2022

Developments and trends in the sustainability startup industry

soulmatesventures

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Foreword by Soulmates Ventures

air	energy	water	circular economy
agriculture and food	mobility	education	health

This report serves as a summary of information, news, data and insights from the sustainable venture capital (VC) industry and startup environment covering the period 2013 – 2021. The information and data in the report can be used as a building block for an introduction to the topic, which Soulmates Ventures expands with its own expertise, experience and vision for the future.

The sustainability VC and startup industry is relatively young and broad, therefore there are not many reliable sources of information that address sustainable, innovative startups from our perspective. This report addresses, in a relevant manner, the area of sustainability in both VC and startup environments. For example – climate-tech startups, impact-tech startups (with positive impact), sustainable startups, etc.

The report aims to provide those interested in the sustainability and VC industry with a data set that summarizes the most up-to-date information from relevant sources. It can serve as possible inspiration for investors to choose their next investment assets and for startup founders as a guide to areas of potential business opportunity. Ideally, the report will also serve decision-makers as a navigator for which technologies to focus on to support their development and the general public as an introduction to this promising landscape which improves the quality of life on this planet.

Soulmates Ventures is an investment accelerator focused on Purpose-Profit Driven (PPD) startups seeking scalable, profitable and sustainable solutions in 8 specific industries – air, water, energy, circular economy, agriculture & food, mobility, education and healthcare. Soulmates Ventures is based in the Czech Republic and is currently focusing its investment activities on the CEE region with future expansion into the rest of Europe and beyond.

In the accelerator programme we are looking for scalable PPD startups that bring innovative solutions to problems in our industries related to sustainability, with MVP (minimum viable product) and a built team of at least 2 members. For more information on accelerator programmes, please visit our website.

Financial values in this report are reported in US metrics: m – millions; bn – billions; trn – trillions.

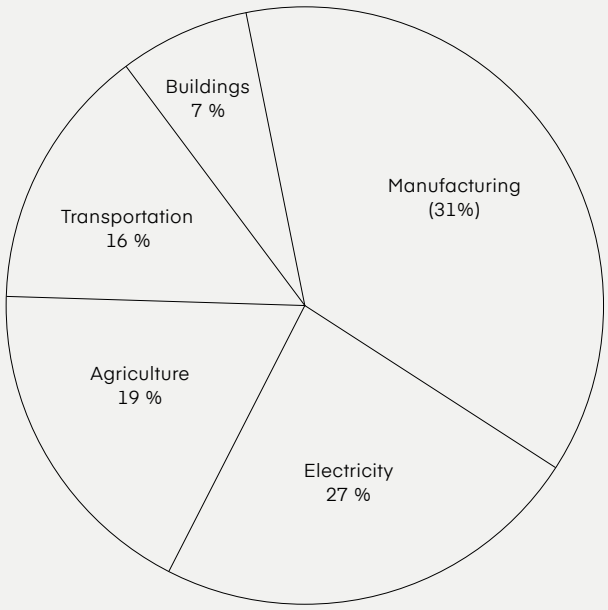
Current efforts will not be sufficient to achieve the goals of the Paris Agreement

The industries that emit the most greenhouse gases:	
Industry and manufacturing (cement, steel, plastic)	> 31 %
Energy	> 27 %
Agriculture	> 19 %
Mobility and transport	> 16 %
Buildings	> 7 %

According to PwC, the transformation towards a zero-emission global economy is currently too slow to meet the international target of keeping temperature increases to +1.5°C above pre-industrial levels.

According to Reuters, we need to increase global investment in climate technologies that enable climate change mitigation and adaptation to $5 trillion per year by 2030.

Global sources of greenhouse gases



Buildings (7 %)
4 % Residential
2 % Commerical
1 % Refrigerants

Transportation (16 %)
7 % Passenger cars
5 % Business and commerial vehicles
2 % Air travel
2 % Ships

Agriculture (19 %)
6 % Livestock
6 % Crops
4 % Land use and forests
3 % Landfills and waste

Electricity (27 %)
19 % Coal
6 % Natural gas
1 % Oil
1 % Other

Manufacturing (31 %)
6 % Cement
6 % Iron and steel
5 % Chemicals
4 % Oil and gas production
10 % Other

Note: % are rounded.
Global annual greenhouse gases production – 52bn tons of CO2eq.

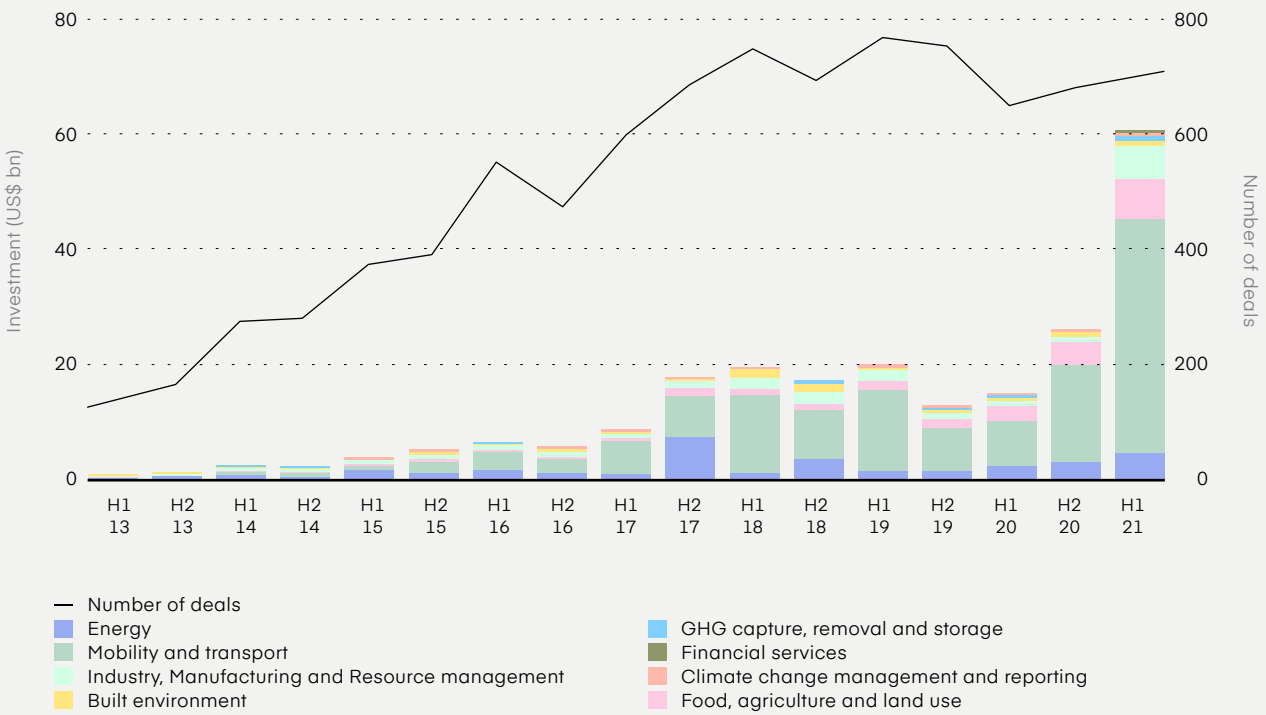
Source: Rhodium Group, Breakthrough Energy

- One of the most effective solutions to avert climate change may be high-quality Purpose-Profit Driven (PPD) startups. The key success factors are a necessary product, sustainable and measurable goals, a scalable business model and support from investors.
- The startup environment should be taken into account in the design of various initiatives and funding by the public industry and international corporations. Efforts should be directed mainly towards supporting early-stage startups with solutions for carbon-intensive industries.

Source: Bloomberg Green, Bill Gates, Rhodium Group, Breakthrough Energy

VC investment volume in more than 600 climate-tech startups in the first half (H1) of 2021	>	**$60bn**
VC investment volume in climate-tech startups in 2013 – 2019	>	**$60bn**
VC investment volume in climate change technologies in the period 2013 – H2 2021	>	**$222bn**
Annual percentage growth (YoY) 2020 – H1 2021	>	**210 %**
Compound annual growth rate (CAGR) from 2013 to 2019	>	**84 %**
Increase in VC investment in climate technology compared to the overall global VC market in 2019	>	**5x**

