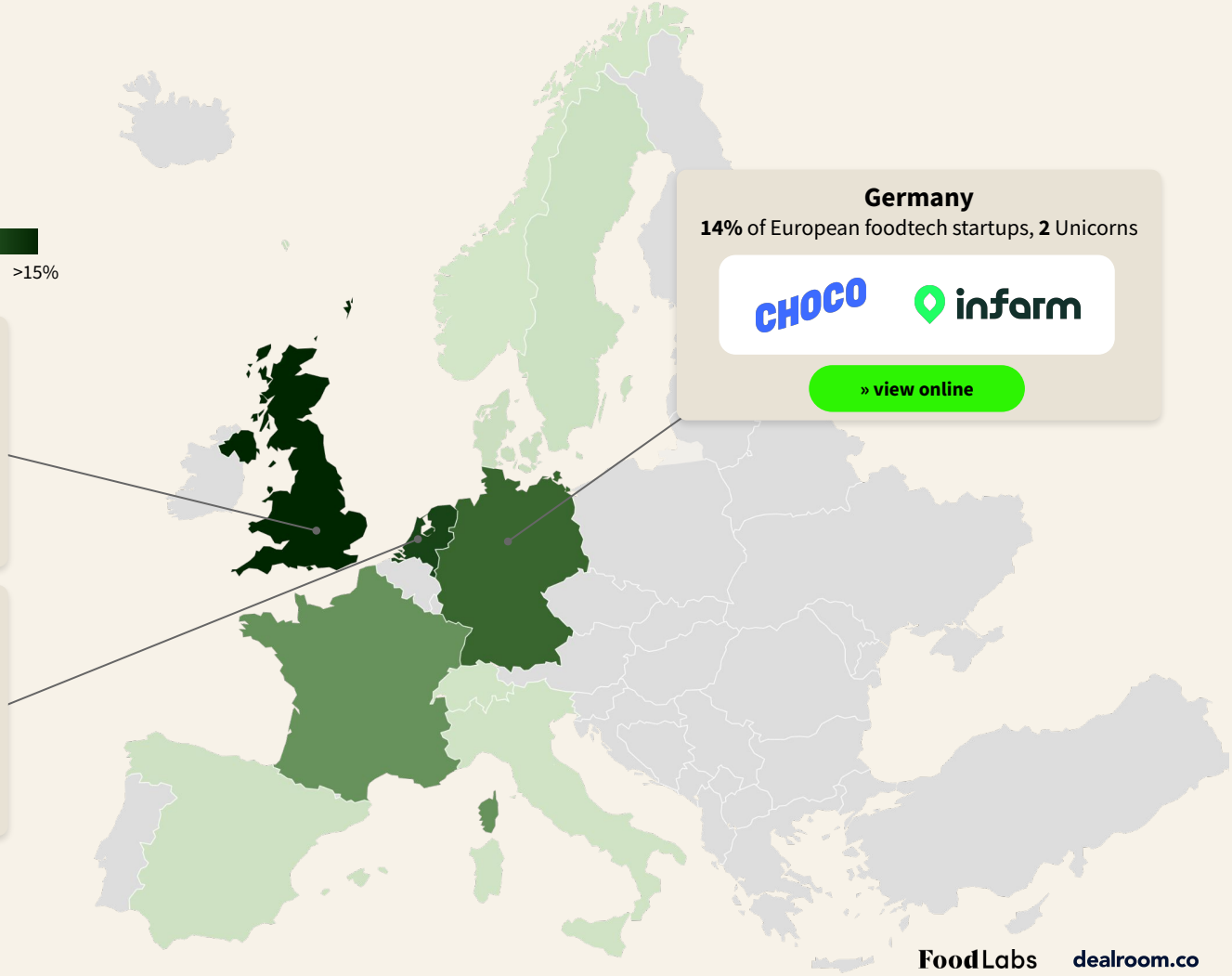
Source: Dealroom.co

FoodLabs dealroom.co

Where are sustainable Foodtech startups based?

