

A THREE-PART RESEARCH SERIES

# CLIMATETECH

Spotlight on Mobilitytech

pillsbury



DATA PROVIDED BY

 PitchBook



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## Executive summary

Climate tech remains a priority area of focus for venture capital (VC) investors despite market volatility, which slowed deal activity at the start of 2022. Following a record year of industry investment, investors remain ever-conscious of the sustainability imperative and the massive economic opportunities that accompany it. This report examines the mobility tech subsegment, which has consistently ranked as one of the largest climate tech subsegments over the past decade. In Q1 2022, it was the second-largest subsegment behind clean tech, with over

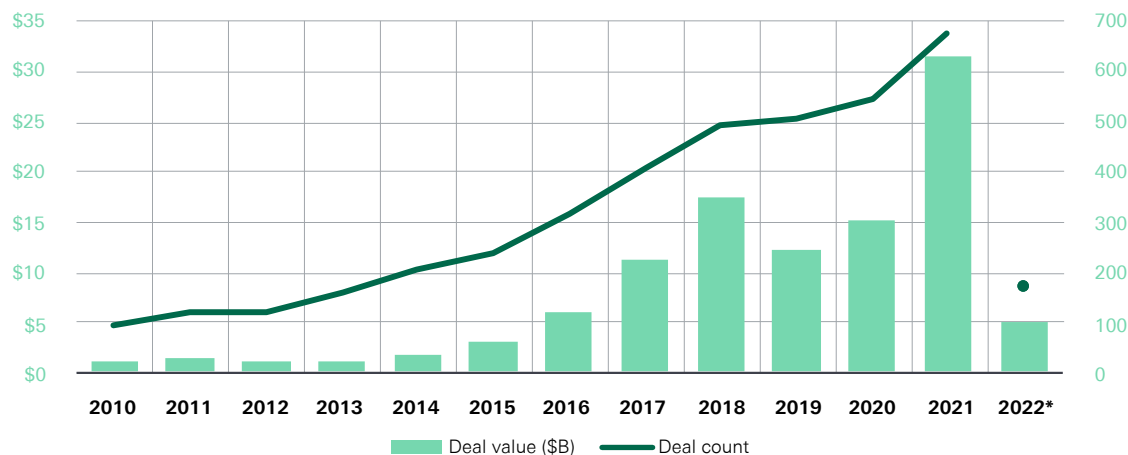
\$2.0 billion of VC invested—more than three times the amount invested in the third-largest subsegment (agricultural tech, or agtech). Mobility tech represents several closely watched industries as supply chain bottlenecks, fuel price fluctuations, and urbanization continue to exacerbate the need for mobility solutions. Coming off a record year for exit value, firms will look to reinvest liquidity, which may kickstart the rise of more prominent early-stage startups and fuel the growth in pre-money valuations and VC deal sizes across the board.

## Investment trends

### Investors are demonstrating continued confidence in climatetech, even as VC activity in general has slowed.

Venture investment in climatetech had a massive year in 2021, with more than \$30.0 billion in deal value generated. The record momentum slowed a bit in Q1 2022 due to market volatility, with \$5.2 billion in deal value yielding an annual run rate of \$20.6 billion. While overall VC deal activity pulled back due to macro-environmental factors, median deal sizes rose more than 50.0% YoY across all investment stages, signaling continued long-term confidence among many investors. While sample sizes in Q1 2022 are low, the data suggests valuations will complement these larger deal sizes, with median pre-money valuations rising across all investment stages as well, albeit by varying degrees. Late-stage VC deals experienced the highest growth during the quarter, with the median pre-money valuation rising 177.4% between 2021 and Q1 2022. The median early-stage valuation rose 12.3% in comparison, and the angel & seed median valuation rose 85.5%, exceeding eight figures for the first time.

