



Global AgriFoodTech

Investment Report 2023



GLOBAL ECOSYSTEM PARTNER

TEMASEK

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Our partners



TEMASEK



AgFunder is one of the world's most active foodtech and agtech VCs. We're rethinking venture capital for the 21st century. Born online in 2013, we use technology, media and network effects to invest in and support transformational founders and technologies. Our news site AFN publishes daily, original news from the frontlines of food+ag+climate, globally.

Temasek is a global investment company with a net portfolio value of \$297 billion as at 31 March 2022. It has 12 offices in 8 countries around the world.

Temasek's Purpose, "So Every Generation Prospers", guides it to make a difference for today's and future generations.

Foodbytes is an inclusive online connection hub that aims to drive more efficient innovation in F&A. With its eight-year track record of picking promising global innovators, Foodbytes helps corporates optimize core business and drive sustainability, while providing startups exposure to potential partners and investors.

AgriFutures grow^{AG} is an online agrifood innovation marketplace to explore, scout and connect expertise, research and investment opportunities in Australia and around the world.

AgriFutures evoke^{AG} Asia Pacific's premier agrifood tech event being held in February 2024.

Global agrifoodtech investing in 2023



There's no denying the second half of 2022 was terrible for venture capital (VC), and agrifoodtech was no exception. Funding to agrifoodtech startups reached \$29.6 billion in 2022, down 44% year-over-year.

Cheap money and increasingly outlandish tech valuations drove 2021's record-breaking \$51.7 billion in agrifoodtech funding. Then, in the wake of war, inflation, and continued supply chain disruptions, the market came crashing down in 2022. A glance at p14 shows just how wild the ride has been over the past two years.

But many of the world's current macro challenges –from soaring inflation to food insecurity to labor shortages –are driving more interest in agrifoodtech as a solution. In a new feature for this year's report, a survey of agrifoodtech VC investors revealed that while they don't expect valuations to improve much in 2023, they were buoyed that our sector is also increasingly recognized in the climate conversation. And it showed in the data.

Funding to climate-related agrifood technologies bucked the global decline, increasing year-over-year, despite the macro headwinds. These included Novel Farming Systems, Bioenergy & Biomaterials, Ag Biotech and Farm Management Software, Sensing & IoT.

With more discipline from founders (and investors too!), the industry can capitalize on the growing interest in using technology to transform our food and agriculture system to be better for people and our planet. This could be a vintage year to invest in agrifoodtech.

With special thanks to our global ecosystem partner Temasek for collaborating on this report with us.

**Thanks for reading,
and as always, let us
know what you think.**

Louisa and the AgFunder team



Key insights



Global agrifoodtech funding totaled \$29.6bn in 2022, a 44% year-over-year (YoY) decline.

The decline is largely in line with global venture capital markets, especially when you strip out the \$5.5bn drop in funding to Chinese agrifoodtech startups.

The drop in deal activity was not as pronounced with 2,797 deals closing, down 19% from 2021, emphasizing the many large outliers from 2021 that pushed totals up.

There were no mega deals in 2022 in stark contrast to recent years. Apart from in 2020, there has been at least one deal of over \$1bn every year since 2016. In 2021 there were four including \$3bn for eGrocer Xingsheng Youxuan.

Funding increased in Ag Biotech, Bioenergy & Biomaterials, Farm Management Software & IoT, and Novel Farming Systems.

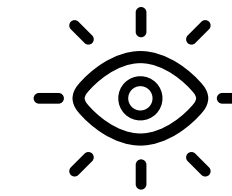
Funding declined more than 35% for meal delivery, eGrocery, alternative protein, cloud retail and Midstream technologies.

Chinese investors pulled back dramatically from the food delivery startups they backed with gusto during lockdown. The high cash burn, growth-at-any costs model started to show cracks and cooled with increasing regulation and closures.

Farm tech investment declined just 6% YoY to \$10.2bn across 848 deals. Of particular note was China's increasing focus on farmtech innovations.

Investment in upstream technologies raised significantly more capital than downstream, reaching \$14.8bn across 1,331 deals.

Climate technologies dominated with most upstream innovations working to have a positive environmental impact. As our VC survey on page 14 shows, many respondents believe agrifoodtech's move into the climate tech realm will have a major impact on general investor interest going forward.



Bioenergy & Biomaterials funding increased to \$2.3bn, up 15% from 2021. This highlights the growing momentum for novel alternatives to plastics and animal-based materials as well as clean energy sources.

Ag Biotech funding increased to \$2.7bn versus \$2.5bn in 2021 and was almost flat by number of deals, down just six to 216 (meaning it was not outlier driven).

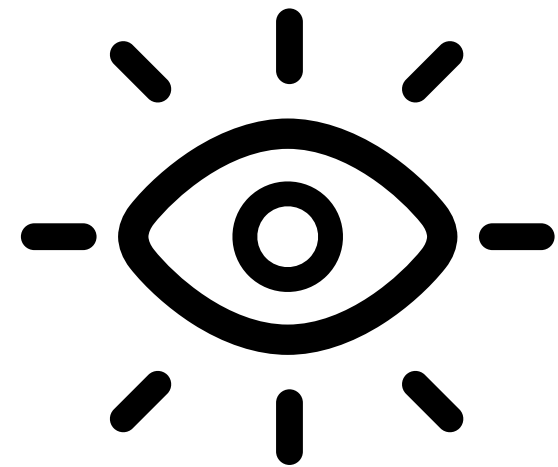
Novel Farming Systems funding increased 21% YoY to \$2.85bn with the number of deals remaining flat YoY with significant deals across both insect and crop-based systems.

Farm Management Software, Sensing & IoT funding increased \$430m to \$1.7bn albeit with a decline in deal activity, hinting at some large deals skewing the data.

Funding to African agrifoodtech startups increased 19% to over \$600m. Some large deals helped inflate this but that's a positive trend in itself.



Key insights



BIGGEST CATEGORY
eGrocery
CLAIMED \$5.1B (17%)
 of Global agrifoodtech
 funding in 2022,
 a 73% year-over-year decline

BIGGEST MARKETS
**US, India,
 and UK**
CLAIMED 55% (\$16.4B)
 in funding in 2022

BIGGEST DEAL
\$768 million
**SERIES E ROUND
 FOR TURKEY'S
 GETIR**

the rapid eGrocery startup valued
 at \$12bn that's available across
 Europe and in 3 American cities

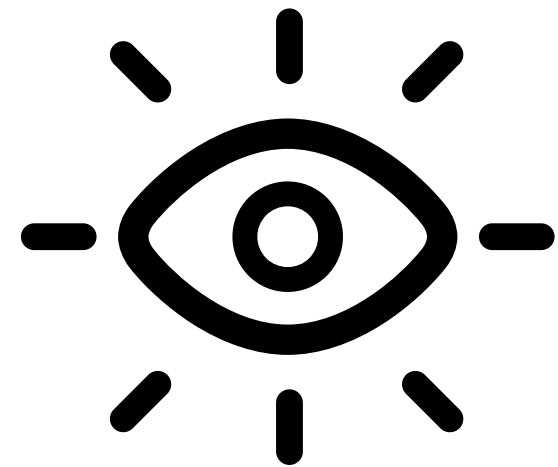
**BIGGEST ALTERNATIVE
 PROTEIN DEAL**
\$400 million
**SERIES C FOR
 UPSIDE FOODS**

one of the first cellular agriculture
 companies, which recently got
 US regulatory approval for its
 cultivated chicken bites

BIGGEST FARMTECH DEAL
\$400 million
**SERIES E FOR
 PLENTY**

a US-based vertical
 farming company

Key insights



BIGGEST CATEGORY DECREASE

Online Restaurants & Meal Marketplaces

\$1.2B TOTAL RAISED,
down 75% year-over-year

CATEGORY WINNERS

Ag Biotech, Bioenergy & Biomaterials, Farm Software & IoT, Novel Farming Systems,

all bucked the global decline posting increases in funding of over 8% year-over-year

BIGGEST REGIONAL INCREASE

Africa

\$640M TOTAL RAISED
up 22% year-over-year

BIGGEST CATEGORY INCREASE

Farm Management Software, Sensing & IoT

\$1.7B TOTAL RAISED,
up 35% year-over-year

CATEGORY LOSERS

Funding declined more than 35% to the following categories:

Alternative Protein, Cloud Retail, eGrocery, Meal Delivery, Midstream Technologies

About AgFunder



AgFunder's platform is built on Four C's, giving us an unfair advantage

Content

- 1m+ visitors annually
- 45+ research reports cited in:



Community

- 150k-strong community (industry who's who)
- 150+ expert contributors to AFN



Capital

- 60+ investments with \$180m AUM
- Top quartile performance
- Sample co-investors



Code

- 50k+ startups in knowledge base (GAIA)
- Analyzed by 150 AI models



Partner Temasek

temasek.com.sg

TEMASEK

To date, we have invested over \$8 billion in the global farm-to-fork value chain. Sustainability is at the core of everything that we do. To that end, we invest in innovative agri-food solutions to enable a more sustainable and resilient food ecosystem.



The global agri-food system is critical to supporting human life and yet as a system, is inefficient, inequitable, and causing inordinate strain on the planet.

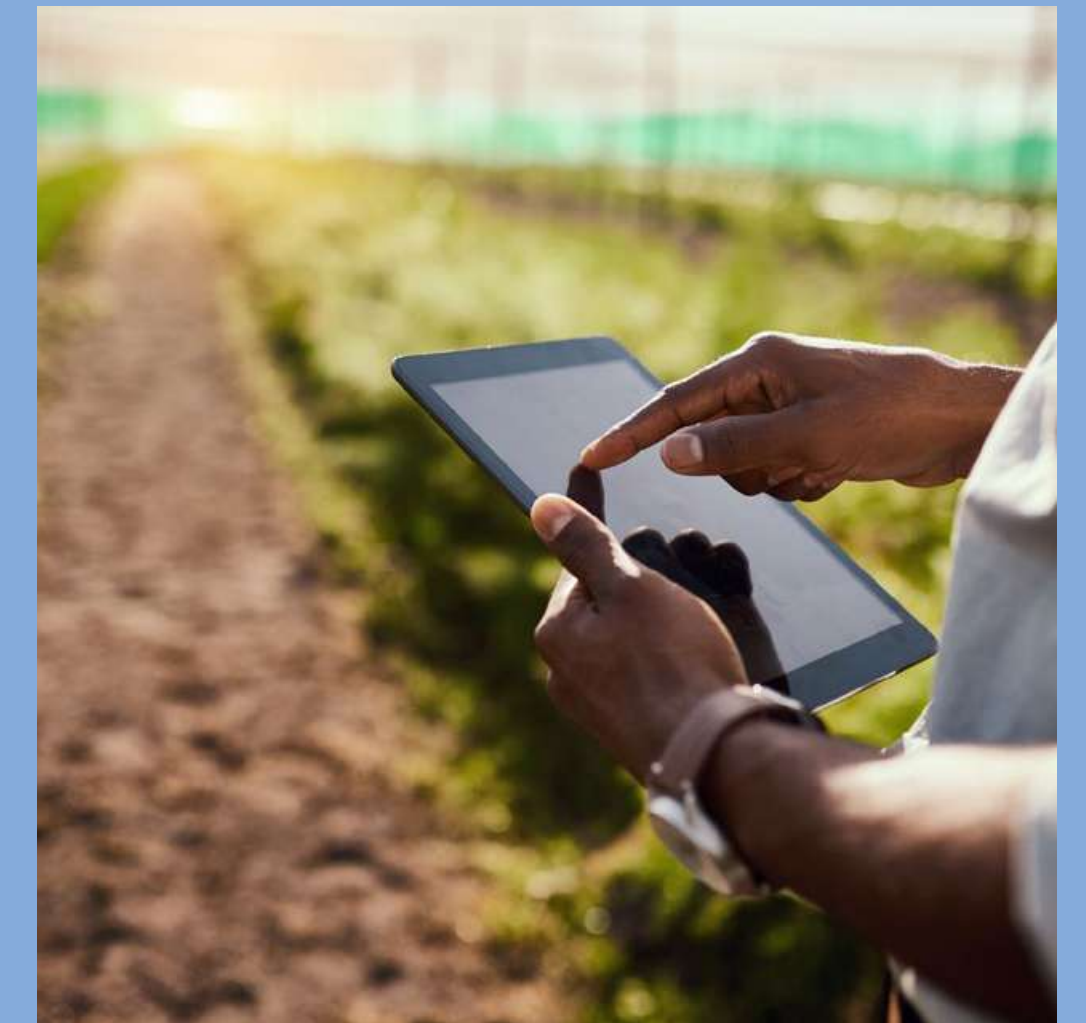
The US\$10 trillion global food industry currently feeds a population of 8 billion people. These figures are expected to rise by 2050: the UN predicts that, compared to 2010 levels, there will be a 60% increase in overall food demand and a 73% increase in animal protein demand, with the expected global population rising above 9 billion.

Existing food production practices account for a third of global greenhouse gas emissions, 70% of freshwater usage, and 80% of deforestation worldwide. Geopolitical instability, protectionist government policies and unpredictable weather events have also fueled a global food crisis, with food price inflation threatening global food security.

The need to invest for a resilient food system, that is also part of the climate change solution, has never been greater.

We believe that agri-food is the single strongest lever to optimise both human health and environmental sustainability. Investors have come to prioritise not only returns, but real-world outcomes, which has resulted in a growing interest in innovative agri-food technologies.

At Temasek, we deploy catalytic capital to enable solutions to key agri-food challenges. Our Agri-Food portfolio is built around our focus on sustainability. We invest in solutions that reduce agri-food systems'



environmental footprint and produce healthier food that is available for all. This is expressed in our strategic focus areas of sustainable proteins, fresh produce, healthy ingredients, and transformative technologies. As an ecosystem builder and early mover in the agri-food tech space, we also scale capital and create value for our partners and portfolio companies. We have built a far-reaching global network that allows us to engage the larger agri-food industry and promote dialogue between key global and regional stakeholders.



Investment highlights

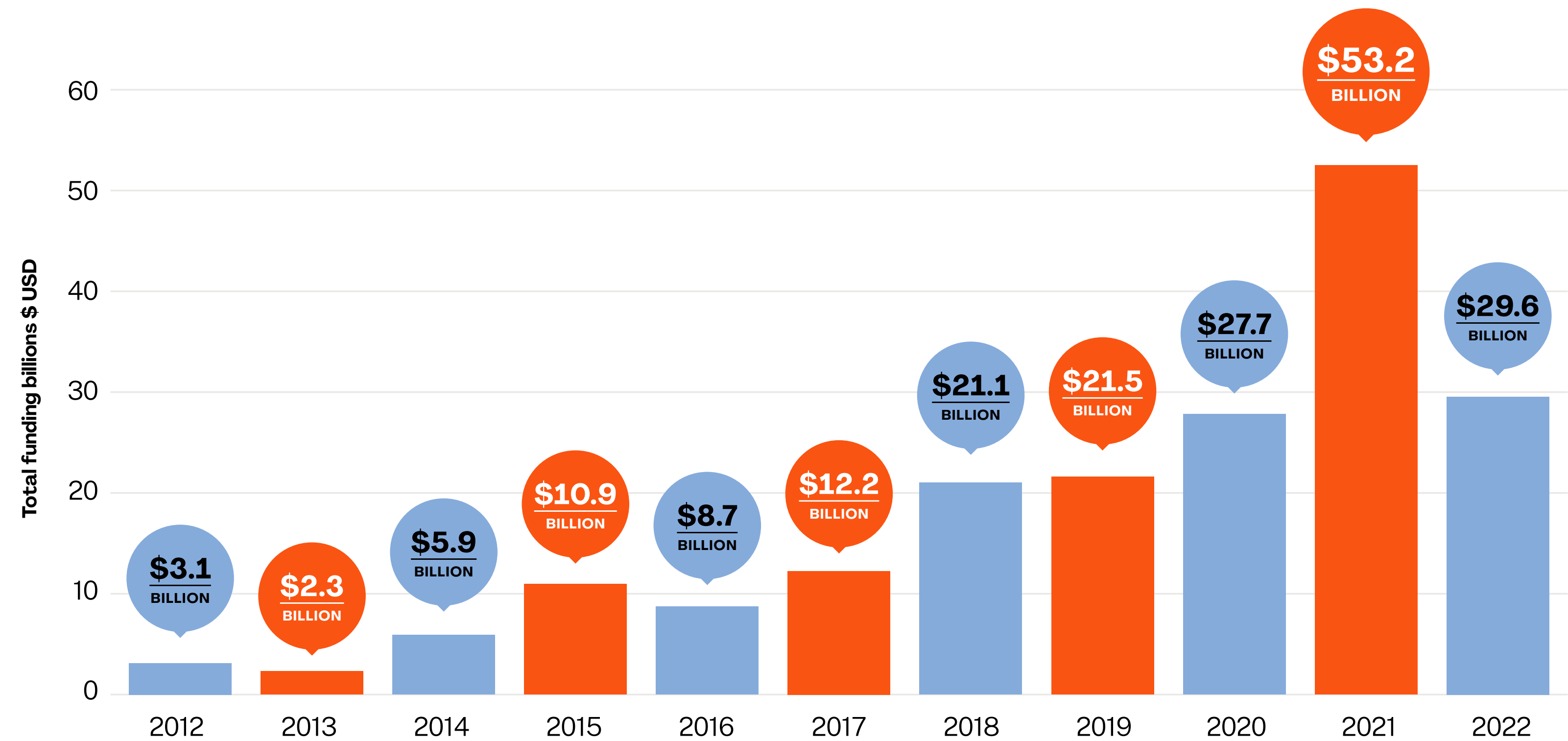


10 years of global agrifoodtech

\$29.6 billion
raised globally in 2022

\$196 billion
total raised globally
since 2012

Global agrifoodtech investment by year









2022 agrifoodtech funding

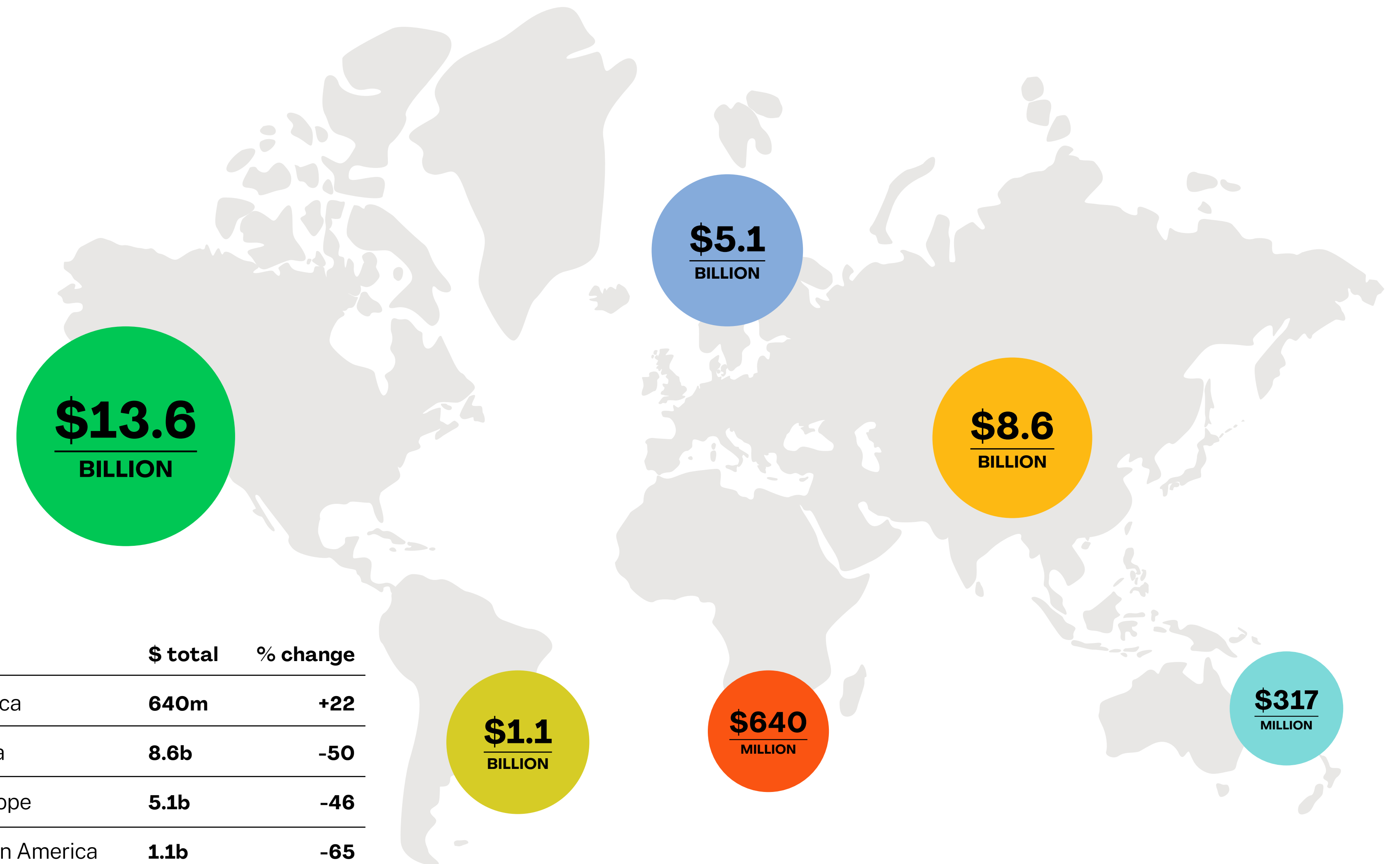
by region

The US continues to dominate the industry accounting for over 90% of North America's total, and within that, California represented nearly half at \$5.5bn.

Asia still has a much bigger agrifoodtech sector than Europe, despite a massive drop in funding to China.

Africa bucked the global decline on the back of some large deals, while Latin America experienced the biggest decline with some of the highest inflation rates globally impacting investor demand.

Region	\$ total	% change
 Africa	640m	+22
 Asia	8.6b	-50
 Europe	5.1b	-46
 Latin America	1.1b	-65
 North America	13.6b	-39
 Oceania	317m	-31



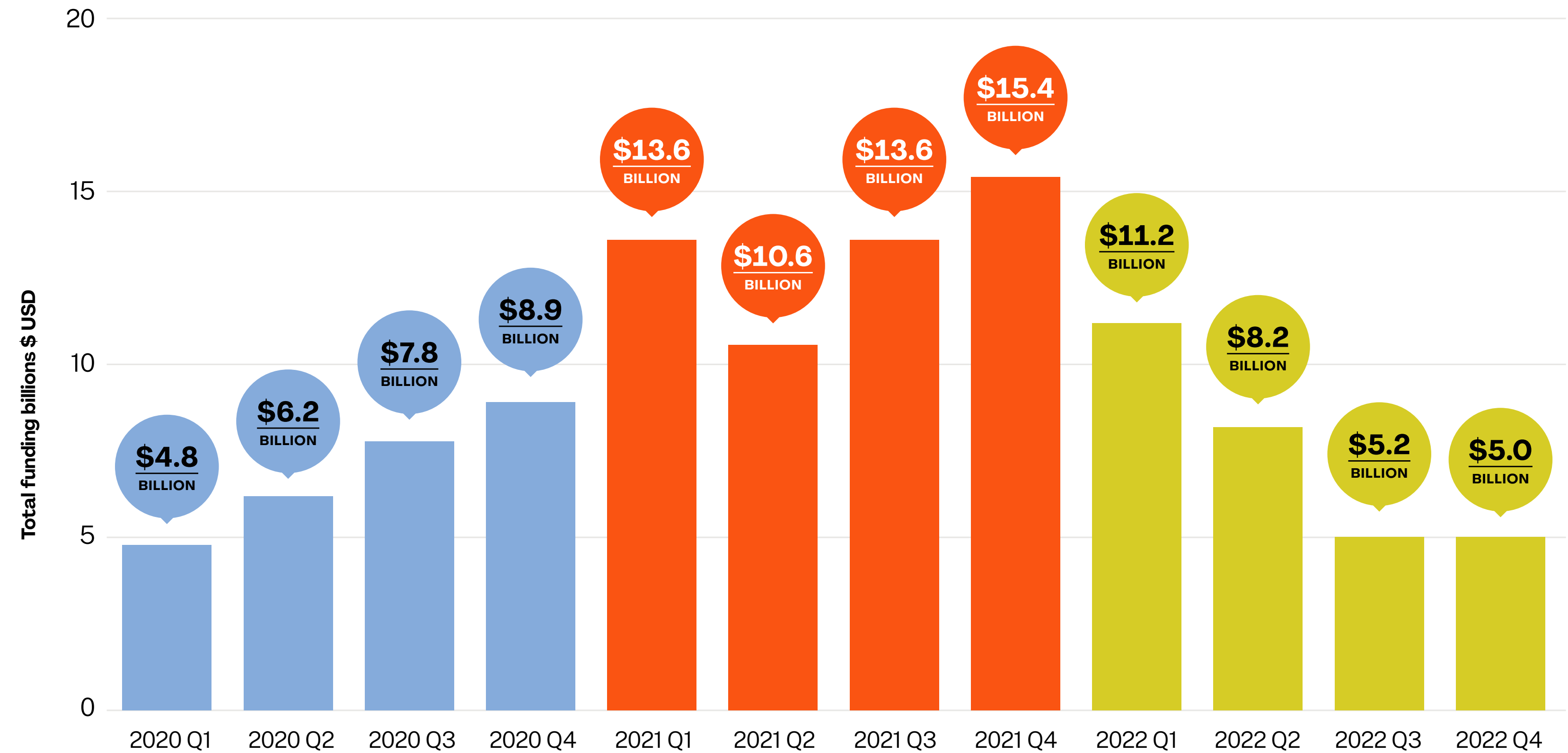
2022 investments by quarter

Investment by quarter clearly tracks the macroeconomic environment experienced globally over the past two years.

In 2020, the pandemic exposed fundamental problems with the food supply chain, prompting increasing investment in tech as a potential solution but also to serve an increasingly digitized consumer. This reached new heights in 2021 as investors gained confidence that the pandemic would be short-term, albeit with long term impacts on consumer behavior.

The invasion of Ukraine in early 2022 created further supply chain disruptions and combined with soaring inflation, investors decided to hold on to their capital in Q3 with a remarkable drop in confidence by Q4.

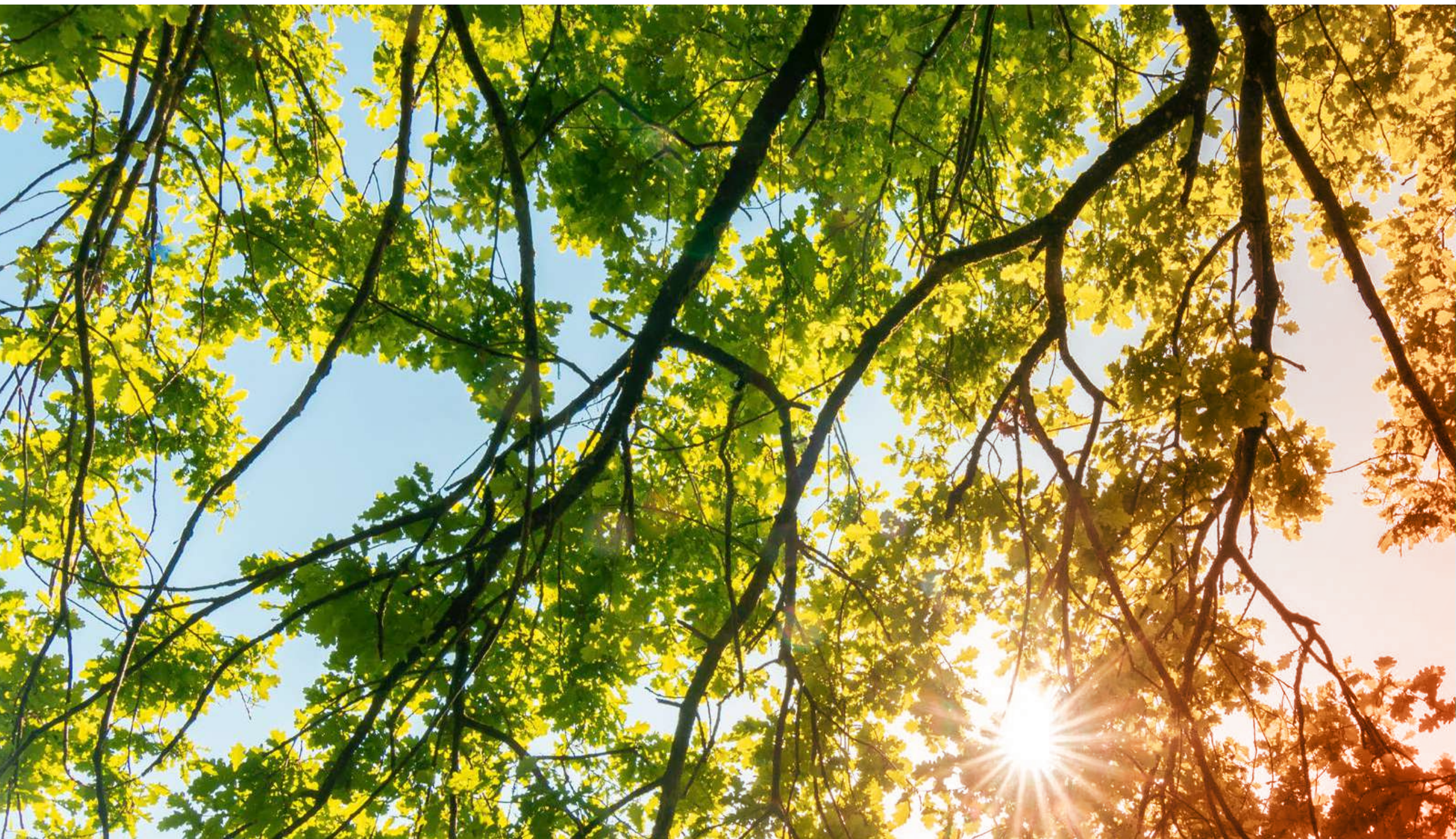
Global agrifoodtech investment by quarter



Agrifoodtech VC trend predictions for 2023



As part of our review of the year gone by, we polled a range of venture capital investors focused on foodtech and agtech to get their take and predictions for 2023. Here's a taste of their responses.



01

Correction in startup valuations

The correction in startup valuations will continue throughout 2023 leading to closures and the consolidation of companies and talent through roll-ups and acquisitions to market leaders in various categories. Plant-based will be particularly affected by down rounds and consolidation is particularly expected among digital agriculture tools (as it has been for many years now!)

“It will be a year of bust-ups, roll-ups and M&A.”

Antony Yousefian,
The First Thirty Ventures

“Lots of investors will keep their money reserved for their own portfolio. Will be difficult for new companies to raise.”

Gideon Soesman,
Greensoil Investments

02

More focus on climate tech

Many respondents commented on the growing recognition of agrifoodtech within the climate conversation, with some arguing that agrifoodtech investors will increasingly broaden their scope into climate. On the flip side, there will be more focus on agrifoodtech from general climate investors.

“Sustainability is much more mainstream to develop a startup in agrifoodtech than a ‘nice to have’ and stakeholders will reward the ones who are genuine in their impact on social and environmental effects and will punish the ones that greenwash their business.”

Bernardo Milesy,
GLOCAL

Investment in agrifoodtech will grow in 2023 “as the narrative will change to be part of the Climate Change assets class.”

Nadav Berger,
PeakBridge

03

Deglobalization & local sourcing

The industry overall will increasingly focus on deglobalization and locally-sourced food, as well as looking for deflationary technologies and products, both in cost of food production and a shift to lower long term healthcare costs.

Agrifoodtech VC trend predictions for 2023



04

More activity and entrants in carbon

From improved measurement, reporting and verification (MRV) capabilities to premium-priced, low-carbon food products, several respondents mentioned carbon as a key – and continuing – area of focus for investors and innovators.

“ We believe the landscape of MRV companies, other facilitators, marketplaces and the carbon economy as a whole could look completely different in the next year or two. Our portfolio company, Bushel, surveyed 1,000 farmers and found that over 60% are interested in participating in a carbon credit program that helps them get paid for soil improvement. Plus, there are many companies with solutions to offer farmers. Yet there are only a handful of MRV companies with steep backlogs and still nascent methodologies, requirements and procedures.”

