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Five years on: global climate tech investment trends since the Paris Agreement

October 2021

Foreword

As global leaders gather at COP26 for the most important climate summit since the Paris Agreement, all eyes are on Glasgow and the UK. This is a pivotal moment which requires the entire global economy to change business practices and commit to net zero emissions to help limit global temperature rises to 1.5C by the middle of this century.

The role of the global tech industry is critical to address the climate crisis. As a driving force of innovation, creativity and making the impossible possible, technology is essential to enable and accelerate transformation at the scale and pace required. Since the Paris Agreement, we have seen exceptional growth in the number of climate tech companies globally - those working to reduce or eliminate greenhouse gas emissions and address the impacts of climate change. We have also witnessed VC investment into climate tech solutions skyrocketing, with global investment growing by almost five times since 2016.

Europe has likewise seen rapid acceleration of climate tech VC investment and global tech hubs like London, Stockholm and Paris are driving this exceptional growth. Europe is one super connected tech ecosystem and in order to really drive progress, we need cities to work together to spark ideas, share knowledge and scale solutions.

Home to the biggest cluster of climate tech companies in Europe, London is determined to be a global leader in taking action to meet global climate commitments. It is one of the first cities in the world to publish a climate plan compatible with the highest ambition of the Paris Agreement. London's ambition to become a net zero carbon, zero pollution and zero waste city is backed by a strong strategy, targets, infrastructure and finance and demonstrates its commitment to being the city of the future, today.

This report explores global investment and startup trends in climate tech since the signing of the Paris Agreement at the pivotal moment of COP26. With a focus on Europe and London, the report reveals how much investment is going into climate tech, which sub industries are attracting the most investment and where potential future growth lies.

It is clear that investment into climate tech is growing fast, and that demand is only going to accelerate further. With global and local governments, private sector, investors and entrepreneurs working towards a common goal, we have the best chance of tackling the global climate crisis.

Lucette Demets, Head of Sustainability at London & Partners



Key takeaways



Climate tech is booming globally

Since the signing of the Paris Climate Agreement, global climate tech investment has skyrocketed, with five times more VC funding in 2021 than 2016.

2021 has been a record year for climate tech investment, with \$32B raised so far this year.

Europe is the fastest-growing region globally for climate tech, with investment growing faster than the global average: 7.0x vs. 4.9x between 2016 to 2021 year to date.



London is a climate tech powerhouse

London is one of the driving forces behind Europe's rapid growth in climate tech. Its startups raising \$3.3B in VC investment since 2016, 16% of Europe's total.

With a thriving climate tech ecosystem, London is home to 416 climate tech companies - more than any other European city.

The UK capital is also a hub for climate tech funds, with London-based VCs raising over half of Europe's dedicated climate tech funds in the last two years.



London has great potential for future growth

The growth of climate tech is been driven by significant global investment into areas such as transportation, energy and circular economy solutions.

London is the second city globally for the number of climate tech rounds raised by startups, suggesting an active ecosystem with significant growth ahead.

Climate tech companies in London are scaling - the city is home to 3 climate tech unicorns and 6 potential future unicorns.

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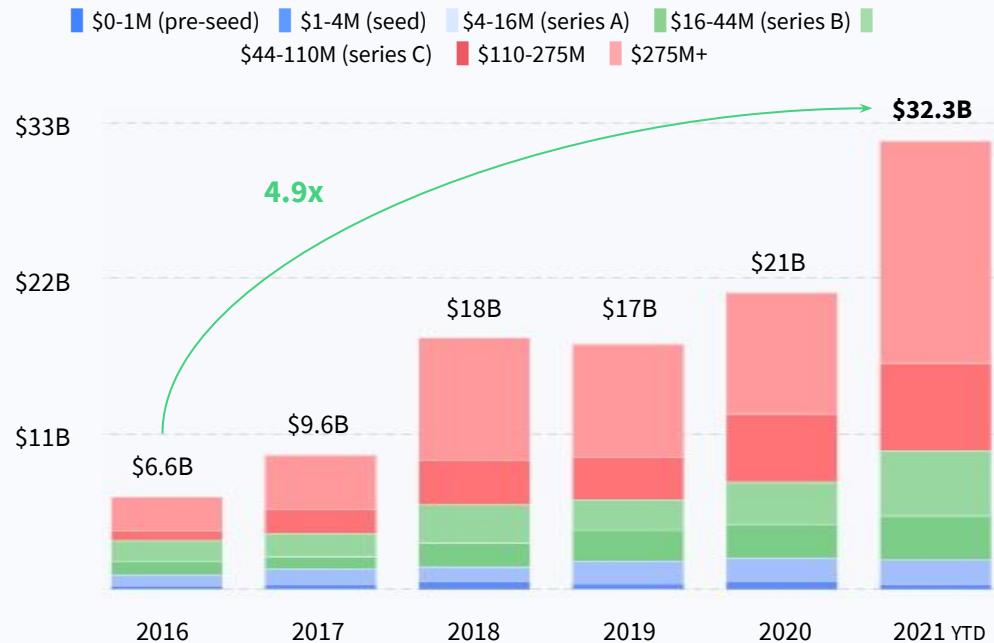
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Regional Analysis



Climate tech startups have raised a record \$32B in 2021 globally, 4.9 times more investment since the Paris Climate Agreement was signed five years ago.