### Climatetech VC deal activity



Source: PitchBook Geography: Global  
\*As of March 31, 2022

Impressive VC returns over the past several years, coupled with the salient nature of the climatetech industry, continue to draw several investor types to climatetech investing. Corporate venture capital (CVC) deal activity and nontraditional investor participation in the industry align with recent trends in overall VC climatetech activity, with deal value in both categories more than doubling between 2020 and 2021. Private equity (PE) growth activity in climatetech skyrocketed in 2021, growing more than 1,000.0% YoY, driven by several massive deals by firms that previously avoided climatetech in favor of more mature industries. PE growth firms closed \$386.6 million in climatetech deals in the first quarter of 2022, suggesting a deceleration from 2021's record year, but still exceeding the total annual deal values of both 2020 and 2019. Venture firms are traditionally more comfortable with the nascency of certain climatetech subsectors, with a growing number of firms and funds dedicated exclusively to the industry. Among VC firms that make at least one-third of their investments in climatetech, deal activity grew by 354.8% between 2020 and 2021, just shy of \$10 billion in deal value, with more than 100 deals completed.

### Mobilitytech represents one of the largest and most commanding subsegments in climatetech.

Climatetech encompasses a variety of subsegments, with mobilitytech among the most prominent and active. Mobilitytech consistently represents the first- or second-largest climatetech subsegment, second only to clean tech since 2019. Over the past few years, demand for sustainable technologies has driven variable yet material growth. Mobilitytech itself includes many different products and services, ranging from electric and autonomous vehicles to last-mile delivery software. VC deal value for mobilitytech companies spiked to \$20.6 billion in 2021, nearly doubling from 2020, as venture activity hastened across many industries. VC activity in the subsegment slowed in Q1 2022, with just \$2.0 billion in deal value across 33 deals.

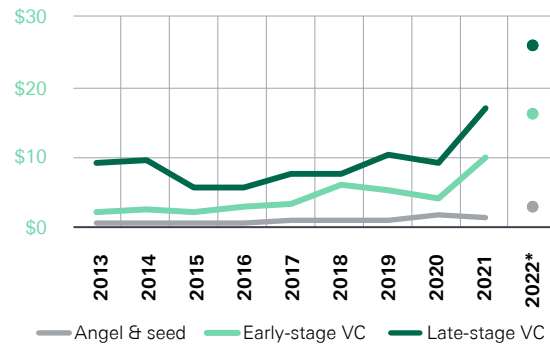
The lion's share of mobilitytech VC deal value is unsurprisingly attributed to Series D and later deals, with deal count in the category more than doubling

# “Governments putting standards in place that direct automakers down a decarbonized pathway is the biggest accelerant for the e-mobility transition.”

**Mona Dajani**

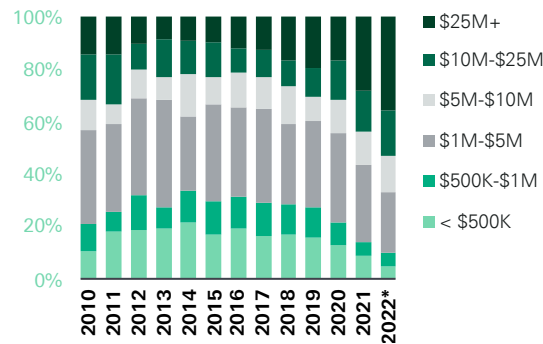
Partner, Global Co-Head, Energy & Infrastructure Projects, Pillsbury

**Median climatetech VC deal value (\$M) by stage**



Source: PitchBook Geography: Global  
\*As of March 31, 2022

**Share of climatetech VC deal count by size bucket**



Source: PitchBook Geography: Global  
\*As of March 31, 2022

1: Early-stage VC deals had low sample sizes of 21 in 2020 and 15 in 2021.