**Michael Lavin,
Germin8 Ventures**

05

More upstream investment overall

The shift towards upstream innovations was clear in the 2022 data and VCs believe it will continue into 2023, especially in Ag Biotech, including synbio, biological crop input alternatives and genetic engineering.

“ AI everything! But importantly in ag biotech. While AI predictions for structural biology (e.g., Alphafold) have taken academia and medicine by storm, there is still a lag in agriculture. I expect this to change in 2023.”

**Yanniv Dorone,
Fall Line Capital**

“ We expect more funding to go into upstream investments and for Agtech to grow into a more diverse set of products for farmers. In Agtech 2.0, we are big believers that founders have discovered what failed in Agtech 1.0 and will not repeat those same mistakes. We have seen farmers adopting technology at much higher rates than in the Agtech 1.0 era, and we are starting to see more founders coming into the space creating solutions with technology that goes beyond the typical solutions and niche subsegments that we have seen the past few years.”

**Stephanie Dorsey,
E2JDJ Ventures**

Agrifoodtech VC trend predictions for 2023



06

Which categories will bring in most funding in 2023?

Artificial intelligence was the most mentioned category, with more respondents applying that to robotics & automation on the farm - particularly in light of macro headwinds for labor and inflation.

Biotech was also popular, from synbio, to GMO to biofertilizers and bio-control products.

Some respondents still think alternative protein and vertical farming will bring in the most amount of funding, albeit less than previously.

There was general agreement that climate-related technologies will be most popular with numerous references to carbon.

“2023 could be the vintage of the farmer. Never before has there been a greater opportunity to extract more value from a given acre with increasing access to emerging innovation: carbon credits, agroforestry and regenerative agriculture, streamlined access to markets, commercialization of waste streams, and a growing premium for positive stewardship of the calories we consume. Winning in these markets, however, will require superior execution. Farmers are not risk-seeking. The benefit has to be immediately evident.”

Andrew Finkelstein,
AgFunder

07

What world events should we be worried about?

The majority of respondents referenced the Ukraine War, persistent inflation across commodities, energy and food, increasing cost of capital, economic impacts of the pandemic and climate change. The lack of attention to the US Farm Bill also featured.

“Riot - and the increasing gap between those who have and those who don't.”

Cecile Sother,
Sabi Fund

08

What frustrated you in 2022?

“Lots of followers and not many lead investors.”

Sanjeev Krishnan,
S2G Ventures

“Founders who did not do their homework and kept doing top down market analysis, focusing only on total addressable market.”

Manuel Gonzalez,
AgFunder

“Overconfidence. Ego. Not enough focus on execution and market fit.”

Bernardo Milesy,
GLOCAL

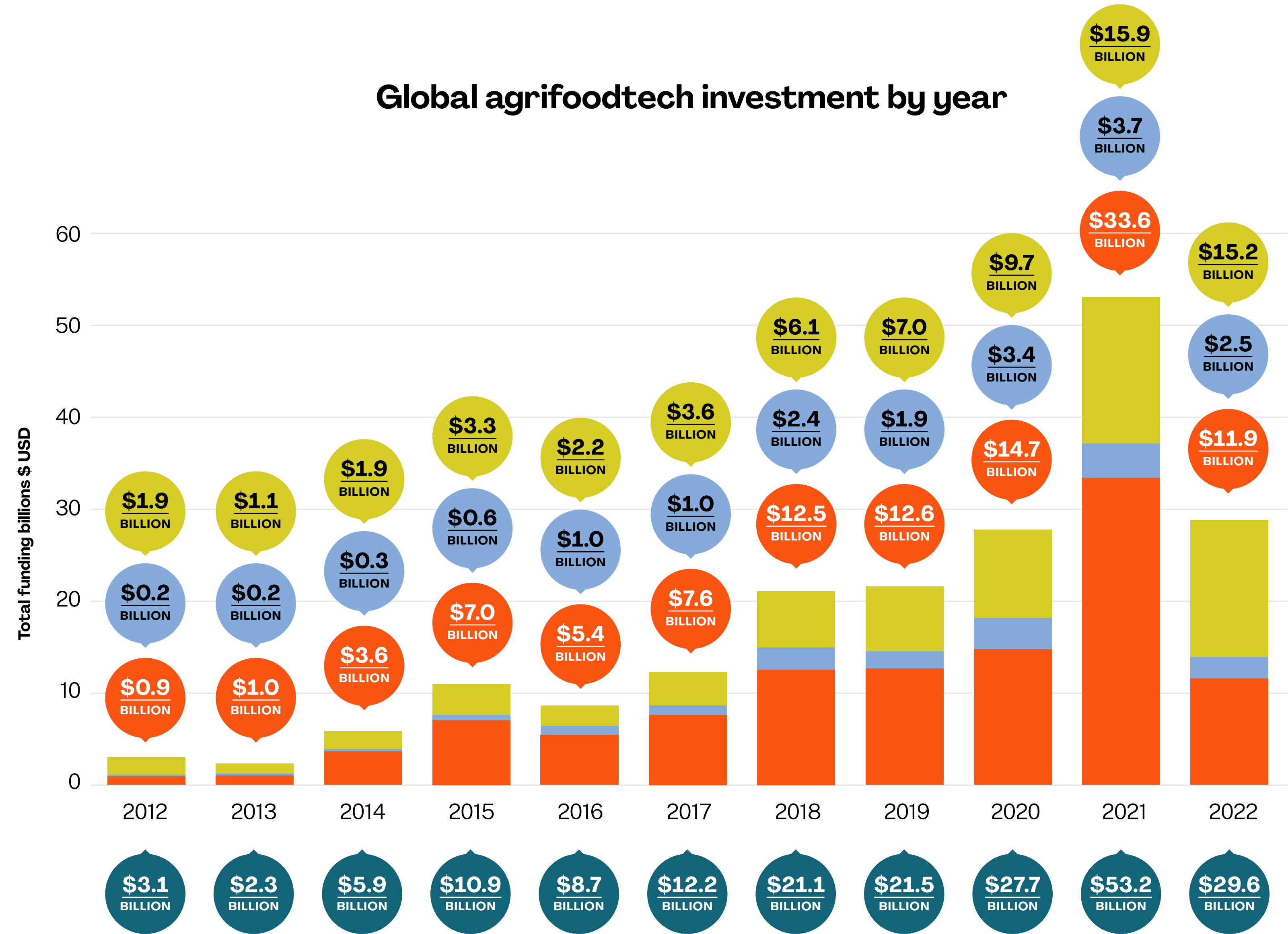
Investments by supply chain

After years of hype and overinflated valuations for consumer-facing food technologies, investors are more interested than ever in upstream categories, most of which fit into the climate tech bucket.

Upstream innovations include those focused on or before the farm and in the novel production of foods.

Four upstream and climate tech categories bucked the global decline: Bioenergy & Biomaterials, Ag Biotech, Novel Farming Systems and Farm Management Software & IoT.

Global agrifoodtech investment by year



- Upstream
- Midstream
- Downstream

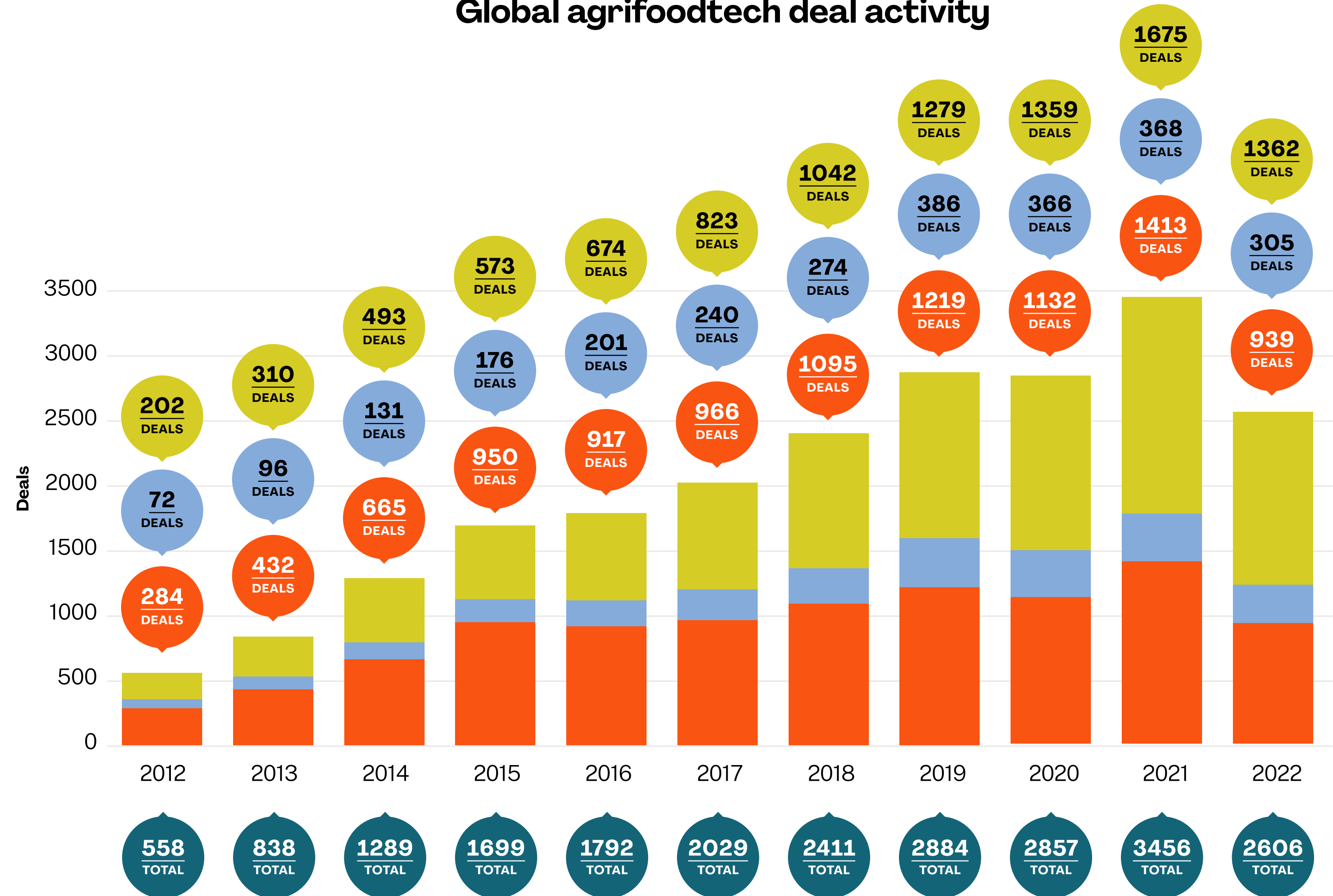
Investments by supply chain

There's no doubt that fewer deals closed across the supply chain in 2022, although our models predict that the total will be over 3,000 once more deals come to light over the next 12 months, a less stark decline considering the macro backdrop.



- Upstream
- Midstream
- Downstream

Global agrifoodtech deal activity



Top read AFN articles of 2022

- ❖ After billions in investment, plant-based meat is a branding catastrophe
- ❖ Infarm's indoor wheat suggests we re-examine the realities of vertically farmed commodities
- ❖ Vertical farming startup Fifth Season shuts down
- ❖ AquaBounty in murky water after accusations of safety violations at GM salmon plant
- ❖ The Production Board invests in Brazil's largest ag retailer in SPAC deal to promote agtech adoption
- ❖ Ag Carbon Market Map: Meet the 75 companies helping to harness the benefits of regen ag
- ❖ John Kempf's innovation-forward regen ag business Advancing Eco Agriculture raises \$4.7m

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Global Edition

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After billions in investment, plant-based meat is a branding catastrophe

October 11, 2022 Adam Hanft

Editor's Note: Adam Hanft - an advisor to AgFunder, [disclosure: AgFunder is AFN's parent company]- is a widely-respected brand strategist who advises Fortune 500 companies, and the world's most innovative startups. He sits on the boards of Scotts Miracle-Gro - the leader in the consumer lawn and garden space, and a significant investor in cannabis - as well as 1800Flowers. Adam is co-author of the "Dictionary of the Future," co-host of the podcast JOLTY, a frequently published journalist, multi-award-winning creative director, and active investor in all things plant-based. He was a strategic and digital advisor to the 2008 Obama campaign, and to the current Prime Minister of Israel. Email him at adam@hanftideas.com.



Adam Hanft

The views expressed in this guest commentary are the author's own and do not necessarily reflect those of AFN.

Radical innovation can be its own brand.

For a while. For a minute.

If you're selling a revolutionary capsule that transports you anywhere in the world, in 30 seconds, you don't need to say more than that.

It's what I call the "Declarative Moment." A simple statement of being.

But soon, 15 companies will be marketing that capsule. You'll need to differentiate.

Your box is more accurate, for instance. It can bring you precisely to the restaurant you want in Paris, not plopp you a mile away.

It does less damage to your immune system.

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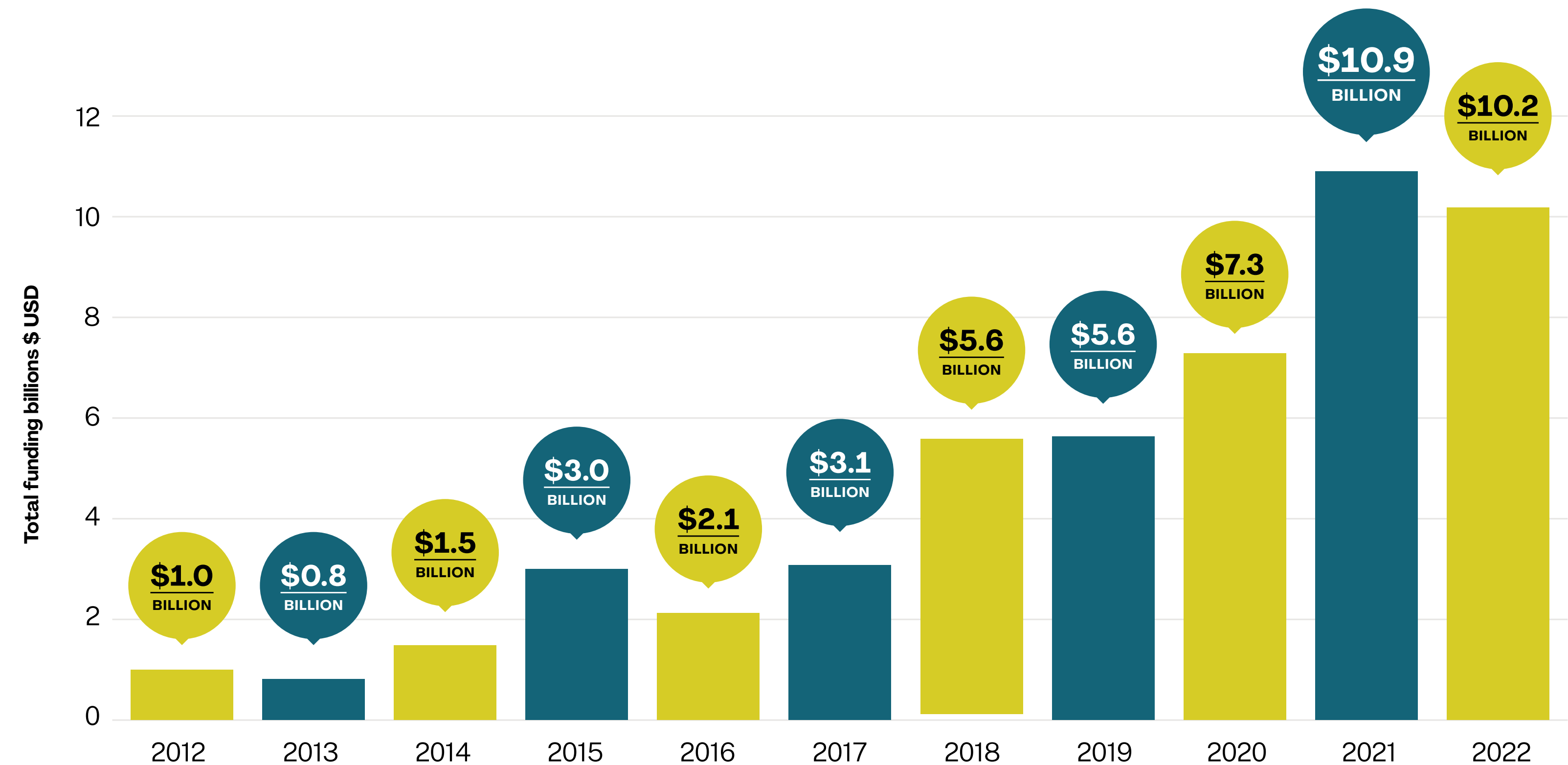
DOWNLOAD NOW

Farm tech spotlight

funding by year

Farm tech investment has increased steadily since 2012 with few setbacks compared to innovations in other parts of the supply chain. While funding was down in 2022 it was much more muted than the rest of agrifoodtech at just 6% year-over-year, likely buoyed by its increasing recognition as a climate tech category.

Farm tech funding by year



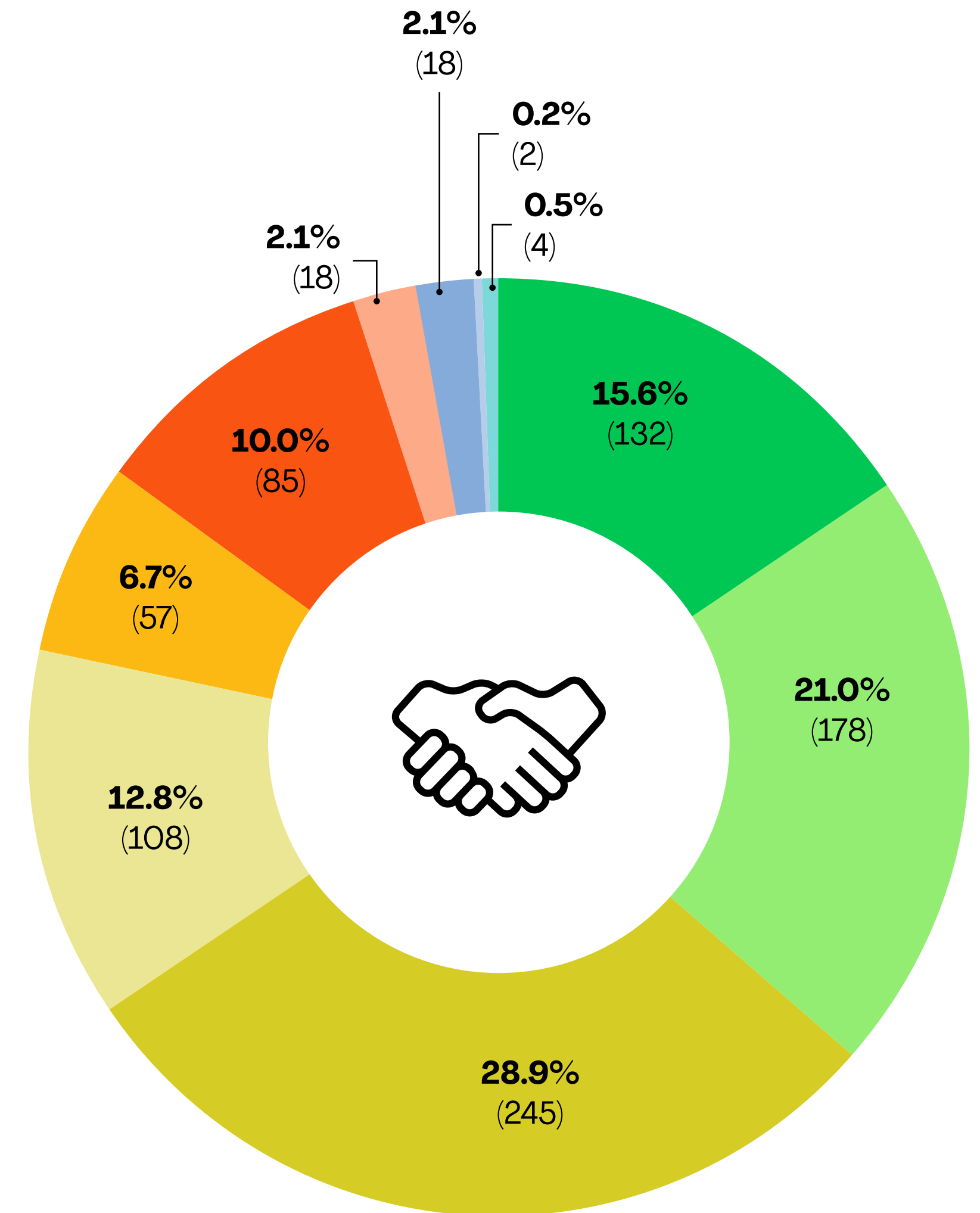
Farm tech spotlight

investment by category 2022

\$10.2 billion
raised globally through Farm tech 2022

2022 Farmtech investment by category

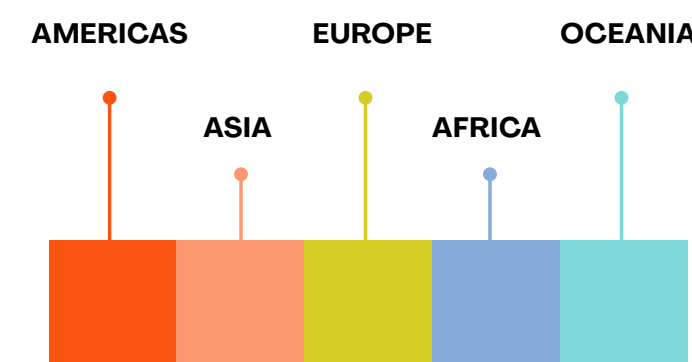
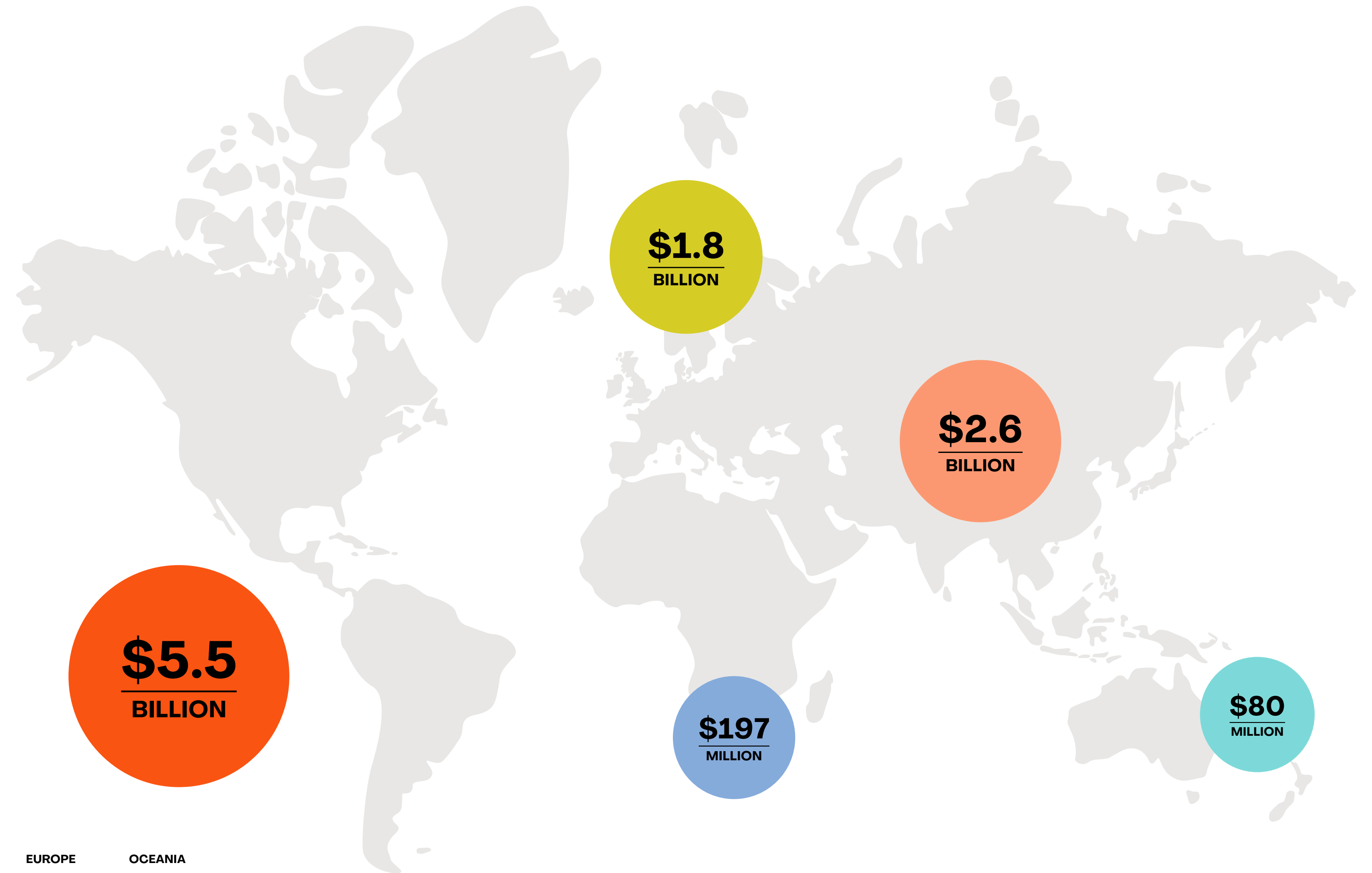
Stream	Category	\$ USD
●	Novel Farming Systems	2.8b
●	Ag Biotechnology	2.4b
●	Farm Mgmt SW, Sensing & IoT	1.7b
●	Ag Marketplaces & Fintech	1.0b
●	Bioenergy & Biomaterials	814m
●	Farm Robotics, Mechanization & Other Farm Eq	709m
●	Farm-to-Consumer eGrocery	466m
●	Midstream Technologies	157m
●	Miscellaneous	107m
●	Home & Cooking	18m



Farm tech spotlight

Top countries (\$ USD)

The Americas still dominate farm tech innovation and investment but the traction in Asia, which is now a larger market than Europe, is notable as innovators work to help their disaggregated and predominantly smallholder farming populations digitize and increase yields sustainably.





Investments by geography



Investments by geography

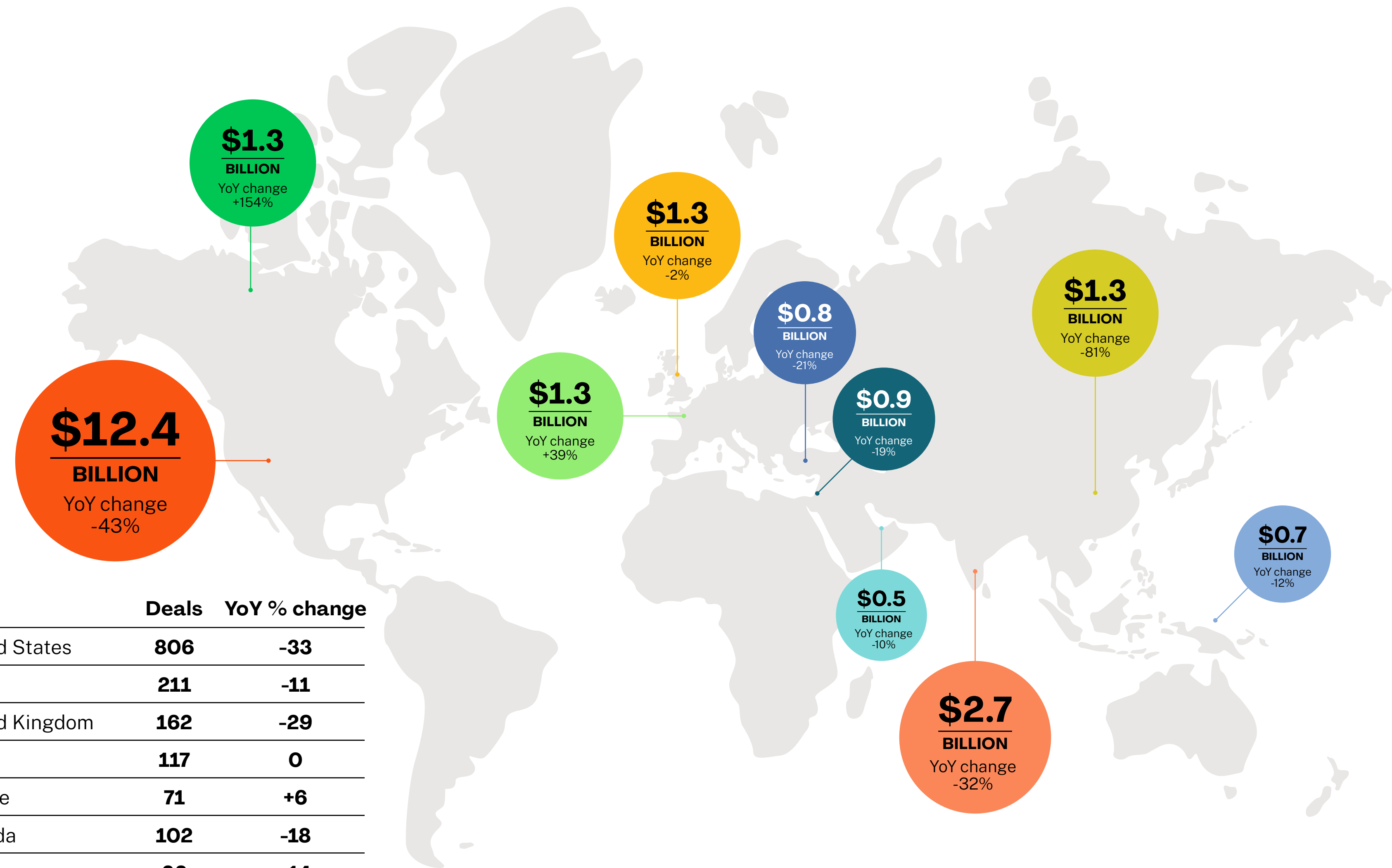
Top 10 countries by funding

Of the total raised by US companies, those based in the state of California -i.e. Silicon Valley- took almost half at \$5.3bn, almost twice as big as the second biggest global market India.

While agrifoodtech is clearly a global industry other states in the US also drew in significant totals, such as New York which beat other leading tech centres like the UK, China and France with \$1.7bn raised. Massachusetts and Illinois were on par with Israel at just under \$1bn.

Deal activity is an important measure of entrepreneurship and while down from 2021's peak, the US closed more deals than all other countries in the top 10 combined.