Investments in climate technology startups and number of investment rounds



Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

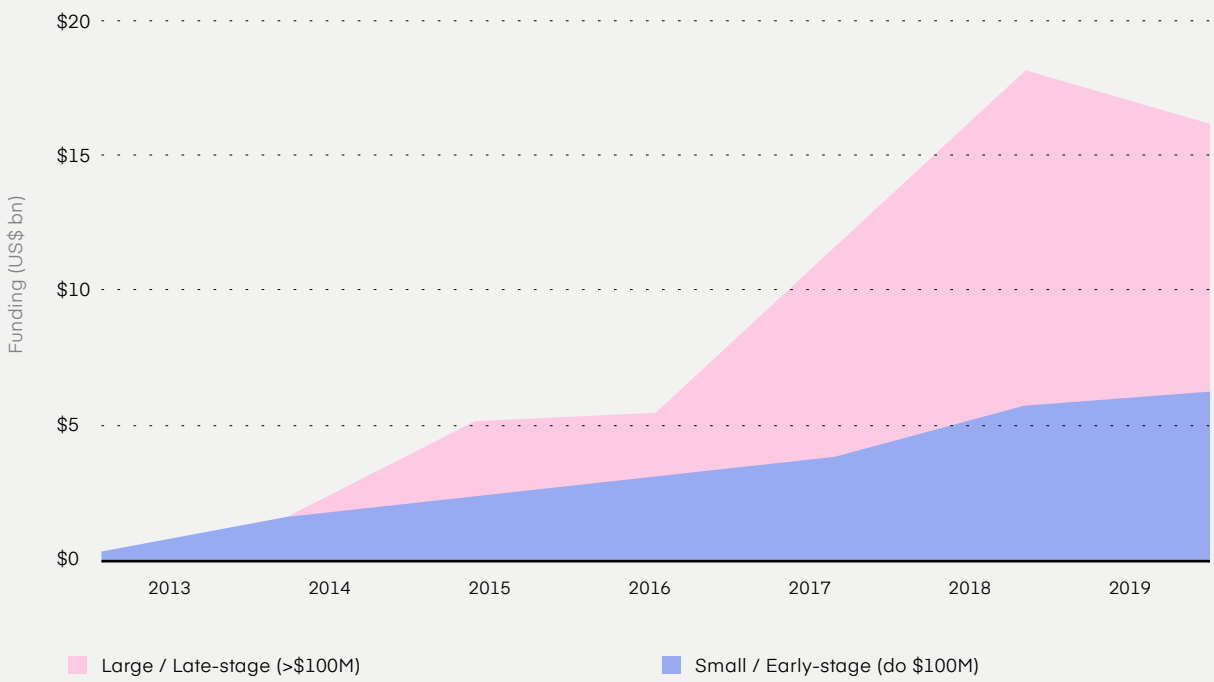
The VC environment for climate technology has demonstrated strong investor interest and a dramatic increase in capital. Investors are beginning to recognize the strong investment opportunities in addressing global issues such as climate change, global health, education levels, and more.

Such projects have the potential to be the biggest investment opportunity of the 21st century, because to achieve a zero-emissions economy by 2050, we will need to change the way we live today. Nowadays, sustainable technologies are becoming a must-have part of all sophisticated investors' investment portfolios.

Source: PwC State of Climate-tech 2021

Average VC value of climate technology investments in H1 2021	>	**$96M**
Average VC value of climate technology investments in H1 2020	>	**$27M**
The average value of VC investment in climate-tech has almost increased from 2020 to H1 2021	>	**4x**
Number of investment rounds in H1 2021	>	**700**
Number of investment rounds in 2019	>	**353**
Number of investment rounds in the period 2013 – 2021	>	**8900**

Breakdown of investments by investment round size



Source: PwC analysis on Dealroom data / PwC a Dealroom

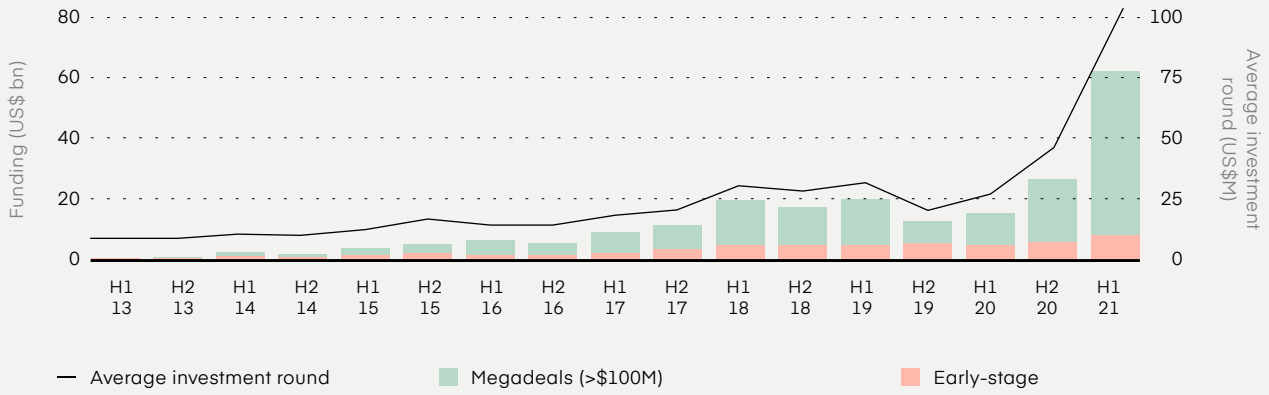
- The number of large and small investment rounds for climate-tech startups has gradually increased. In recent years, there has been a very significant trend in the increase of invested capital in late-stage investments in climate-tech startups, in the order of +$100M.
- For investors, climate technologies are still a relatively new topic and therefore they minimize investment risk by selecting investments that have already proven successful in the market, even at the cost of a higher investment amount.
- The increase in late-stage investments is the main factor that has influenced the increase in total capital invested in the climate technology industry.

Source: PwC State of Climate-tech 2021

The average size of so-called megadeals (>$100M) has grown from $130M in 2013 to over $430M H1 2021.

The biggest investment rounds in 2021		
Lucid Motors	>	$6,9bn
Rivian	>	$5,2bn
Northvolt	>	$2,75bn
Cruise	>	$2,75bn
Ginkgo Bioworks	>	$2,5bn
Commonwealth Fusion Systems	>	$1,8bn
Svolt	>	$1,6bn
GoodLeap	>	$800M
Redwood Materials	>	$700M

Investments in climate-tech startups by size of investment round



Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

The situation is less forgiving for early-stage investment rounds, where the overall number has remained at similar levels since 2018. Climate early-stage startups require increased support due to longer development run-ways and higher development costs.

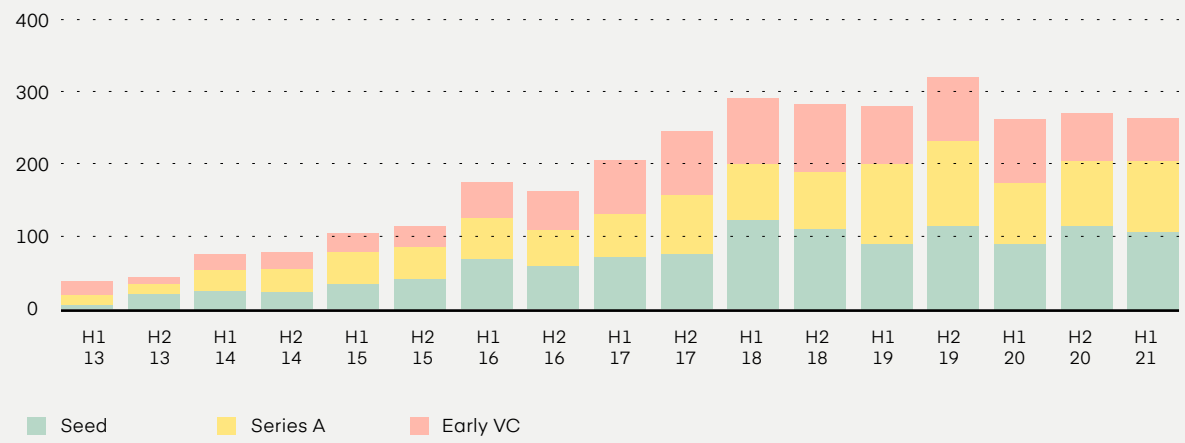
We believe that with the addition of more investors, there will be room for increased investment in early-stage startups focused on finding solutions for carbon-intensive industries.

These startups play a key role in achieving a carbon-free economy because:

- They create technologies that may not yet exist.
- They improve existing tested technologies to make them market competitive.
- They innovate established technologies to make them globally scalable.
- They globally scale quality business models and much needed innovative products with impact potential.

Source: PwC, HolonIQ

Number of early-stage investment rounds with a value greater than 1M USD



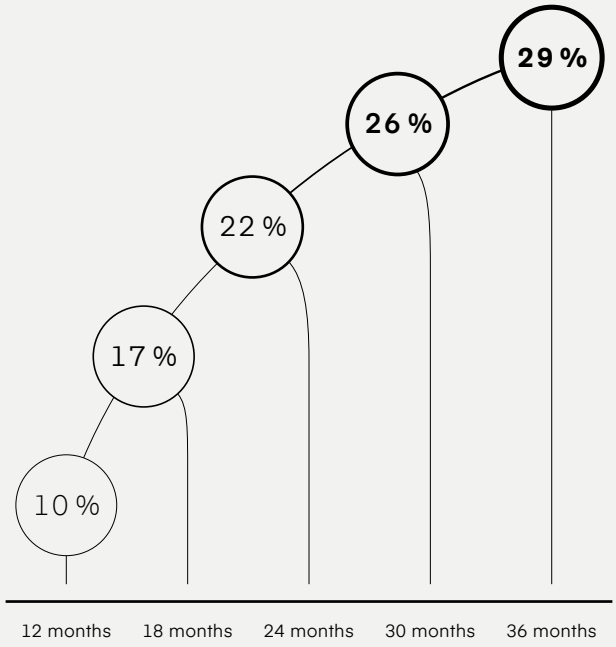
Source: PwC analysis on Dealroom data / PwC a Dealroom

The reason for this success rate may be the strong potential of climate-tech startups to attract investment once they bridge the seed stage and show that their product is viable in the market.