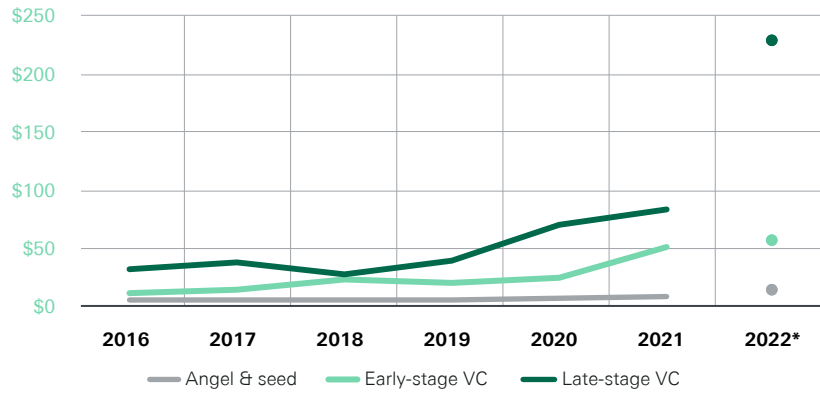
between 2020 and 2021. By contrast, the Series A deal count decreased by 26.7% during the same period but still represented the greatest number of deals closed during 2021. The slowdown in early-stage investment reflects firms’ reduced appetite for risk as COVID-19 rocked portfolios and as resources were preserved for holdings with longer track records.

Historically, mobilitytech deals have been concentrated within the \$1 million to \$5 million and \$25 million+ ranges. But in recent years, the gap between the two has widened, with the \$25 million+ range extending its lead. Of the 33 deals closed in Q1 2022, 18 were over \$25 million. Bigger check sizes create higher valuations, with the median pre-money valuation for late-stage VC deals growing dramatically, by 633.8% YoY, compared with 83.5% for early-stage VC deals.<sup>1</sup>

## Investor appetite for climatetech and mobilitytech continues to surge globally.

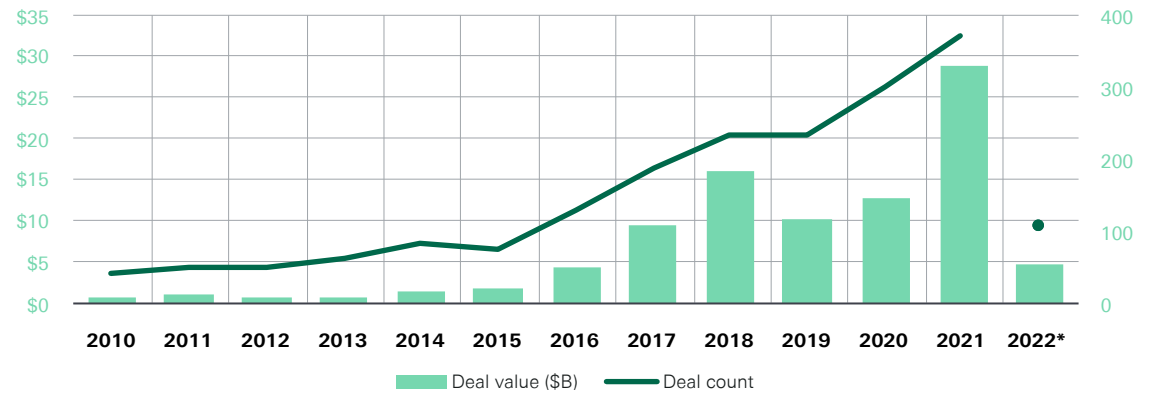
Historically, North America, Asia, and Europe have dominated both the climatetech industry and the mobilitytech subsegment with their established startup ecosystems, large economies, and active government involvement in sustainability efforts. Of the three regions, Asia generated the highest deal value from 2017 and 2020, but North America pulled ahead in 2021. Europe more than doubled its deal value between 2020 and 2021 and ranked first in Q1 2022.