Country	Deals	YoY % change
United States	806	-33
India	211	-11
United Kingdom	162	-29
China	117	0
France	71	+6
Canada	102	-18
Israel	66	-14
Turkey	29	+12
Indonesia	60	+2
United Arab Emirates	38	+41



Share of agrifoodtech investment

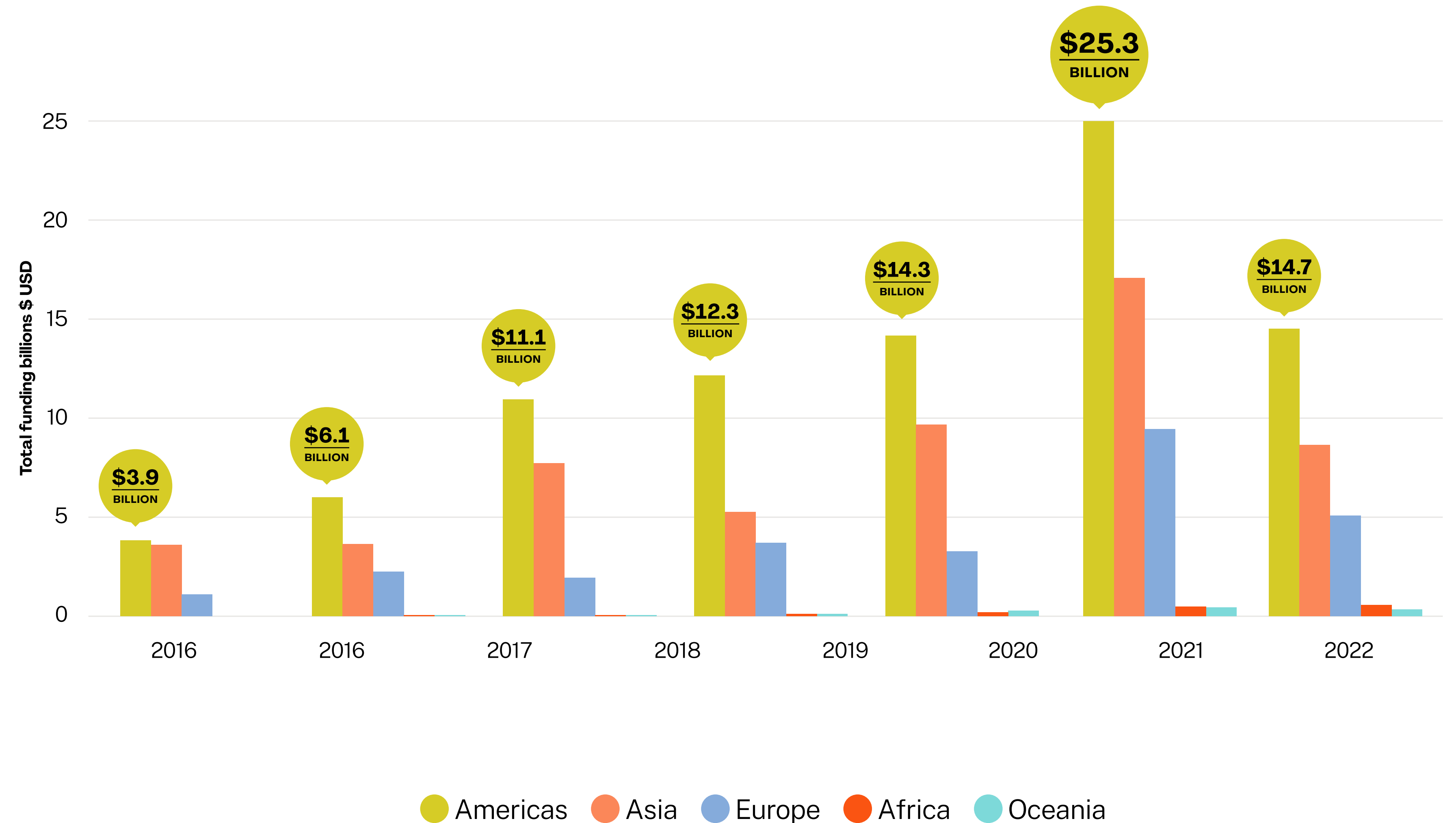
by geography

Since 2016, the Americas have taken the lion's share of VC funding for agrifoodtech except in 2015, when some mega Chinese and Indian food delivery deals warped the data. The Americas led 2022 funding in every category besides Ag Biotech, in which it tied with Asia for \$1.3bn.

In keeping with overall investment trends, VC funding for the Americas dropped nearly 42% in 2022, leaving a dollar figure more on par with 2020.

Changes in regional investment

(\$ USD)



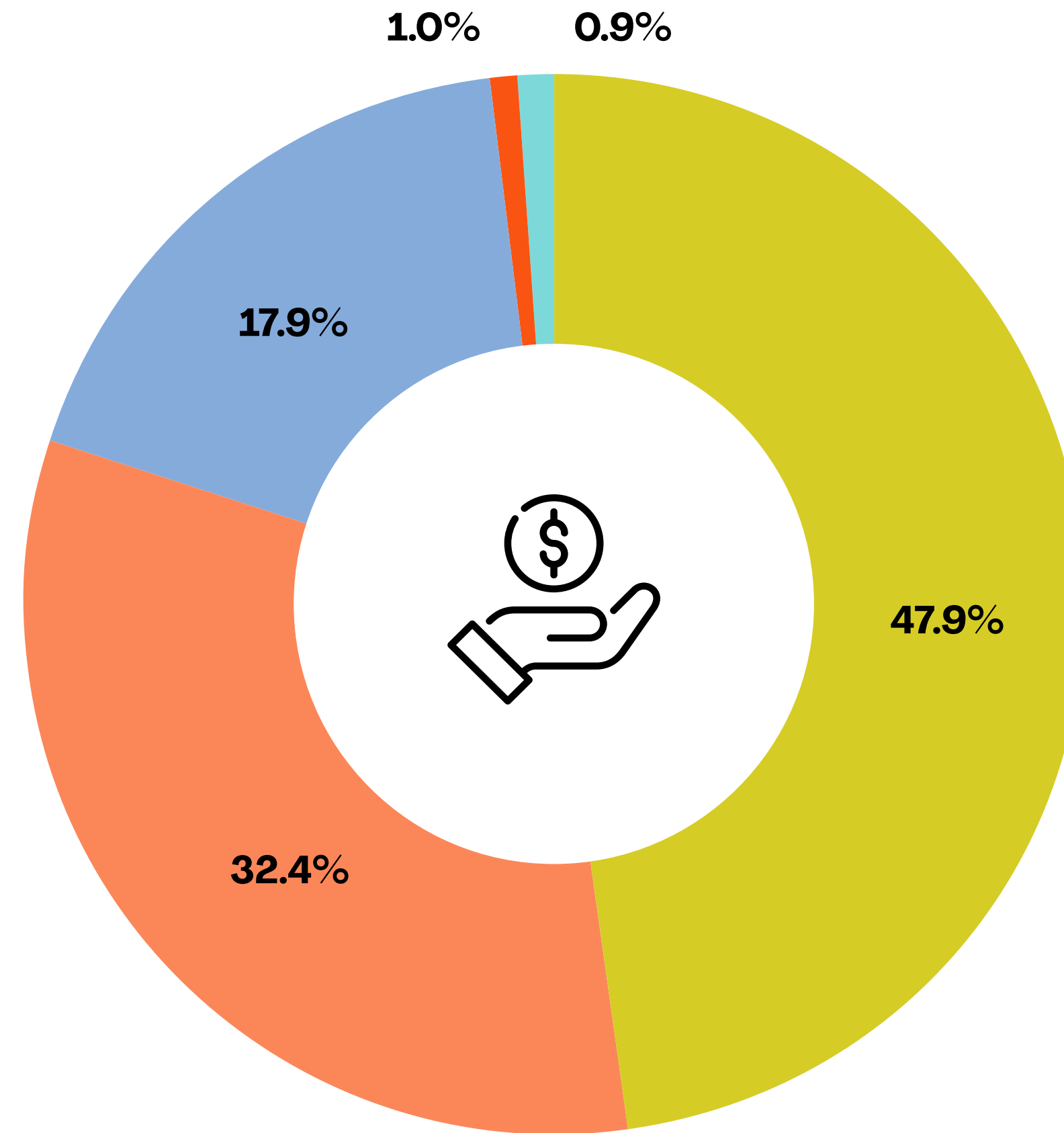
Share of agrifoodtech investment

by geography

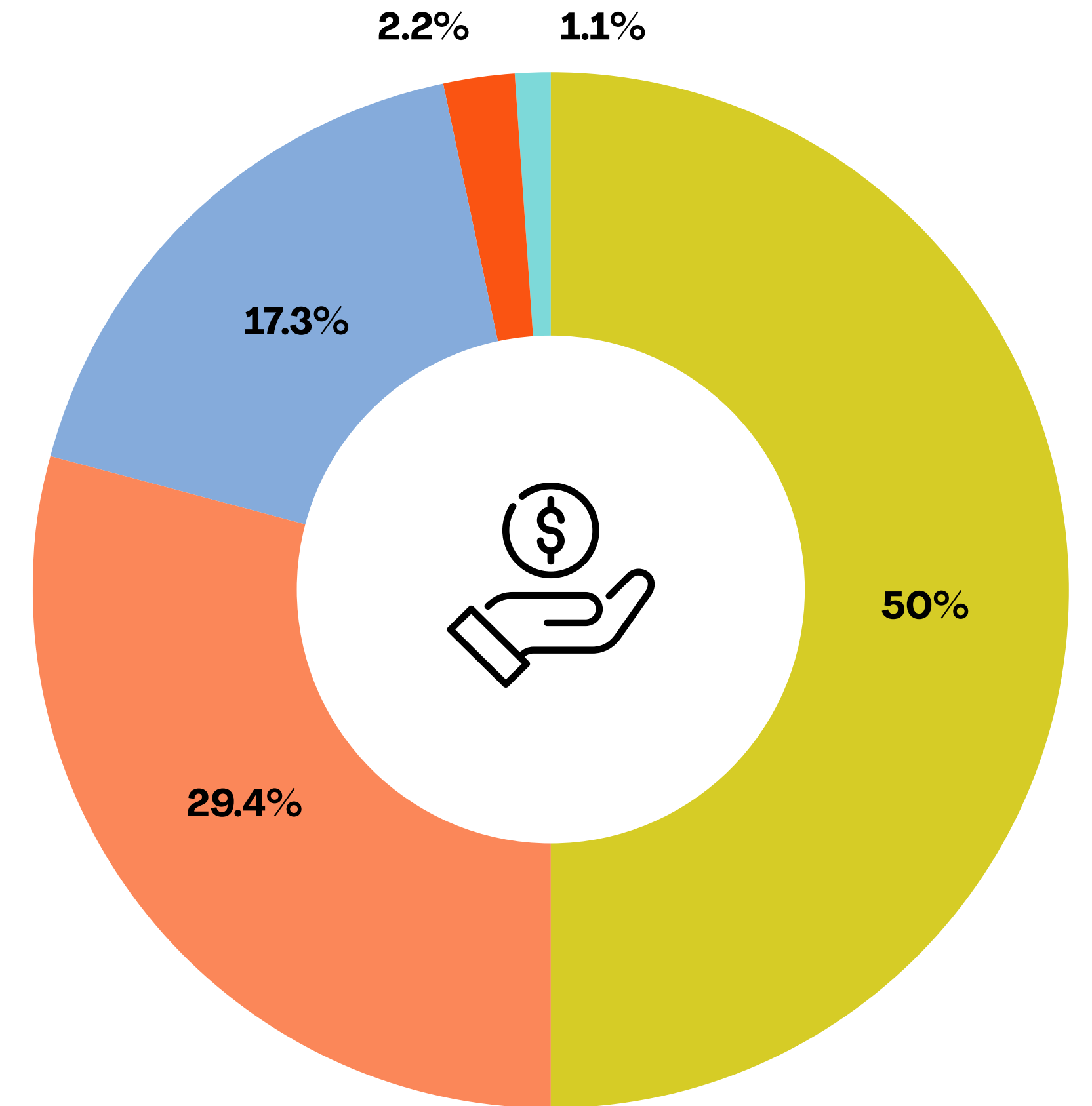
The percentage of the investment pie each region took varied minimally from 2021 to 2022. Asia had the largest decrease, likely because of the decline in eGrocery funding in China.

Encouragingly, Africa's share of the pie more than doubled. While Africa still accounts for a thin slice of overall investment, there was a 22% increase in funding to African startups.

\$ Funding 2021



\$ Funding 2022



- Americas
- Asia
- Europe
- Africa
- Oceania



Investments by geography

US in focus (\$ USD)

It's notable that the top deals outside of the US continue to be downstream in the food delivery segment with Turkey's Getir scoring the year's biggest deal.

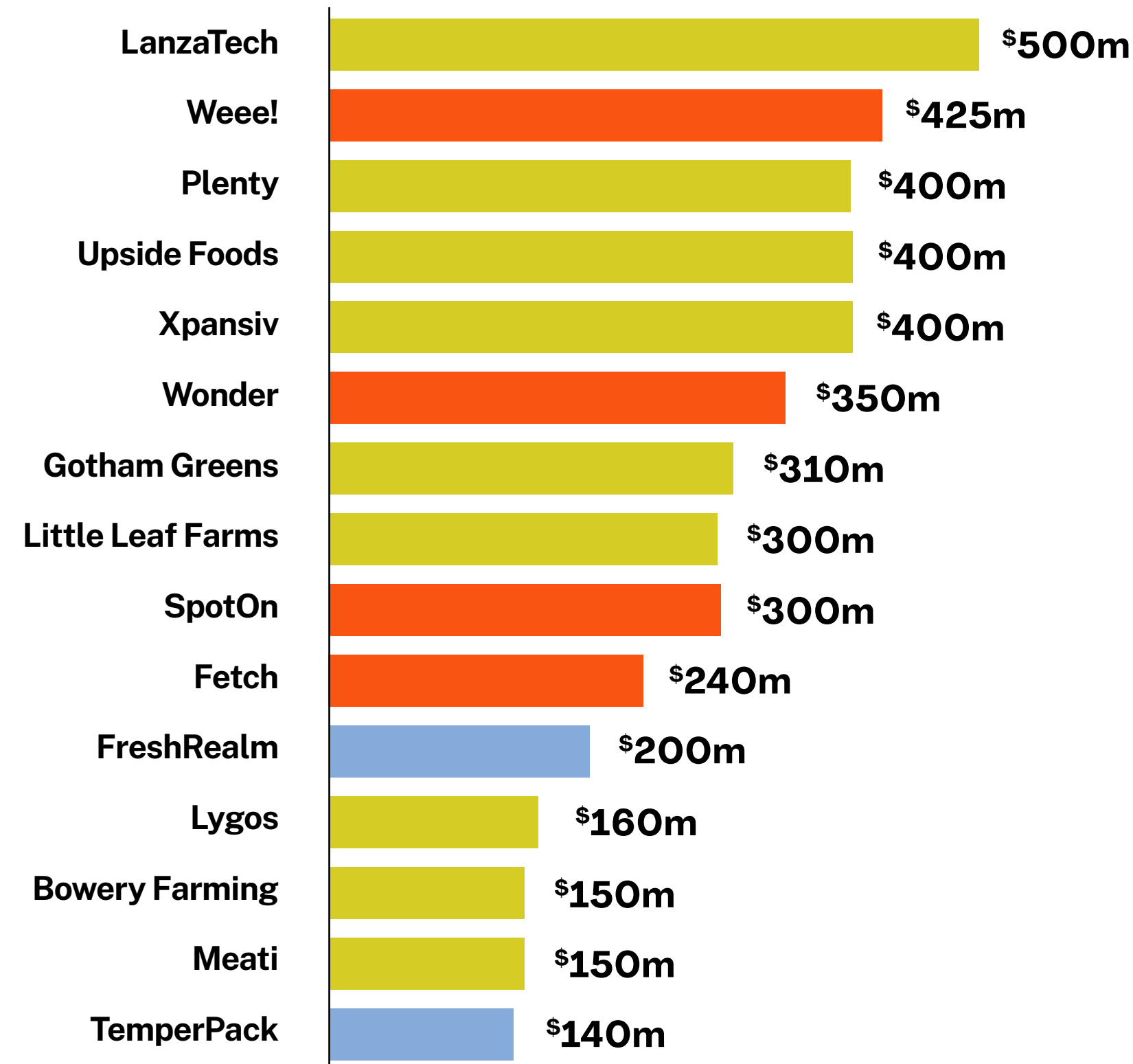
Upstream innovations are increasingly grabbing investor attention particularly as climate tech investing gathers pace.



- Upstream
- Midstream
- Downstream

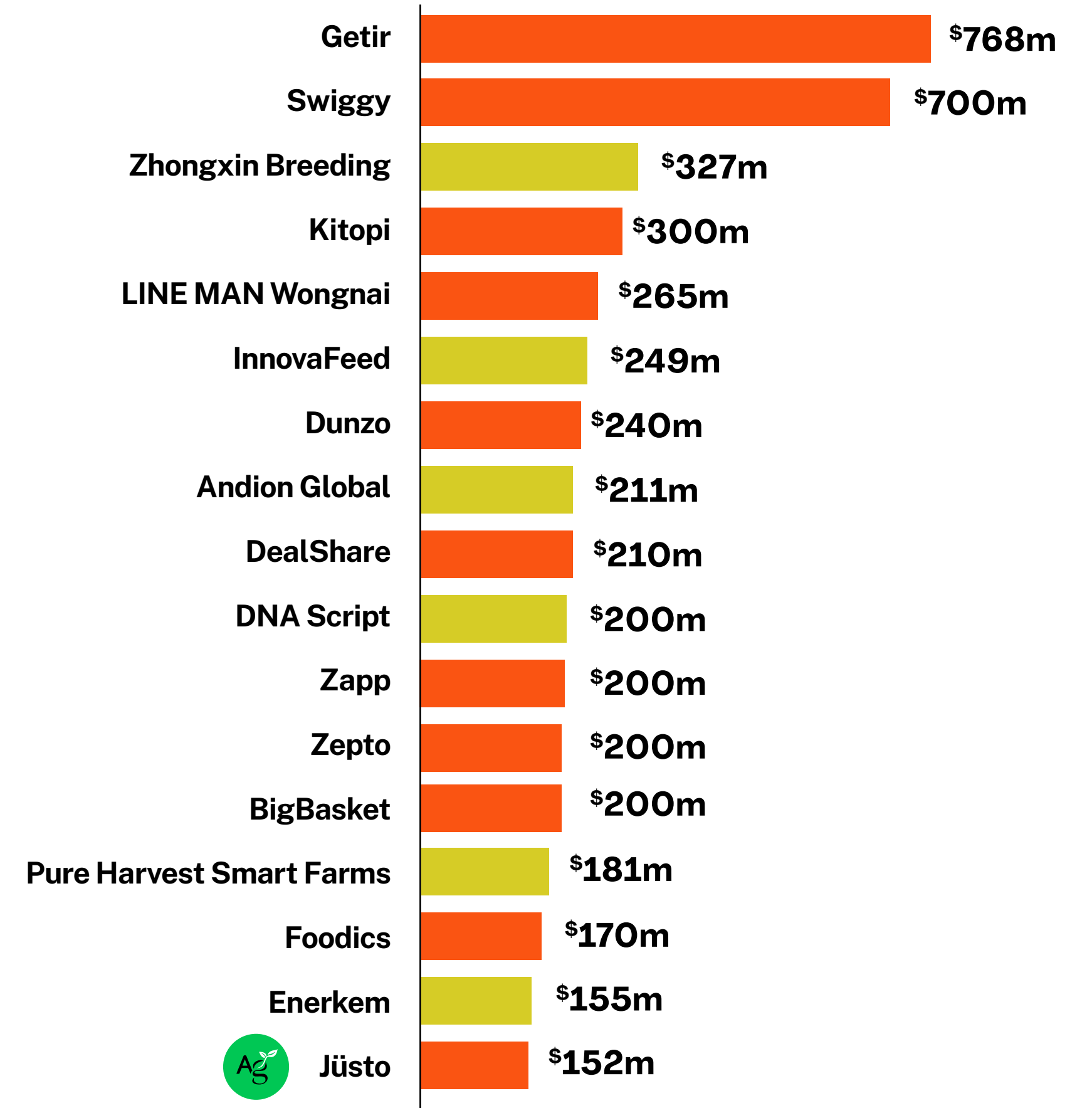
Top US Deals 2022

(\$ USD)



Top Non-US Deals 2022

(\$ USD)



US spotlight

Investment totals
(\$ USD)

806 deals
across the region

\$12.4 billion
\$USD investment

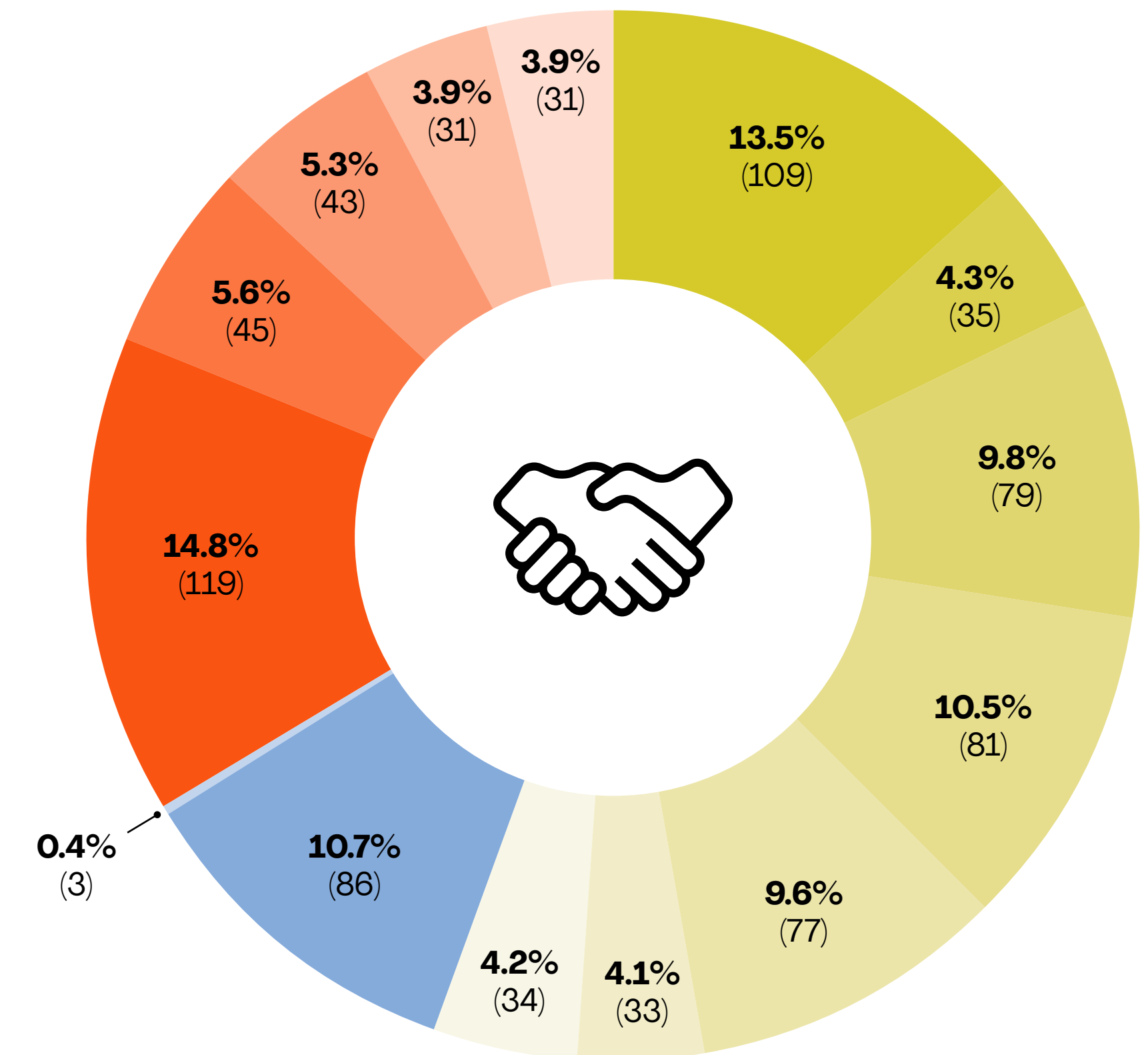


- Upstream
- Midstream
- Downstream

Investment by category 2022 (\$ USD)

Category	\$	USD
● Innovative Food	\$	1.5b
● Novel Farming Systems	\$	1.5b
● Bioenergy & Biomaterials	\$	1.2b
● Ag Biotechnology	\$	1.2b
● Farm Mgmt SW, Sensing & IoT	\$	823m
● Ag Marketplaces & Fintech	\$	623m
● Farm Robotics, Mechanization + Equipment	\$	292m
● Midstream Technologies	\$	1.0b
● Miscellaneous	\$	107m
● In-store Retail & Restaurant Tech	\$	1.9b
● eGrocer	\$	862m
● Online Restaurants & Marketplaces	\$	618m
● Home & Cooking	\$	440m
● Cloud Retail Infrastructure	\$	247m

Investment by deal count 2022



Startup spotlight

CommonGround

AGRIBUSINESS MARKETPLACE



CommonGround is a fast-growing, data centric land acquisition platform committed to transparency and modernization of the land leasing and land sales industry. CommonGround brings transparency to an inherently convoluted business practice of handshake deals and coffee shop land lease transactions.



commonground.io

 AGFUNDER PORTFOLIO COMPANY

What stood out to you the most about 2022?

2022 showed the land industry unprecedented growth yet hesitancy on the cusp of economic uncertainty. At CommonGround, we were able to take this trend to grow the business over 300% by assisting our landowner clients in establishing a fair market value for the land, farmer users to grow their operation by bringing more inventory to the market and land broker partners to expand the reach of their brokerages.

How would you describe the agrifoodtech sector to an outsider?

Agrifoodtech challenges the long-standing business practices of agriculture to become more efficient and competitive in

a natural resource restrictive environment while still meeting the ever-changing demands of the consumer.

What are the biggest challenges facing the world's food and agriculture industry today?

“Buy land, they’re not making it anymore.”
-Mark Twain

Urban sprawl, along with other factors, has consumed approximately 1.9 million acres of farmland per year since 2014. Farmers are tasked with increasing efficiency while maintaining or increasing the soil health on their increasingly limited resource, land.

How is your technology making a positive impact on the world?

From landowners, whether retired or new investors, by allowing their yearly income to increase, setting themselves and future generations up for financial success to the farmer, from first generation to multi-, by allowing access to grow their operations and directly impacting their rural communities.

What has been your experience fundraising?

We’ve been lucky to have our customers –landowners, land professionals and farmers – to believe in our mission so deeply that they demanded to invest in it. Venture investors have also seen that with such a strong product market fit, the future is looking bright. While there is general uncertainty in the global markets, one thing is for sure, farmland will continue to prove resilient as it always has.



China spotlight

Top deals (\$ USD)



Total investment in China agrifoodtech dropped over 80% to \$1.3 billion in 2022 from nearly \$7 billion in 2021 after several years of consumer-related investment. Many companies also held back fundraising plans during dampened consumer confidence from the country's extended Covid lockdowns. Positively, attention turned towards upstream investments which speaks to the growing pool of agrifood entrepreneurs responding to top-down priorities for food security and carbon neutrality goals. New funding activity was particularly pronounced in breeding and biotechnology for farm inputs.



01 Zhongxin Breeding
\$372 million
 AG BIOTECHNOLOGY

02 Bluepha
\$125 million
 BIOENERGY / BIOMATERIALS

03 Starfield Food & Science Tech
\$100 million
 INNOVATIVE FOOD

04 Mojia Bioscience
\$80 million
 MIDSTREAM TECHNOLOGIES

05 Enzymaster
\$47 million
 BIOENERGY / BIOMATERIALS

06 Feng1
\$47 million
 IN-STORE RESTAURANT & RETAIL TECH

07 Zhiyi Pharmaceuticals
\$45 million
 AG BIOTECHNOLOGY

08 Huili Bio
\$45 million
 AG BIOTECHNOLOGY

09 Readline
\$43 million
 AG BIOTECHNOLOGY

10 Derit Seeds
\$40 million
 AG BIOTECHNOLOGY

China spotlight

Investment totals
(\$ USD)

117 deals
across the region

\$1.3 billion
\$USD investment

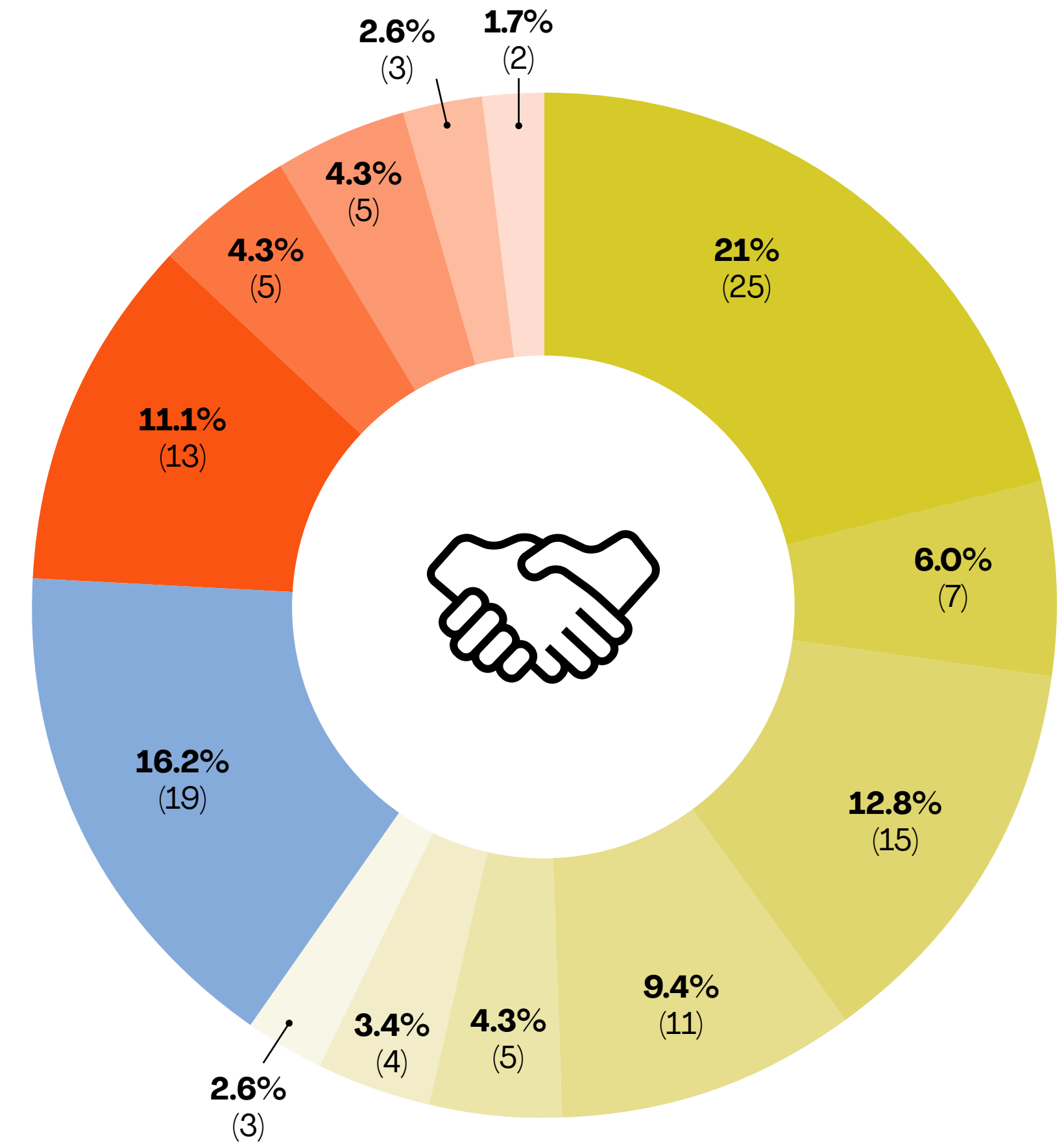


- Upstream
- Midstream
- Downstream

Investment by category 2022 (\$ USD)

Category	\$	USD
● Ag Biotechnology	\$	642m
● Bioenergy & Biomaterials	\$	206m
● Innovative Food	\$	135m
● Farm Mgmt SW, Sensing & IoT	\$	34m
● Farm Robotics, Mechanization + Equipment	\$	31m
● Ag Marketplaces & Fintech	\$	15m
● Novel Farming Systems	\$	15m
● Midstream Technologies	\$	164m
● Miscellaneous	\$	0m
● In-store Retail & Restaurant Tech	\$	80m
● Online Restaurants & Marketplaces	\$	5m
● Home & Cooking	\$	3m
● eGrocer	\$	3m
● Cloud Retail Infrastructure	\$	0m

Investment by deal count 2022



Australia spotlight

Top deals (\$ USD)



Australia's agrifoodtech sector matched the global trend with investment dropping 40% year-over-year to \$248 million. But there are some bright spots with Vow, one of the world's leading cellular agriculture companies, raising a hefty Series A in November at one of the worst times for fundraising in history. Another leader in its category AgriDigital closed a round in May to take its digital grain management platform to the US.

AgriFutures[®] **grow** AG. | AgriFutures[®] **evoke** AG.