Investor interest is even stronger if there is already a startup with a success story on the market.

An example is Tesla's electric mobility business, which delivered more than 20,000% appreciation to investors who put capital into it in 2011. (Cnbc)

Raising of Series A investment round by time elapsed since the seed investment round



Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

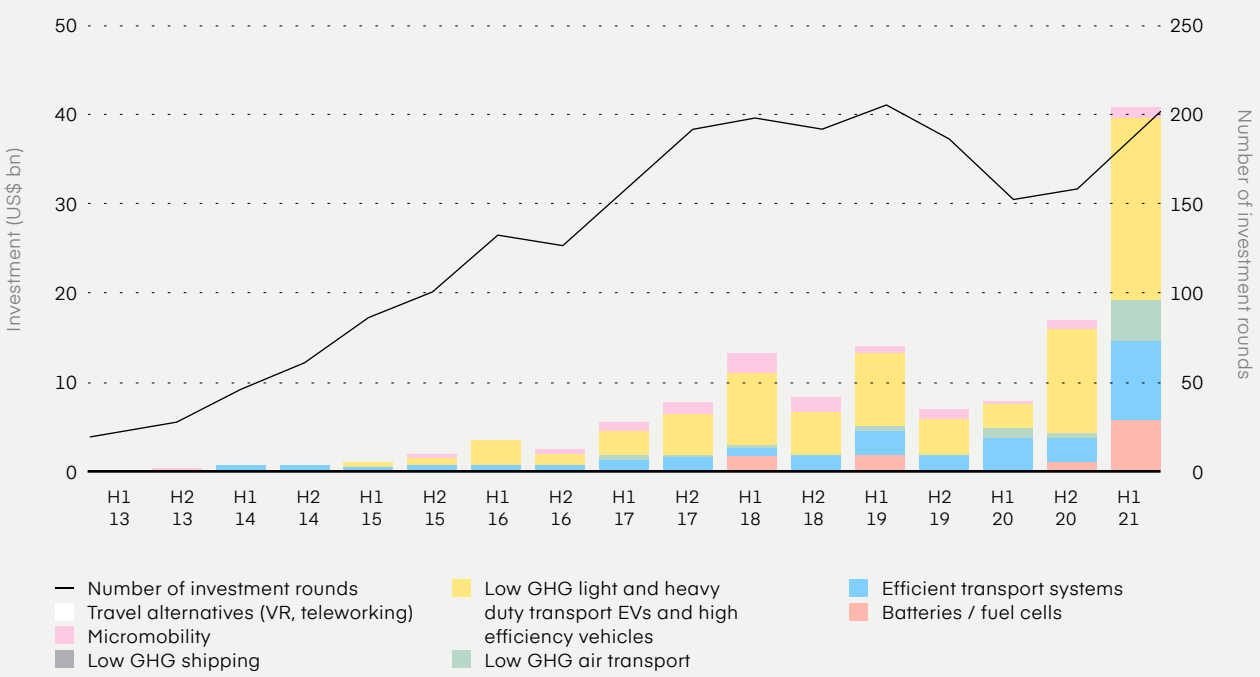
Early-stage investors, interested in investing, can take advantage of the increased success rate of climate startups to close a Series A investment round after seed-round in the next 36 months, to effectively capitalize on the invested capital.

Investment rounds typically result in an increase in the valuation of the startup and thus an increase in the early-stage investor's initial investment, which has supported a meaningful development-stage startup and potentially contributed to improving life on our planet.

Source: PwC State of Climate-tech 2021

The industry that has received the most investment	>	**Mobilita**
Value of VC investment in climate technologies attracted by mobility in the period 2013 – H1 2021	>	**$132bn** (60 %)
Investments in the mobility industry between H2 2020 – H1 2021	>	**$58bn**
Investments in the mobility industry in 2019	>	**$37bn**
Compound annual growth rate (CAGR) in the mobility industry over the period 2013 – H1 2021	>	**133 %**

VC investment size and number of investment rounds in the mobility and transport industry



Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

The biggest investment rounds in the mobility industry in 2021

Rivian	>	$5,2bn
Svolt	>	$3,1bn
Northvolt	>	$2,75bn
Cruise	>	$2,75bn

The mobility and transport industry received 61% of the total investment capital directed towards climate technologies between 2013 and 2021. However, it accounts for only 16% of total greenhouse gas emissions. Going forward, there is a need to allocate some of the capital directed to mobility to other, more carbon-intensive industries.

But we must not overlook the important role of the mobility industry as a major pioneer of sustainable and low-carbon technologies and business models. Mobility is making decarbonisation in other industries a greater reality.

Source: PwC State of Climate-tech 2021

The 5 most promising technologies in terms of Emissions Reduction Potential (ERP), which account for 81% of total emissions reductions by 2050 received only 25% of total invested capital in the period 2013 – H1 2021.

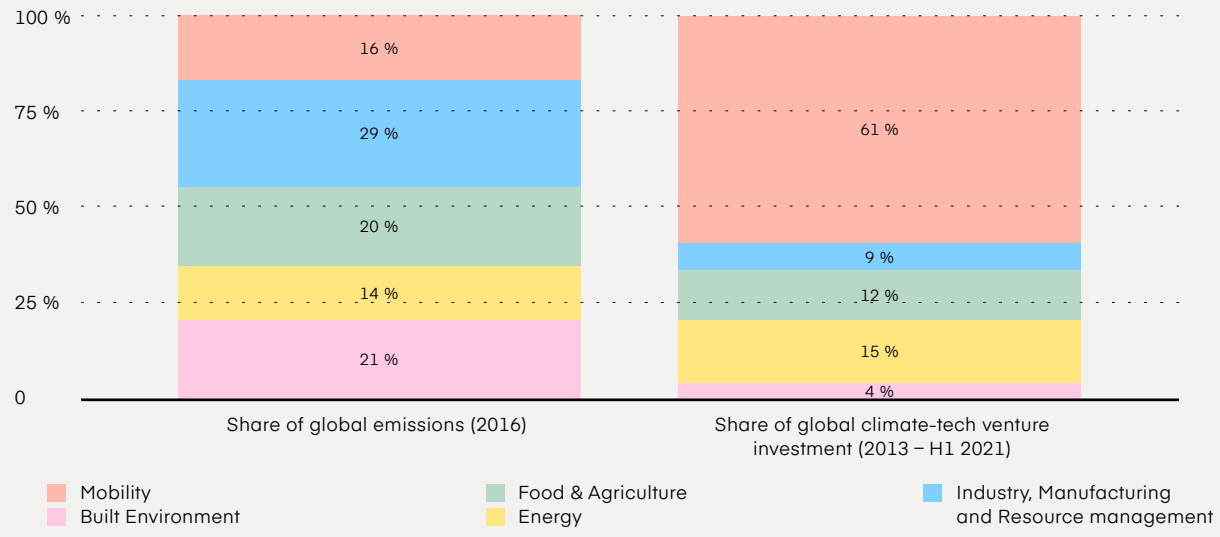
— Solar energy
— Wind energy
— Food waste technologies
— Green hydrogen production
— Alternative food/low-carbon proteins

Once the technology has established a proven business model, capital will start to flow quickly and can greatly help to accelerate market entry. Unfortunately, today, investment is mostly directed to lower ERP industries, while high ERP industries are underfunded and remain neglected in the technology and business development.

The largest gap between ERP and capital raised has been observed in the industries:

— Built Environment
— Industry, Manufactures and Resource Management

Size of share of global greenhouse gases production and VC capital raised by the industry



Note: Emissions data are allocated to the end industry associated with the emissions. For example, mobility-related energy consumption is allocated to mobility and transport rather than energy. No emissions are allocated directly to Financial Services.

Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

At present, capital is not being deployed in climate technologies in line with the potential for climate impact and most investment is attracted by a handful of mature technologies.

While funding is needed in all industries, targeting funding to early-stage technologies with high ERPs can kick-start subsequent breakthrough innovations and technology tipping points. These will enable the adoption of meaningful and effective decarbonisation in carbon-intensive industries and provide attractive investment opportunities.

Climate-tech startups identified in the period 2013 – 2021	>	**3000+**
Climate-tech startups identified in the period 2013 – 2019	>	**1200+**
Climate-tech unicorns identified in 2021	>	**78 unicorns**
Climate-tech industries in which unicorns are most commonly found	>	**Mobility** (43) **Food and agriculture** (13) **Circular economy and Industry** (10) **Energy** (9)
Climate-tech unicorns identified in 2019	>	**43 unicorns**
The share that climate-tech investments now represent of every VC dollar invested globally	>	**14 cents** (14 %)

Overview of unicorns in the sustainability industries

Energy	Mobility	Circular economy	Education
• Northvolt • Sion Power • Plug Power • Catl • Sunrun • Enpal • Aurora • Form Energy	• Tesla • Nio • Rivian • Lucid • Voi • Bird Rides • Prometheus Fuels • Beta • Volocopter	• Redwood Materials • GoodLeap • Nest • Bolt Threads • Li-Cycle • Rubicon	• Udemy • ApplyBoard • Unacademy • Course Hero • Quizlet
Healthcare	**Food and agriculture**	**Water**	**Air**
• Cityblock • Babylon • Alto • Orca Bio • Lyra • Calm • Ro • Tempus • WeDoctor	• Beyond Meat • Impossible Foods • Oatly • Perfect Day • Apeel • Inari	• Innovyze • Evoqua	—

Companies engaged in positive impact share a common value proposition, according to Dealroom >

€1,6trn

($1,76trn)

Source: PwC, Dealroom

According to Dealroom, there are now globally 146 unicorns with a positive impact, 52 of them have earned unicorn value in 2021.