Global climate tech investment

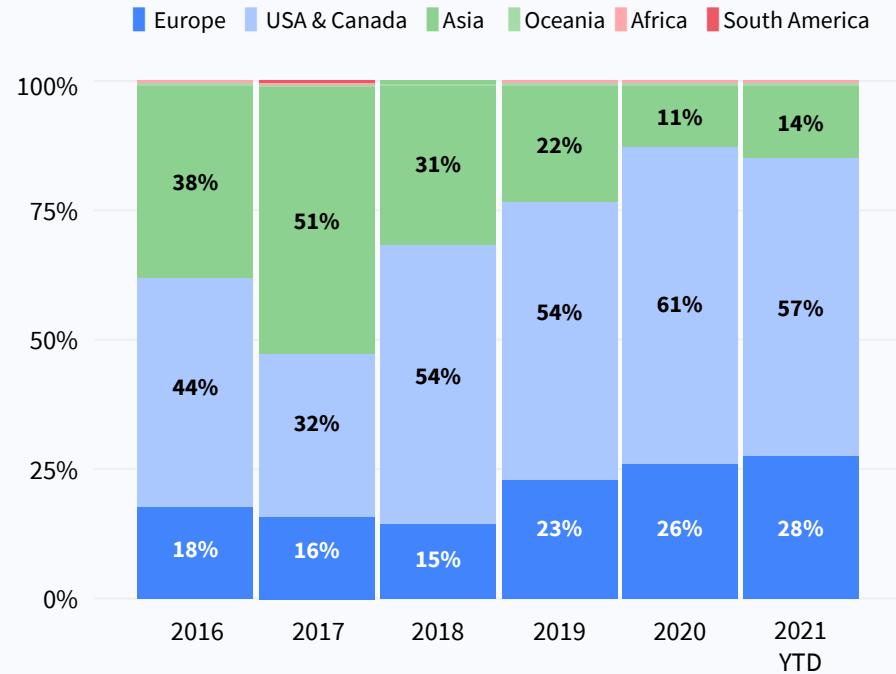


Biggest rounds of 2021 YTD

Company	HQ	Transaction
norhvolt	Stockholm Sweden	\$2.8B Growth Equity
RIVIAN	Irvine United States	\$2.5B Growth Equity
SVOLT	Boading China	\$1.4B Growth Equity
goodleap	Roseville United States	\$800M Late VC
REDWOOD MATERIALS	Carson City United States	\$700M Series C

European climate tech startups have been leading investment growth, attracting a growing share of the global capital in the space.