01

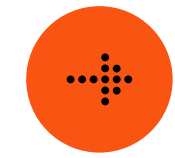


MILKRUN

\$54 million

EGROCERY

MILKRUN



02

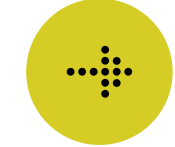


Vow

\$49.2 million

INNOVATIVE FOOD

Vow



03



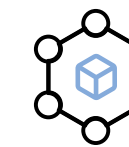
Nourish Ingredients

\$28.6 million

INNOVATIVE FOOD

nourish
INGREDIENTS

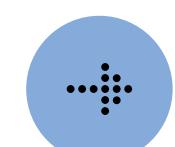
04



Lumachain

\$19.5 million

MIDSTREAM TECHNOLOGIES

LUMACHAIN
ILLUMINATE OUR FUTURE

05

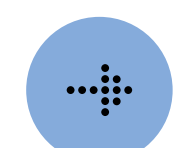


AgriDigital

\$17.8 million

MIDSTREAM TECHNOLOGIES

AgriDigital



Australia spotlight

Investment totals
(\$ USD)

34 deals
across the region

\$248 million
\$USD investment



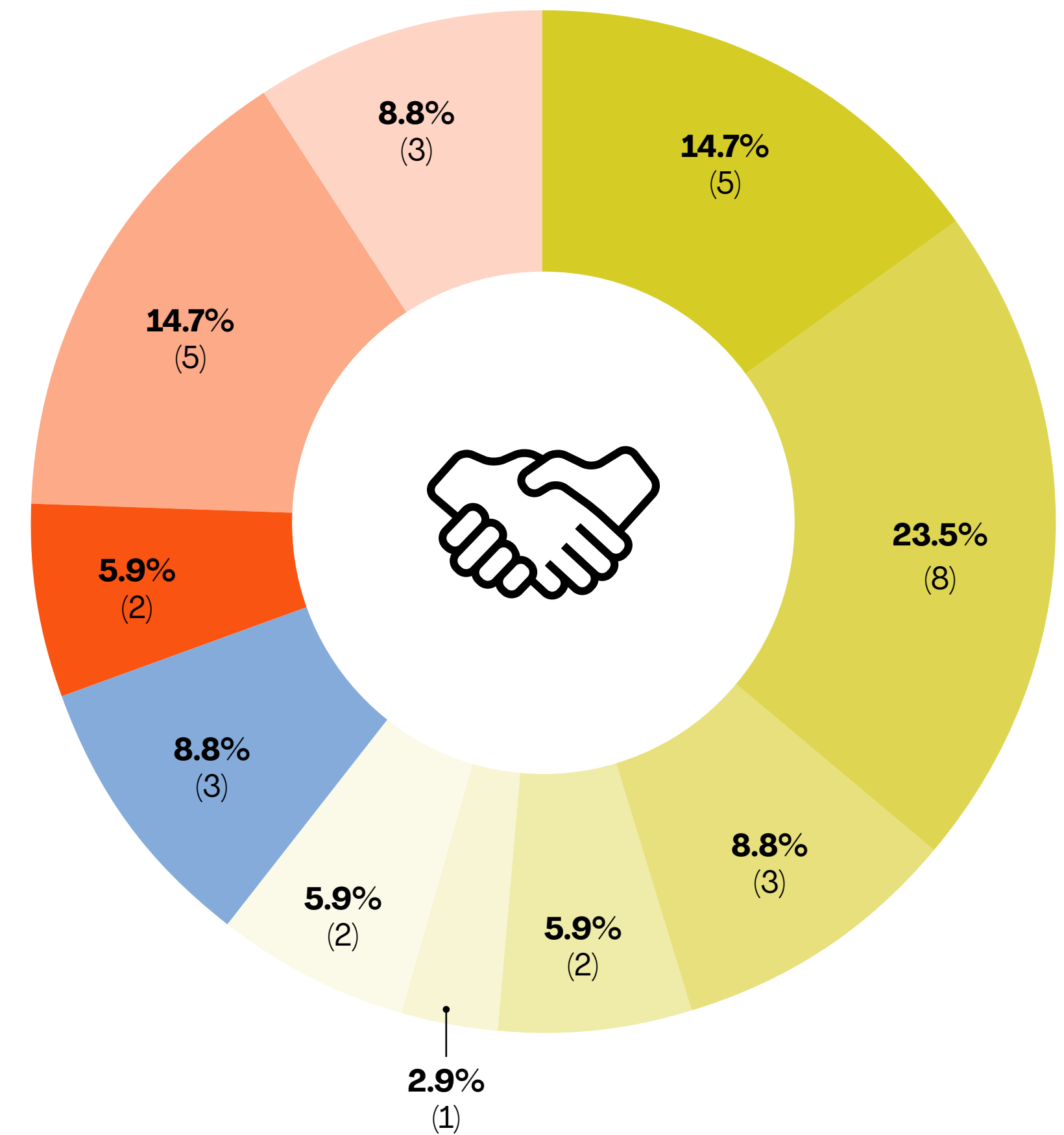
- Upstream
- Midstream
- Downstream



Investment by category 2022 (\$ USD)

Category	\$	USD
● Innovative Food	\$	98m
● Farm Management Software & Sensing	\$	26m
● Bioenergy/Biomaterials	\$	12m
● Ag Marketplaces & Fintech	\$	5m
● Ag Biotechnology	\$	5m
● Farm Robotics, Mechanization + Equipment	\$	5m
● Midstream	\$	37m
● eGrocery	\$	54m
● Online Restaurants + Meal Marketplaces	\$	5m
● In-Store Retail & Restaurant Tech	\$	131k

Investment by deal count 2022



Startup spotlight

Loam Bio

AG BIOTECHNOLOGY



Loam equips farmers with the tools to address climate change. Using microbial technology to capture carbon from the atmosphere and store it stably in the soil, helping to boost cropping productivity, reduce inputs and drive environmental co-benefits. After years of development and trials, Loam is launching its products in the Australian, US, and Canadian markets.



loam

 loambio.com

How would you describe the agrifoodtech sector to an outsider?

It's the science, technology, and research that supports our global food and fibre supply-chains to be more resilient, sustainable and scalable.

What are the biggest challenges facing the world's food and agriculture industry today?

Climate change.

What keeps you up at night?

The carbon market being undermined by companies who don't put farmers and the quality of environmental impact first. There is an enormous opportunity here to achieve real climate action, and create resilience in our food supply chains, but this could be derailed by bad actors.

What stood out to you the most about 2022?

The maturation and increased participation in global carbon markets is providing greater opportunities for farmers to embed climate technologies, like Loam, into their cropping systems and be rewarded.

This growing demand for transparent, economically valuable products in the natural capital space, led to Loam launching SecondCrop, its carbon project offering. SecondCrop is a farmer-focused carbon project pathway that maximises the benefits delivered back to farmers.

How is your technology making a positive impact on the world?

Giving farmers the tools to be leaders in climate action. Loam's microbial technology allows farmers to remove CO₂ from the atmosphere and store it stably in agricultural soils. At scale.

What are your predictions for 2023 in our industry?

A lot of businesses saw significant funding in 2019-2021. Those technologies are now maturing and available to farmers to be leaders in climate action.

What has been your experience fundraising?

Climate tech has proven to be incredibly resilient in the current fundraising environment. There is still strong demand for innovative technologies, like Loam's, from investors who are aligned with our mission to draw down gigatonnes of CO₂.

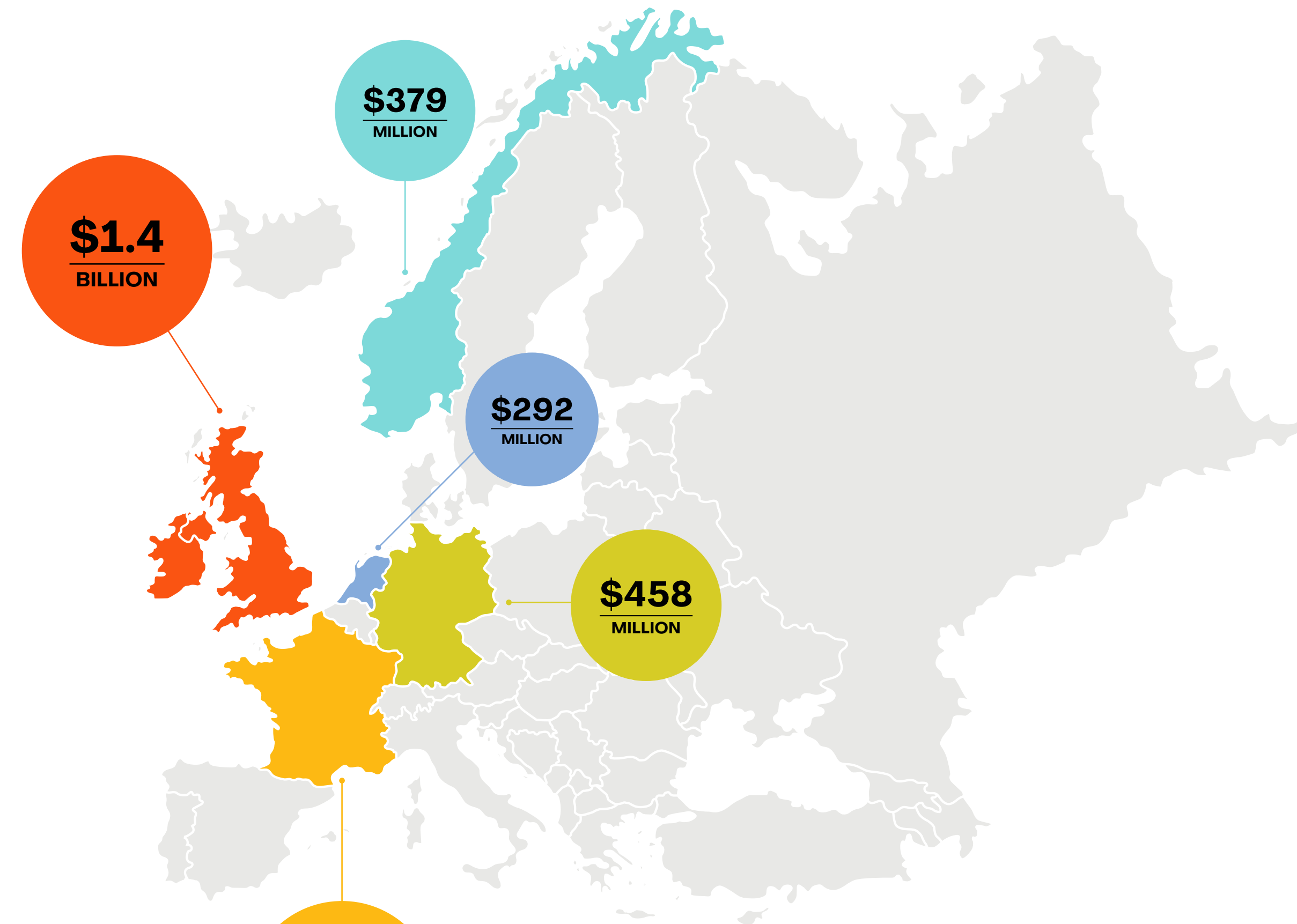


Europe spotlight

Top 5 countries by funding (\$ USD)



France was an outlier in 2022 posting a nearly 40% increase in funding for its agrifoodtech startup ecosystem. While driven by some large upstream deals, including a large round for an insect farming company, the number of deals closed during the year also increased 6% compared to 2021. The country has an increasingly varied ecosystem across the supply web after years of downstream dominance. The UK also held up relatively well scoring some large deals in eGrocery and indoor agriculture, albeit with a 30% drop in deals year-over-year.



Country	\$ total	YoY change
United Kingdom	1.4b	-2%
France	1.3b	+39%
Germany	457.8m	-84%
Norway	378.6m	+20%
Netherlands	292.4m	-68%



Europe spotlight


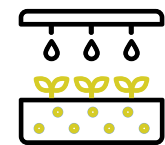

Investment totals
(\$ USD)

665 deals
across the region

\$5.1 billion
\$USD investment



- Upstream
- Midstream
- Downstream




01  InnovaFeed SERIES D
 **\$249.3 million** 
 NOVEL FARMING SYSTEMS

02  Rohlik SERIES D
 **\$210 million** 
 EGROCERY

03  Zapp SERIES B
 **\$200 million** 
 EGROCERY

04  DNA Script SERIES C
 **\$200 million** 
 AG BIOTECHNOLOGY

05  Deliverect SERIES D
 **\$150 million** 
 CLOUD RETAIL INFRASTRUCTURE

06  Kolonial.no SERIES A
 **\$150 million** 
 EGROCERY

07  GrowUp Farms LATE
 **\$136.2 million** 
 NOVEL FARMING SYSTEMS

08  ICEYE SERIES D
 **\$136 million** 
 FARM MGMT SOFTWARE, SENSING & IOT

09  Descartes Underwriting SERIES B
 **\$120 million** 
 AG MARKETPLACES + FINTECH

10  Choco SERIES B
 **\$111 million** 
 MIDSTREAM TECHNOLOGIES

Partner Foodbytes

foodbytesworld.com

Foodbytes
Powered by Rabobank

Foodbytes, Rabobank's long-standing innovation arm, is now an online connection hub designed to drive more efficient innovation. With its eight-year track record of scouting the most promising global innovators, Foodbytes helps corporates optimize core business through startup collaboration, while providing startups continuous exposure to potential partners and investors. Join the network at foodbytesworld.com

Why is Foodbytes strategically important to Rabobank?

It's a critical tool that helps Rabobank achieve its mission of feeding the world more sustainably, amplifies our role as a trusted connector, and uncovers new models for supporting F&A businesses through knowledge, networks and finance. The new Foodbytes hub is a critical tool for existing clients to future-proof their businesses and for pioneering startups to reach scale through collaboration - all while helping the bank finance the future of food.

What is an 'Online Connection Hub' and what are the benefits for the different players?

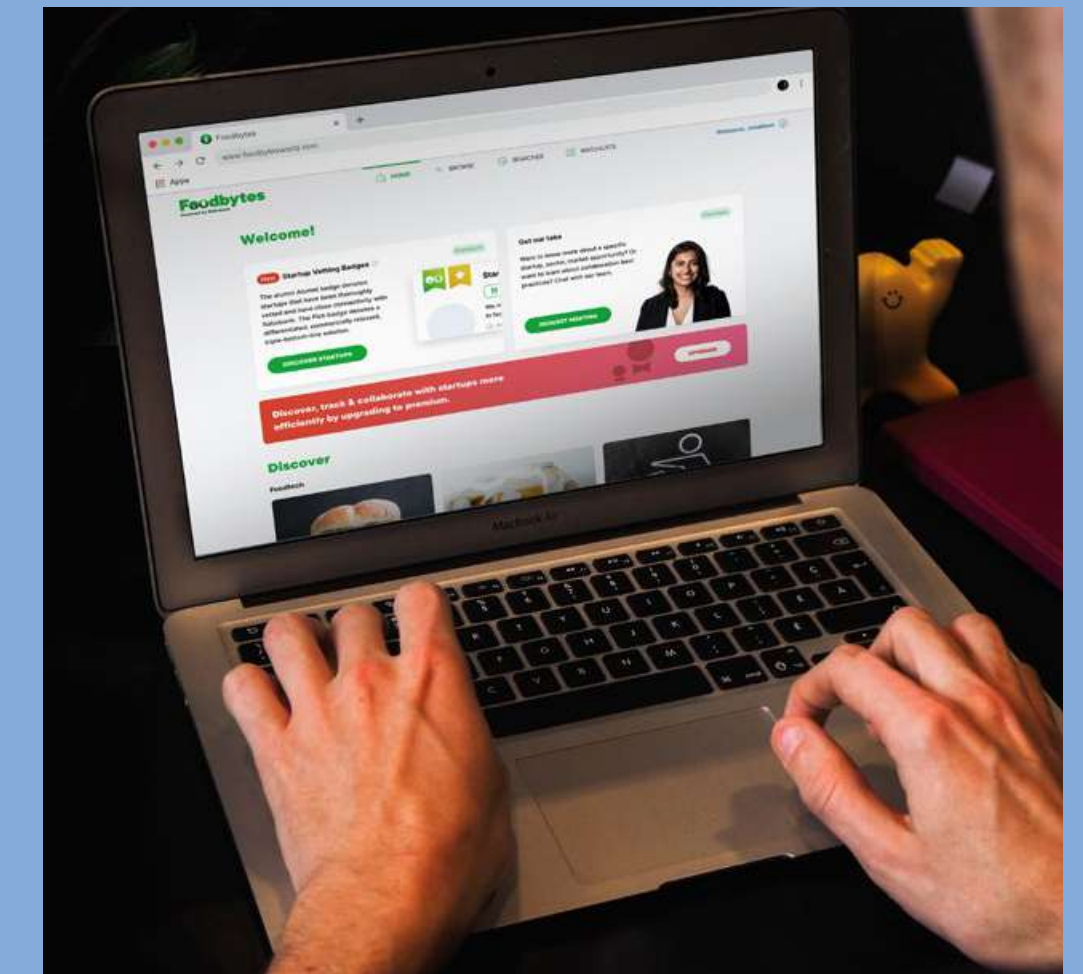
For corporates and investors, it's a CRM that affords self-serve access to more than 1,200 verified startups, plus monthly curated insights and vetted startup lists. For startups, it's a continual open mic to efficiently showcase their tech, traction and current needs to potential partners and funders.

What is one tangible Foodbytes collaboration success story?

Through a Foodbytes connection, Ginkgo Bioworks partnered with fermentation-based food colorant startup Phytolon. Helping early stage companies scale and succeed is part of Ginkgo's mission to make biology easier to engineer. Partnering with Ginkgo enabled Phytolon to expand its product portfolio and get closer to commercialization. Phytolon went on to raise a \$14.5M Series A in July 2023, led by DSM Venturing.

What startup trends does Foodbytes believe will see continued adoption and impact in 2023?

Upstream, robotics and automation technologies, as well as more sophisticated and



integrated farm management information systems. Downstream: biodiverse diets and regenerative agriculture will gain further traction, food waste and loss will remain a hotbed for cross-industry collaboration, and the alternative protein boom will give way to new fermentation frontiers, and molecular farming. Lastly, carbon emission mitigation and measurement will continue to dominate the sustainability conversation.

What types of startups, corporates and investors are part of Foodbytes' network?

Early corporate adopters include Barilla, Rich's, Hershey's and G&M. The Foodbytes startup network spans 73 countries, with 75% generating revenue, and nearly all seeking partnerships or funding. Notable startups include ReGrow, Amai Proteins, Goterra, Muncher, Hello Tractor and Planet Farms. Learn more by setting up a FREE [foodbytes account](https://foodbytesworld.com).



Africa spotlight


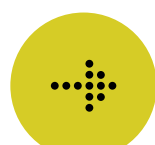
Top deals (\$ USD)



While total agrifoodtech funding dipped in many regions in 2022, investment in Africa jumped 22% to \$640 million from \$526 million in 2021. Digitizing the region's many small and informal retailers was a key trend in 2022 with Nairobi-based Wasoko's Series B round boosting the year's total. Wasoko, which enables retailers to restock shelves using their mobile phones, boosted the year's total. Meanwhile MarketForce is building a B2B platform dubbed RejaReja (Swahili for 'retail') enabling traders to source goods directly from manufacturers and distributors.



01 Wasoko
 **\$125 million**
 IN-STORE RETAIL & RESTAURANT TECH 

02 ThriveAgric
 **\$54.6 million**
 AG MARKETPLACES & FINTECH 

03 MarketForce
 **\$40 million**
 IN-STORE RETAIL & RESTAURANT TECH 

04 Apollo Agriculture
 **\$40 million**
 AG MARKETPLACES & FINTECH 

05 MaxAB
 **\$40 million**
 MIDSTREAM TECHNOLOGIES 

06 Capiter
 **\$33 million**
 MIDSTREAM TECHNOLOGIES 

07 Vendease
 **\$30 million**
 MIDSTREAM TECHNOLOGIES 

08 Brimore
 **\$25 million**
 CLOUD RETAIL INFRASTRUCTURE 

09 Sanergy
 **\$19 million**
 BIOENERGY & BIOMATERIALS 

10 Jabu
 **\$15 million**
 MIDSTREAM TECHNOLOGIES 

Africa spotlight

Investment totals
(\$ USD)

142 deals
across the region

\$640 million
\$USD investment

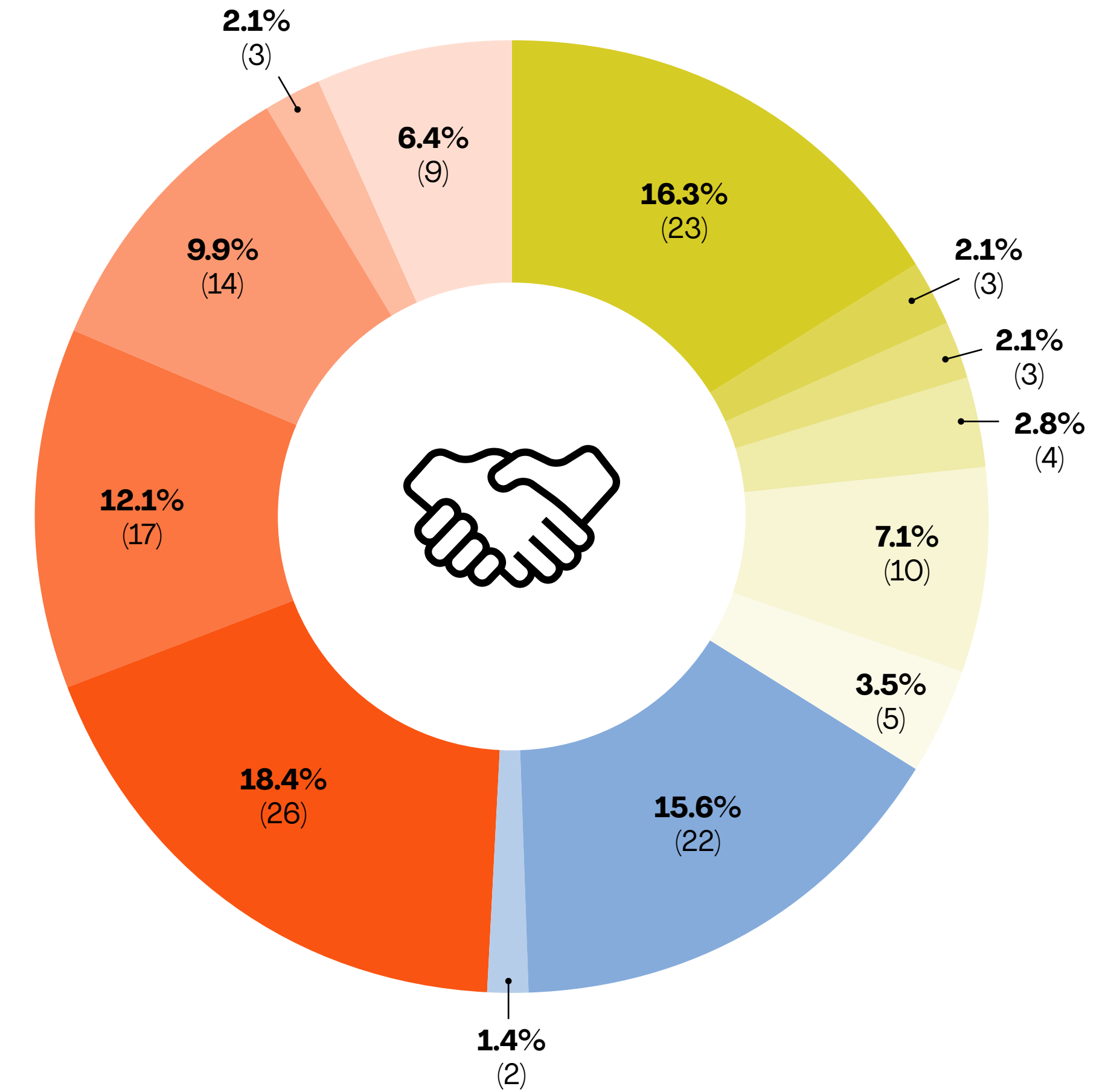


- Upstream
- Midstream
- Downstream

Investment by category 2022 (\$ USD)

Category	\$	USD
● Ag Marketplaces & Fintech	\$	131m
● Bioenergy & Biomaterials	\$	19m
● Farm Robotics, Mechanization + Equipment	\$	10m
● Novel Farming Systems	\$	8m
● Farm Mgmt SW, Sensing & IoT	\$	1m
● Innovative Food	\$	0m
● Midstream Technologies	\$	170m
● Miscellaneous	\$	20m
● In-store Retail & Restaurant Tech	\$	197m
● Cloud Retail Infrastructure	\$	44m
● eGrocer	\$	24m
● Home & Cooking	\$	8m
● Online Restaurants & Meal Marketplaces	\$	8m

Investment by deal count 2022



Africa spotlight

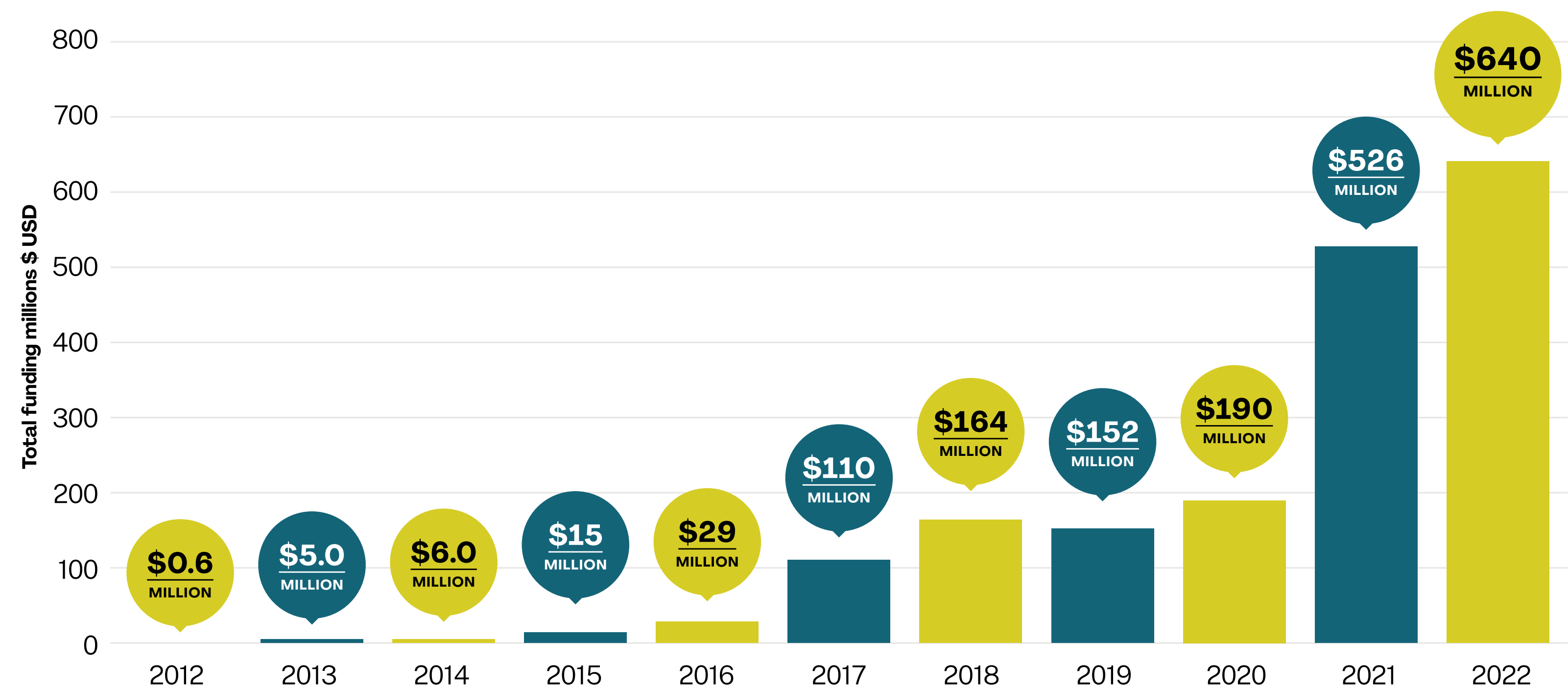
Investment totals

(\$ USD)

As in 2021, the big spending in 2022 was concentrated on three areas: Ag Marketplaces & Fintech, Midstream Technologies, and Retail & Restaurant Tech. Two interesting fintech-focused seed rounds seed rounds included an \$8.4m investment in Nigerian startup Kippa, which is building a bookkeeping platform for SMEs; and a \$7.3m investment in Numida, which supports micro and small businesses with loans of \$100-\$5,000 disbursed via a mobile app.

Africa agrifoodtech funding by year

(\$ USD)





Investments by category



Funding by category

While downstream categories eGrocery and Retail & Restaurant Tech once again raised the most funding, the numbers tell only part of the story.

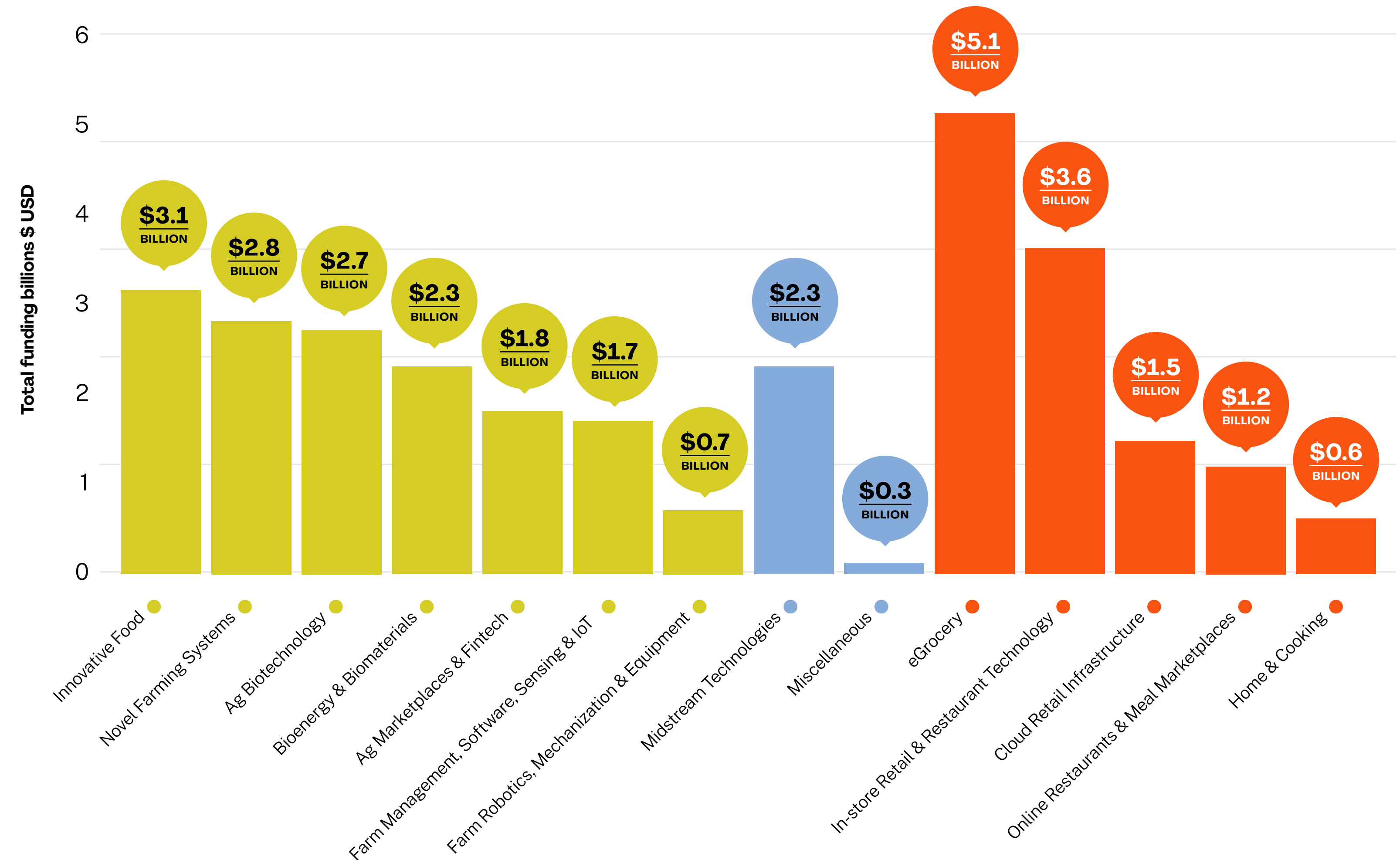
For example, the \$5.1bn raised by eGrocery in 2022 is largely thanks to a few large rounds very early in the year -- before the market crash; (18) companies raised \$100m or more each.

The more compelling story is the increased investor attention to upstream technologies, most of which are climate solutions.