An important question is what the real value of the companies is, given cases like the electric car startup Rivian, which has not yet sold a single car to retail customers but already has achieved a higher market valuation than General Motors or Ford.

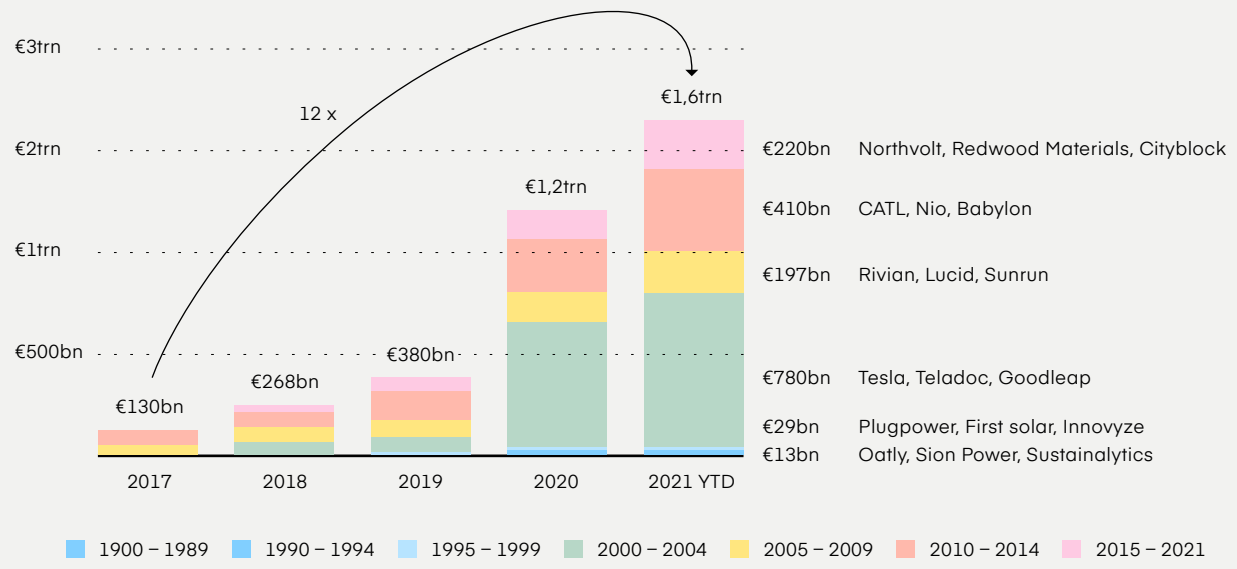
Experienced investors suggest that the climate technology industry is far from fulfilling its potential, but that investors are currently beginning to put their trust in it.

— Larry Fink, CEO of Blackrock, the world's largest financial group, said he believes there will be another 1,000 unicorns in the climate technology industry. (Cnbc)

— Earlier this year, Bill Gates predicted that there would be at least 10 companies in the climate technology industry like Tesla, Microsoft, Amazon and Alphabet, but today we only know about a handful of them. (Cnbc)

— The BCG Henderson Institute estimates that the cumulative global investment will reach $75trn. to achieve zero emissions by 2050. (Sifted)

Combined enterprise valuation by launch year



Source: Dealroom

The success stories of sustainable startups and their journey to achieving the global unicorn value of $1B are extremely important to the entire startup market. They demonstrate the real competitiveness of sustainable technologies with other VC industries of the world.

This, in turn, increases confidence among investors who want to invest their capital in meaningful projects and talented founders, with the vision of a breakthrough solution and an exciting financial return.

Source: Dealroom

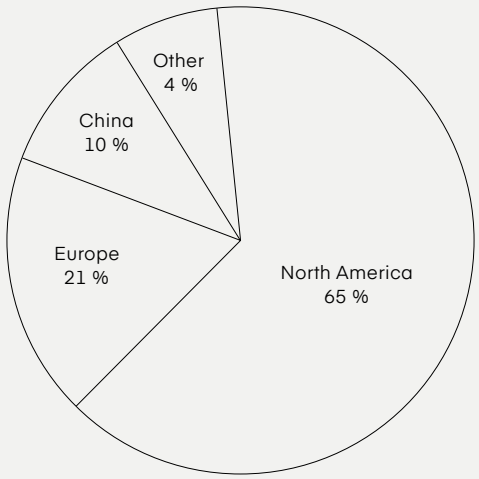
The most active regions for invested capital in climate-tech startups in the period H2 2020 – H1 2021:

North America	**$57bn** (65 %)
Europe	**$18bn** (21 %)
China	**$9bn** (10 %)

The most active investment hubspots for climate-tech startups:

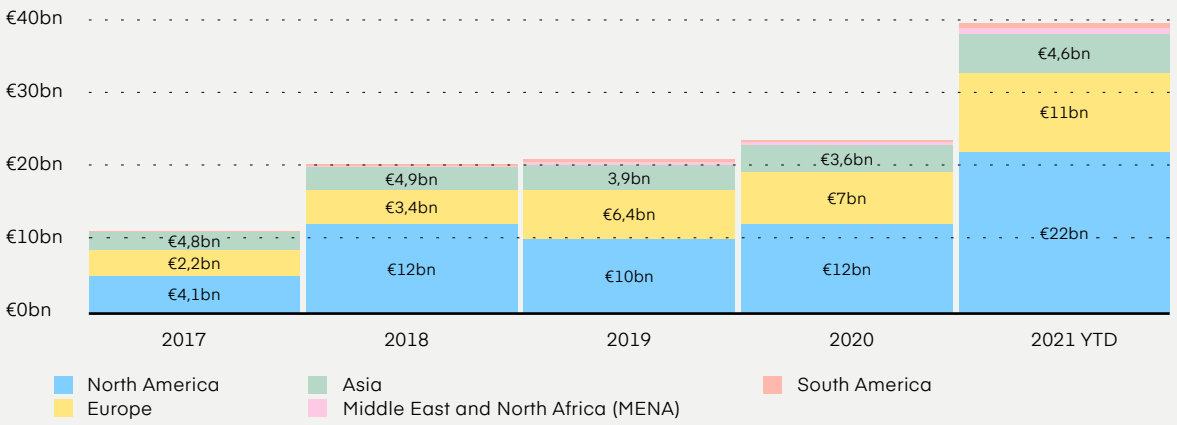
San Francisco, U.S.
London, U.K.
Berlin, Germany
New York, U.S.

Climate technology financing by region in the period H2 2020 – H1 2021



Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

Value of VC investments in positive impact startups by region of their headquarters



Source: Dealroom

For the startups with a positive impact, Dealroom's infographic of the most active regions showed the same ranking, but lower values for the amount invested:

North America	**€22bn** ($24,2bn)
Europe	**€11bn** ($12,1bn)
Asia	**€4.6bn** ($5,1 bn)

* values are rounded

All regions confirm positive growth in investment in sustainable technologies. In the future, VC activities will increase in developing countries, which will be most vulnerable to climate change. Because of the acute threat, these countries also provide an interesting and relatively unexplored market for sustainable technologies.

At present, these regions are severely underfunded and lack the appropriate expertise and supportive startup environment.

Source: PwC, Dealroom

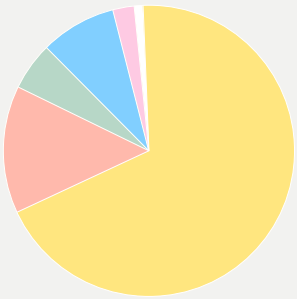
Mobility was the industry with the highest investment in all 3 top regions. From a first glance, it is clear that mobility takes up a disproportionate share of climate-tech investment capital in all regions.

The situation is the most dramatic in the Chinese startup landscape, where mobility represents 99% of climate technology investment.

In the European market, the situation is the most diversified. Here, mobility represents 58%. The remainder is then split between other industries, with Agriculture and Food, Energy and Industry, Manufacturing and Resource management being the most prominent.

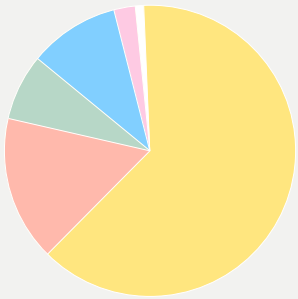
The US startup landscape is similar to Europe, but mobility takes a larger share of climate technology investments here – 66%, followed by the same sectors as in Europe.