**Median climatetech VC pre-money valuation (\$M) by stage**



Source: PitchBook Geography: Global  
\*As of March 31, 2022

**Climatetech VC deal activity with nontraditional investor participation**

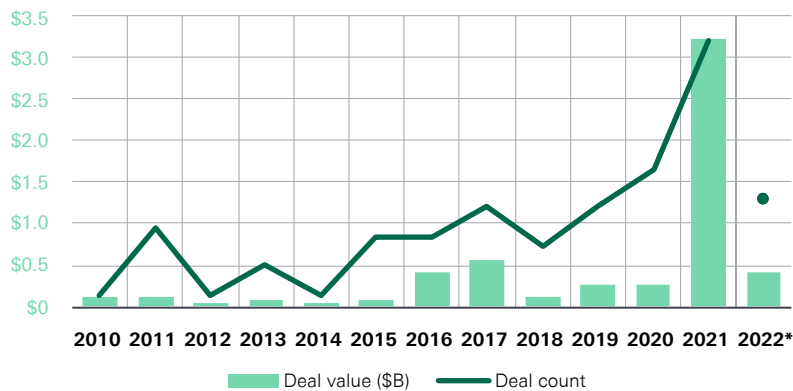


Source: PitchBook Geography: Global  
\*As of March 31, 2022

“It’s clear that the Rubicon has been crossed by the automotive industry; it will not reverse the transition to battery-powered electric vehicles.”

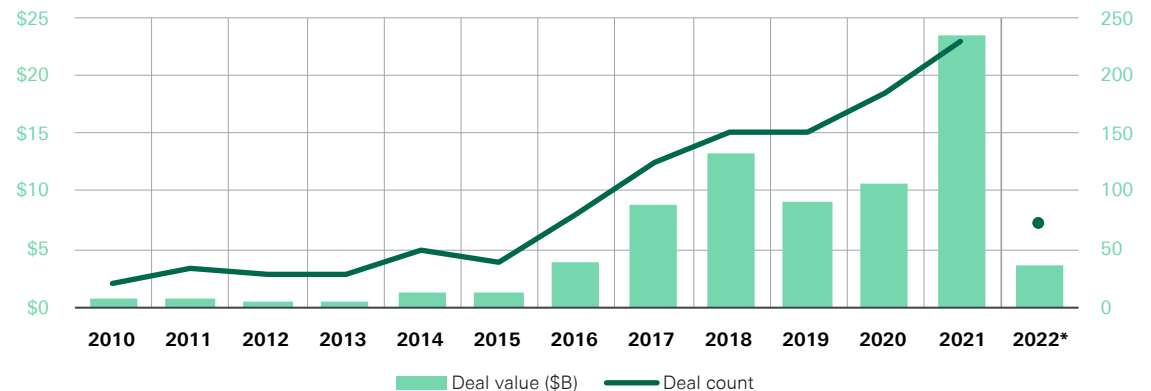
**Shaalu Mehra**  
Partner, Corporate

**Climatetech VC deal activity with PE growth participation**



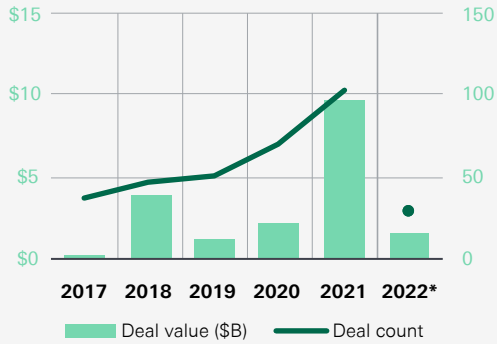
Source: PitchBook Geography: Global  
\*As of March 31, 2022

**Climatetech VC deal activity with CVC participation**



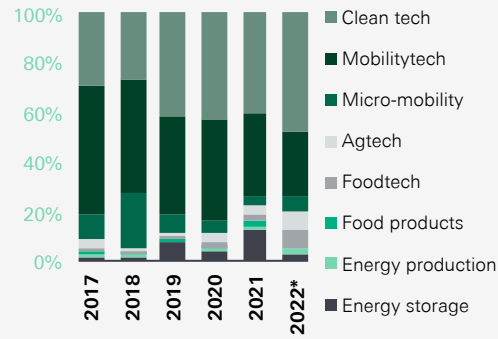
Source: PitchBook Geography: Global  
\*As of March 31, 2022