Global climate tech investment per HQ region

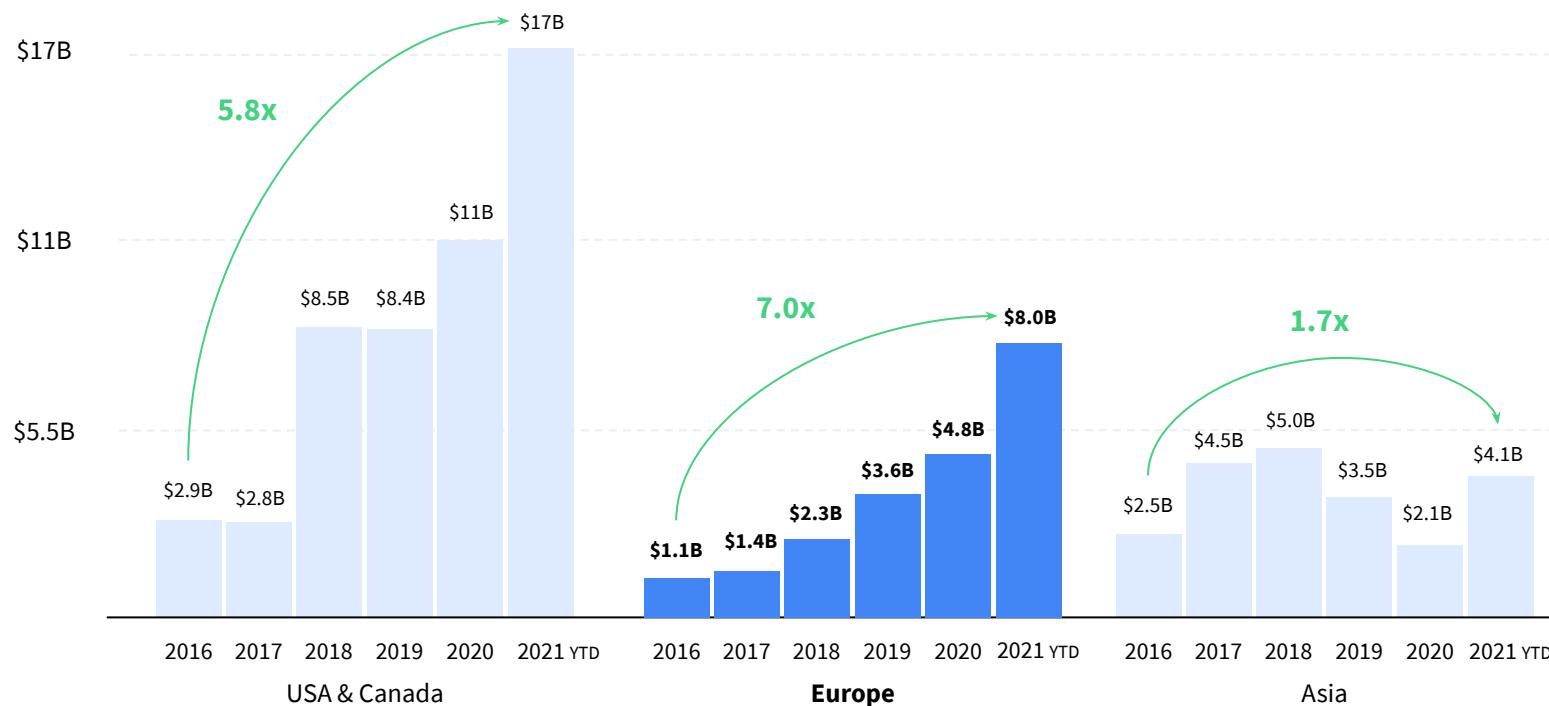


Biggest rounds of 2021 YTD in Europe

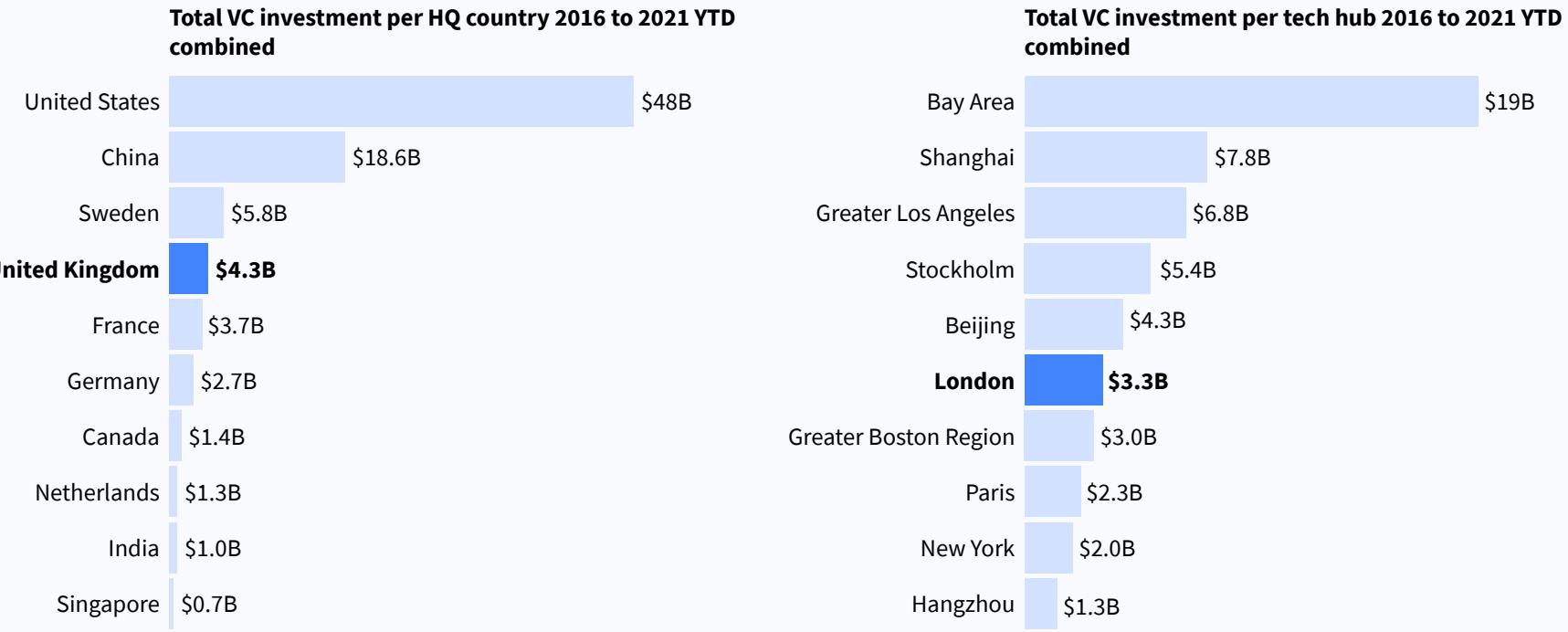
Company	HQ	Transaction
northvolt	Stockholm Sweden	\$2.8B Growth Equity
BackMarket	Paris France	\$335M Series D
Vinted	Vilnius Lithuania	\$275M Series F
VOLOCOPTER	Bruchsal Germany	\$241M Series D
Vestiaire Collective	Paris France	\$210M Series D

Europe is now the fastest growing region for climate tech, with investment growing 7 times since 2016.

Climate tech investment per HQ region



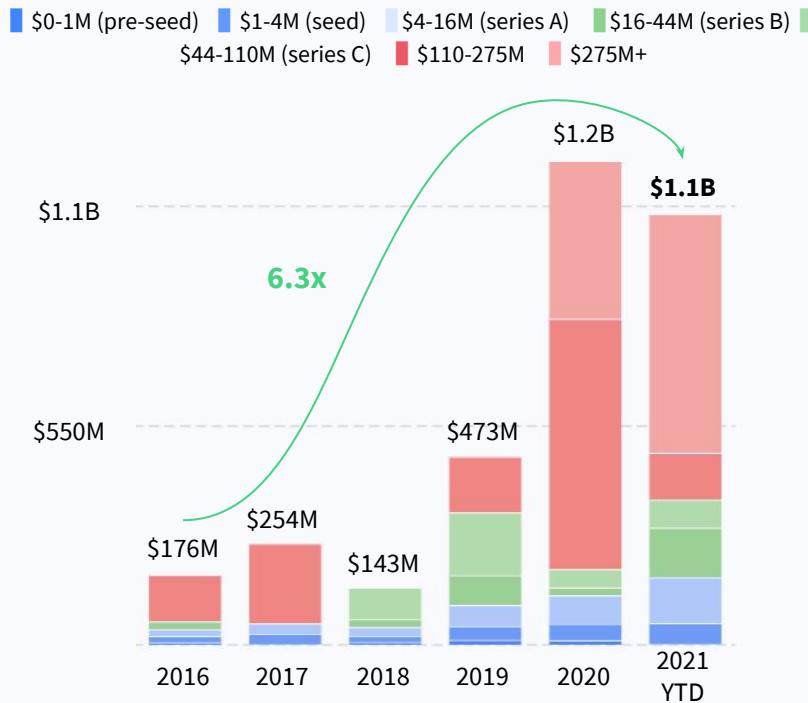
The UK ranks 4th globally for climate tech investment, with London-based startups receiving over 70% of UK funding.