Climate-tech funding by industry in U.S. start-ups H2 2020 – H1 2021



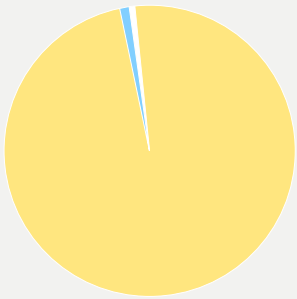
66 %	Mobility and transport
12,5 %	Food and agriculture
8,2 %	Energy
9 %	Industry, manufacturing and resource management
1,7 %	Financial services
0 %	Other (GHG capture, removal and storage; Climate change management and reporting)

Climate-tech funding by industry in European start-ups H2 2020 – H1 2021



58,4 %	Mobility and transport
16,9 %	Food and agriculture
10,1 %	Energy
9,4 %	Industry, manufacturing and resource management
2,5 %	Built environment
0 %	Other (GHG capture, removal and storage; Climate change management and reporting)

Climate-tech funding by industry in Chinese start-ups H2 2020 – H1 2021



99 %	Mobility and transport
0,7 %	Food and agriculture
0 %	Industry, manufacturing and resource management

Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

The goal of the startup environment and the public industry will be to kick-start investment activity in other carbon-intensive industries in the near future. There is a need to focus investment and innovation activity on all continents into key industries for climate change, such as energy, industry, manufacturing, agriculture and food.

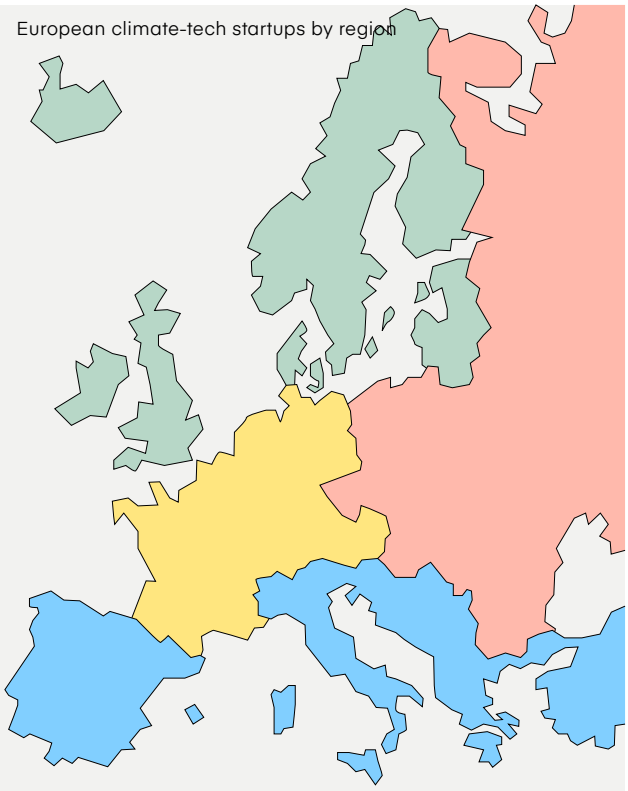
With the emphasis on self-sufficiency and localism of business, we can expect efforts on all continents to convert the maximum of the supply chain to their own environment. Each continent will progressively aim to achieve maximum self-sufficiency and competitiveness, vis-a-vis other regions.

Source: PwC, Dealroom

In the European region, the highest number of climate-tech startups was created in Western Europe – 53%, Northern Europe – 36% and Southern Europe – 7%. The situation is worst in Eastern Europe, where only 3% of climate-tech startups were launched.

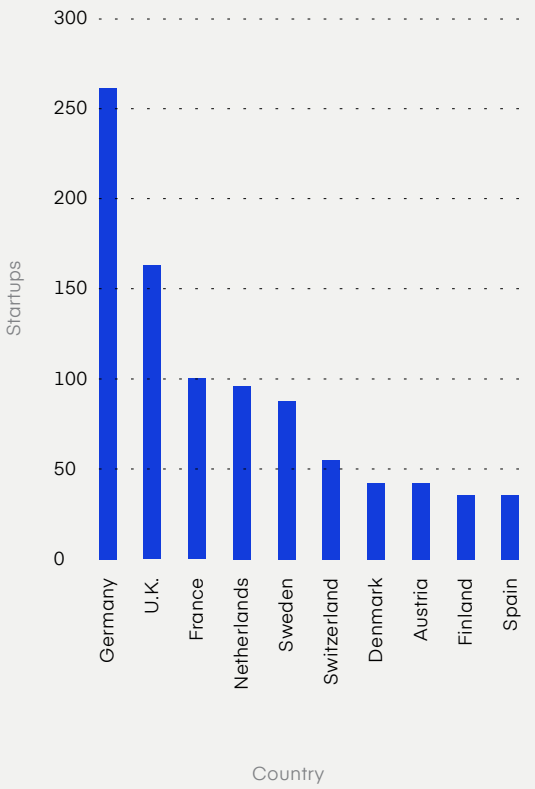
In terms of European countries, the highest number of climate-tech startups was launched in Germany – 24%, the UK – 15% and France – 9%. Germany, together with Sweden, also received the most climate-tech venture capital between 2006 and 2021.

European climate-tech startups by region



Source: SpeedInvest a Creandum

Number of climate-tech startups in Europe broken down by country of headquarters



Source: SpeedInvest a Creandum

At present, funding needs to be strengthened, mainly in Eastern and Southern Europe. Both regions offer great potential and experience in selected climate technologies. As the first success stories of climate-tech startups in these regions start to emerge, an increase in capital from VC investors is expected.

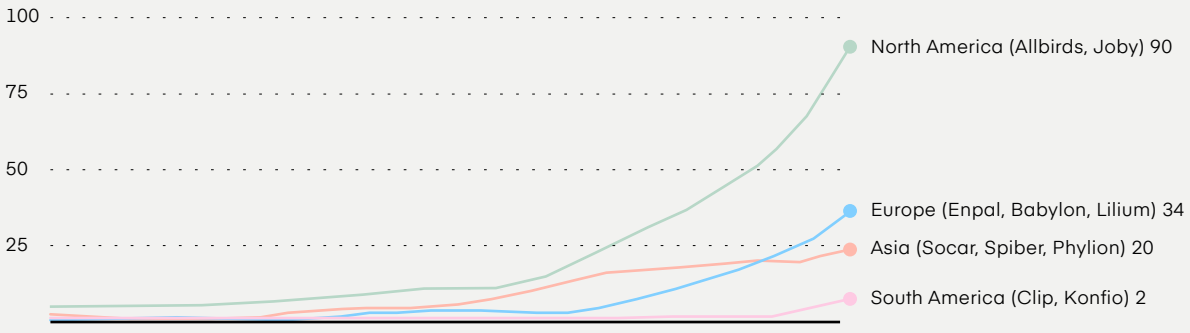
The CEE region, where we are focused and where we are building a startup ecosystem for sustainable projects, is now on the rise. The unexplored markets of the relatively young startup landscape, which provides a lot of exciting opportunities, are starting to produce the first successful unicorns and the region is starting to thrive.

Source: SpeedInvest, Creandum

According to Dealroom's data, most impact-tech unicorns were founded by the location of their headquarters in:

North America	**90**
Europe	**34**
Asia	**20**

Cumulative number of impact-tech unicorns by region of company headquarters



Source: Dealroom

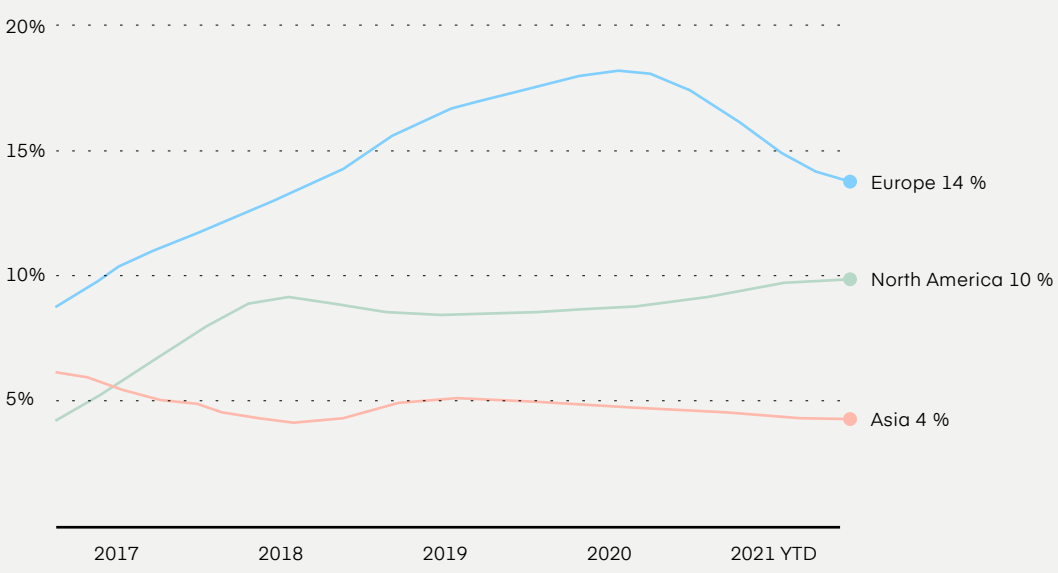
According to Dealroom, the most investment-active region in terms of startups with a positive impact is:

Europe – 14% of total VC investment goes into positive impact. This confirms the European market as a major pioneer in positive impact investing. However, the highest percentage of the amount invested is not enough to guarantee the highest number of impact-tech startups founded.