**VC deal activity by firms investing one-third or more in climatetech**



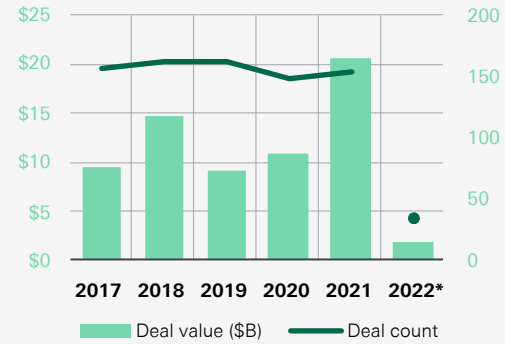
Source: PitchBook Geography: Global  
\*As of March 31, 2022

**Share of climatetech VC deal value by top select verticals**



Source: PitchBook Geography: Global  
\*As of March 31, 2022

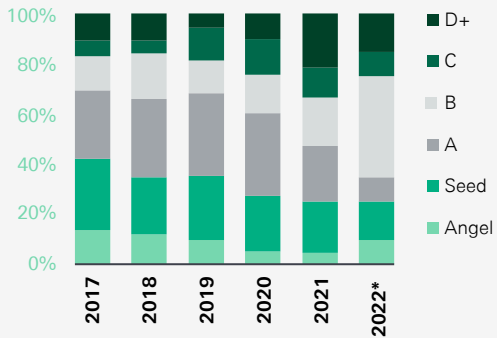
**Climatetech and mobilitytech VC deal activity**



Source: PitchBook Geography: Global  
\*As of March 31, 2022  
Note: Companies are tagged as both climatetech and mobilitytech, which is a smaller population than general climatetech.



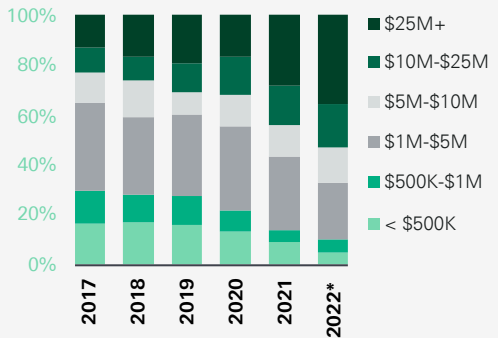
**Share of climatetech and mobilitytech VC deal count by series**



Source: PitchBook Geography: Global  
\*As of March 31, 2022

Note: Companies are tagged as both climatetech and mobilitytech, which is a smaller population than general climatetech.

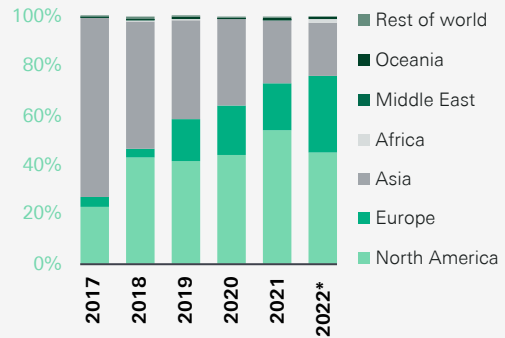
**Share of climatetech and mobilitytech VC deal count by size bucket**



Source: PitchBook Geography: Global  
\*As of March 31, 2022

Note: Companies are tagged as both climatetech and mobilitytech, which is a smaller population than general climatetech.

**Share of climatetech and mobilitytech VC deal value by region**



Source: PitchBook Geography: Global  
\*As of March 31, 2022

Note: Companies are tagged as both climatetech and mobilitytech, which is a smaller population than general climatetech.

## What trends are exciting to you in the mobility space right now?

DAJANI: The most exciting trend I am seeing is the surge of support around conversion of internal combustion engines (ICE) to electric vehicles (EVs). In the U.S., the Biden administration announced plans to reduce greenhouse gas emissions by at least half by 2030. China and Europe EV markets have hit inflection points, with their proportion of all new car sales hitting 15% and 20%, respectively. In Norway, which is seeking to become the first nation to end the sale of ICE cars by 2025, nine in 10 new cars sold there in 2021 were either electric vehicles or rechargeable hybrids. In the U.S., that figure is about 8% and growing.