- Upstream
- Midstream
- Downstream

2022 Funding by category



Funding by category

The fall from grace of the alternative protein segment is well documented. But, as part of our Innovative Food category, which includes other novel food products such as sugar replacements, it was still the third best funded and second most active by deal count. The push to reduce our reliance on livestock farming continues unabated.

In-store Retail and Restaurant Technologies deals were the most numerous. It's an increasingly globally-diverse category as emerging markets innovators seek to digitize and aggregate their numerous informal shops and restaurants.



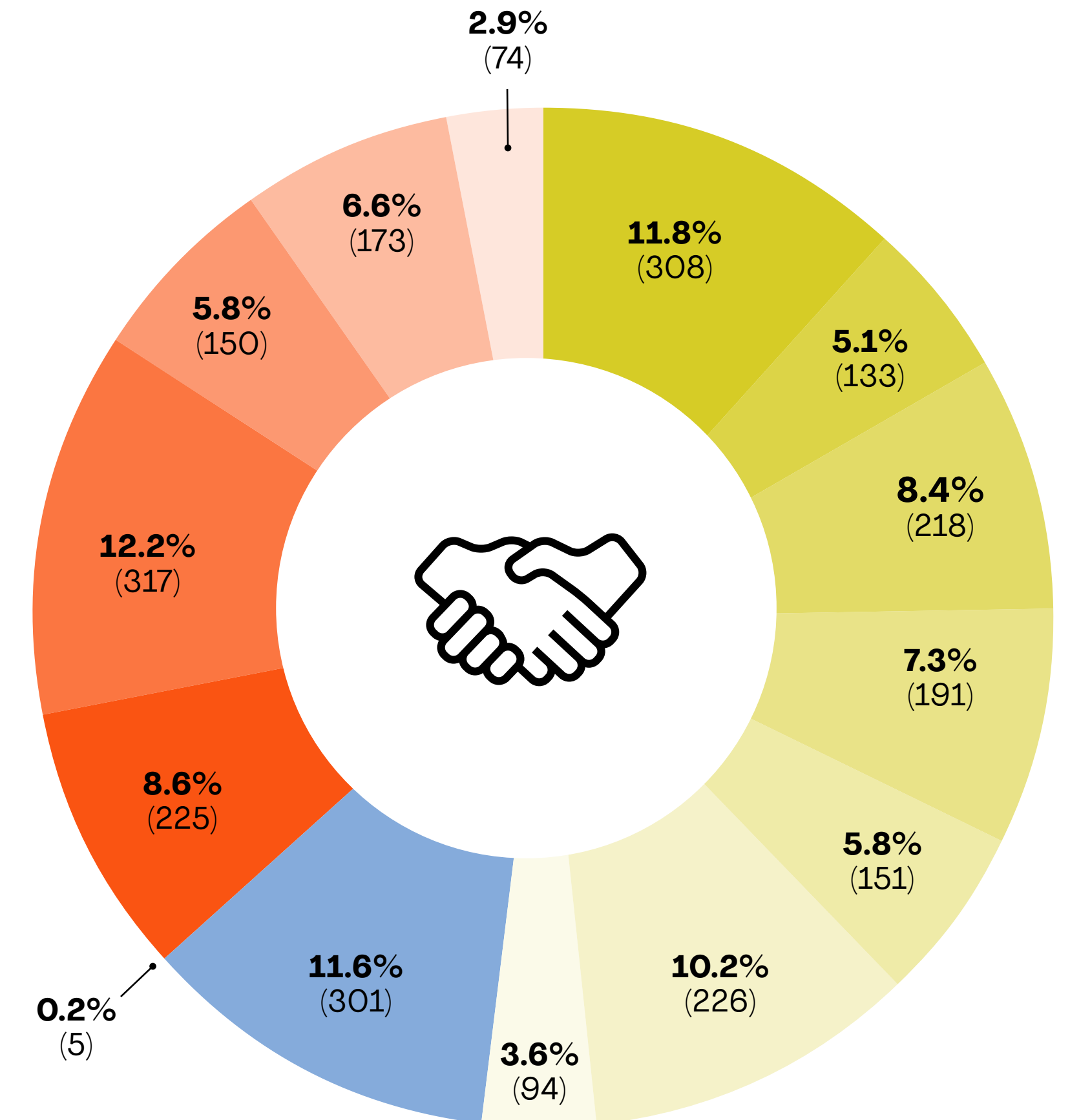
- Upstream
- Midstream
- Downstream

Categories by funding 2022

(\$ USD)

Category	\$	USD
● Innovative Food	\$	3.1b
● Novel Farming Systems	\$	2.8b
● Ag Biotechnology	\$	2.7b
● Bioenergy & Biomaterials	\$	2.3b
● Ag Marketplaces & Fintech	\$	1.8b
● Farm Management & Software Sensing IoT	\$	1.7b
● Farm Robotics, Mechanization & Equipment	\$	714m
● Midstream Technologies	\$	2.3b
● Miscellaneous	\$	127m
● eGrocer	\$	5.1b
● In-store Retail & Restaurant Tech	\$	3.6b
● Cloud Retail Infrastructure	\$	1.5b
● Online Restaurants & Marketplaces	\$	1.2b
● Home & Cooking	\$	553m

Categories by deal count 2022



Funding by category

Four categories related to climate and efficiency experienced an increase in funding in 2022, including Ag Biotech, Farm Management Software, Sensing & IoT, Bioenergy & Biomaterials and Novel Farming Systems.

It's been a wild ride for downstream startups; eGrocery would skew this chart as it raised over \$19bn in 2021, dropping 73% in 2022.

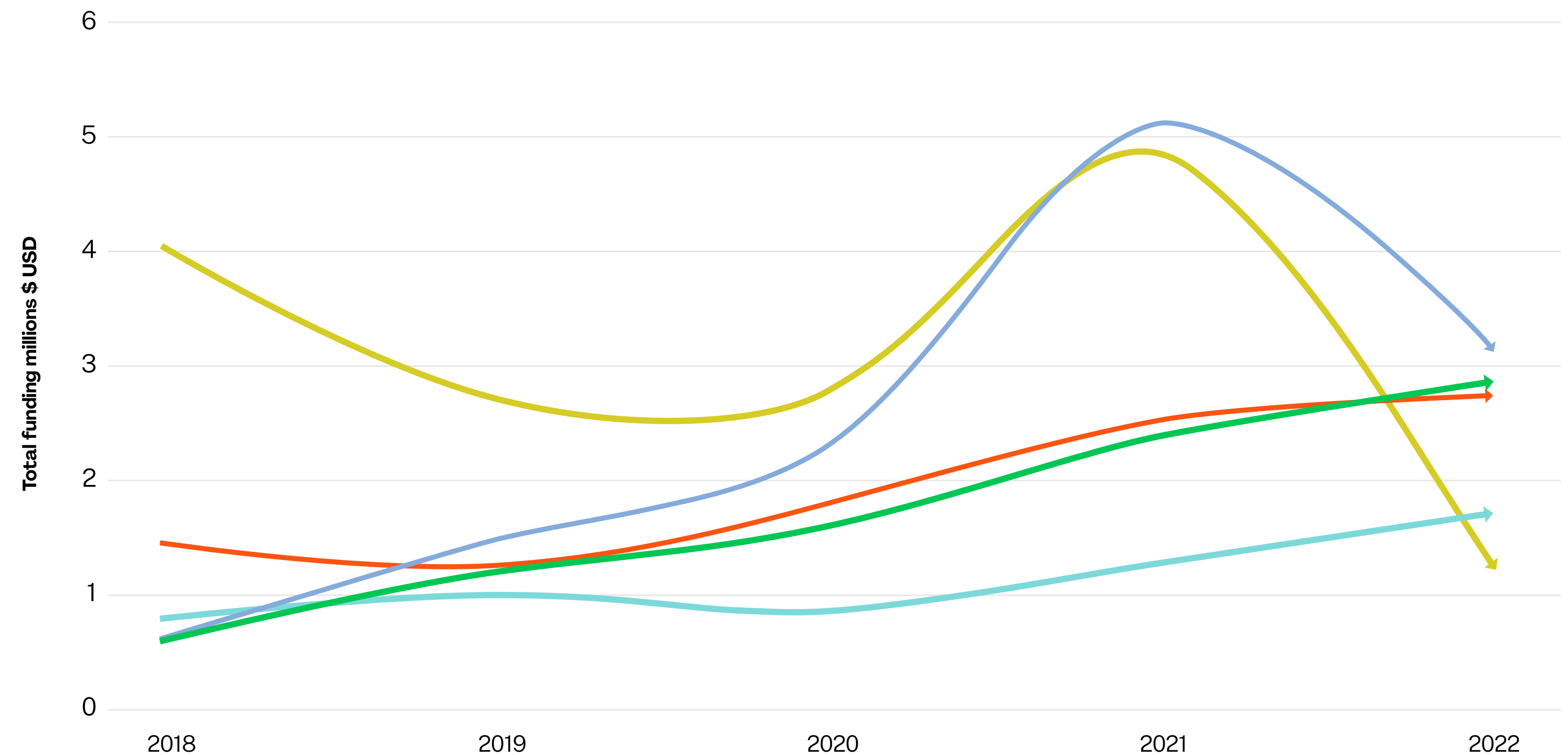
Cloud Retail Infrastructure and Online Restaurants & Meal Marketplaces also dropped over 70% each year-over-year.

Funding declined more than 35% to Innovative Food and Midstream Technologies in 2022.



- Online Restaurants & Meal Marketplaces
- Innovative Food
- Ag Biotechnology
- Novel Farming Systems
- Farm Mgmt SW, Sensing & IoT

Funding by select categories
YoY 2018-2022



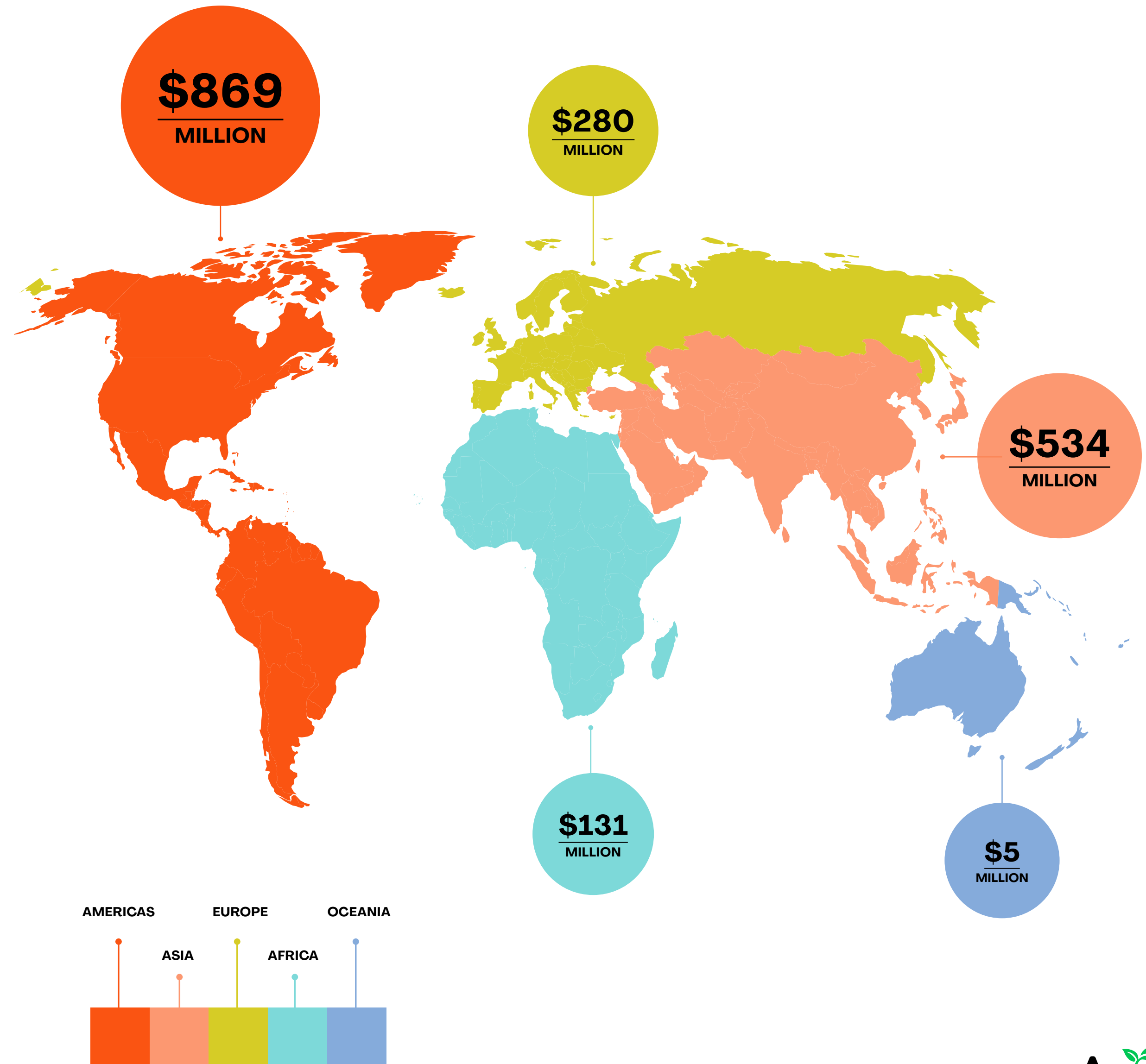
Agribusiness marketplaces & fintech



Funding by region (\$ USD)



While still a small category in upstream technologies, Agribusiness Marketplaces & Fintech startups are especially important for emerging markets and developing countries. Marketplaces can play a major role in boosting farmer incomes in Asia and Africa by providing farmers with access to new markets for the first time to sell their wares for better prices or purchase higher quality inputs than previously. Meanwhile, Latin America has an ample supply of agrifintech startups wanting to help more farmers bring business online. Investment in the category declined very slightly to \$1.8 billion in 2022 from \$1.9 billion in 2021.



Agribusiness marketplaces & fintech

















Top deals (\$ USD)


















Several companies that raised top rounds in 2021 were back in 2022, including India startups Dehaat and Captain Fresh, and Colombia-based digital marketplace Frubana.

Another notable company on the list is US-based Pachama, which is trying to improve accounting and reporting in forest carbon markets. Pachama's presence underscores the bigger role climate tech startups played in 2022 for VC investing.



01	 Xpansiv 	\$400m	DEBT	
02	 Descartes Underwriting 	\$120m	SERIES B	
03	 Frubana 	\$75m	SERIES C	
04	 Agriconomie 	\$60.5m	SERIES B	
05	 Dehaat  	\$60m	LATE	

 AGFUNDER PORTFOLIO COMPANY

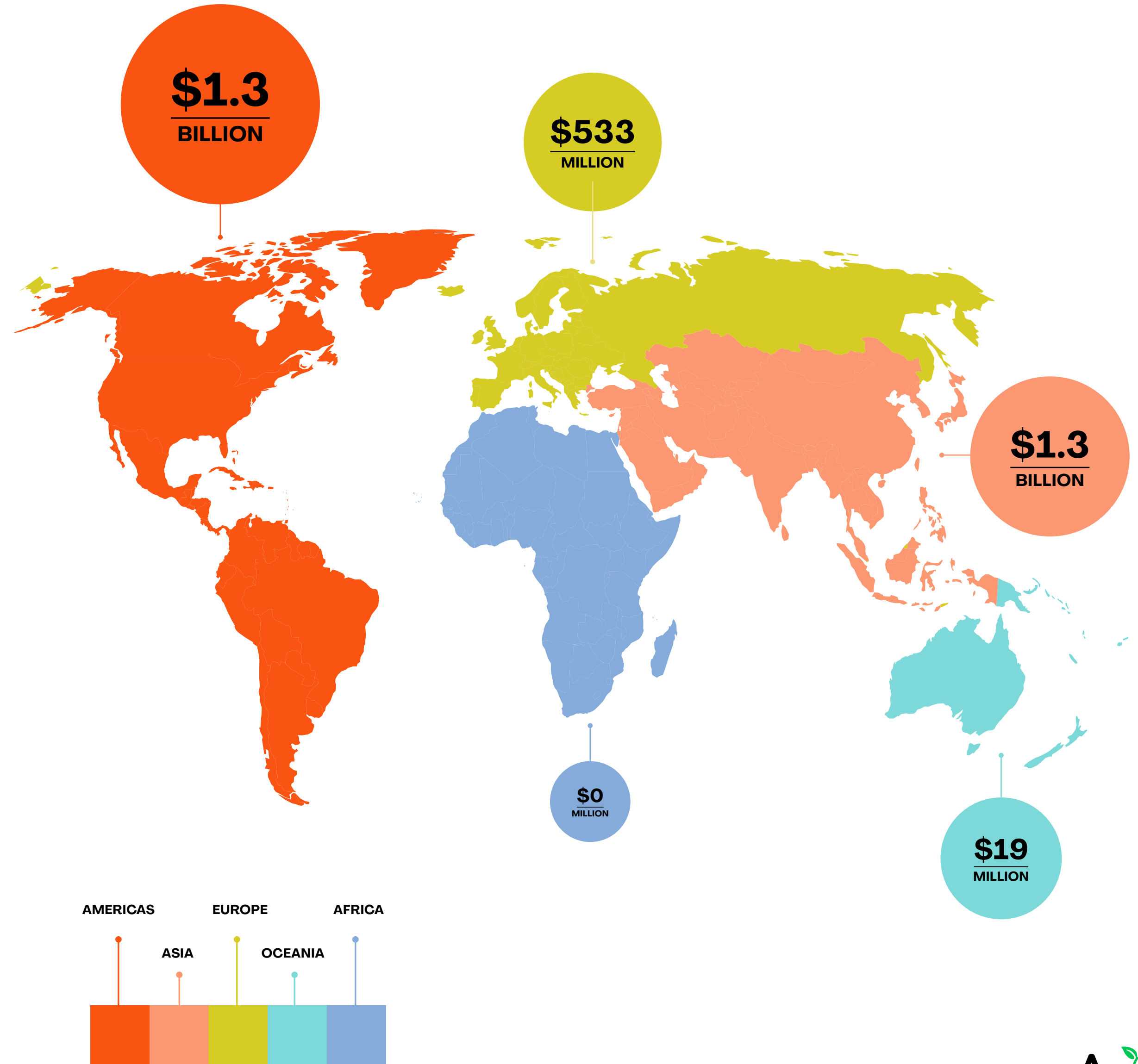
06	 Stable 	\$60m	SERIES B	
07	 Captain Fresh 	\$57.3m	SERIES C	
08	 Pachama 	\$55m	SERIES B	
09	 ThriveAgric 	\$54.7m	DEBT	
10	 Jai Kisan 	\$49m	SERIES B	

Ag biotechnology

Funding by region (\$ USD)



Overall funding in Ag Biotech rose 8.5% from \$2.51 billion in 2021 to \$2.73 billion in 2022. In a category otherwise dominated by North America, Chinese pig breeder Zhongxin Breeding, which deploys genomic selection, somatic cell cloning and other technologies to develop new breeding lines to meet market demand raised \$327 million.



Ag biotechnology











Top deals (\$ USD)












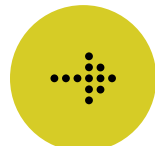
Two new players to watch in this space are US-based Traitology and French startup Neoplants, which both raised seed funding in 2022.

Traitology develops traits in row crops such as soybeans to improve yields, extend growing seasons, and increase resilience to climate change and disease; while Neoplants genetically engineers houseplants to absorb pollutants in the air.



01	 Zhongxin Breeding		
	\$327m	SEED	
02	 DNA Script	DNASCRIPT	
	\$200m	SERIES C	
03	 Inari	INARI	
	\$124m	LATE	
04	 Absolute Foods	absolut Agriculture. Reimagined	
	\$100m	SERIES B	
05	 Vestaron	VESTARON THE POWER OF PEPTIDES	
	\$82m	LATE	

 AGFUNDER PORTFOLIO COMPANY

06	 Sound Agriculture	SOUND	
	\$75m	SERIES D	
07	 Enko Chem	ENKO	
	\$70m	SERIES C	
08	 Ostara	OSTARA	
	\$70m	SERIES C	
09	 Brightseed	AG BRIGHTSEED	
	\$68m	SERIES B	
10	 Anuvia Plant Nutrients	ANUVIA PLANT INSPIRED PRODUCTS	
	\$65.5m	SERIES D	

Startup spotlight

Eion

AG BIOTECHNOLOGY



Eion is a carbon removal company that does three things: we permanently remove CO₂ through enhanced rock weathering, directly measure that carbon removed, and deliver this process by working within existing agricultural practices. Together, we can remove over 1/5th of humanity's carbon dioxide emissions since the industrial revolution.

Eion's 2022 has been one of immense growth. We closed our Series A this past winter, giving us the strategic plan and financial runway to eventually become the highest quality and quantity provider of permanent carbon removal in the world.

Enhanced rock weathering is a natural cycle the Earth has used for millions of years to remove CO₂ from the atmosphere. To accelerate this slow process, Eion pulverizes minerals and transports them to agricultural lands, where they are applied just like other amendments that alkalize soil. Today, we are loading trains with our mineral (olivine) for our 2023 vintage of carbon removal, as they will be applied to farmland this spring, with the final direct measurement taken in the late fall.

Eion has established deep relationships with trusted agricultural operators who are pillars of their communities. To justify developing Eion-specific supply chains, Eion needs stable demand and long-term commitments. If the demand for carbon removal follows feast-and-famine cycles, it will be especially difficult for our agricultural partners, who will need guaranteed demand to garner farmers' trust and commitment. Eion has the ability to rapidly scale, and permanently remove millions of tons of CO₂, so long as groups continue to invest in high quality carbon removal.

Carbon removal purchases directly fund the procurement, transportation, and application of olivine. Our ability to measure and verify the carbon removed converts these soil-alkalizing minerals into permanent carbon removal. Without purchases, olivine remains in-ground, and farmers either manage their soil pH via other means, or they make do with an impaired output from their fields. As Eion continues to grow, we will create real, tangible carbon removal jobs in some of the most rural parts of the US, showing that every community has a role to play in decarbonizing our world.

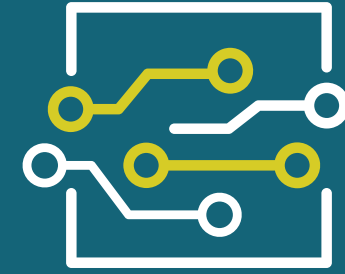


 eioncarbon.com

 AGFUNDER PORTFOLIO COMPANY



Farm management software

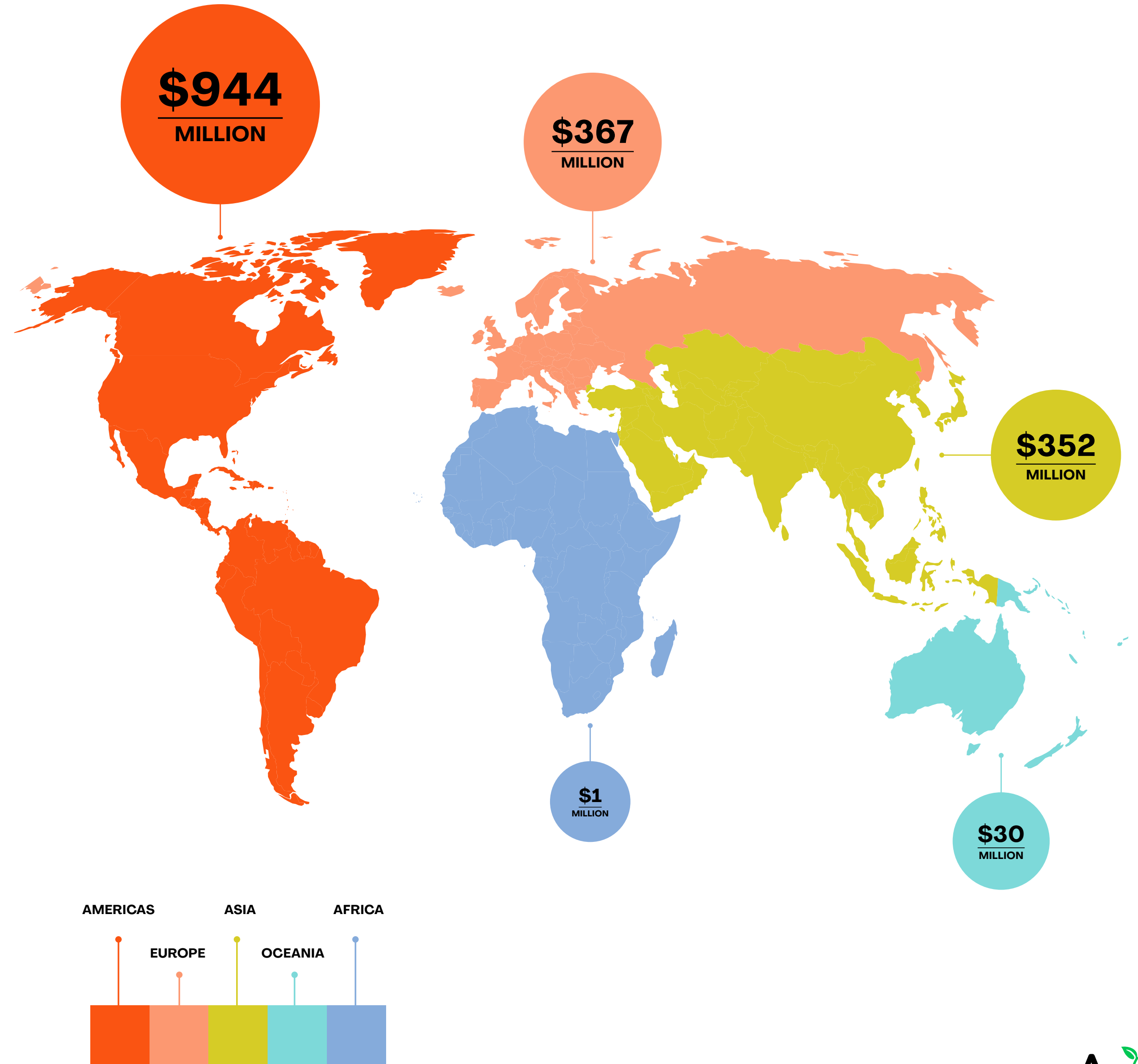


Funding by region (\$ USD)



Farm management software jumped 35% to \$1.69 billion in 2022, with a slight decline in deal activity highlighting some large deals. Questions remain about the overall quality of the tools on offer, especially in precision ag, as farmers have often struggled to get value for their money and efforts implementing these tools.

The US still leads investment in this category, but Asia has seen tremendous growth in farmtech categories over the last couple years. India is Asia's leader in this category; China's ecosystem is starting to gather momentum, too.



Farm management software
















Top deals (\$ USD)





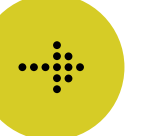



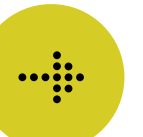





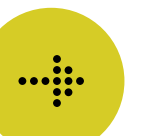


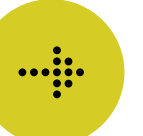
Korea's Greenlabs is working to digitize the entire ag supply chain.

Two players raising sizable Series A rounds in 2022 were Israeli startup SupPlant (\$27m), which has developed an AI system to analyze data generated from crops through sensors and translate this data into irrigation commands; and US-based Perennial (formerly Cloud Agronomics), which raised \$18m to expand its soil carbon measurement, reporting and verification platform.



01	 Greenlabs 	\$140m	SERIES C	
02	 ICEYE 	\$136m	SERIES D	
03	 Project Canary 	\$111m	SERIES B	
04	 Capella Space 	\$97m	SERIES C	
05	 Ignite Impulse Inc. 	\$96.5m	SERIES B	

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06	 Truterra 	\$90m	LATE	
07	 Solinftec  	\$60m	LATE	
08	 BeeHero 	\$42m	SERIES B	
09	 Arable 	\$40m	SERIES C	
10	 Taranis 	\$40m	SERIES D	

Startup spotlight

Propagate

FARM MANAGEMENT SOFTWARE



Propagate is a software, development and financing ecosystem that makes it easy for farms to transition acreage to agroforestry. Their platform provides access to agronomic insights, technical assistance, and financing so that farms can reduce risk while integrating fruit, nut and timber trees with animal or crop farming systems.



Propagate

propagateag.com

 AGFUNDER PORTFOLIO COMPANY

What stood out to you the most about 2022?

The macro-economic environment shifted in 2022, yet we saw steady interest and demand for climate-smart and/or regenerative agriculture that acted at odds with the macroeconomic climate.

What are the biggest challenges facing the world's food and agriculture industry today?

Climate change and nutrient density.

What keeps you up at night?

The pace at which capital providers are promoting carbon, biodiversity, and climate solutions is faster than it has ever been, yet the real world infrastructure is not developing at the same speed.

How is your technology making a positive impact on the world?

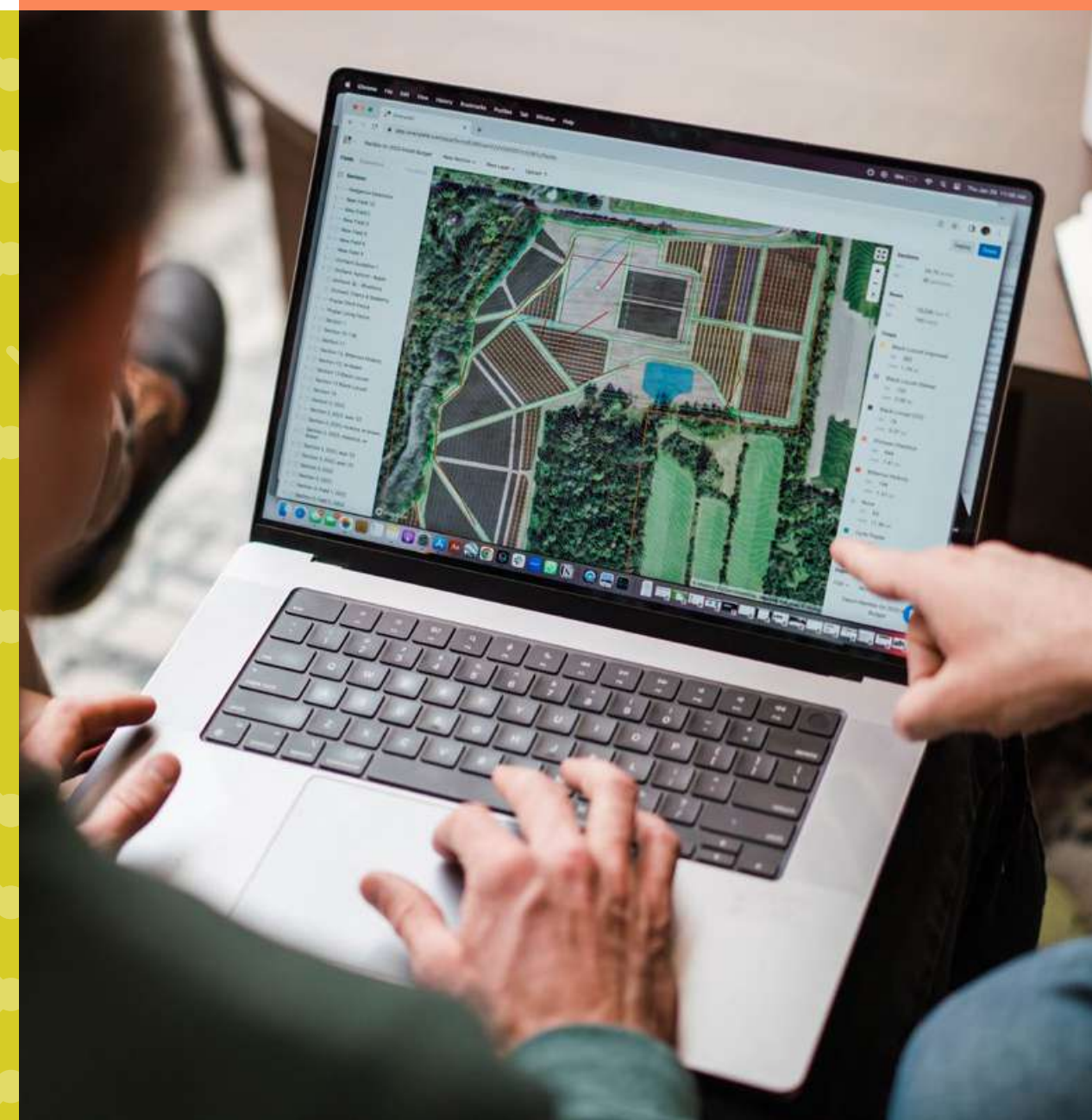
Our ecosystem of products and services are making it easier for farms to transition to agroforestry. Over the last 5 years, we have planted nearly 100,000 trees, with a pipeline of about 750,000 more trees to be planted. Our forecasts are highlighting millions of tons of carbon to be sequestered while producing organic, nutrient dense food. For example, the transition of 10,000 acres of corn/soy to agroforestry has the potential to sequester 700k-800k tonnes of carbon.