America – 10% of total VC investment goes into positive impact. However, compared to the lower percentage in Europe, America holds the top spot for the highest number of impact-tech startups founded.

Asia – 4% of total VC investment goes into positive impact. The Asian market is the youngest of the three and therefore the lowest percentage can be expected.

Share of impact-tech investments in total VC investments in selected continents



Source: Dealroom

Source: Dealroom.co

In 2021, Czech startups received investments worth:

(CzechCrunch)

> $730M

According to the law firm Mavericks, the following has been implemented in the Czech Republic startup landscape in 2021:

— Over 100 pre-seed and seed investments.

— Median pre-money valuations of pre-seed and seed startups increased from $2,6M in 2019 and $3,3M in 2020 to $5,3M in 2021.

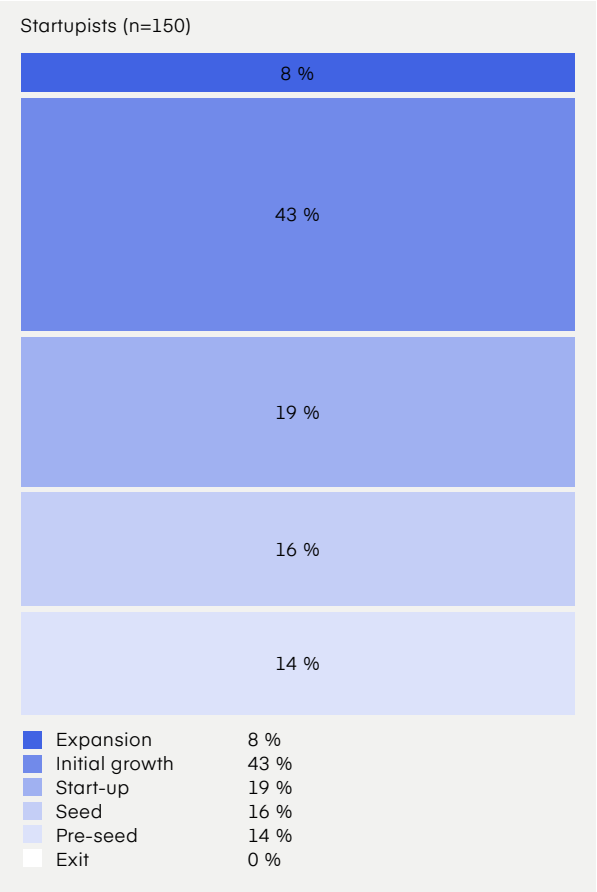
— Median investment amounts for pre-seed and seed startups increased from $0,44M in 2019 to $0,55M in 2020 and $0,6M in 2021.

The most significant investment rounds of Czech startups or startups with Czech roots in 2021 include:

Rohlík	>	$210M + $132M
Rossum	>	$100M
Productboard	>	$72M
Twisto	>	$18M + $99M
Resistant AI	>	$16,6M
Shipmonk	>	$290M + $65M

The Startup Report 2020 survey, which addressed 150 startupsists from the Czech Republic, revealed the development stages of their startup. With the current development of the Czech startup environment, new investments and exits, the actual statistics would be more growth-oriented today.

— 14 % Pre-seed
— 16 % Seed
— 19 % Start-up
— 43 % Initial growth
— 8 % Expansion
— 0 % Exit



Source: Startup Report

Source: Startup Report, Mavericks, CzechCrunch, Forbes, Crunchbase

Out of 150 startupists, the industries with a focus on sustainability are detailed below:

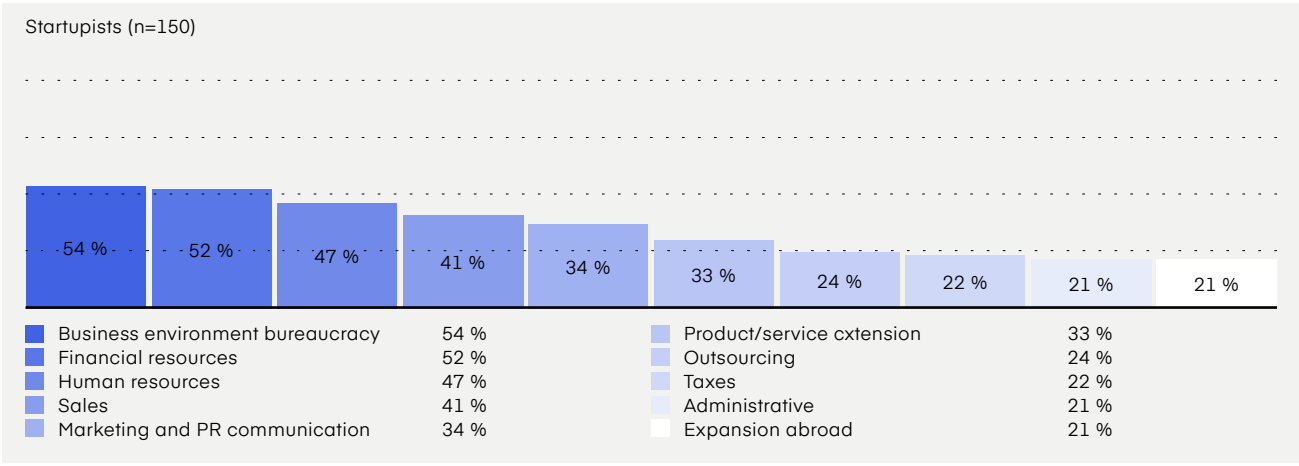
16 % of startupists	Agriculture
	Food
	Life Sciences
13 % of startupists	Transport
	Logistics
	Mobility
10 % of startupists	Education
9 % of startupists	Smart Cities
7 % of startupists	Clean-tech
	Medtech
	Healthcare
5 % of startupists	Energy
	Environment

Furthermore, the questionnaire shows the distribution of startupists according to the target customer:

— 54 % B2B industry
— 37 % B2C industry

Startupists cited the following as the biggest obstacles on their journey:

— 54 % Bureaucracy of the business environment
— 52 % Financial resources
— 47 % Human resources
— 41 % Sales



Source: Startup Report

In the future, the Czech Republic should focus on improving the legislative environment for startups and making them easier to establish, manage and operate in the early-stage phase.

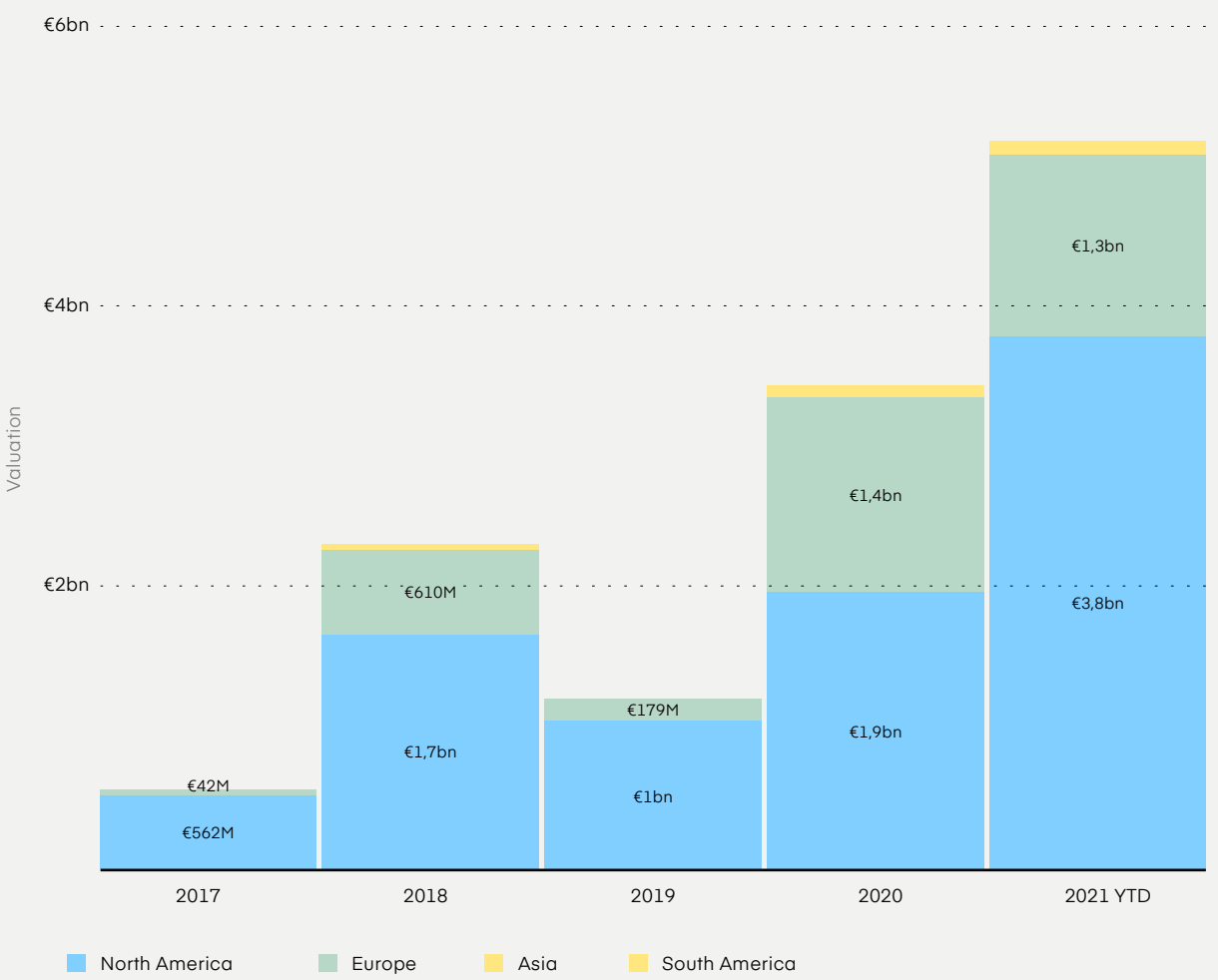
The legislative and financial initiatives developed should be consulted with the expert startup community to ensure that the initiatives make sense and achieve the most effective implementation.