London Overview

Climate tech investment into London has already surpassed \$1B in 2021, growing 6.3x since 2016, faster than the global average (4.9x).

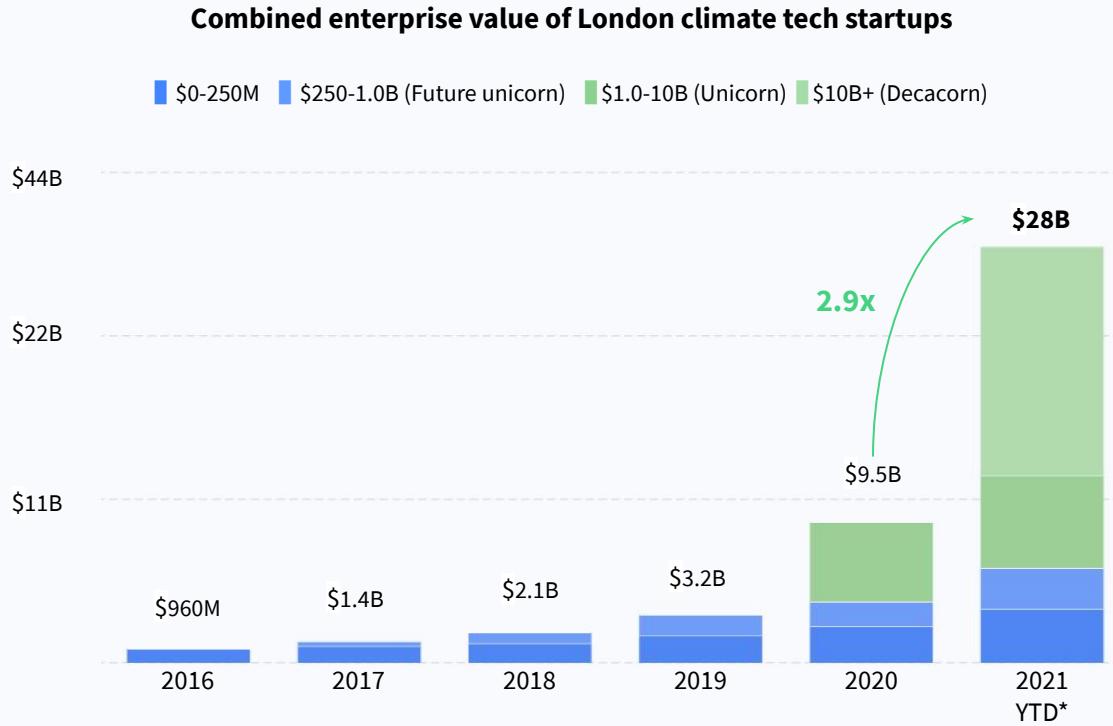
Climate tech investment into London startups



Biggest rounds in 2021 YTD

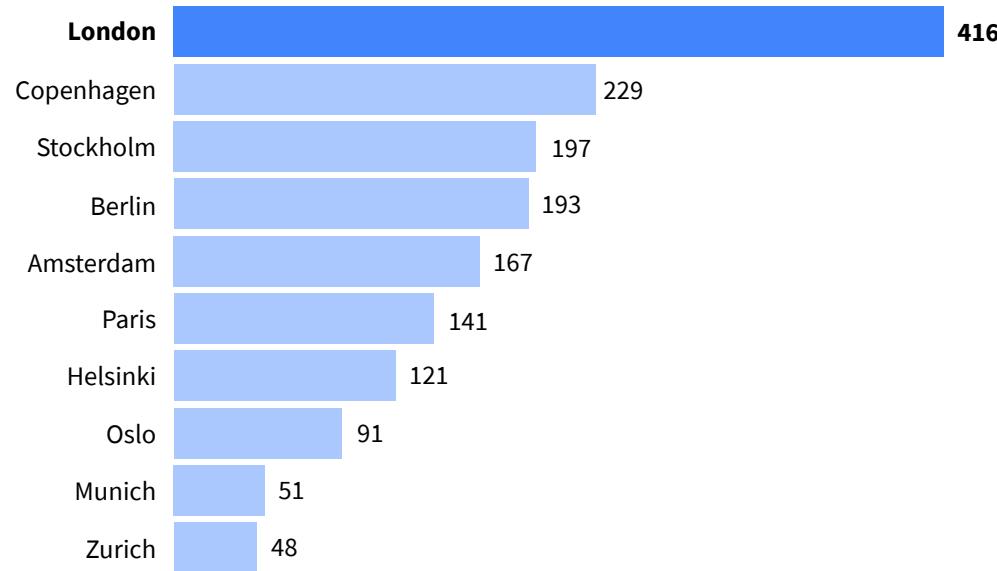
octopusenergy	Octopus Energy Clean energy supplier	\$600M Growth Equity September
newcleo	Newcleo Nuclear fission energy	\$118M Early VC August
Highview Power	Highview Power Cold energy storage	\$70M Growth Equity February
Olio	Olio Distributes soon-to-expire food	\$43M Series B September
carbon clean	Carbon Clean Solutions Direct air capture	\$30M Series B July
cervest	Cervest Climate risk platform	\$30M Series A May
Circulor	Circulor Responsible sourcing	\$14M Series A June
THIS	THIS Plant-based meat	\$13M Series E June

The combined value of London climate tech startups has almost tripled in the last year alone, thanks in large part to big exits from Arrival and Depop.



London leads in Europe for the number of climate tech startups.