ZARGHAMEE: Yes, it is obviously the EV revolution, which I define to also include hydrogen-powered vehicles. Mobility is one area of climatetech where we are beginning to see policy alignment between the U.S. and other leading markets, not to mention the efforts of EV manufacturers and other businesses to seize market opportunities. Road transportation has always been a major source of CO<sub>2</sub> emissions, and regulatory and business landscapes are evolving to reflect that fact. One might compare the Biden administration's ambitious goal of a 50% EV sale shares by 2030 to the European Commission's proposal to reduce CO<sub>2</sub> emissions from cars by 55% during the same timeframe. Similarly, both the U.S. and the EU have passed or proposed laws to facilitate expanding EV charging station networks while also offering financial incentives for consumer adoption of EVs.

MEHRA: I agree and will add that the scope of collaboration amongst global original equipment manufacturers (OEMs) and Tier 1 suppliers in the development and mass production of EV platforms and batteries is also noteworthy. Global OEMs have

committed to aggressive timelines to transition their product lines and are partnering to pool capital and expertise, as well as to mitigate the novel technological, commercial, supply chain, and regulatory challenges arising as they deploy this rapidly evolving technology at scale. Robust joint venture governance and intellectual property (IP) licensing protocols remain imperative to avoid the type of dysfunction seen, for instance, in the smart phone ecosystem a decade ago, in which co-dependent commercial partners were concurrently battling in high-stakes litigation over underlying technologies.

## What does the EV market need to continue this trend? What unique hurdles do you see mobilitytech clients facing?

MEHRA: It's clear that the Rubicon has been crossed by the automotive industry; it will not reverse the transition to battery-powered electric vehicles. The OEMs remain committed to aggressive timelines, notwithstanding the myriad global challenges we are all aware of, and indeed, they are lobbying regulators to affirm aggressive EV transition targets. They are motivated by the business opportunities new mobility models present and the shareholder returns they are already witnessing from their EV migration plans. The institutional constraints on EV deployment are well-known: the development of charging and battery-replacement infrastructure, the building process of electrical grids, and looming expiration of tax incentives around the world. Regarding EV production, while the chip shortage is likely transitory, constraints for sourcing battery materials are becoming severe. This will ultimately need to be addressed through technological breakthroughs in underlying battery technology.

ZARGHAMEE: For the EV revolution to succeed, several new and existing technologies must be scaled up. For example, the need to expand the network of EV charging stations. These will have to be manufactured, installed, and connected to the grid on a much greater scale than before. The Infrastructure Investment and Jobs Act earmarks \$5 billion to states and an additional \$2.5 billion to communities and corridors to build out the grid network.

Similarly, heightened demands will be placed on manufacturing and distribution of lithium-ion battery packs and the chemicals used in them. Besides the perennial concerns regarding supply chain continuities, which have really come under focus since the COVID-19 pandemic, attention must be paid to the regulatory authorizations necessary to bring to market a host of chemicals upon which the new battery technologies depend.

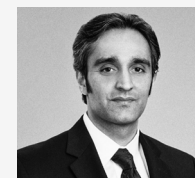
## Talk about what is happening in the U.S. and Europe in terms of government policy and support.

MEHRA: Norway's remarkable success in promoting the adoption of EVs is empirical proof of the viability of an aggressive, nationwide transition. Through tax incentives and public infrastructure investment, over 80% of the country's new car sales now comprise plug-in vehicles. The EU Commission has proposed plans requiring 100% transition to zero emissions vehicles by 2035, and these plans have vociferous support across the automotive industry.

DAJANI: Europe is certainly speeding up its push to EVs and is currently ahead of the U.S. because of government support. European regulators are clamping down with new CO<sub>2</sub> emission standards. Governments putting standards in place that direct



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Partner, Corporate

automakers down a decarbonized pathway is the biggest accelerant for e-mobility transition. This is why we are seeing a transition from ICE to EV cars. In the U.S., we are looking at strategies that have been employed by European counterparts to accelerate our own EV adoption. The Infrastructure Investment and Jobs Act's provision of \$7.5 billion to jump-start EV adoption was a good start, as are the included EV tax incentives intended to spur consumer demand, but we still have a way to go.