Initiatives should come from both the public and private industries, particularly for early-stage startups that have a high potential for GHG reduction or other significant contributions to a sustainable future.

Source: Startup Report

Unique investors identified in the period 2013 – H1 2021	>	**6000**
Unique investors identified in the period 2013 – 2019	>	**2700**
Active investors in the period H2 2020 – H1 2021	>	**2500**
Active investors v H1 2021	>	**1600**
Investors who closed a total of 2 or fewer deals in climate-tech startups in 2019	>	**75 %**

Total value of global funding directed to technologies with positive impact



Source: Dealroom

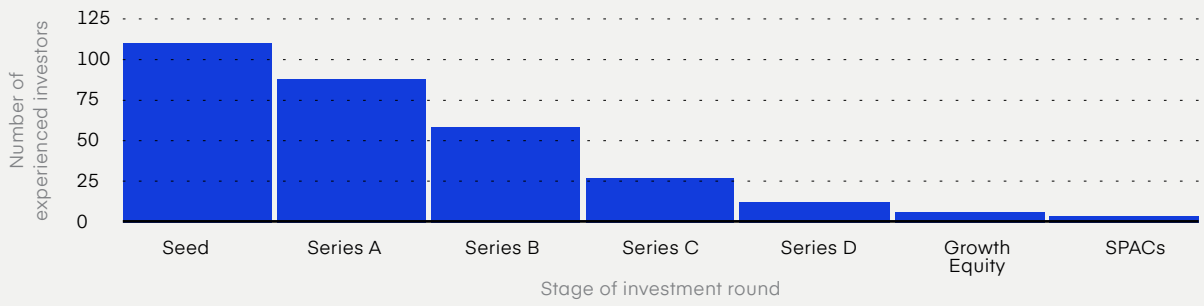
According to PitchBook data, global investors closed the same number of climate-focused funds during 2021 as were collectively launched in the previous 5 years.

The year 2021 set a record for the amount of capital going to sustainable startups globally from investors and investment funds. In terms of startups focused on positive impact, North America was the most active region.

Source: PwC, Dealroom

A key challenge is aligning the time horizon of climate-tech startups with investors. More patient venture capital is needed to fund innovations in capital-intensive areas of climate technology, especially in the early-stage phase.

Number of experienced climate-tech investors by stage of investment round

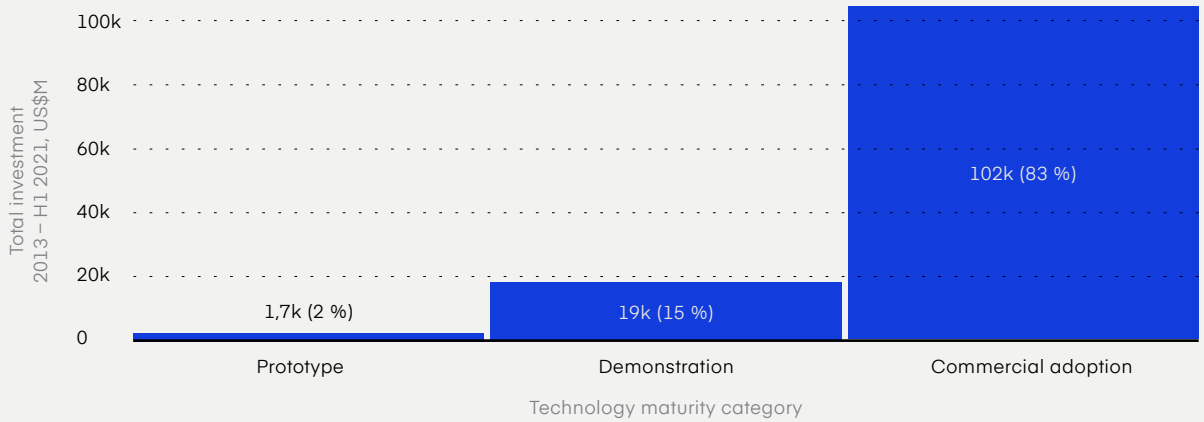


Note: An experienced investor is defined here as an investor who has participated in at least five climate technology investment rounds. Time period – H1 2013 to H1 2021.

Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

Significant and sustained investment is needed throughout the innovation lifecycle to ensure that commercially ready solutions are able to scale globally in the next decade. At the same time, research and development will be accelerated to achieve the necessary breakthroughs for a carbon-free future. At present, there is a significant gap in funding for climate technologies in terms of their technological maturity. Most funding goes to technologies in the market adaptation phase.

Total financing of climate technologies by technological maturity category

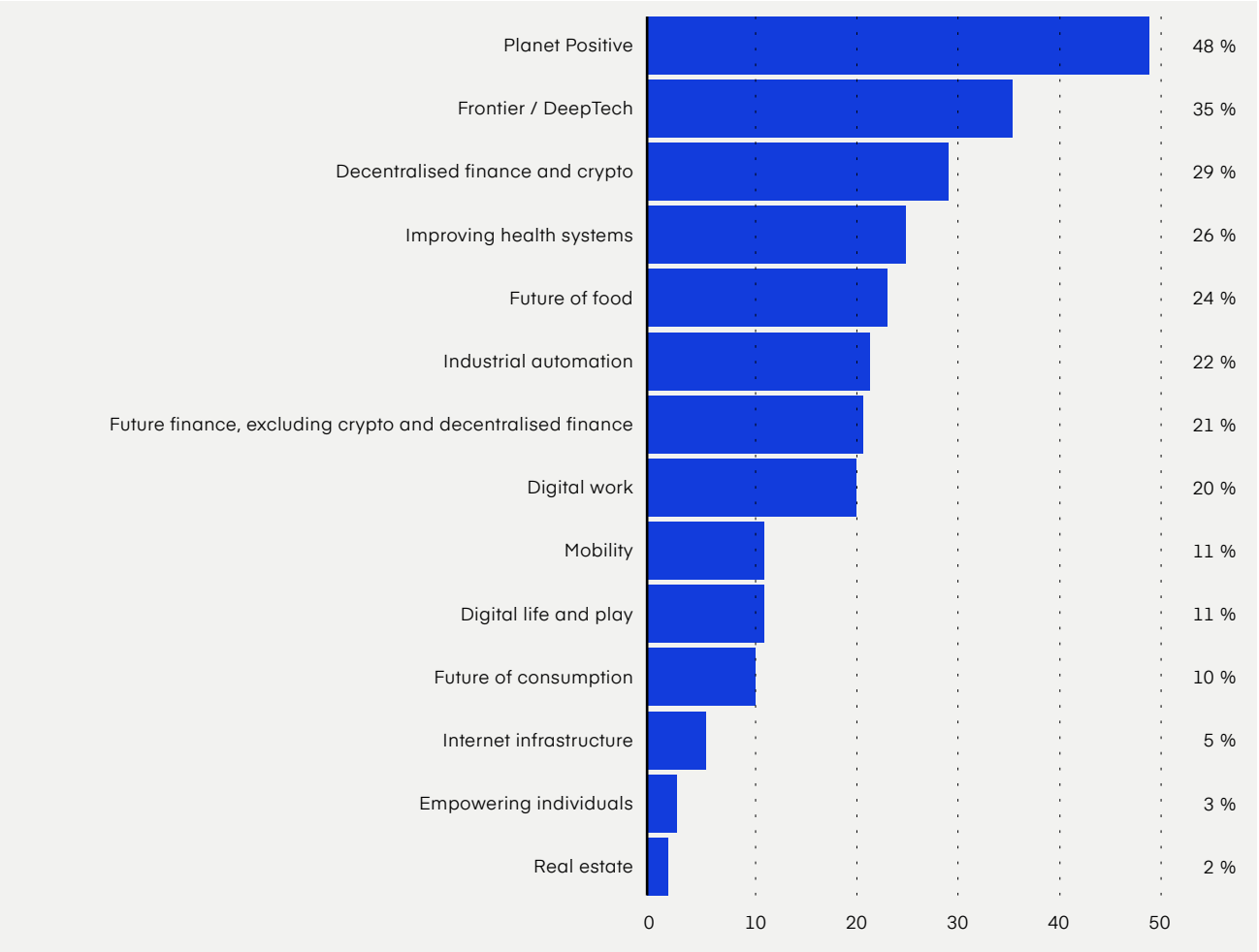


Source: PwC State of Climate Tech 2021, analysis of Dealroom data / PwC a Dealroom

Source: PwC, Dealroom

- The paradox remains that despite the largest number of experienced investors being in the early-stage prototyping phase, the largest amount of investment is in the late-stage commercial adoption phase. Currently, we need to increase the amount of long-term capital in early-stage climate-tech startups with large ERP.
- For example, Breakthrough Energy Ventures has set up a 20-year climate-tech fund instead of requiring a return within the traditional ten years.
- We can expect such strategies from larger funds, institutional and corporate investors, and public funding programs.