What are your predictions for 2023 in our industry?

2023 will bring more focus on sustainability and transition to climate-smart/regenerative agriculture. Incentive programs and funding for practices like agroforestry will begin to drive new products (ranging from software to finance to insurance and more) that will be made to specifically address operational challenges of regenerative practices like agroforestry at the farmgate.

What has been your experience fundraising?

We are lucky to have investors that believe deeply in our mission to make agroforestry a cornerstone of agriculture. While our fundraising efforts in 2022 required detailed attention, our approach to deliver positive returns across financial, ecological and social forms of capital has made our experience fundraising fruitful.



Startup spotlight

Klim

FARM MANAGEMENT SOFTWARE



Klim's mission is to scale up regenerative agriculture as quickly as possible and unlock the food sector's potential to contribute to climate solutions and food security. The core of Klim is its digital companion for regenerative farmers, enabling them to transition and monetize ecosystem services.

What stood out to you the most about 2022?

2022 was a breakthrough year for regenerative agriculture as major food companies not only committed to regeneratively transform their supply chains but actually started to execute. The culmination of this breakthrough was witnessed at COP27, where for the first time food and agriculture was the hot topic, and Klim had the opportunity to present.

What keeps you up at night?

It's this: can we play a significant role in improving the bargaining power of farmers long-term? Farmers have been marginalized for millennia, pressed to become price takers, and often locked into unsustainable business models. I want to see this change.

How is your technology making a positive impact on the world?

Our holistic offering to multiple stakeholders within the food industry is designed to significantly reduce the environmental impact of agriculture. Our approach is scalable worldwide, and enables the entire agricultural sector to be transformed, leading to improved soil fertility and reduced inputs of fertilizer and pesticides while maintaining yields. As a result, farmers, and by extension food companies, can reduce CO₂ emissions from their operations, store additional atmospheric CO₂ through humus build-up, and unlock side benefits such as improved biodiversity, food quality, and profitability.

What are your predictions for 2023 in our industry?

In 2023, it is likely that the regenerative transformation of the agrifoodtech industry will see significant uptake; those who were so far inactive will initiate pilot projects, those who have started with pilot projects will begin to broadly roll out across different supply chains. Farmers will have improved access to support for their regenerative journey, and measurement technology will continue to improve. Consumers will show an increasing interest in regenerative agricultural practices as they become more aware of how these practices can increase the sustainability of the food system.

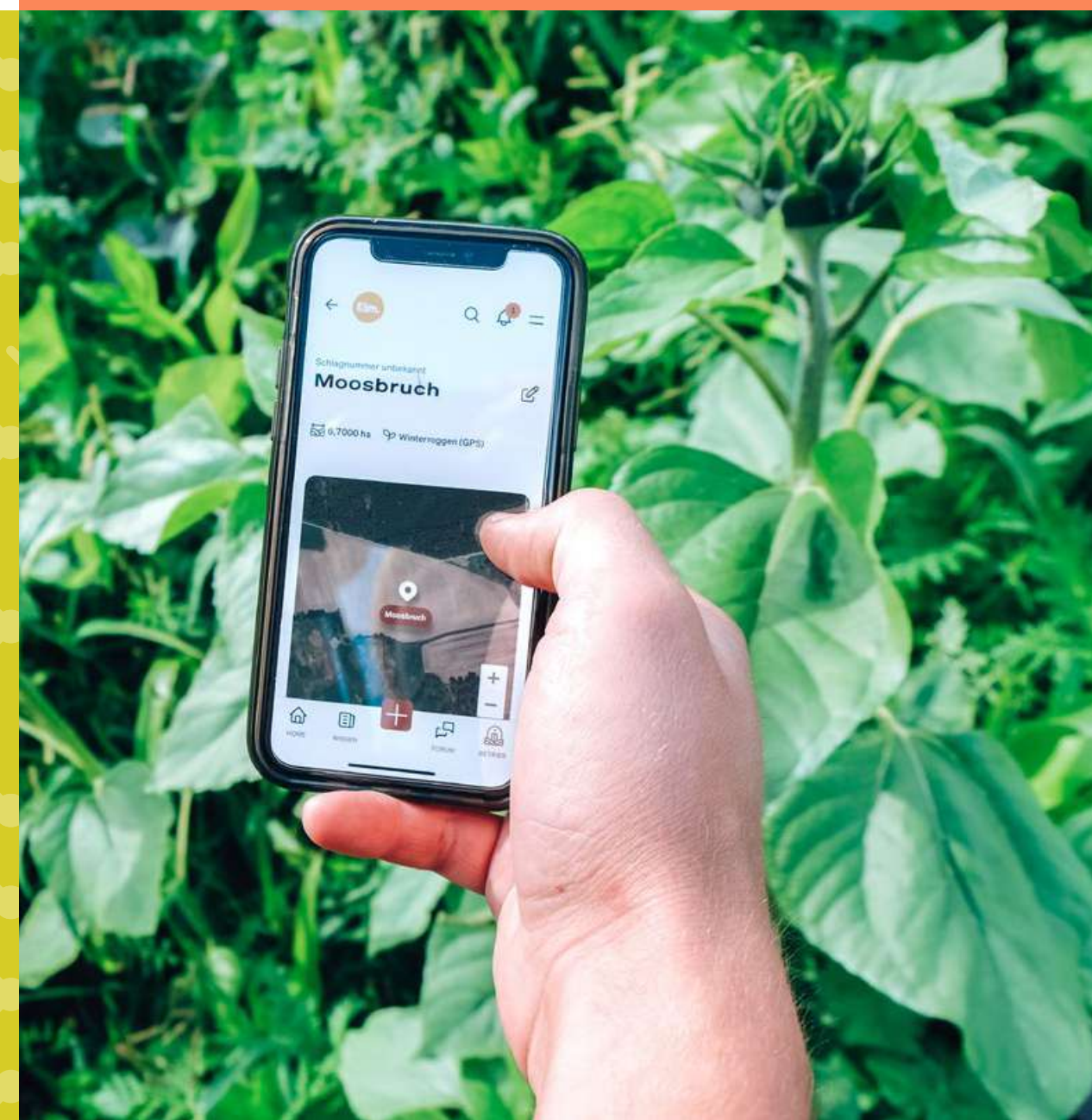
What has your experience fundraising been like?

In a nutshell: in 2020 few investors even knew about regenerative agriculture, in 2022, few did not. This change happened very fast.



klim.eco

 AGFUNDER PORTFOLIO COMPANY



Startup spotlight

efishery

FARM MANAGEMENT SOFTWARE



eFishery is Indonesia's first Aquaculture Intelligence company aimed at increasing the livelihoods of smallholder fish & shrimp farmers. It offers an end-to-end platform from an IoT automated feeding solution to a feed marketplace. The goal is to build an aquaculture ecosystem in Indonesia, which is profitable and sustainable for all stakeholders.

eFishery

efishery.com

How is your technology making a positive impact on the world?

Our technology provides a sustainable solution for fish and shrimp farmers by automating their feeding and reducing feed waste. By doing so, we help farmers increase their productivity and profitability while reducing the impact on the environment. And using the data we gather, we can create disintermediation in the industry so farmers can get fair prices and access to better inputs and markets. Currently we have supported close to 100,000 farmers with more than 300,000 ponds across Indonesia.

What has your experience fundraising been like?

It evolves over time. When we started 9 years ago and when we raised our seed round in 2015, no one cared about the agritech or aquaculture tech sector. 99% of investors said no to us and it was really hard to raise money. This happened until our Series A in 2019. Since then, along with the proof that we show on our growth, as well as increased knowledge of the industry, more investors are paying attention to the sector. After that, our fundraising experience has been positive, with investors recognizing the potential of our technology to revolutionize the aquaculture industry. We have received funding from several notable investors and are continuously seeking strategic partnerships to help us achieve our goals. And I can confidently say that right now, almost all investors put agritech as one of their key sectors, which says a lot on how the industry is progressing.

What keeps you up at night?

Well, what doesn't?! On a serious note, ensuring that eFishery as the organization can truly serve its purpose to empower farmers and also keeping positive impacts to the ecosystem, is surely what fills my head constantly.



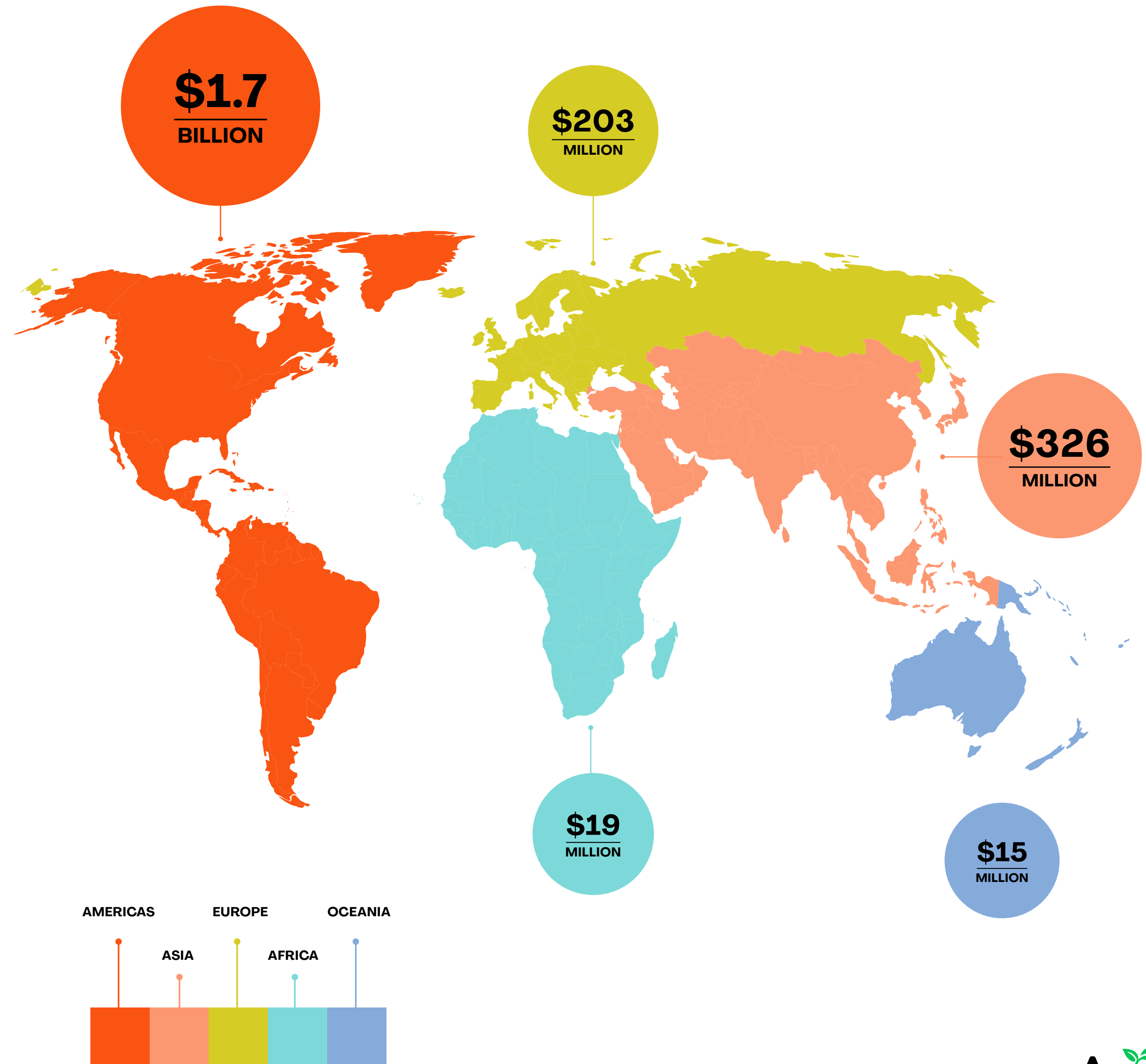
Bioenergy / Biomaterials



Funding by region (\$ USD)



Investment in this space increased 13.5% to \$2.29 billion in 2022 bolstered by a \$500m investment in carbon capture and transformation firm LanzaTech, which has since gone public. Significant late-stage funding was also awarded to two Canadian companies: Andion Global, a specialist in biogas production and wastewater treatment; and Enerkem, which manufactures biofuels and renewable chemical products from non-recyclable waste.



Bioenergy / Biomaterials

Top deals (\$ USD)



Two early-stage players to watch (not pictured) are English startup Shellworks and Dutch startup Pectcof. Shellworks is on a mission to replace plastic packaging in the beauty industry with a substance produced via microbial fermentation that “behaves like a natural polyester;” while Pectcof uses coffee pulp (the fruit around the coffee seed/bean) as a source of bio-based materials, “at the same time detoxifying the waste stream produced by the second most traded commodity in the world.”

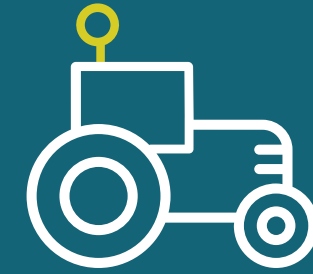


01	LanzaTech	LanzaTech	\$500m	LATE	
02	Andion Global	andion	\$211m	LATE	
03	Lygos	LYGOS	\$160m	SERIES C	
04	Enerkem	Enerkem	\$155m	LATE	
05	Bluepha	Bluepha	\$125m	SERIES B	

AGFUNDER PORTFOLIO COMPANY

06	MycoWorks		\$125m	SERIES C	
07	Natural Fibre Welding		\$85m	DEBT	
08	Bioveritas	BIOVERITAS	\$65m	LATE	
09	64x Bio	64x Bio	\$55m	SERIES A	
10	Reshamandi	RESHAMANDI RELATIONSHIPS MATTER	\$55m	SERIES A	

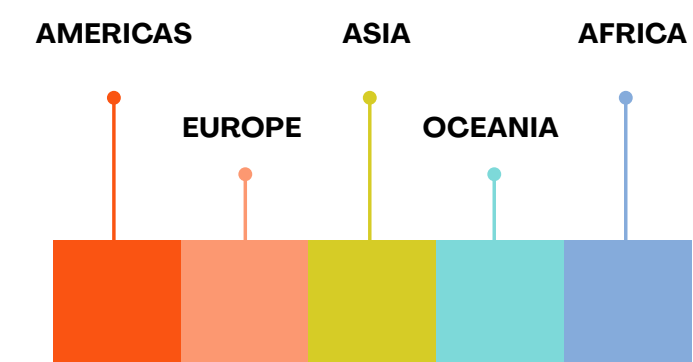
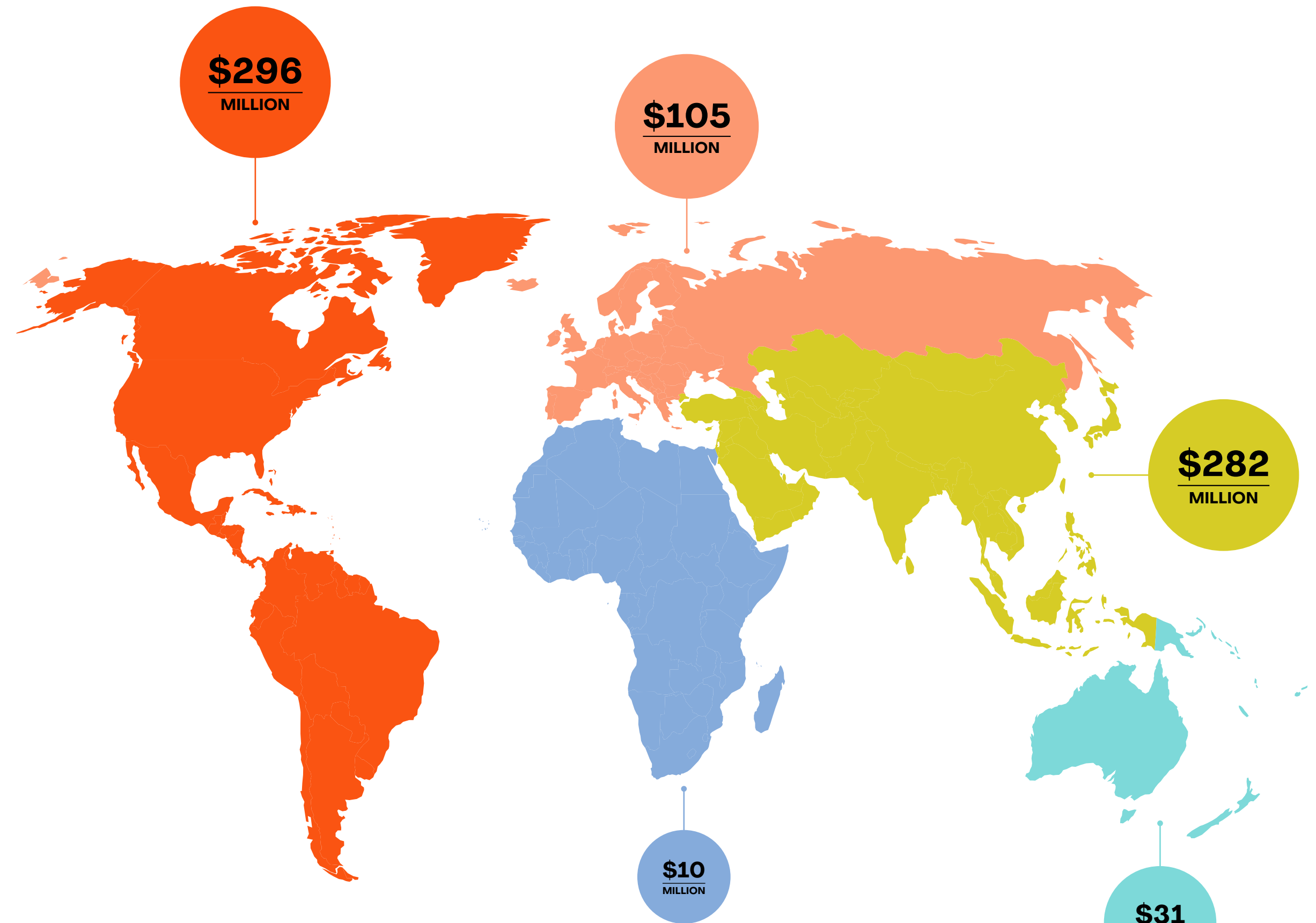
Farm Robotics, Mechanization & Equipment



Funding by region (\$ USD)



Despite continued labor shortages globally driving demand for more automation, overall investment in this category dropped 11.5% in 2022 to \$723 million with the biggest checks going to Indonesian startup eFishery and Israel's Beewise. eFishery provides feeding devices, software and financing for fish and shrimp farmers; while Beewise has created an autonomous beehive with a robotic beekeeper, reducing bee mortality by up to 80% to help "secure pollination for a stable food supply."

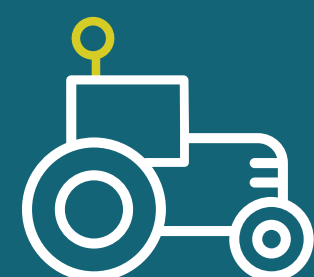














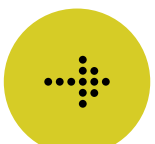


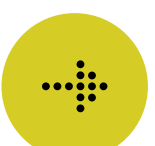
Farm Robotics, Mechanization & Equipment

Top deals (\$ USD)









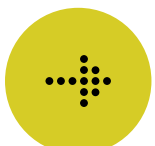


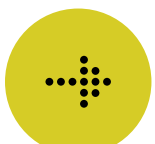


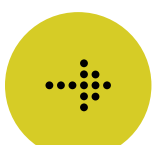


Outside of the top deals for 2022, two other startups (not pictured) to watch for in this space are AgFunder portfolio company Aigen and Australia's Lleaf. US-based Aigen makes solar-powered weeding robots; Lleaf has developed patented light absorbing and emitting plastics that improve natural and artificial light for indoor-grown plants.



01	 eFishery 	\$90m	SERIES C	
02	 Beewise 	\$80m	SERIES C	
03	 Blue Ocean Robotics 	\$51m	DEBT	
04	 Verdant Robotics  	\$47m	SERIES A	
05	 FarmWise 	\$45m	SERIES B	

 AGFUNDER PORTFOLIO COMPANY

06	 Moleaer 	\$40m	SERIES C	
07	 Pyka 	\$37m	SERIES A	
08	 Naïo Technologies 	\$34m	SERIES B	
09	 eFishery 	\$33m	DEBT	
10	 Aerodyne Group 	\$30m	SERIES C	

Startup spotlight

Tevel

FARM ROBOTICS



Israeli startup Tevel is solving the immense shortage in fruit picking labor using Flying Autonomous Robots. Tevel's A.I.-driven robots gently harvest fruit and empower farmers with real-time data for better orchard management. This sophisticated technology helps farmers stay in business by increasing their profits, yield and fruit quality.

What stood out to you the most about 2022?

In 2022 Tevel made the transition from R&D to commercial stage. We launched our U.S. operations, harvesting a variety of stone fruit and apples in California and Washington. It was also the second year of our operations in the Piedmont region of Italy where we continued to gain traction and experience picking a variety of fruit. We saw a surge in interest from European and U.S. farmers aided by the strong performance of our Flying Autonomous Robots throughout the apple and stone fruit season. Veteran industry players, including ag machinery manufacturers, closely engaged with us for future collaborations, all together setting the stage for a busy and fruitful 2023.

What are the biggest challenges facing the world's food and agriculture industry today?

The immense shortage in labor is the most serious challenge. Farmers worldwide are scrambling and competing for workers to pick fruits in time to meet surging demand for food. The shortage of guaranteed, reliable ag labor and its soaring costs results in lower quality fruit. Food prices are higher today but growers are not seeing the profits and with their margins already razor-thin, this furthermore threatens the survival of their business.

What keeps you up at night?

In the literal sense, our team is up at night receiving data reports from our Flying Autonomous Robots operating in different time zones. More to the point, as the first and only player in the market that is harvesting fruit using flying robots, we have already overcome so many challenges and are now scaling up. Our global expansion comes with its own set of challenges such as how to deliver increased demand for our technology and to boost our funding, production and support.

What has been your experience fundraising?

Tevel has raised \$32m to date. Key investors include AgFunder, Kubota, OurCrowd, Maverick Ventures, Club Degli Investitori and Forbon. We are raising our Series C round now to support our global expansion, including ramping-up production of our robots, enhancing partnerships, and continuing R&D to support new varieties of fruit and additional tasks such as artificial pollination, pruning and precision spraying.



tevel-tech.com



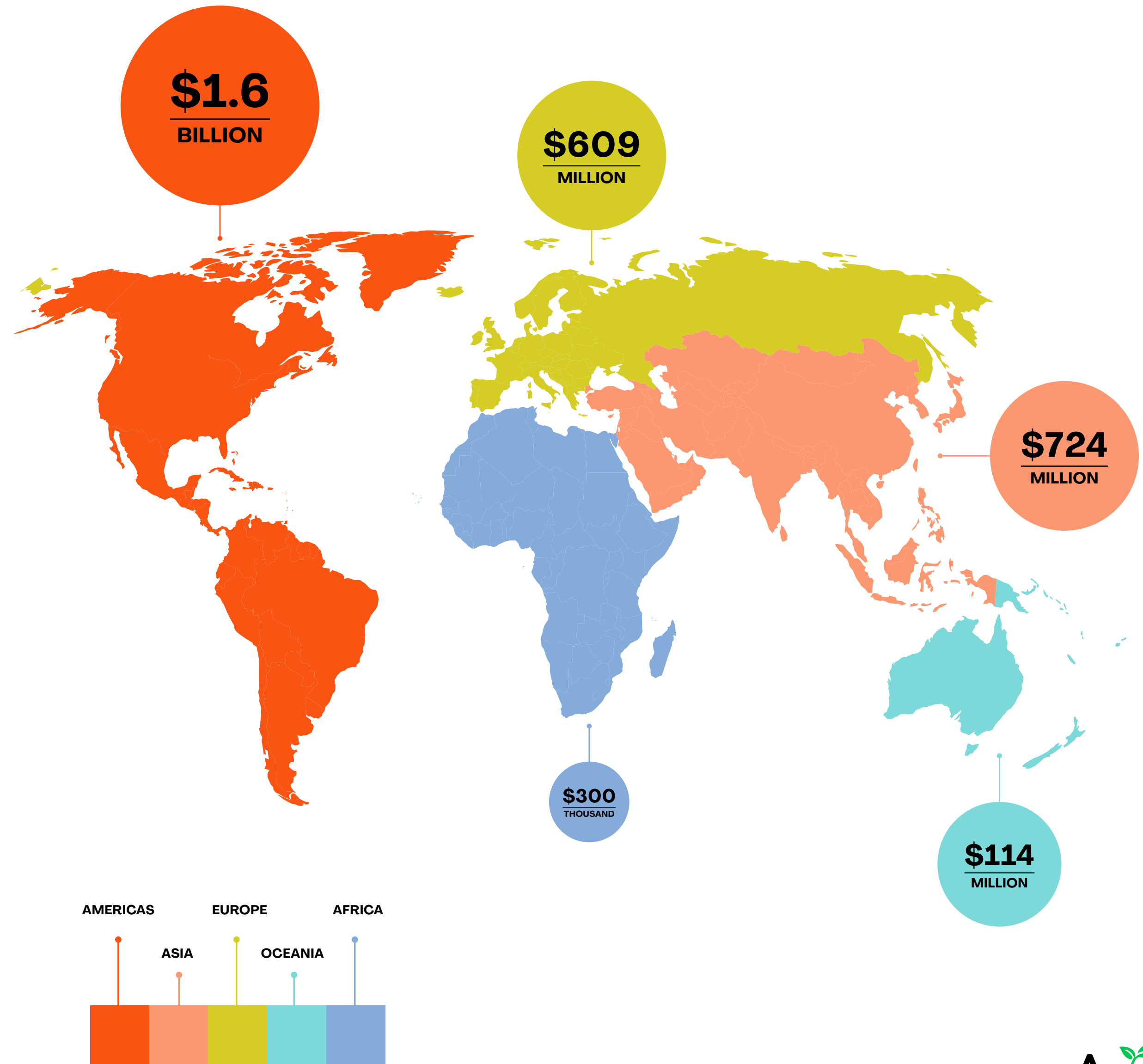
Innovative foods



Funding by region (\$ USD)



While the Americas secured more investment than other regions for alternative proteins in 2022, the region experienced a sharp drop-off in funding compared to 2021. Worldwide, invested capital was down double digits in North America, Latin America, and the Middle East and Africa. Asia-Pacific and European companies closed some bumper rounds including Israel's Redefine Meat and Remilk and Singapore's Next Gen Foods all raising more than \$100m.


















Innovative foods












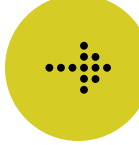



Top deals (\$ USD)



2023 will be a critical year for cultivated meat as a handful of the better-funded players edge closer to commercialization in Singapore, the US, and Israel. The animal-free dairy space is also one to watch, as major CPG companies test the waters (with mixed results thus far) and startups face challenges securing funding and finding available precision fermentation capacity to scale up production.



01	 Upside Foods 	\$400m	SERIES C	
02	 Meati 	\$150m	SERIES C	
03	 Redefine Meat 	\$135m	SERIES B	
04	 Remilk 	\$120m	SERIES B	
05	 Athletic Greens 	\$115m	LATE	

06	 Next Gen Foods 	\$100m	SERIES A	
07	 Starfield Food & Science Technology 	\$100m	SERIES B	
08	 Wildtype 	\$100m	SERIES B	
09	 MycoTechnology 	\$85m	LATE	
10	 Planted Foods 	\$71.3m	DEBT	

Startup spotlight

Umaro

INNOVATIVE FOODS



Umaro Foods is improving the quality and lowering the cost of plant-based meat, starting with juicy, mouthwatering bacon. By using seaweed in new ways, the company is creating novel solutions for taste and performance in both fat and protein. With these innovations, Umaro Foods seriously delivers on flavor.

What stood out to you the most about 2022?

2022 was marked by a tough financial climate. Both public and private entities and public entities were asked to do more with less. Consumers had to evaluate their spending habits and make prudent decisions around necessity versus luxury.

What are the biggest challenges facing the world's food and agriculture industry today?

A lack of diversity in the crops we grow renders us increasingly dependent on herbicides and pesticides to protect our food. As blights evolve and develop immunity, our style of farming large swaths of monocrops becomes increasingly threatened.

Additionally, in a highly globalized food system, armed conflict can echo far beyond the boundaries of the countries involved. The cost of fertilizer skyrocketed as a result of the war in the Ukraine, which had a ripple effect throughout many food categories around the globe. In a highly globalized food system peace and cooperation are essential for price and supply stability.

What keeps you up at night?

We are living in what some in the scientific community have labeled the seventh mass extinction. A recent study found that wildlife populations have plunged 69% in the last 50 years. As we continue to clear forested land for livestock, the trend is positioned to continue unless we make big changes to the ways in which we produce and consume food.

How is your technology making a positive impact on the world?

Seaweeds can produce more protein per unit area versus conventional crops, with no freshwater, no herbicides/pesticides, no land use and no synthetic fertilizer.

What has been your experience fundraising?

Our first fundraising was catalyzed by an appearance on Shark Tank in 2021. Our next fundraising will be under a less rosy economic climate and a higher bar for the plant-based meat category. Having committed investors on our team giving strategic advice makes a world of difference.

umarofoods.com

 AGFUNDER PORTFOLIO COMPANY



Startup spotlight

UnReal Milk

INNOVATIVE FOODS



Brown Foods-UnReal Milk is the first US company to produce cow-free “real whole milk” in a lab. UnReal Milk is made using cultivated mammary gland cells and has an estimated 90% lower carbon footprint than traditionally-produced milk but will be 100% identical, unlike any other milk alternative in history.

UnReal Milk

unrealmilk.com

 AGFUNDER PORTFOLIO COMPANY

What stood out to you the most about 2022?

In 2022 we became the first company in the US to secrete real whole milk in lab. We got selected for the prestigious Y Combinator and were able to expand our operations across US, India and Japan.

What are the biggest challenges facing the world's food and agriculture industry today?

Food production contributes to 26% of global greenhouse gas emissions and hence is a huge contributor to global warming. Secondly, the need to scale food production has forced us towards extensive use of chemicals like hormones, which has disturbed the food ecosystem.

How would you describe the agrifoodtech sector to an outsider?

The agrifoodtech sector is using technology to innovate across the food ecosystem to ensure food security for all, without harming the planet.

How is your technology making a positive impact on the world?

Cattle farming contributes to 30% of the global methane emissions, which is a huge contributor to global warming. Extensive use of hormones and growth factors across the dairy industry amounts to unimaginable animal cruelty. Our UnReal Milk is estimated to reduce the carbon footprint of milk by 90% and is completely cow-free and hence cruelty-free.

What are your predictions for 2023 in our industry?

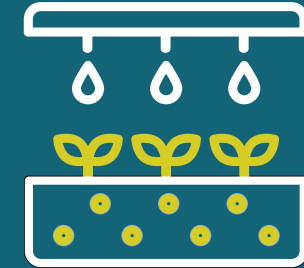
2023 will see a huge push towards animal free food systems, as we also expect the first US regulatory approved cultivated meat to come to market. People will rapidly move towards cultivated animal-free products where they do not have to compromise on taste and texture.

What has been your experience fundraising?

Despite the tough economic situation we were successfully able to raise ~\$2.3M in 2022. Fundraising can happen in any economic macroenvironment; if you have a strong value proposition and a clear de-risked path to achieve the same with some strong evidence.