MEHRA: In the U.S., the California Air Resources Board (CARB) is driving transition to EVs. After the Environmental Protection Agency (EPA) reinstated CARB's regulatory authority in March to regulate vehicle greenhouse gases under the Clean Air Act (CAA), CARB has proposed standards that similarly require all new vehicle sales to be for zero-emission vehicles by 2035, supplemented with aggressive interim targets. While the EPA's grant of authority under the CAA is being challenged by 17 other state attorneys general, the automotive industry has been very vocal in its support of CARB targets.

ZARGHAMEE: As a regulatory attorney with a specialization in the field of chemical regulation, I am particularly interested to see how the EPA will implement its authority under the Toxic Substances Control Act in terms of issuing, denying, or conditioning pre-market approvals for the chemicals necessary to sustain continued development in the realm of mobilitytech.

### **What do current regulations mandate for the mobility/EV sector in terms of battery recycling? What options are available in an increasingly circular economy?**

ZARGHAMEE: At the federal level in the U.S., the EPA has not issued firm regulations, other than to prohibit the disposal of batteries at municipal landfills or their recycling by noncertified businesses. Rather, the EPA and Department of Transportation (DOT) have published recommendations on how consumers and businesses should recycle such batteries, advocating for the use of certified electronic recyclers and automobile manufacturers' take-back programs. Consequently, private businesses, including auto manufacturers and electronic recyclers, are taking the lead, often in collaboration with one another and with the support of state environmental agencies.

There is a great deal of money to be made in this field. One of the more stunning examples is from Europe, where the Swedish company Northvolt, which combines battery recycling with manufacturing, was recently valued at almost \$12 billion and has racked up orders worth a reported \$27 billion. As the EV transition continues, regulations at both the federal and state level will likely be promulgated. But for now, things have yet to settle into place.

### **Beyond EVs, what other emerging technology trends are you most excited about right now?**

DAJANI: I firmly believe hydrogen will be huge for big industrial transportation, such as trucking, railroad, and shipping. While the price point remains too high for widespread adoption, there is no debating that hydrogen fuel cell energy is clean and sustainable, can ease the energy transition, and can support ESG-minded outcomes. Any energy source that presents that kind of win-win-win scenario is worth investing in.

And the increasing viability of autonomous vehicles presents enormous opportunities. The ability to carry passengers or cargo at lower altitudes in urban and suburban areas could be a real gamechanger for logistics businesses. We are likewise seeing an acceleration of amphibious drones, such as those used to resupply offshore ships, instead of sending smaller boats that generate greater emissions.

MEHRA: There are some interesting developments in the integration of micromobility solutions within the public sector. Municipalities are collaborating with the private sector to enable fare systems that work seamlessly across commercial providers and public transit systems, integrate micromobility solutions in multimodal transit hubs, secure transit availability and rate equity for traditionally underserved communities, and redress gaps in mass transit that do not otherwise scale efficiently.

I'm also particularly interested in the ancillary technologies emerging from electric and autonomous vehicle development. I expect a continued surge in VC for robotics, leveraging the technology and expertise developed initially in the autonomous vehicle sector. The advancement of battery technologies in the EV space, such as high-density solid-state batteries, will have vast applications in verticals beyond transit.

ZARGHAMEE: Given how rapidly technology is advancing and the inevitability of the energy transition, what I think will be most fascinating is how quickly companies get through the evaluation stage and start implementing real changes. Businesses often forecast in terms of five- or 10-year windows, but the latter timeframe will take us past many of the climate-related regulatory deadlines. To meet the moment, businesses are going to have to acknowledge that the future is now.