In the State of European Tech 21 questionnaire, LP (Limited Partners) investors chose Planet Positive as the most promising area. Other sustainability-related topics were – Improving health system as 4th, Future of food as 5th, Mobility as 9th and Future of consumption as 11th.



Source: StateofEuropeanTech.com

Source: StateofEuropeanTech.com

In general, sustainable technologies can be divided into three categories according to their current stage of development:

Prototype
Technologies in the R&D phase working on prototype development with the aim of creating a pilot project.

Demonstration
Technology with ongoing pilot projects and testing to obtain real data and information for optimization and market entry.

Commercial adaptation
Technology with proven business models in relevant markets with the goal of scaling.

The aim is to develop technologies with the highest potential to reduce emissions, as soon as possible, for subsequent commercial deployment and scaling of positive benefits to society and the planet.

A large number of technologies in the climate-tech industry, which do not yet have many unicorn-valued startups in their market, and therefore represent an investment opportunity, are significantly underfunded today. Especially those that:

— Have high CAPEX
— Are focused on hardware
— Are early-stage
— Have a high final price per product
— Have no proven business model and market

The current state of development of some sustainable technologies according to PwC.

Prototyp

▲ Direct Air Capture and Storage (DAC/S)
▲ Low GHG iron and steel
▲ Low GHG shipping
▲ Ocean & tidal power

Demonstration

• Alternative foods / low GHG proteins
▲ Carbon capture, utility and storage (CCUS) in power
▲ Precision agriculture
• Food waste technology
• Green hydrogen production
▲ Low GHG conrete
▲ Sustainable aviation fuel (SAF)

Commerical Adoption

• Light duty batter electric vehicles (BEV)
• Solar energy
• Wind energy
• Micromobility

▲ Relatively emerging areas of climate technology that could offer investors the opportunity of 10x – 100x returns or more, as there are not yet many – or any – unicorns in these markets. (PwC)

⃠ These technologies are extremely important for the decarbonisation of industries and economies. To achieve the global goal of the Paris Agreement – removing 50% of current greenhouse gas emissions by 2030 – we can use technologies that are already on the market. However, to achieve a 100% reduction by 2050, almost half of the reduction depends on technologies that are currently in the idea, research or prototype phase, or do not even exist yet. In the next 30 years we need to get these technologies to the stage of full commercial adaptation.

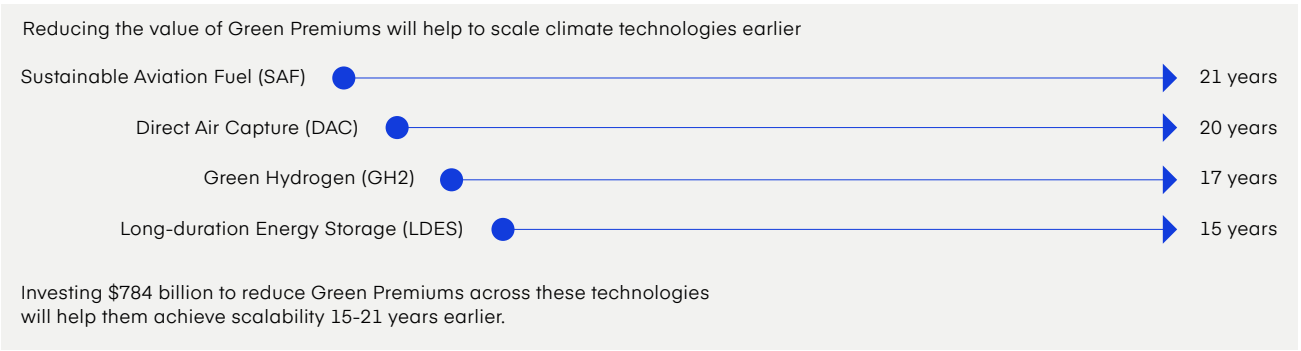
Source: PwC, Dealroom, IEA

The main purpose of the capital flowing into sustainable technologies is to reduce their Green Premiums – that is, the difference in price a customer has to pay to buy a more sustainable product choice.

Bill Gates' Breakthrough Energy Ventures fund will focus on investing in and developing 4 key sustainable technologies over the next few years to reduce their market price:

— Sustainable Aviation Fuel (SAF)
— Direct Air Capture (DAC)
— Long-Duration Energy Storage (LDES)
— Green Hydrogen (GH2)

Technology	Green alternative price	Traditional price	Green Premium
Electricity	$0,15 kWh	$0,13 / kWh	$0,02 / kWh (15 %)
Electric vehicle	$36 500 (Chevy Bolt)	$25 045	$11,455 (46 %)
Fuel for long-distance freight transport	$3,18 / gallon	$2,64 / gallon	$0,54 / gallon (20 %)
Cement	$224 / ton	$128 / ton	$96 / ton (75 %)
Aviation fuel	$9,21 / gallon	$1,84 / gallon	$7,37 / gallon (400 %)
Ground beef for hamburgers	$8,29 / 0,5 kg	$4,46 / 0,5 kg	$3,83 / 0,5 kg (86 %)



Source: Breakthrough Energy analysis; data from Rhodium Group and IEA / Rhodium Group a Breakthrough Energy

In this decade, great efforts are needed from both innovators and investors to bring these new technologies to market in a timely manner.

VC investors need to start doing what they do best – facilitating market price reductions (Green Premiums) and adapting emerging sustainable technologies to the market to make them ready for global scaling. If they don't, they risk missing this investment opportunity and the chance to play their part in tackling climate change, health and education levels, biodiversity loss and other global challenges.

Source: PwC, Speed & Scale, Rohidum Group, Breakthrough Energy

Sustainability trends for 2022

- Greenhouse gas reduction throughout the supply chain; driven by coporations and large companies.
- Overview of the non-financial data of private companies and their environmental performance under public scrutiny.
- Divestment of fossil fuel assets is not enough to achieve a carbon-free portfolio. Investors will be more proactive in their investments.
- Investment will start to go into solutions that will help us adapt to climate change. There is no Planet B.
- With the advent of regulation and the introduction of sustainability-related concepts, an environment more immune to greenwashing will begin to emerge.
- The need for a coherent reporting system in terms of sustainability and non-financial information (most often ESG analysis) to enable quality benchmarking.
- Non-financial data will start to appear more in documents and materials of companies and public entities.
- To preserve and restore biodiversity, we need to change the way we produce, process, consume and recycle food. Current ways are no longer sustainable.
- Lessons from the Covid-19 pandemic and building more resilient health systems for future health crises.
- Decarbonisation investment and planning must include the most vulnerable communities. Developing countries need to have competitive low-carbon technologies available to use for their development.
- To achieve breakthrough sustainable innovations, more attention and patient capital from VC investors is needed for growth-stage startups. Especially if the startup also tackles hardware.
- Investors need to focus on financing critically underfunded sustainable technologies that have high potential for emission reductions and other sustainability benefits to support the development and decarbonisation of society.
- Investors and LPs must require and encourage analysis of non-financial data and information prior to closing a deal, with ongoing reporting throughout the life of the investment.
- Investors need to financially support sustainable projects over a long-term investment horizon to ensure optimal technology development and full market adaptation. This role should still be left to large and institutional investors at the moment.

Source: PwC, MSCI

Factors involved in the increase of capital into the climate-tech industry:

— Quality of technology and infrastructure
— Finance and investor demand
— Political situation and public support
— Entry of quality people into the sustainability industry
— Demand from corporations and large firms
— Demand from customers interested in sustainable products
— Success stories of inspiring founders

Barriers that currently prevent even greater success:

Finance
— Lack of access to the specific types of capital that climate-tech startups need
— Inflow of new funding mainly for late-stage investments, but not for early-stage.

Human Resources
— Lack of talented people with specific skills
— There is a lack of success stories in certain industries to attract investor attention

Technology
— Uncertainty of the time horizon of the R&D phase
— Untested methods and procedures to achieve market and product fit
— High Green Premiums

Politics and processes
— Regulatory markets are not compatible, which complicates expansion abroad
— Regulation is in some cases too complex
— Lack of regulatory initiatives

Source: PwC

Recommendations for further action

1. Invest in Purpose-Profit Driven startups in the early-stage phase of the development cycle.

2. Attract and provide a great environment for talented founders and experts in the startup space in the sustainable industry.

3. Increase public and private funding and the number of initiatives to promote sustainable innovations.

- https://www.pwc.com/gx/en/services/sustainability/assets/pwc-the-state-of-climate-tech-2020.pdf
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Development and trends in the startup environment in sustainability

2022