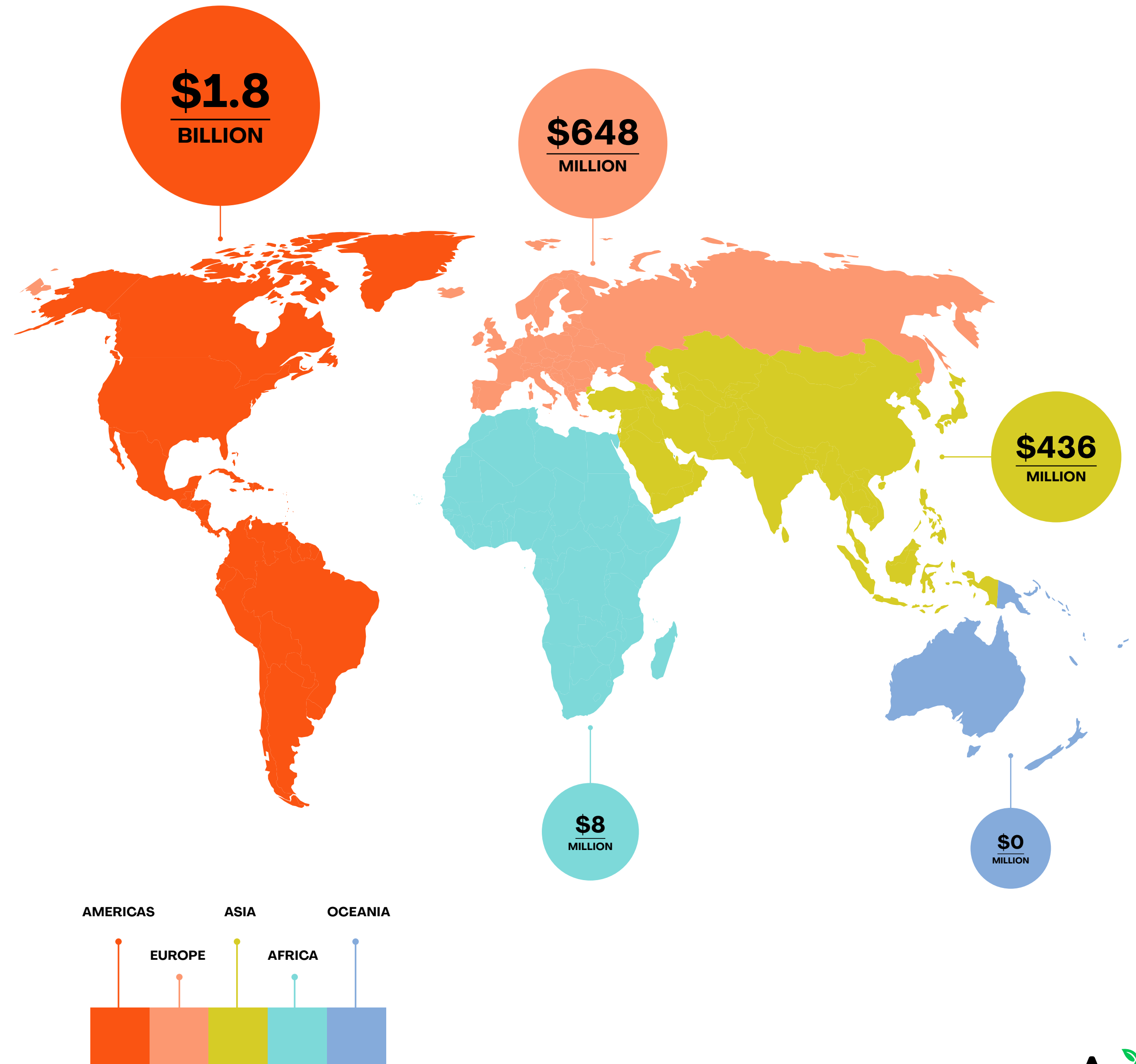
Novel farming systems



Funding by region (\$ USD)



From multi-storied vertical farms using artificial lighting to vast modern greenhouses harnessing sunlight, it has become clear that not all indoor farming systems are the same, with a series of failures prompting a sharper focus on models with proven unit economics and financial returns. That said, the promise of local produce, security of supply, a “fresh,” “local,” and “pesticide-free” positioning, and potentially lower risk of foodborne illness, remains alluring and investment jumped 21% year-over-year to \$2.85 billion in 2022.

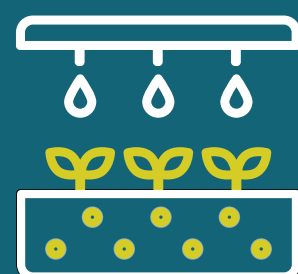


Novel farming systems

Top deals (\$ USD)



If the human food market for edible insects has moved at a frustratingly glacial pace, animal feed (notably poultry and aquaculture), pet food, and soil health, present bigger commercial opportunities. Two of the top-funded European players in the segment, InnovaFeed (black soldier flies) and Ynsect (mealworms), are expanding their geographical reach and building large-scale, highly-automated production facilities in the US. There are also a growing number of algae and aquaculture systems startups raising funding in this category.



01	Plenty		\$400m	LATE	
02	Gotham Greens		\$310m	LATE	
03	Little Leaf Farms		\$300m	SERIES B	
04	InnovaFeed		\$249m	SERIES D	
05	Pure Harvest Smart Farms		\$180m	SERIES B	

06	Bowery Farming		\$150m	DEBT	
07	GoodLeaf Farms		\$150m	DEBT	
08	GrowUp Farms		\$136m	LATE	
09	Soli Organic		\$125m	SERIES D	
10	Protix Biosystems		\$57m	LATE	

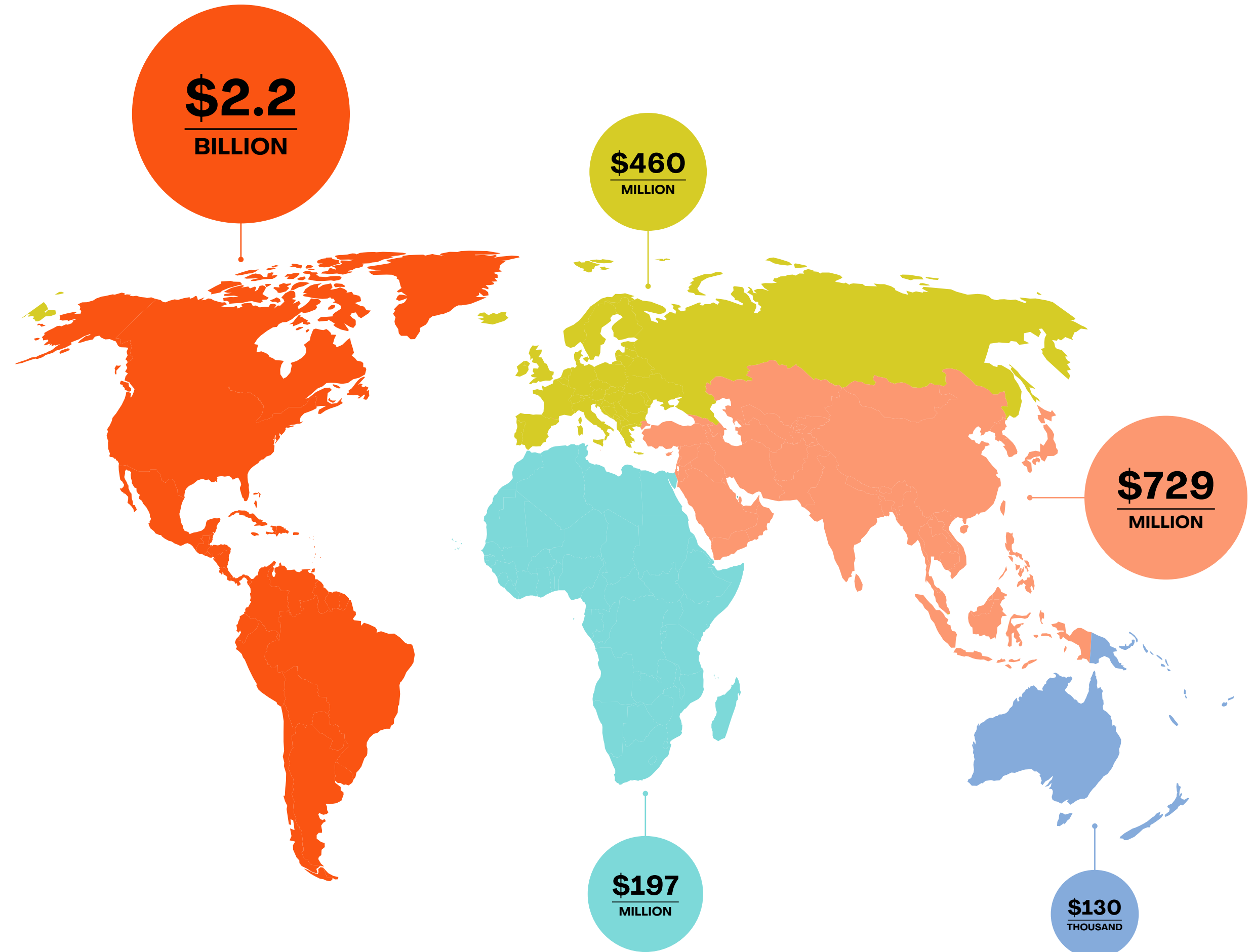
Instore restaurant and retail tech



Funding by region (\$ USD)



Investment dropped to \$3.55 billion in 2022, with significantly smaller top deals than in 2021 when the category raised \$4.6 billion. This diverse segment of the supply chain includes payment solutions, robotics and automation, and digital tools, all of which were represented in the top deals including SpotOn's \$300m Series F and Wasoko's \$125m Series B round to enable retailers to restock shelves using their mobile phones.



Instore restaurant and retail tech

Top deals (\$ USD)



Two seed rounds of note in this segment (not pictured) both went to German startups in 2022. Luca — which pivoted from a Covid contact tracing app to a restaurant payment app — bagged \$33m; while RECUP — which offers reusable cups and bowls for a deposit that users can recover when they return the items to foodservice locations — raised \$12.9m.

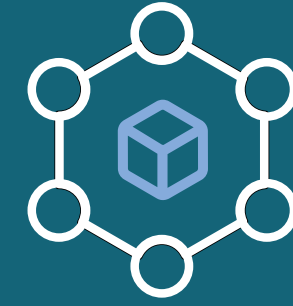


01	SpotOn	\$300m	LATE	
02	Fetch	\$240m	LATE	
03	Foodics	\$170m	SERIES C	
04	Karma Kitchen	\$137m	SERIES A	
05	Wasoko	\$125m	SERIES B	

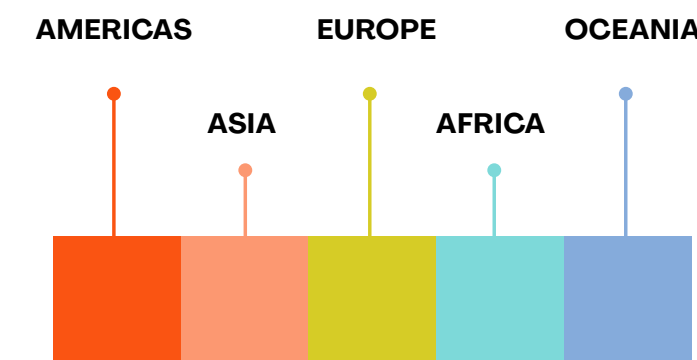
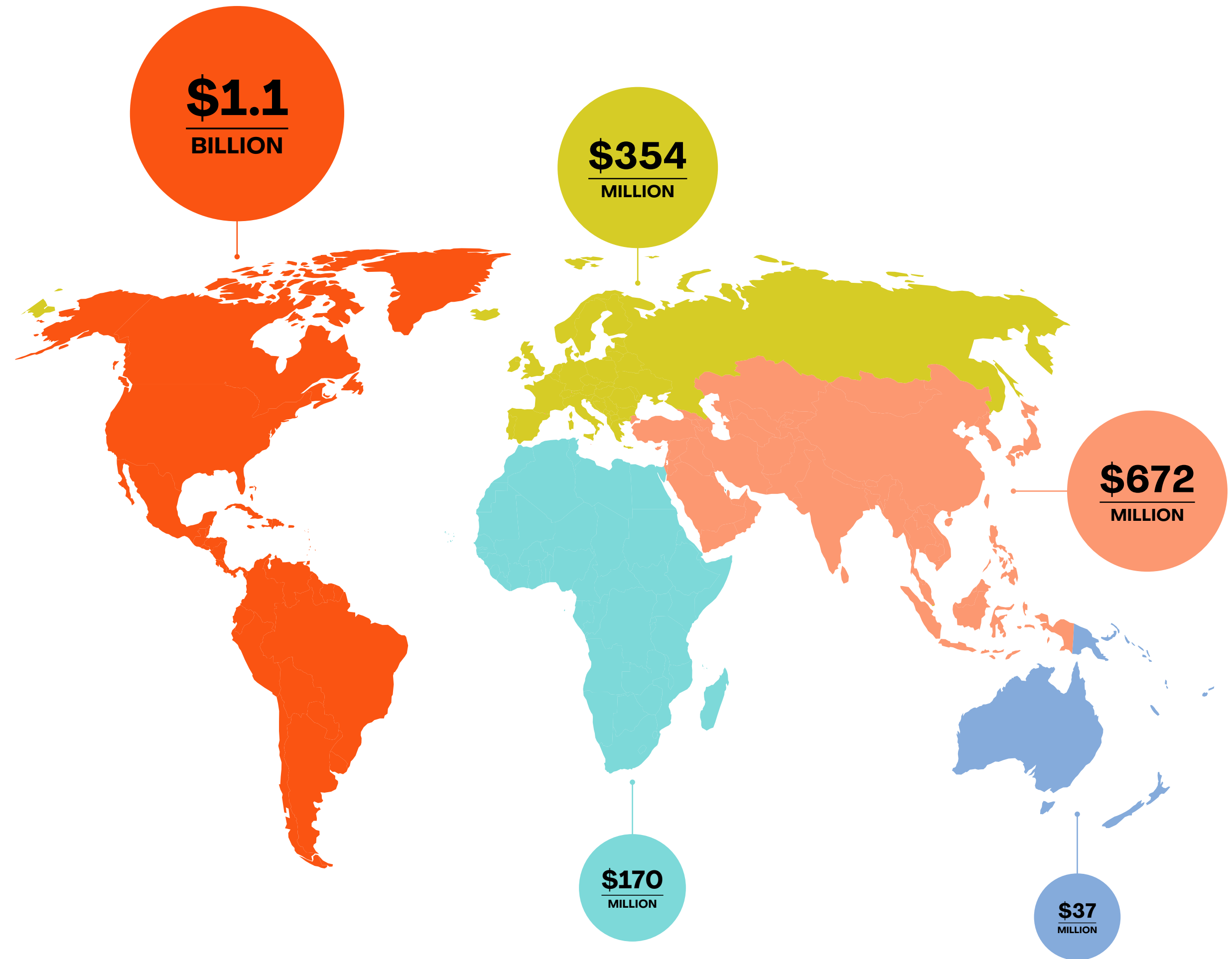
06	Connecteam	\$120m	SERIES C	
07	Afresh	\$115m	SERIES B	
08	TouchBistro	\$110m	LATE	
09	Trigo	\$100m	SERIES C	
10	Swiftly	\$100m	SERIES B	

Midstream technologies

Funding by region (\$ USD)



Overall investment in this segment dropped to \$2.3 billion in 2022 from \$3.7 billion in 2021, but sizeable sums were raised by US-based firms FreshRealm (\$200m), which is building a nationwide chilled food distribution system; and TemperPack (\$140m), which makes patented recyclable thermal liners for shipping perishables that are pitched as a more sustainable alternative to Styrofoam.







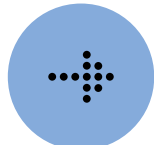

Midstream technologies

Top deals (\$ USD)




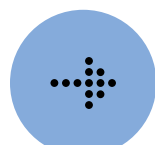


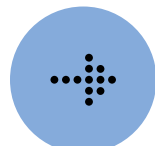


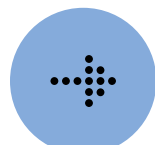


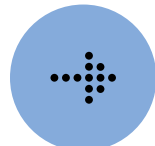


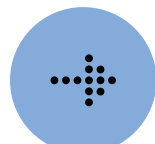


Three African startups raised sizeable Series A rounds in 2022 (not pictured) to help to connect the fragmented grocery supply chain across the continent. Cairo-based Capiter, an e-commerce platform connecting manufacturers, retailers and foodservice companies, raised \$33m. Lagos-based VendEase, an online marketplace enabling foodservice companies to digitize, track, and automate procurement and inventory management, raised \$30m; and Windhoek, Namibia-based e-commerce platform Jabu, raised \$15m.



01	 FreshRealm 	\$200m	LATE	
02	 TemperPack 	\$140m	SERIES C	
03	 Choco 	\$111m	SERIES B	
04	 WayCool 	\$95m	SERIES D	
05	 Mojia Bioscience 	\$80m	SERIES B	

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06	 Apeel Sciences  	\$75m	DEBT	
07	 Tipa 	\$70m	SERIES C	
08	 Restaurant Cheetah 	\$60m	SERIES C	
09	 Mori 	\$50m	SERIES B	
10	 Shopkirana 	\$45m	SERIES C	



Food Waste



Key insights



Reducing food waste is a top solution for mitigating climate change and protecting natural resources. And with the continued growth of the world's population, it is more critical than ever to make better use of the food already being produced. More businesses are recognizing the impacts food waste solutions can have on sustainability goals—as well as the opportunities they offer for investment returns.

After a focus on Imperfect Produce Channels and Edible Coatings, funding momentum has shifted to new solution types.

Solutions for enhanced demand planning (AI-enabled software that helps retailers optimize inventory) are leading the way with large venture rounds for Afresh and Crisp.

Startups that help foodservice businesses optimize operations and reduce waste—such as Galley and Odeko—also attracted funding.

These four companies alone made up approximately 15% of funding in 2022—or \$260m total.

Larger platforms are starting to acquire smaller solution providers,

which is a positive sign for current and future funders, as there are now more examples of exits in the space.

Food waste business models tend to be targeted to a specific sector or waste stream—and by the nature of being niche, organizations may need to expand to other categories or be acquired by a larger platform. For example, FoodLogiQ's supply chain traceability software was acquired by private-equity owned ESHA Research in 2022.

Certain business models benefit from scale, leading operators to consolidate—such as Atlas Organics being acquired by Generate Capital.

Misfits Market committed to consolidation by acquiring Imperfect Foods to scale and compete with incumbent offerings.

Food waste businesses are gaining public attention – now we're eagerly watching for execution and adoption.

Do Good Foods and Too Good To Go have each received broad attention for their expansion plans. Do Good Foods has demonstrated food waste volume; the results of Too Good To Go's North

American expansion are not yet public.

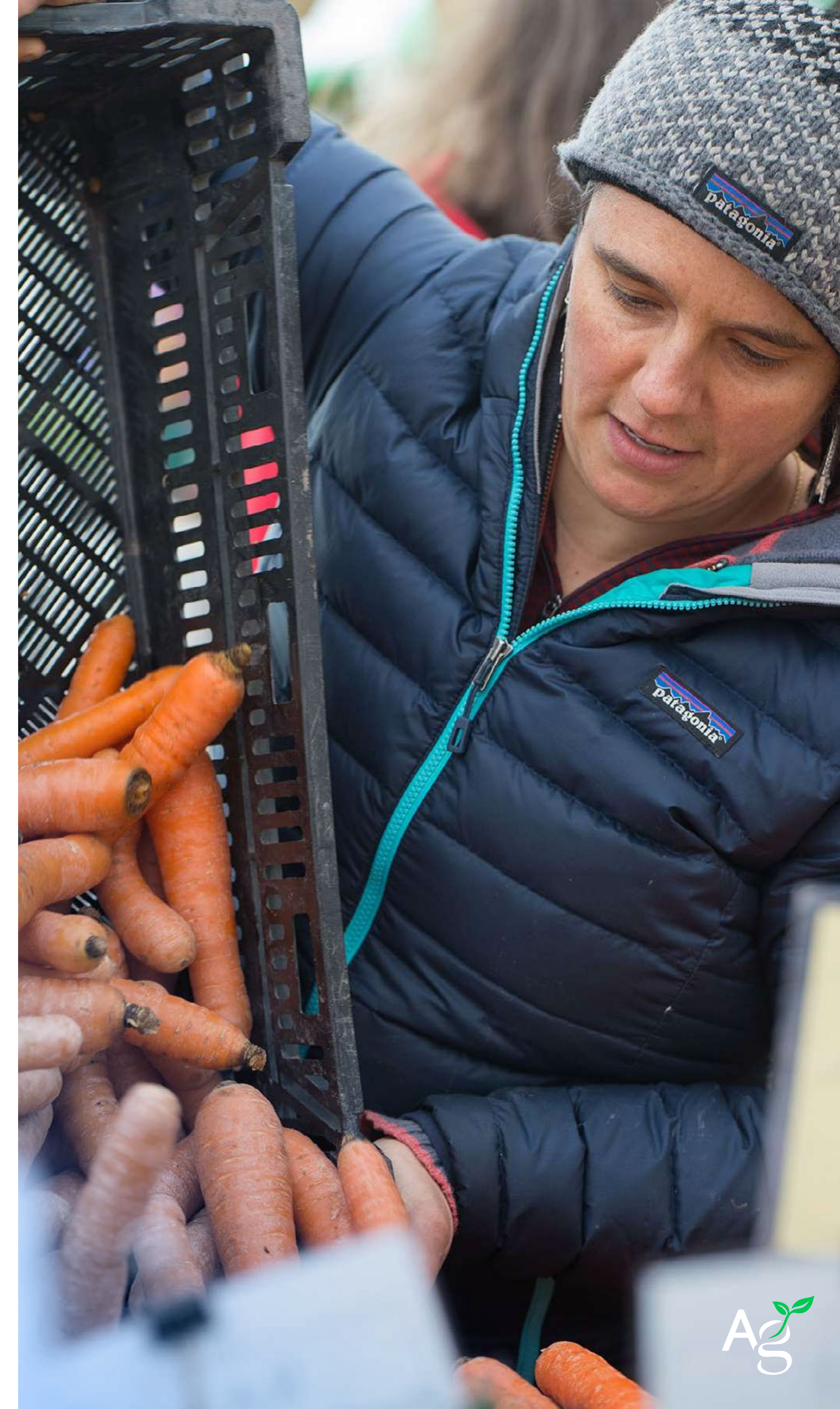
Edible coatings company Apeel Sciences launched advertising as part of its continued push into groceries, with spots running on social and streaming platforms to reach a consumer audience.

As organics collection continues to be a pain point for many parts of the U.S. due to a lack of logistics and infrastructure, innovation focused on organics recycling is having a moment.

North American leaders included food waste reduction as one of only six climate-focused commitments in their recent summit, and local legislation – like organics bans that restrict food waste from landfills – is being enacted around the country.

The Solid Waste Authority of Central Ohio recently showed that a food waste reduction campaign targeted at households can have positive results.

Policy support and government funding should continue to increase, which should increase the attractiveness of related food waste solutions for investors.



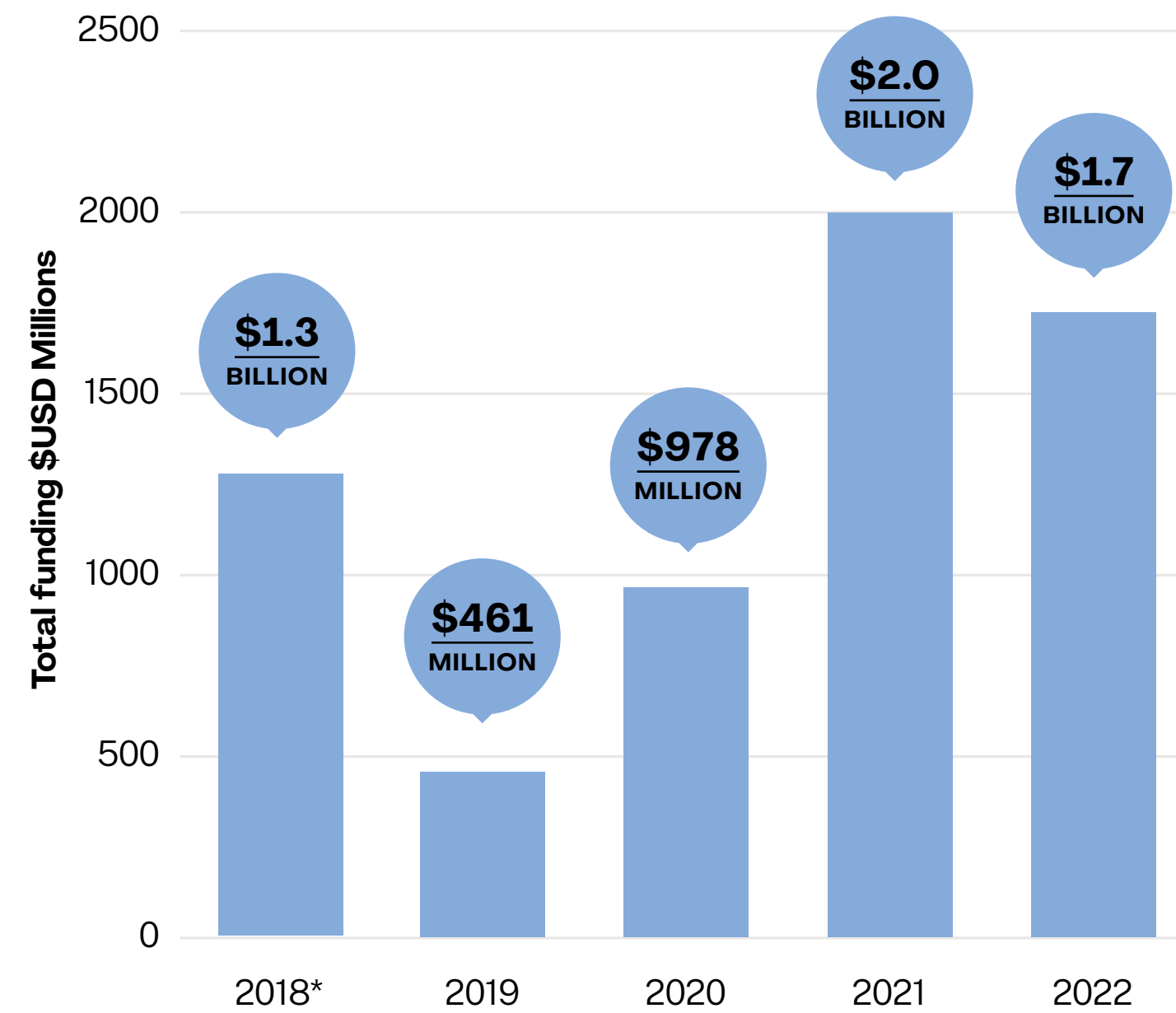
Funding and deals



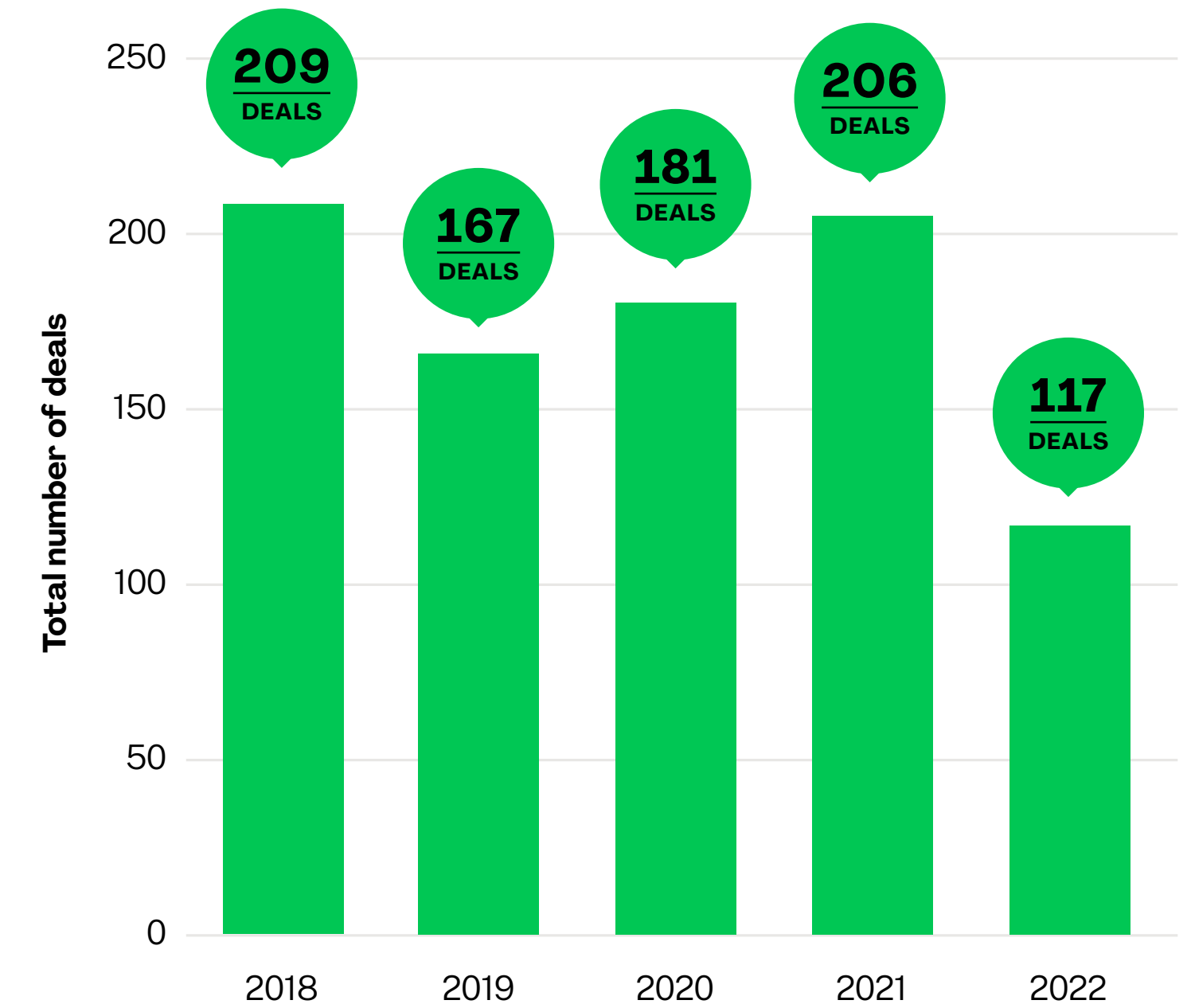
After a record year for US private funding toward food waste in 2021, the total amount of investments in 2022 has seen a leveling off, primarily driven by the challenging macro environment.

Funding

Direct invested \$ USD



Deals



● Funding ● Deals



*INCLUDES EXCEPTIONAL TRANSACTION OF KROGER'S \$727M ACQUISITION OF HOME CHEF.