Cumulative number of climate tech startups created per tech hub



Selected newly founded London climate tech startups

Startup	Launch date	Description
newcleo Futureable Energy	2021	Nuclear fission energy
Abatable	2021	B2B carbon offsets
INCUBE	2020	Modular construction
skoot	2020	Carbon negative lift-sharing
CLIMATE X	2020	Climate risk analytics
minimum	2020	B2B carbon offsets

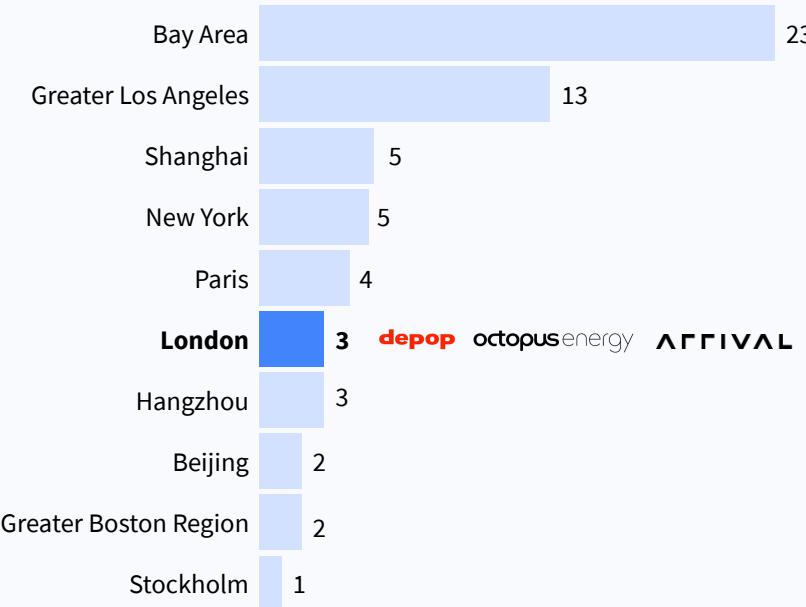
London is also the second city, globally, for number of rounds raised by climate tech startups, suggesting an active early-stage ecosystem.

Climate tech rounds per HQ city

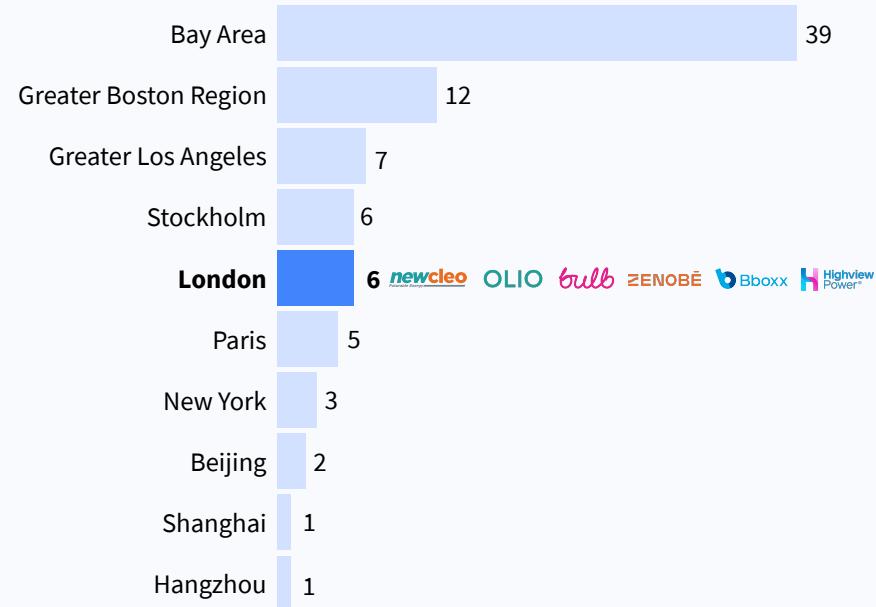
	2016	2017	2018	2019	2020	2021YTD
Bay Area	70	48	98	91	92	69
London	31	31	26	54	65	40
Berlin	9	19	12	18	17	24
New York	14	24	19	17	18	22
Greater Boston Region	8	21	20	18	21	18
Greater Los Angeles	13	19	23	16	21	17
Stockholm	12	15	22	27	17	16
Paris	19	19	18	14	24	10
Houston	2	8	6	11	2	6
Munich Metropolitan Area	10	10	10	9	15	6

London is producing a number of fast-growing climate tech companies, home to 3 climate tech unicorns and 6 potential future unicorns.

Number of climate tech unicorns per city



Number of potential future climate tech unicorns per city



London is amongst the leading hubs for climate tech globally, with high levels of investment, dedicated climate tech VC funds and a thriving startup ecosystem

	 London	 Stockholm	 Greater Los Angeles	 Beijing	 Greater Boston region	 Bay Area
Climate tech investment since 2016	\$3.3B	\$5.4B	\$6.8B	\$4.3B	\$3.0B	\$19B
Number of climate tech rounds since 2016	247	109	109	22	106	468
Number of climate tech startups	416	197	76	10	82	349
Combined value of climate tech startups	\$28B	\$18B	\$60B	\$24B	\$13B	\$941B
Dedicated climate tech VC firms	18	3	4	/	14	35

London-based VCs have raised over half of all European dedicated climate tech funds in the last two years.