European foodtech value

<5% >15%



United Kingdom

17% of European foodtech startups

modern milkman Huel®

» view online

The Netherlands

15% of European foodtech startups

VIVERA PROTIX

» view online

Germany

14% of European foodtech startups, **2** Unicorns

CHOCO infarm

» view online

Source: Dealroom.co

2. Foodtech overview

Foodtech Overview

The global food system is estimated to contribute 30% of total greenhouse gas emissions, with over half of those a result of livestock agriculture. Even if fossil fuel emissions were immediately halted, global protein production alone would make meeting the Paris Agreement's 1.5°C target impossible. Not only the production, but also the food supply chains needs to change to meet 2050 targets. Packaging counts for approximately 20% of our GHG emissions, PET being the biggest contributor[2], while more than 1.3 billion tons of food waste are generated along the whole food supply chain, producing approximately 3.3 Gigatons of CO2 equivalent per year.[3] Bottom-up awarenesses can only support the top-down implementations and innovations needed to foster a more resilient food chain.

Key food innovations for climate transition

Food Innovation

Innovative technologies that can enable the decarbonization of the key food markets such as animal proteins.

Sustainable Distribution

Implement circular, non-fossil based packaging for food and beverages

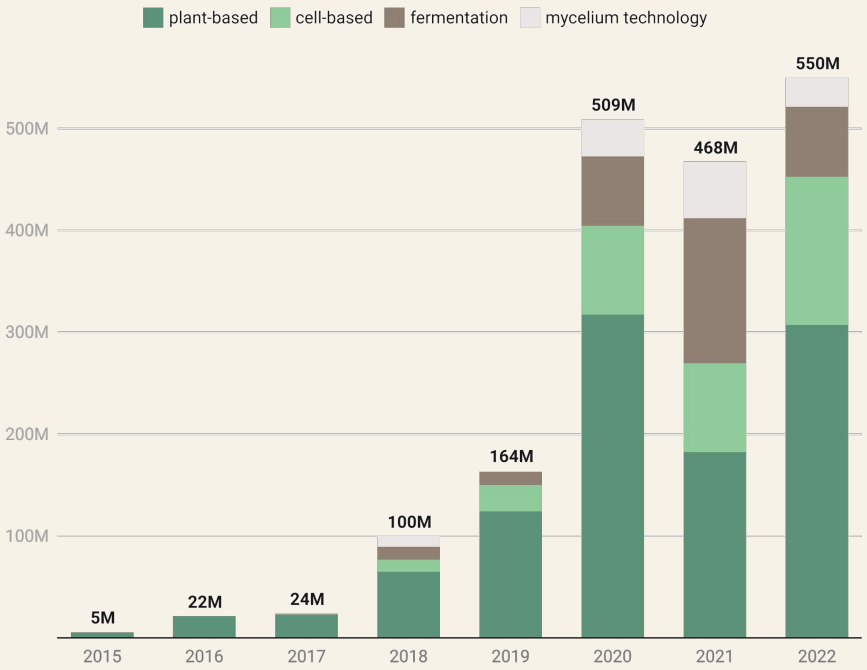
Food circularity

Ensure circularity also in the post-retail phase, by avoiding food waste through recycling and upcycling

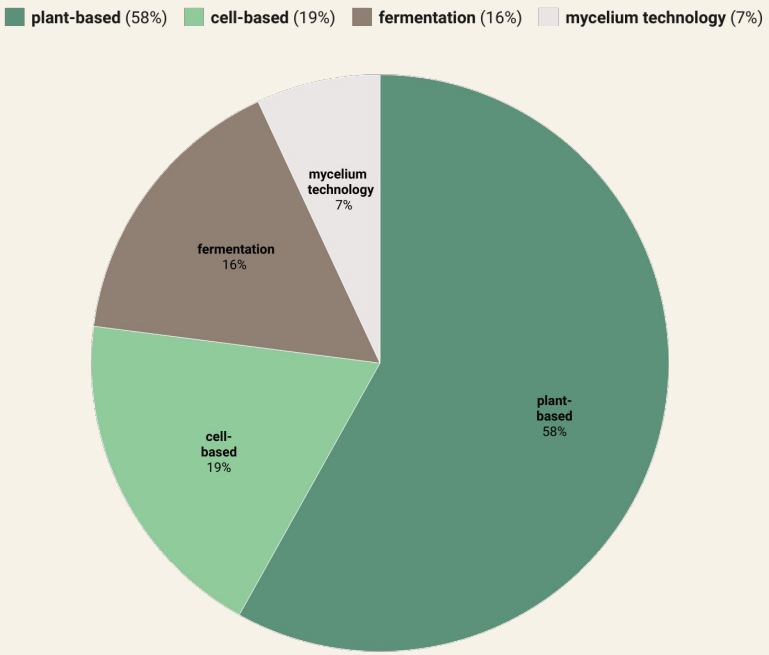
Source:
1) https://www.worldbank.org/en/topic/climate-smart-agriculture
2) https://content.sifted.eu/wp-content/uploads/2023/03/10135101/Packaging-Unwrapped.pdf
3) https://www.sciencedirect.com/science/article/abs/pii/S019592552100127X