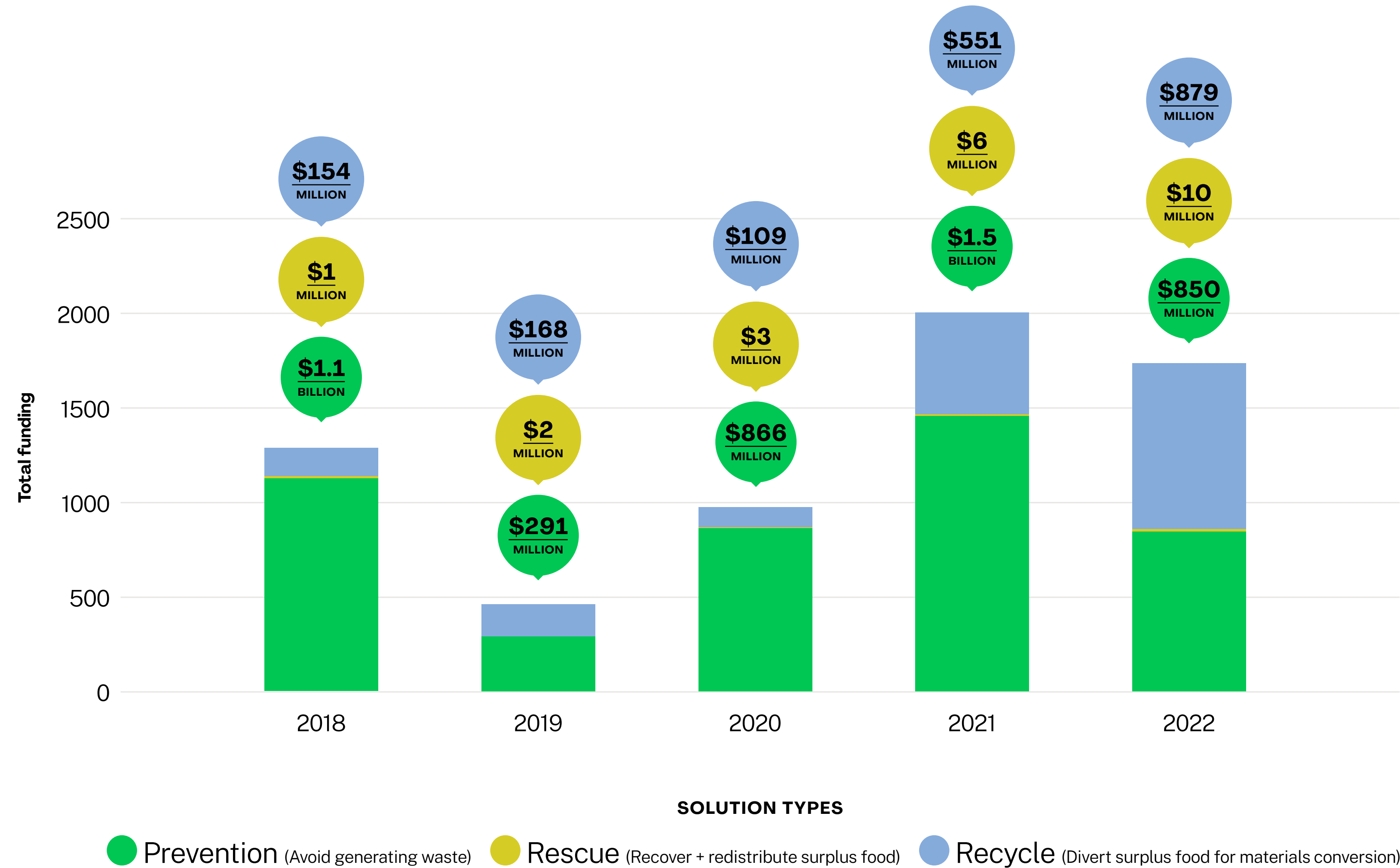
Funding and deals

By solution type

Current levels of private investment into food waste solutions for 2022 are at ~\$1.7b, but this does not include the deal value for the Misfits Market and Imperfect Foods merger, whose size remains undisclosed. Including this deal, we estimate that the total level of investment for 2022 is likely around \$2b – meaning it exceeds historical trends.

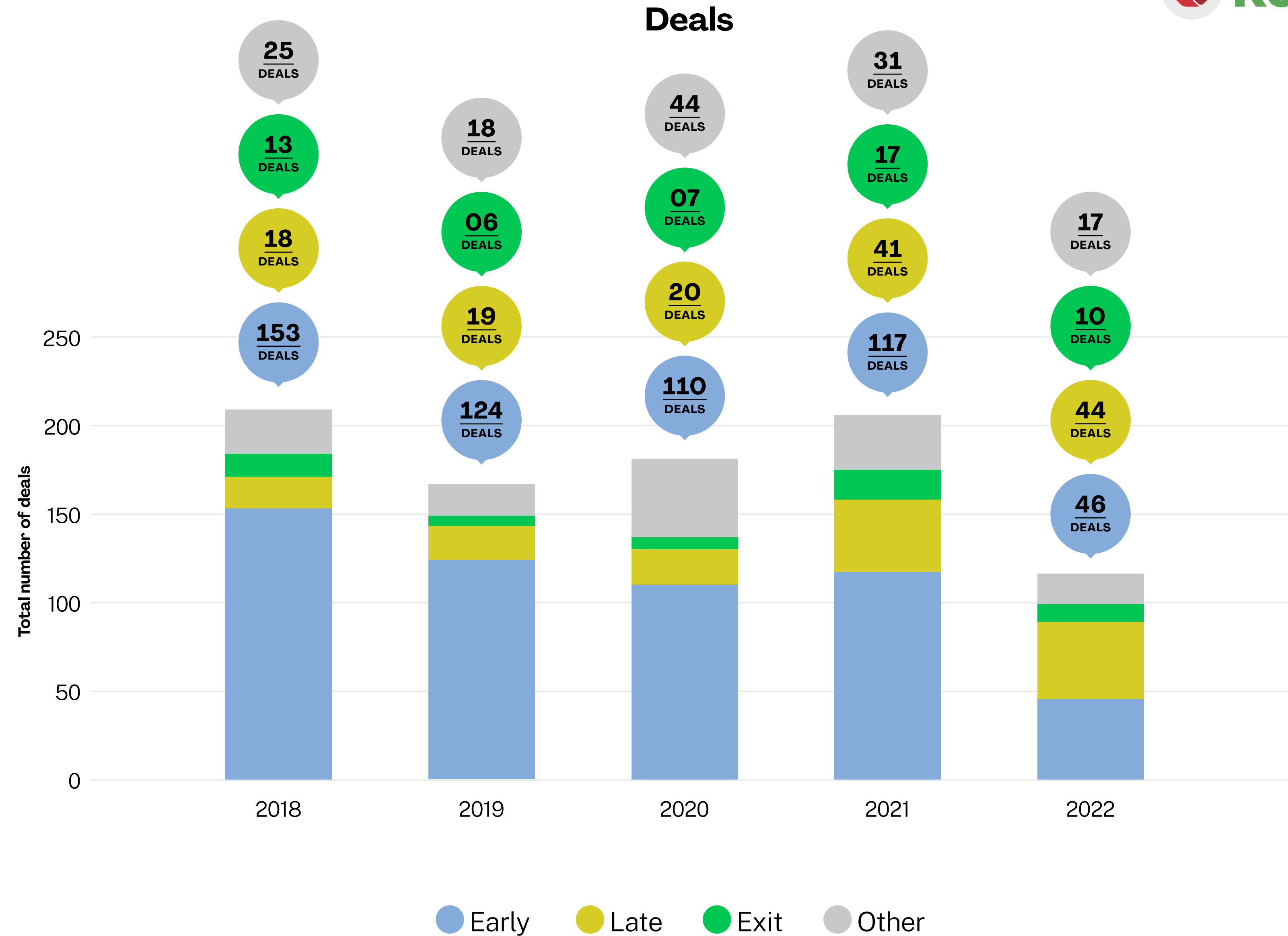


Funding
Direct invested \$ USD



Deals by stage

Later-stage deals remain robust, as companies – which were in the early stage in previous years – are starting to scale.



Largest deals and participants 2022





The largest deals this year focused on recycling, shelf-life extension, and tools related to tracking and optimizing inventory. There has been steady interest by private equity funders in recycling assets, as business adoption and policy changes make them more attractive.





- Prevention
- Recycle
- Rescue








Series A

COMPANY		RAISED	STREAM
 atomo	Atomo	\$47m	●
kencko	Kencko	\$18m	●
 BETTER ORIGIN	Better Origin	\$16m	●
 GALLEY	Galley	\$14m	●
 Flashfood	Flashfood	\$10m	●

Series B/C

COMPANY		RAISED	STREAM
 Afresh	Afresh	\$115m	●
mori	Mori	\$52m	●
crisp.	Crisp	\$35m	●
 RipeLocker	Ripelocker	\$7m	●

Exits

COMPANY		RAISED	STREAM
 Vanguard	Vanguard Renewables	\$700m	●
 AgroFresh	AgroFresh	\$158m	●
 VEGANO	Vegano	\$6m	●
 ATLAS	Atlas Organics	na	●
 IMPERFECT FOODS	Imperfect Foods	na	●



Investments by stage



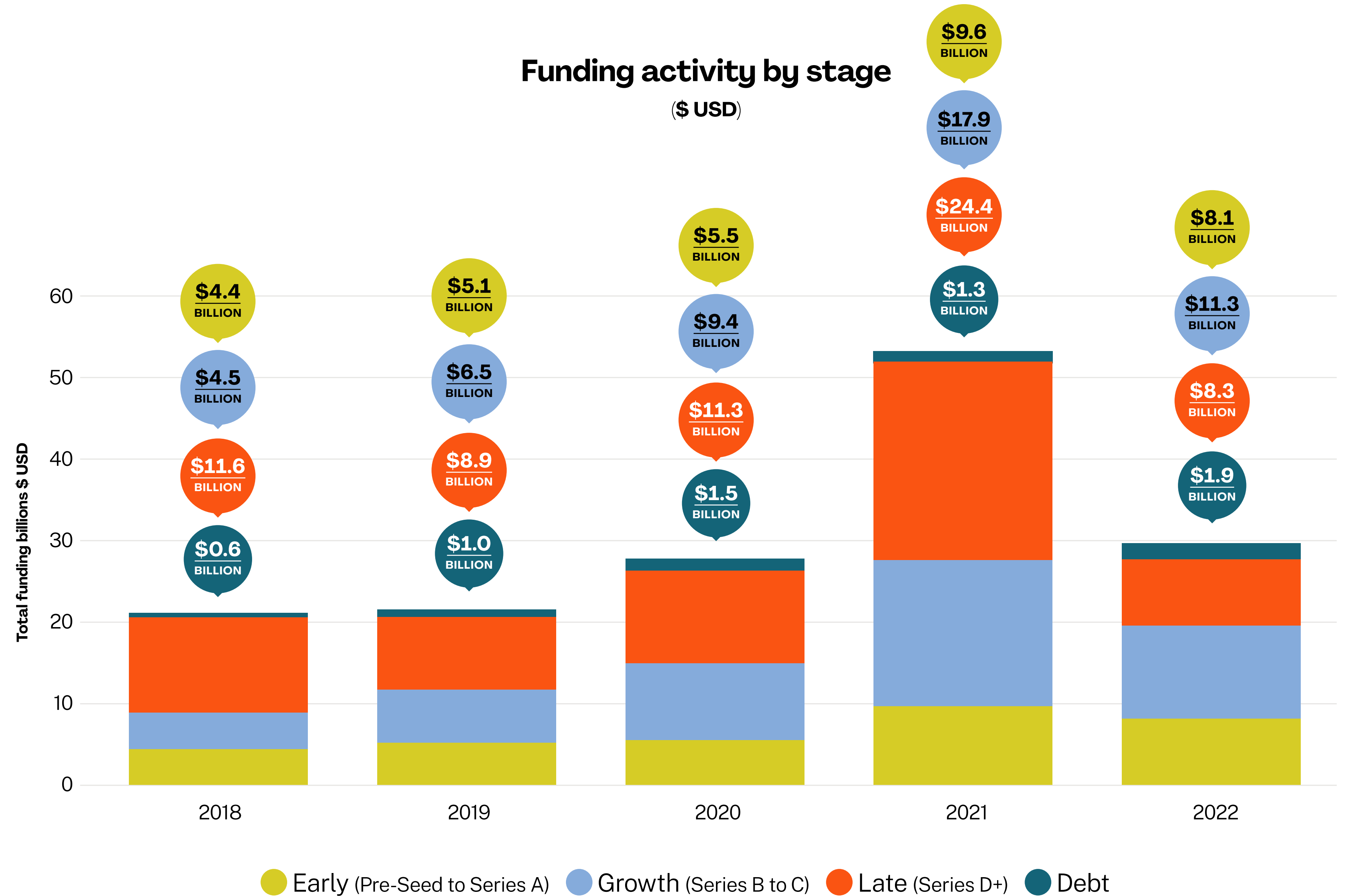
Investments by stage

Total funding decreased at every stage in 2022, with late stage capital dropping the most, by 66%. The decline is largely due to the slowdown in funding for eGrocery, which accounted for the bulk of late-stage deals in 2021.

Setting outlier year 2021 aside, funding for early and growth stages increased steadily from 2020 levels, while the late stage decreased slightly from 2020 to 2022.

Funding activity by stage

(\$ USD)

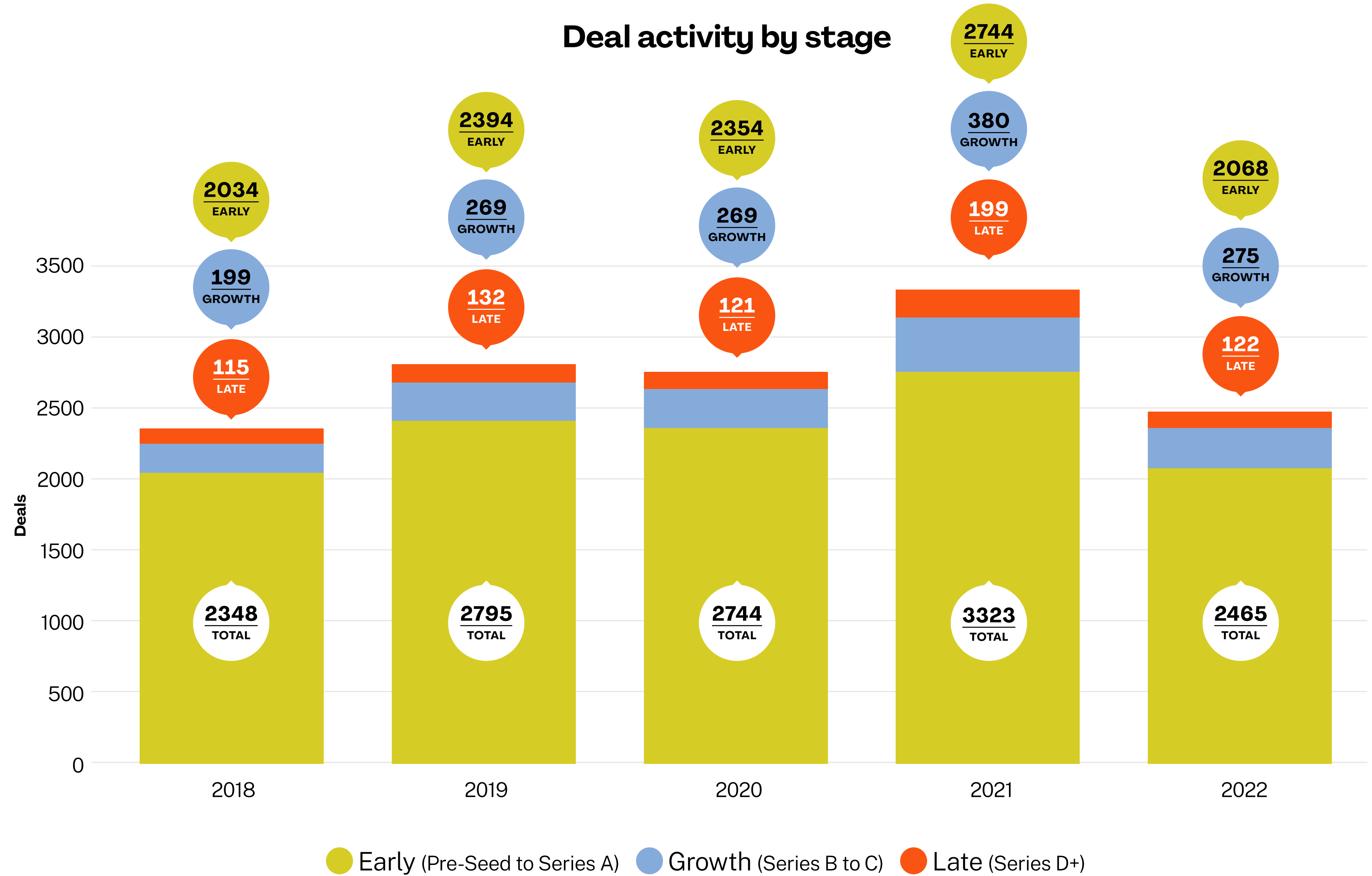


Investments by stage

As with total funding, late-stage deals saw the sharpest decrease: 39%. This is unsurprising, given the slowdown in funding to downstream categories where late-stage deals have dominated in recent years.

That early stage deal activity was back on par with 2018 is a somewhat concerning signal for deal flow, especially given the rise of agrifoodtech investors, but could mean only the very best ideas will be funded in future years.

Deal activity by stage



● Early (Pre-Seed to Series A) ● Growth (Series B to C) ● Late (Series D+)

*excluding debt deals



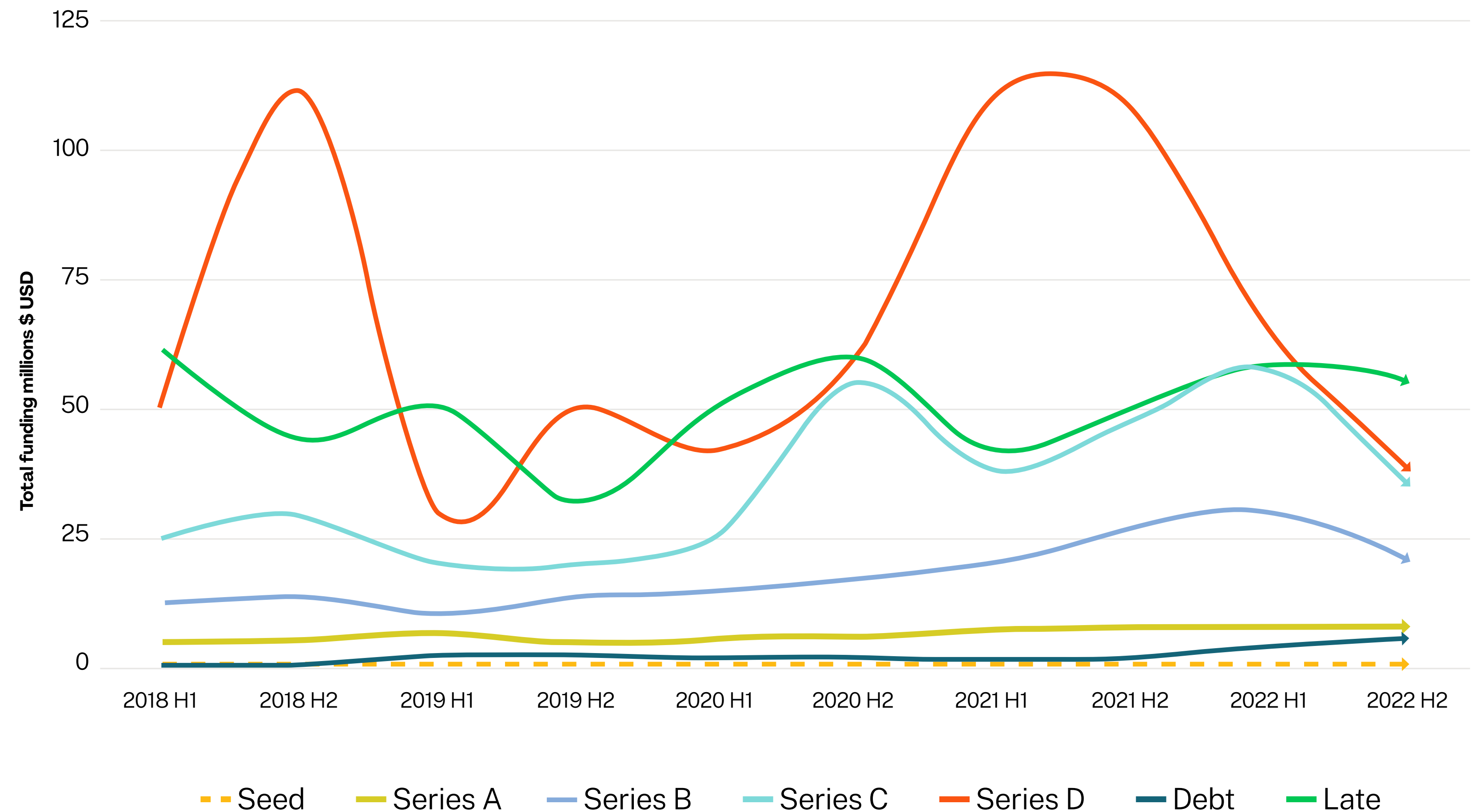
2022 investments by stage

A \$3bn Series D for Chinese eGrocer Xingsheng Youxuan skewed the median in 2021.

Series C, D and late stage startups experienced the most pronounced drops in median deal size in 2022 ending the year lower than the second half of 2020.

Earlier stage companies at seed, Series A and Series B are still raising larger rounds than in H2-2020. The Series A median for H2-2022 was \$8.1m while Series B was \$20m.

Median deal size by stage 2018-2022



Investments by stage

Top deals 2022 (\$ USD)

Funding to downstream Chinese startups may have dropped off a cliff but 2021-founded livestock genetics company Zhongxin Breeding's whopping seed stage deal shows how big local investors can go.

Brazilian wine delivery company Evino topped the Series A charts, while a US 3D printing company came second. Next Gen Foods proved its fundraising firepower again after raising a mega \$20m seed round in 2021.



- Upstream
- Midstream
- Downstream

Seed

COUNTRY	RAISED	COMPANIES FUNDED	STREAM
	\$327m	Zhongxin Breeding	●
	\$33m	luca	●
	\$28m	Ruiyun Cold Chain	●
	\$25m	Traitology	●
	\$20m	Faeth Therapeutics	●
	\$20m	Typhur Technology	●
	\$20m	Neoplants	●
	\$18m	Current Foods	●
	\$17m	qlub	●
	\$15m	Imagindairy	●

Series A

COUNTRY	RAISED	COMPANIES FUNDED	STREAM
	\$128m	Evino	●
	\$105m	3D Virtual Technologies	●
	\$100m	Next Gen Foods	●
	\$66m	Outside	●
	\$55m	64x Bio	●
	\$54m	MILKRUN	●
	\$50m	Kula Bio	●
	\$49m	Vow	●
	\$48m	GOURMEY	●
	\$47m	VitroLabs	●

Investments by stage

Top deals 2022 (\$ USD)

Food delivery isn't totally dead, as evidenced by some notable growth-stage deals from startups including Wonder, Zapp and Jüsto.

Another notable area for growth-stage capital was in mushroom products. Meati, which makes plant-based proteins from fungi, and MycoWorks' mushroom leather alternative are both examples of the potential 'shrooms have in providing agrifood with more sustainable ingredients and materials.



- Upstream
- Midstream
- Downstream

Series B

COUNTRY	RAISED	COMPANIES FUNDED	STREAM
	\$350m	Wonder	●
	\$300m	Little Leaf Farms	●
	\$265m	LINE MAN Wongnai	●
	\$200m	Zapp	●
	\$181m	Pure Harvest Smart Farms	●
	\$152m	Jüsto	●
	\$135m	Redefine Meat	●
	\$135m	Bluepha	●
	\$125m	Wasoko	●
	\$120m	Descartes Underwriting	●

Series C

COUNTRY	RAISED	COMPANIES FUNDED	STREAM
	\$400m	Upside Foods	●
	\$300m	Kitopi	●
	\$200m	DNA Script	●
	\$170m	Foodics	●
	\$160m	Lygos	●
	\$150m	Meati	●
	\$140m	GREENLABS	●
	\$140m	TemperPack	●
	\$125m	MycoWorks	●
	\$120m	Connecteam	●

Investments by stage

Top deals 2022 (\$ USD)

The biggest later stage rounds, such as Getir's Series E, happened in the first half of 2022, before the downturn started.

Novel Farming Systems were an important part of later-stage rounds, and not just hydroponics-based vertical farming systems. While Plenty and Gotham Greens both secured large rounds, Soli Organic raised funds for its soil-based indoor farming business. There was also funding for non-leafy-green systems, such as InnovaFeed's insect farming technology.



- Upstream
- Midstream
- Downstream

Series D


COUNTRY	RAISED	COMPANIES FUNDED	STREAM
	\$249m	InnovaFeed	●
	\$231m	Rohlik	●
	\$200m	Zepto	●
	\$150m	Deliverect	●
	\$136m	ICEYE	●
	\$125m	Soli Organic	●
	\$95m	WayCool	●
	\$75m	Sound Agriculture	●
	\$70m	NotCo	●
	\$65m	Anuvia Plant Nutrients	●

Late Stage

COUNTRY	RAISED	COMPANIES FUNDED	STREAM
	\$768m	Getir	●
	\$700m	Swiggy	●
	\$500m	LanzaTech	●
	\$425m	Weee!	●
	\$400m	Plenty	●
	\$310m	Gotham Greens	●
	\$300m	SpotOn	●
	\$240m	Fetch	●
	\$240m	Dunzo	●
	\$211.5m	Andion Global	●

Top dedicated agrifoodtech investors by companies

There are now some 200+ food and ag-focused venture capital firms, according to Valoral Advisors. In recent years, several launched with a focus on alternative protein, including Big Idea Ventures, Siddhi Capital and Blue Horizon featured here. But increasingly funds are broadening their scope into climate tech as agrifoodtech with that growing category.

RANK	INVESTOR	NO. DEALS	COMPANIES FUNDED INCLUDE
01	Big Idea Ventures	47	Aquacultured Foods, Bright Biotech, Meat. The End.
02	Rockstart Ventures	45	MoooFarm, Orderlion, Reduced
03	S2G Ventures	35	Faeth Therapeutics, Atomo Coffee, Soli Organic
04	Siddhi Capital	35	Ark Biotech, Liberation Labs, Mycotechnology
05	AgFunder 	30	Black Sheep Foods, Faeth Therapeutics, Nobell Foods
06	HackCapital	24	Plantish, Michroma, Cultivated Biosciences
07	Blue Horizon	23	Tropic Biosciences, Atomo Coffee, Planetary
08	Astanor Ventures	23	Umiami, MicroHarvest, Galley
09	Gullspång Re:food	21	Agreena, Mission Barns, Everytable PBC
10	PeakBridge	18	Rival Foods, Standing Ovation, Forsea
11	Döhler Ventures	18	Clean Food Group, Willicrof
12	Temasek	17	UPSIDE Foods, InnovaFeed, Country Delight



FOODHACK

DATA CONTRIBUTED IN
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AGFUNDER GLOBAL FUNDS



AgFunder invests in impactful themes

A snapshot of investments from AgFunder's 60+ strong portfolio of global startups operating across the supply chain.

Select AgFunder portfolio companies

Automation				Future of Food Service			
Decarbonization				Supply Chain /Logistics			
Food as medicine				Upcycling			
eCommerce Marketplaces				Farm Digitization			
Alternative Protein				Biotech			
Controlled Environment Ag				Sustainable Materials			





Appendix



Agrifoodtech category definitions



- Upstream
- Midstream
- Downstream

	<p>Ag Biotechnology On-farm inputs for crop & animal ag including genetics, microbiome, breeding, animal health</p>		<p>Midstream Technologies Food safety & traceability tech, logistics & transport, processing tech</p>
	<p>Agribusiness Marketplaces & Fintech Commodities trading platforms, online input procurement, equipment leasing, farmer fintech</p>		<p>Miscellaneous All other agrifood-related tech</p>
	<p>Bioenergy & Biomaterials Novel materials, non-food extraction & processing, feedstock technology, hi-tech cannabis pharma</p>		<p>In-Store Retail & Restaurant Tech Shelf-stacking robots, 3D food printers, payment systems, food waste monitoring IoT</p>
	<p>Farm Management Software, Sensing & IoT Ag data capturing devices, decision support software, big data analytics</p>		<p>eGrocery Online stores + marketplaces for sale and delivery of processed and unprocessed ag products to consumer</p>
	<p>Farm Robotics, Mechanization & Equipment On-farm machinery, automation, drone manufacturers, grow equipment</p>		<p>Home & Cooking Tech Smart kitchen appliances, nutrition technologies, food testing devices & home grow kits</p>
	<p>Novel Farming Systems Indoor farms, aquaculture, insect & algae production</p>		<p>Online Restaurants and Meal Marketplaces Online tech platforms delivering prepared food and meal kits from a wide range of vendors</p>
	<p>Innovative Food Cultured meat, novel ingredients, plant-based proteins</p>		<p>Cloud Retail Infrastructure On-demand enabling tech, ghost kitchens, last-mile delivery robots & services</p>

Sources & methodology



Data Sources & Curation

Utilizing new advanced machine-learning algorithms and artificial intelligence to help identify and categorize agrifoodtech startups, our knowledge base has grown to more than 30,000 companies, with new startups and historical data being added each day.

The raw data for our reports comes from Crunchbase, which gathers publicly-available information such as press releases and US Securities and Exchange Commission filings, as well as crowdsourcing directly from the industry. AgFunder contributes data from its own collection methods, including private communications with investors and companies. We also collect data from partners across the globe to ensure we have the most comprehensive, accurate and curated dataset and knowledge base of agrifoodtech companies and investments.

The raw data is painstakingly curated by the AgFunder team, along with their data partners, to ensure they are relevant, accurate, up-to-date, and categorized according to AgFunder's proprietary tagging system.

We update and improve our dataset continuously throughout the year, meaning total figures from previous years' reports will shift as our dataset becomes more complete.

In 2022, we tightened our definitions of what constitutes an agrifoodtech venture to ensure that the emphasis on food and agriculture is core to the business.

That's had a recalibrating effect on this year's investment figures as well as some past data. Examples include logistics, drones, cloud and any other tech services that may have started in agrifood but have since added other sectors or pivoted away from agrifood. We've maintained historical rounds that were raised on an agrifood focus, where we could.

While we are happy to share our findings, we reserve all rights with respect to AgFunder research and this report and we require it to be fully and accurately cited when any of the data, charts, or commentary are used.

Undisclosed Financings

Of the 2606 financings in this report's curated dataset, 647 were undisclosed and could not be determined through research or direct sources. We exclude undisclosed financings when computing averages and median values. In some cases, we're able to confidentially obtain financing figures directly from investors on the condition they're only included in aggregate.

Multiple Financings

In some cases, Crunchbase displays multiple financings for the same company in the same year. This can be because a company closes subsequent rounds in the same year, but it can also be the result of several closes of the same round. We keep them separate unless they are announced as one single round.

Categorization

AgFunder's categorization system is designed to capture broad themes across the complex agrifoodtech value chain. The agrifood sector has a wide supply chain spanning inputs and industrials, farming, logistics, wholesale distribution, processing, retail distribution, and the consumer. In many cases, technologies such as marketplaces connect different links in the supply chain and so in this report we've chosen to focus on high-level themes. To assist with the categorization and to avoid subjectivity, AgFunder first employs over 150 machine learning and artificial intelligence models to suggest category placement and to help tag the company according to the technology and its place in the supply chain. Finally, the AgFunder team manually reviews the suggestions for each company, often with significant research and debate among our team.

Starting with our 2023 Global Agrifoodtech Investment Report, we combined Agribusiness Marketplaces and Fintech into one category as there is often overlap between the two. We maintained any fintech tools for retailers or restaurants within the Retail Tech category. Given the reduction in funding to food delivery services, in this report we've combined Online Restaurants & Meal Kits with Restaurant Marketplaces as very similar business models.

We've also taken a stricter stance on cannabis and CBD-related startups; there needs to be clear proprietary technology involved. We will not include pure consumer packaged goods or pure production, as we wouldn't include pure production in any other crop. If we believe the growing facilities are particularly high tech or utilize proprietary technology, we will still include it in our Novel Farming Systems category. The same goes for processed products; if the extraction technique is particularly innovative, we'll include it as a Biomaterials or Midstream Tech startup. Large vertically-integrated cannabis companies are also excluded.

Data partners

DATA POWERED BY



Image credits



	Cover Black Sheep Foods		P 9 Temasek		P 34 LoamBio		P 47 Trace Genomics		P 57 Verdant		P 70 Leanpath
	P 10 Umaro		P 37 Foodbytes		P 49 Eion		P 59 Tevel		P 71 Harvest Against Hunger		
	P 2 Intergriculture		P 15 Chinova		P 37 Foodbytes		P 50 Klim		P 60 Juicy Marbles		P 76 Brightseed
	P 4 Modern Synthesis		P 23 Klim		P 38 Babban Gona		P 52 Propagate		P 62 Umaro		P 85 Sentera
	P 5 Black Sheep Foods		P 29 CommonGround		P 41 Justo		P 54 eFishery		P 63 Unreal Milk		
	P 10 Temasek		P 32 LoamBio		P 45 Aquaconnect		P 55 Modern Synthesis		P 68 Apeel		



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