Amount of climate tech funds raised by VC firms



Largest climate tech funds raised up until Q3 2021

Name	HQ	Fund size
lightrock	London	\$900M
2150	London	\$312M
blue horizon	Zurich	\$200M
<norrsken>	Stockholm	\$138M
PALE BLUE DOT	Malmö	\$96M

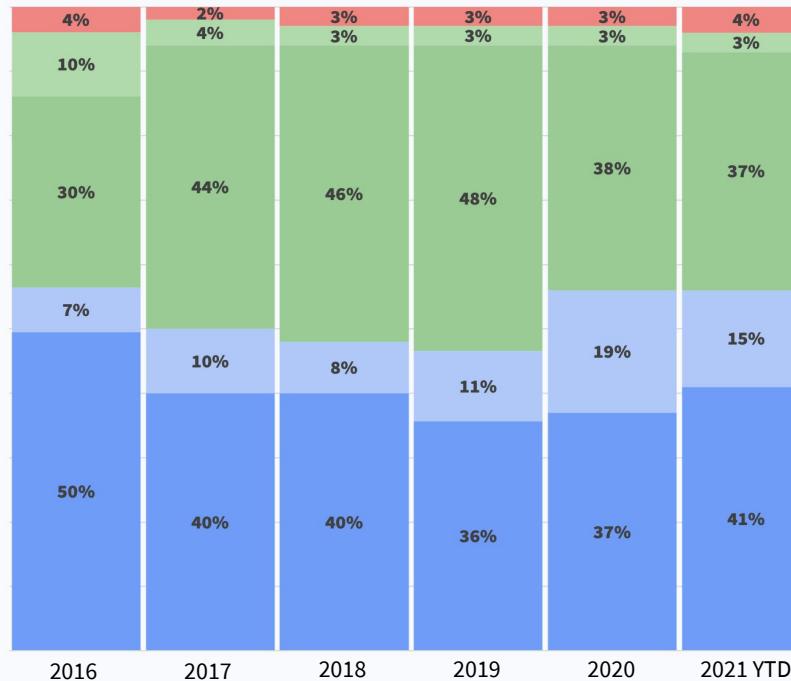
Sector Overview



On a global level, energy and transportation startups attract over 80% of climate tech funding.

Share of investment raised by global climate tech startups per sector

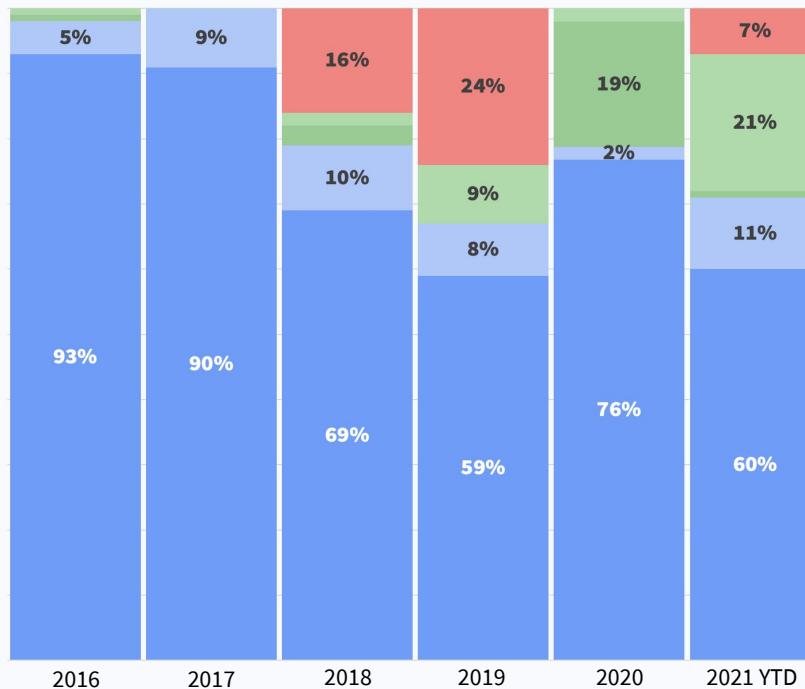
■ Energy ■ Food ■ Transportation ■ Enterprise Software ■ Circular economy



In London, energy startups are attracting the most climate tech investment, with circular economy and enterprise software gaining a great share.

Share of investment raised by London climate tech startups per sector

■ Energy ■ Food ■ Transportation ■ Enterprise Software ■ Circular economy



There is an emerging pipeline of climate tech startups in London across the most important sectors.

Food



Distributes soon to expire food

Total funding: \$51M
Valuation: \$171M - \$259M
Launch year: 2015

Rising stars:



Energy



Clean energy provider

Total funding: \$1.2B
Valuation: \$4.6B
Launch year: 2015

Rising stars:



Transportation



Electric vans manufacturer

Total funding: \$631M
Valuation: \$8.3B
Launch year: 2015

Rising stars:



Enterprise software



Climate risk platform

Total funding: \$35M
Valuation: \$120M - \$180M
Launch year: 2016

Rising stars:



Circular economy¹



Marketplace for second-hand

Total funding: \$100M
Valuation: \$1.6B
Launch year: 2011

Rising stars:



What is your mission?

Our mission is to reduce food waste in the home - at scale - by leveraging the power of digital technology and local communities. We do this by connecting people to their neighbours, and volunteers to local businesses, so that surplus food and other household items can be given away, not thrown away. Our vision however is much larger than this - we want to completely reinvent how people consume by making it hyper-local and sustainable. The next step is the launch of a new 'Borrow' section which will connect neighbours to lend and borrow everyday household items.

You saw a huge surge in new users during the pandemic - over half of your 5m users - why do you think this is and what does the future look like?

We experienced hockey-stick growth during the pandemic, both in terms of user numbers, but also in terms of the number of businesses wanting to work with us. That's because we collectively woke up to the importance of food, the power of community, and the urgency of the climate crisis; plus we were increasingly living and working at home, which made OLIOing (neighbour-to-neighbour sharing) much easier.

As we look to the future we're particularly excited by the potential for our Food Waste Heroes Programme, which enables businesses such as Tesco, Pret a Manger

Tessa Clarke
Co-Founder and CEO



Booker, Compass Catering and many more to have zero food waste locations.

We do this thanks to our 30,000+ trained volunteers - Food Waste Heroes we call them - who collect unsold food at the end of the day, and redistribute it to their local community via the OLIO app.

How has London supported your growth?