Alternative Protein startups raised $550M in 2022. Since 2016, plant-based protein startups raised 58% of Alt Protein investment.

European investment in alternative protein per type



European investment shares in alternative protein per type (2016-2023)



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Food Circularity & Sustainable Distribution

The current linear food chain of 'make, use, and dispose' is inefficient and unsustainable. Globally, 30% to 40% of food intended for human consumption is wasted. Opportunities to reduce waste exist at every step along the supply chain from farm to table.

A circular food chain is needed to tackle the embedded carbon in food waste and the strain on natural resources. In this system, resources such as water are used more efficiently, while waste streams are upcycled. Food circularity can reduce carbon emissions, protect carbon sinks and also create new sources of sustainable energy.

Notable circular foodtech innovations

Food peels for longer-lasting products PeelPioneers	**AI X Restaurant Food Waste** winnow	**Food-waste-based ingredients** REDUCED
Seaweed-based packages NORIWARE	**Circular returnable food packages** Vytal	**Farm waste upcycling into advanced materials** rice house

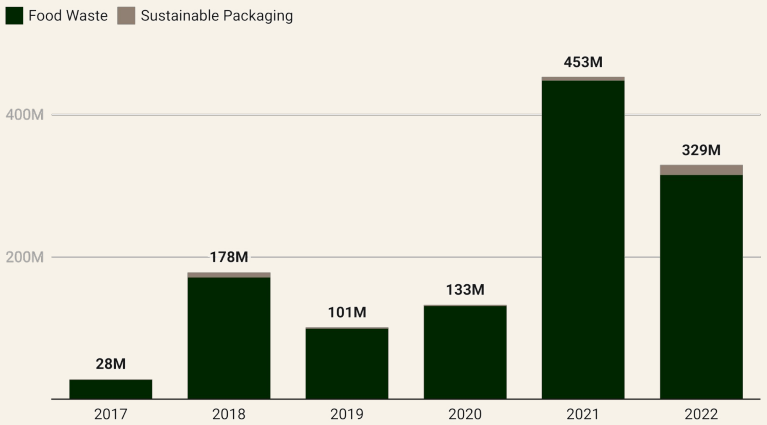
160+
European startups

160+ startups with a combined enterprise value of **$117B, up 2x since 2020**.

$329m
VC investments raised in 2022

$329M raised in 2022, down 27% year on year, but still **up +100% since 2020.**

European investment in circular FoodTech



Source: Dealroom.co

3. AgTech overview

AgTech Overview

Food production is struggling to keep up with the growing demand as crop yields level off, ocean health declines, and natural resources—including soils, water, and biodiversity—dangerously decrease. The food security challenge will only become more difficult, as the world will need to produce about 70% more food by 2050 to feed an estimated 9 billion people.[1]

Coordinated efforts will be needed to foster sustainable production cycles, optimize natural resources and strengthen climate change adaptation. A new generation of technologies is emerging aiming to tackle these challenges.

Key agricultural innovations for climate transition

Ensure Soil Health & Biodiversity

Through the active employment of substances that protect the soil and the biodiversity.

Optimize Land Usage & Strengthen Adaptation Strategies

Through innovative agricultural practices that enhance agricultural productivity within confined land spaces

Foster resilient resource management

Through the development of models for efficient use of resources that limits waste and enhance circularity in agriculture

Source: 1) https://www.worldbank.org/en/topic/climate-smart-agriculture

> ***“The environmental footprint of our food system is enormous — a stark fact that is reflected in the data. Agriculture is responsible for massive water use, greenhouse gas emissions, and land use.***

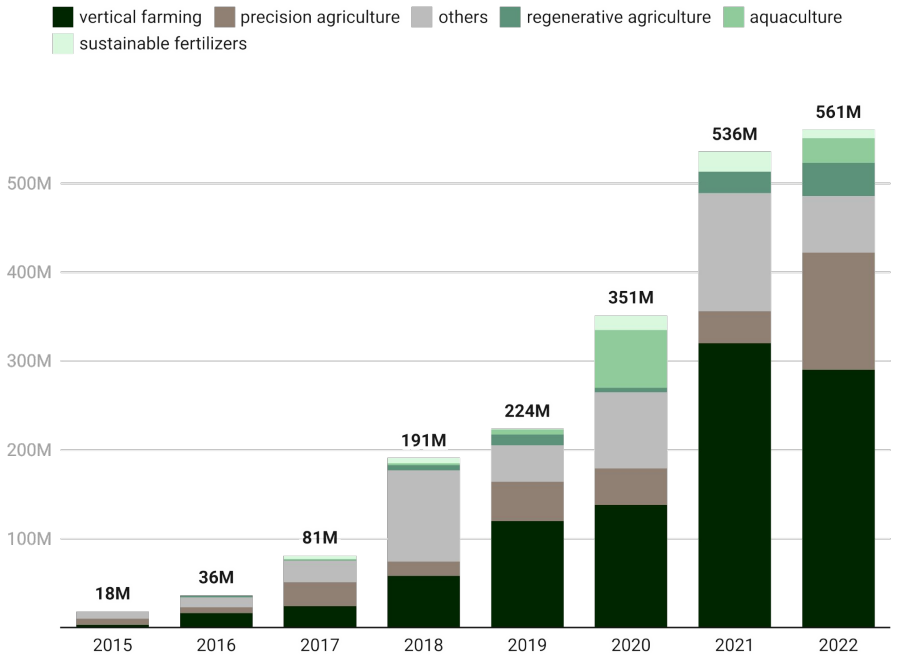
Christian Guba
Principal
at **FoodLabs**

This isn’t a wake-up call, but a call to action. Technology and innovation offer a buffet of potential solutions. Mycelium, precision fermentation, molecular farming, and cell culture — all different routes to the same goal: less impactful food production. Each comes with unique timelines and strengths in cost, taste, texture, scalability, and regulation. They promise land-independent, sustainable protein production without the burden of traditional animal agriculture.

AgTech breakthroughs are reshaping the core of agriculture. Feeds that reduce methane, fertilizers that capture nitrous oxide, enhanced rock weathering for carbon sequestration. Traditional agriculture, done right, can sequester carbon, preserve biodiversity, maintain soil health. We should value these practices while embracing new technologies.”

European sustainable agtech startups raised a total of $561M in 2022, growing by 5%. Vertical farming leads for amount of investment within the last five years.