The very first OLIO pilot took place in 5 postcodes in North London in 2015, and ever since then London has played an integral role in getting us to where we are today! We've benefitted from programmes such as the Mayor of London's International Business Programme - which took us on an incredibly helpful & inspiring trade mission to Silicon Valley - and Tech Nation's Upscale; as well as the rich ecosystem of events, investors and peers which have enabled us to learn fast and unlock funding. London is also leading globally in the emerging tech for good and impact spaces, so it's been brilliant having that support as we've been breaking new ground.



HQ: London

Founded: 2015

Founders: Tessa Clarke and Saasha Celestial-One

Funding: \$51M

OLIO connects neighbours with each other and with local businesses so surplus food can be shared, not thrown away. This could be food nearing its sell-by date in local stores, spare home-grown vegetables, bread from your baker, or the groceries in your fridge when you go away. For your convenience, OLIO can also be used for non-food household items too.

What made you choose to found Arrival here?

Arrival is a global tech company, accelerating the mass adoption of EVs worldwide, and it made perfect sense for us to set up a London HQ. The UK is a key location for us, with our R&D Facility based in Banbury, and our first UK Microfactory currently undergoing fit-out in Bicester, Oxfordshire.

London and the UK have an incredibly strong talent pool in tech, automotive, software, hardware, and many other disciplines who have created brilliant innovations for Arrival, such as our unique composite material - developed in Oxfordshire - which is recyclable, doesn't require painting, and is more durable than steel: a game-changer in terms of vehicle design and production. In addition, we have also been able to attract excellent global talent to the business through the visas available to us.

What are your future plans following your recent SPAC IPO?

We are laser focused on execution. We've been building up capabilities for the past 6 years, with over 2,000 employees and our Microfactories currently undergoing fit out in the US and UK.

Avinash Rugoobur
President



Tell us more about The Arrival Microfactory and its advantages

Production takes place in rapidly scalable, small-footprint Microfactories which are located near to demand, creating local jobs, using local supply chains and paying local taxes, ensuring huge regional benefits for communities around the world, and reducing the impact of global shipping to further increase sustainability.

Decentralising production brings economic benefits to a much wider range of communities and regions than the traditional automotive manufacturing approach and due to the small footprint required for a Microfactory, reduces its environmental impact significantly too.

This local approach also enables Arrival to create products designed for local requirements, creating the right product for the right country so they don't have to make any unnecessary compromises and can provide their people with the best possible mobility experience.

Why did you choose to expand into the US?

Before announcing our US headquarters in Charlotte, North Carolina, we were already working with a number of partners in the states. It is an important market for us and one where we've had a huge interest from fleet operators and cities to help them accelerate the transition to electric vehicles. For instance, we have a strong partnership with the City of Charlotte, who have signed an MOU with us, which demonstrates our shared vision, guiding principles, and goals to improve sustainability efforts and reduce greenhouse emissions.

ARRIVAL

HQ: London

Founded: 2015

Founder: Denis Sverdlov

Funding: \$631M

Using a revolutionary new method of design, Arrival creates electric vehicles that elevate the everyday, empower local communities and unlock true sustainability.

What makes Crate to Plate unique?

Hydroponic vertical farming has proven to have essential advantages over traditional farming methods, allowing Crate to Plate to grow produce locally in urban environments. This approach uses minimal water (95% less than farming with soil), with little space required. Hydroponics and urban farming are still a relatively new initiatives in the UK and we are unique because we offer a wide variety of produce that can grow in any single one container, rather than the traditional hydroponics which focused mainly on microgreens. We also have a direct to consumer business, as well as supplying restaurants and retailers.

Tell us more about the “15-minute cities” concept and the role of Crate to Plate to achieve this.

The 15-minute city is all about improving quality of life by creating cities where everything a resident needs can be reached within a 15-minute walk of home. Crate to Plate supplies a wide range of super fresh organic lettuces, leafy greens and herbs to local residents, London's Michelin star restaurants like Hide and retailers like Fortnum and Mason. I want everyone to be able to get fresh leafy greens no more than a mile away from where they live. Being based in unused land in the urban environment means we are able to get to customers as quickly as possible, in the most sustainable way.

Sebastien Sainsbury
CEO



Why did you choose to set up Crate to Plate in London?

In the UK, over 80% of fruit and vegetables are grown in Europe and imported. We saw a huge opportunity to harness our knowledge through extensive R&D in Florida and bring hydroponic farming to London. The UK and London have exceptional regeneration projects and the food production element is vital. We can utilise this land and tech and innovation to future-proof the farming industry.

What are your future plans?

Crate to Plate has an ambitious UK expansion plan and we have new farms opening soon in Stratford and Kentish Town. We hope to have 100 container farms around London in the near future and we have a strong pipeline of different urban spaces including rooftops and basements. We also have plans to expand to other UK cities like Manchester and Birmingham as well as international expansion.



HQ: London

Founded: 2020

Founder: Sebastien Sainsbury

Funding: Undisclosed

Crate to Plate is a London-based urban farming business bringing sustainable, local production of leafy greens to urban communities. Crate to Plate harnesses state-of-the-art hydroponics technology and eco-friendly innovation – to grow the freshest possible produce, totally chemical and pesticide free.

The last 18 months have had a huge impact on every level of society – how has the pandemic affected Octopus Energy?

The pandemic has had a tremendous impact on people's lives and the economy, but given our digital nativeness, we were able to get out of this storm stronger than we entered it. We've always been a completely digital company, with our whole customer service platform and way of working housed on the cloud. So when lockdown hit, we asked our team to take their laptops home on the Friday, and were 100% remote working on the Monday.