European VC Investment activity in sustainable agtech startups 2015-2022



Largest sustainable agtech rounds in 2022 » view online

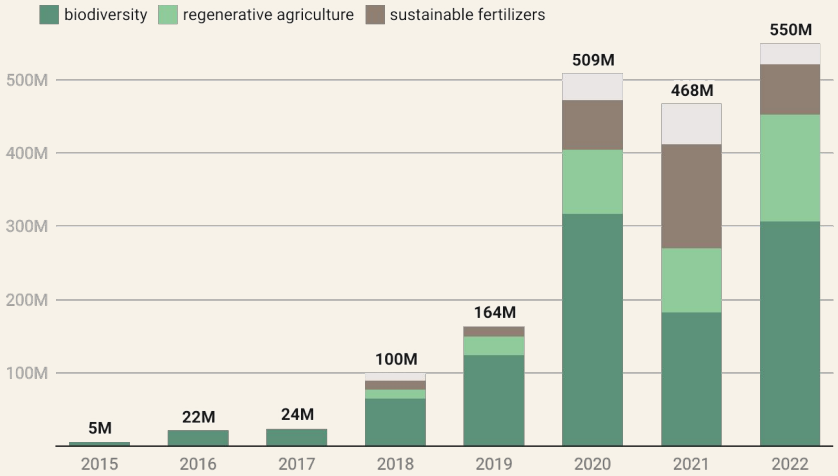
Company	Headquarter	Transaction
growUp	London	**£100M** Growth Equity VC
plantlab	's-Hertogenbosch	**$50M** Growth Equity VC
naïo Technologies	Escalquense	**$32M** Late VC
Planet Farms GO VERTICAL	Milan	**$30M** Early VC
vertical future	London	**£21M** Series A

Source: Dealroom.co

Ensure Soil Health & Biodiversity

Globally, about 24% of the global land area has been affected by degradation mainly driven by agriculture. Soil degradation affects negatively biodiversity, diminish nutrients and minerals and ultimately limit effective food production.

Regenerative farming practices can increase yield from 5 to 35 percent, restore soils and pull more carbon from the air. They include use compost and manure instead of artificial fertilizers, carbon capture, and biodiversity conservation.



100+
European startups

$109m
VC investments raised in 2022

With a current combined **value of $2B.** This is the highest value ever reached for startups in this space.

European startups focusing on soil health raised **$109M in 2022**, with a 8% drop compared to 2021. Only regenerative agriculture startups went up **by 54%.**

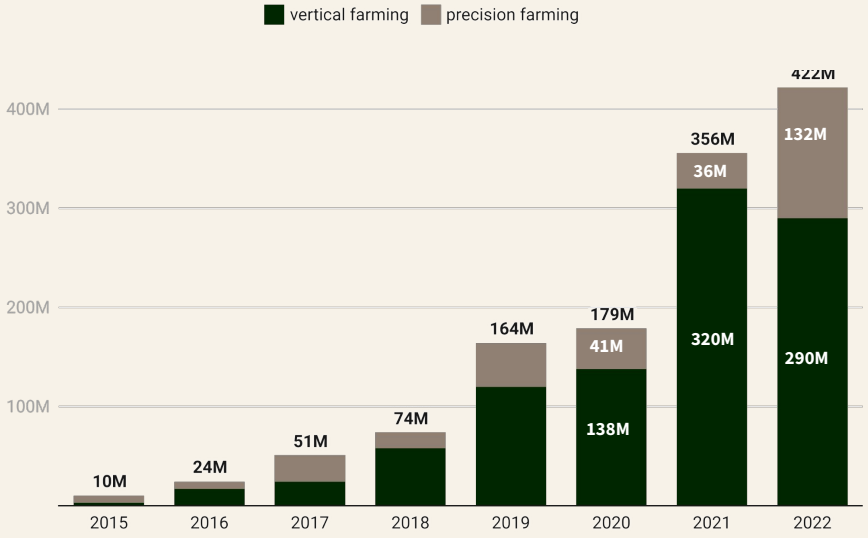
Notable circular foodtech innovations

Gaïago — Soil Revitaliser	eAgronom — Crop Analytics	BEEODIVERSITY regenerating value — Biodiversity monitoring
Klim — Carbon offsetting & credits for farmers	loam — Sustainable inoculants	N2 Applied — Recycled biofertilizers

Source: Dealroom.co

Optimize Land Usage

To meet 2050 targets, there needs to be a significant shift in the way we optimise land use. As of today, 36% of all land is agricultural. With the growing food demand, land usage is a key issue to ensure food security. This is why, practices like vertical and precision farming become increasingly important to limit the area of land we use and optimize crop production.



160+
European startups

150+ startups with a combined enterprise value of **$4.7B, up 38%** since 2021.

$422m
VC investments raised in 2022

European land-focused startups raised **422M** in 2022**, up 18%** year on year and **+100%** from pre-pandemic level.

Top land usage startups to watch based on Dealroom Signal

NAME	DEALROOM SIGNAL	MARKET	TYPE	GROWTH 12 months growth	LAUNCH DATE
GeoPard Agriculture Simplifies the complexity of precis…	68	B2B food enterprise software agritech	commission saas	43%	Apr 2019
GrowUP Farms Turning food production on its hea…	63	B2B food agritech	commission manufacturing	-	May 2013
Crocus Labs Crocus Lab is an integrated horticu…	62	B2B food energy agritech energy efficiency	artificial intelligence commission manufacturing	-	2020
constellr At constellr, we support food secur…	60	B2B food space agritech		-	Apr 2020
Infarm Urban farming services company t…	59	B2B food agritech	artificial intelligence machine learning iot internetofthings deep tech subscription	-17%	2013
CyStellar Geospatial intelligence company o…	58	B2B food agritech	blockchain big data deep learning recognition technology iot internetofthings	-14%	Jan 2017
			machine learning		

Source: Dealroom.co

Resilient resource management

Agriculture is extremely water-intensive, accounting for an average of 70% of all freshwater withdrawals globally.[1] Resolving the environmental challenges of the future requires a reconsideration of how water is managed in agriculture. Traditional irrigation systems are wasteful in many different ways, but they don't have to be. An array of advanced technologies arose in the recent years that improve water efficiency in agriculture.

Notable watertech solutions

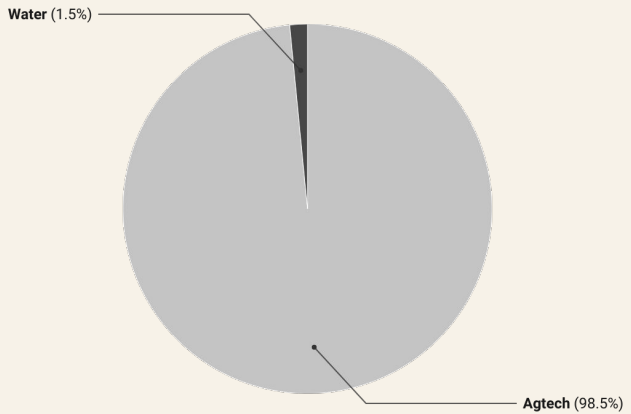
AgriRain IaaS Irrigation as a service	Future pump Solar Water Pumps	ROOF WATER FARM Wastewater treatment
Baltic Freya Aeroponics technology	Vytal Precision Irrigation	VanderSat Satellite Water Observation

20+
European startups

150+ startups with a combined enterprise value of **$4.7B, up 38%** since 2021.

$16m
VC investments raised in 2022

European water-focused startups raised **16M in 2022**, with a growth of **+300%** from 2021. Water tech is an untapped industry. In the last five years, only 1.5% of the investment went to water technologies



Created with Datawrapper

Source: 1) https://www.worldbank.org/en/topic/water-in-agriculture

A few words on our methodology.

What is a startup?

Companies designed to grow fast. Generally, such companies are VC-investable businesses. Sometimes they can become very big (e.g. $1B+ valuation).

When startups are successful, they develop into scaleups (>50 people), grownups (>500 people) and result in big companies. Only companies founded since 1990 are included in this report.

What is a startup?

What is a unicorn?

Unicorns are (former) startups that reached US$ 1B valuation or exit at one point in time.

What is a Unicorn?

Geographic methodology

Dealroom's proprietary database and software aggregate data from multiple sources: harvesting public information, user-submitted data verified by Dealroom, data engineering. Data is verified and curated with an extensive manual process.

The data on which this report builds is available via **app.dealroom.co**. For more info please visit dealroom.co or contact **support@dealroom.co**.

Venture Capital, Investors

Investment are referred to by their round labels such as Seed, Series A, B, C, … late stage, and growth equity. VC investments excludes debt or other non-equity funding, lending capital, grants and ICOs.

Buyouts, M&A, secondary rounds, and IPOs are treated as exits: excluded from funding data, but included in exit data.

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Source: Dealroom.co

Previous reports:

The State of European Foodtech 2023

The State of European Foodtech 2021

Impact startups – 2022 in review

Impact startups - 2021 in review

To read the report *The State of European Foodtech 2023*, click **here**

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