Since then, Octopus has gone from strength to strength, almost tripling our employee numbers, and doubling our customers in a year that was very difficult for many businesses. We also expanded across the globe, opening in Japan, US, Germany, Spain and New Zealand and we launched our own renewable generation business. We've had 18 incredibly exciting months and we can't wait to see what we'll achieve in the next 1.5 years.

You recently secured significant backing from Al Gore – what are your future plans?

The investment from Generation Investment Management, which is chaired and co-founded by Al Gore, will be used to supercharge our mission to offer cheaper green energy across the world. We've already used two previous successful funding rounds to expand to 11 additional countries, and we'll be able to go even further with this newest one.

The investment will help us drive the decarbonisation of heat through our heat pump R&D and training centre, clean up our roads with electric cars and green hydrogen for HGVs, and build and manage more renewable generators. We will help the world use technology to make energy cheaper and greener, faster.

Rebecca Dibb-Simkin
Global Director for Product
and Marketing



Tell us more about the Octopus Centre for Net Zero and why you chose to base this in London.

London is a global city with access to many great universities, think tanks, scientists and researchers, it's also Europe's leading technology hub. The Centre for Net Zero looks at how digital technology can drive net zero and the decarbonisation of heat and transport, so a strong tech sector with access to world leading research and talent was vital to establishing a research house like this.

What are the biggest future challenges and opportunities for Octopus Energy and the clean energy sector?

Energy is a \$2 trillion dollar market still undisrupted by technology. There is a huge opportunity for entech pioneers like Octopus to bring innovative technology to markets that have been underserved and stagnant, turbocharging the green energy revolution.

Octopus Energy has been in operation for almost 6 years now, and is already valued at over \$4bn. This proves that there is a strong demand for the solutions we're creating, and we're just at the beginning. Green energy will change our future forever — it'll be bigger than the internet.

octopusenergy

HQ: London

Founded: 2015

Founder: Greg Jackson

Funding: \$1.2B

The energy industry in Britain is ruled by a handful of complacent dinosaurs peddling fossil fuels, pricing trickery and poor customer service. In 2016, Octopus entered the market to disrupt the status quo with energy that's good for the planet, good for your wallet, and, honestly, good for your soul.

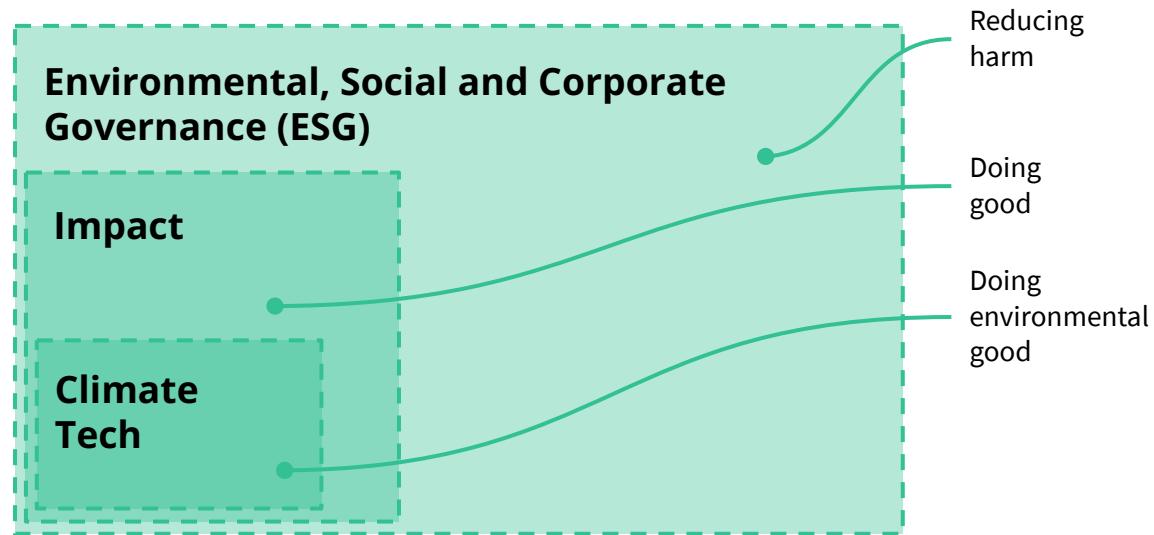
What is climate tech?

We consider an impact startup to be a company addressing one or more of the UN Sustainable Development Goals¹.

In this report, we refer to climate tech startups as companies that are applying technologies to reduce Green House Gas (GHG) emissions or addressing the impacts of climate change².

Impact and climate tech both sit within a broader framework of Environmental, Social and Corporate Governance (ESG) which seeks to reduce the harmful impact of business.

In this report we examined over 5,100 global climate tech startups.



Venture capital methodology and definitions.

Startups, scaleups, grownups and tech

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

When startups are successful, they develop into scaleups (>50 people), grownups (>500 people) and result in big companies, like Arrival or Northvolt.

Only companies founded since 1990 are included in this report.

Venture capital investment

Investment numbers refer to rounds such as Seed, Series A, B, C, late stage, and growth equity rounds.

Venture capital investment figures exclude debt or other non-equity funding, lending capital, grants and ICOs.

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

Investment rounds are sourced from public disclosures including press releases, news, filings and verified user-submitted information.

Accelerators and workplaces

Fixed-term, cohort-based programs that include seed investment, connections, sales, mentorship, educational components and culminate in a public pitch event or demo day to accelerate growth.

We consider an accelerator as an ‘investor’ since it takes equity from its startups whereas a ‘workplace’ does not take equity from its tenants.

In this report, co-working spaces, shared office space that also offer community support, are considered as part of workplaces.

Valuation

The combined valuation of the tech ecosystem is based on their market cap or latest transaction value.

Transaction value is realized from exit or implied unrealised valuation from the latest VC round, which is either announced or estimated by Dealroom based on benchmarks.



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