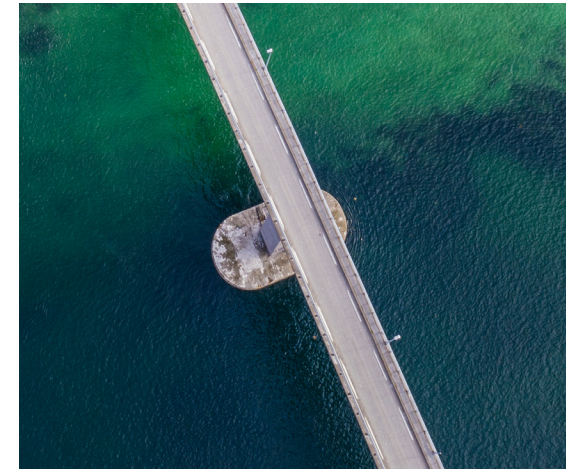


## Exit trends

**While exit activity has decelerated, excess liquidity may propel greater investment going forward.**

The effects of market volatility in Q1 2022 were reflected most strongly in exit activity, and climatetech was no exception with exit value at \$5.2 billion in the quarter. But while exit value may have cooled, exit count remains high. 15 deals closed in Q1 2022—more than half the number recorded in all of 2020 and just one deal shy of the total number of exits completed in 2019. Most of the exits in the quarter were acquisitions, while public listings, at \$4.4 billion, were responsible for the largest share of the total exit value. Mobilitytech exits also experienced a record

year in 2021, with exit value exceeding \$75.0 billion across 28 deals, representing 336.3% YoY growth in value and nearly doubling its deal count. Public listings accounted for the majority of exit count and value. Notable IPOs included EV manufacturer Rivian (NASDAQ: RIVN), which raised \$11.9 billion, and internet of things (IoT) company Samsara (NYSE: IOT), which raised \$805.0 million. Cash flow from these exits will allow firms to close larger deals and, depending on the viability of new entrants, invest in early-stage companies alongside late-stage companies. As firms reinvest the massive amount of liquidity generated through 2021's exits, the climatetech and mobilitytech industries will continue to grow.

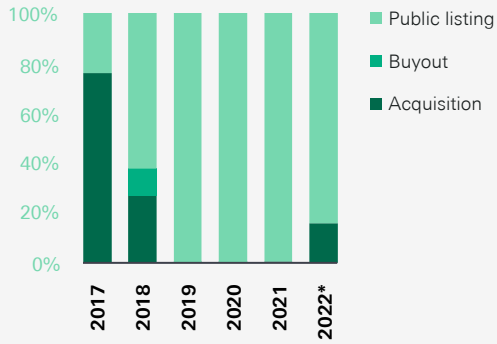


**“Mobility is one area of climatetech where we are beginning to see policy alignment between the U.S. and other leading markets, not to mention the efforts of EV manufacturers and other businesses to seize market opportunities.”**

**Reza Zarghamee**

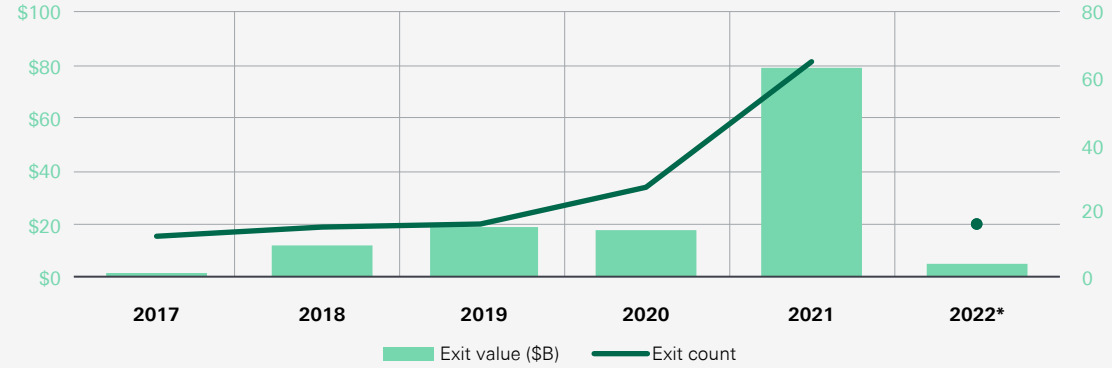
Partner, Environmental & Natural Resources

### Share of climatetech VC exit value by type



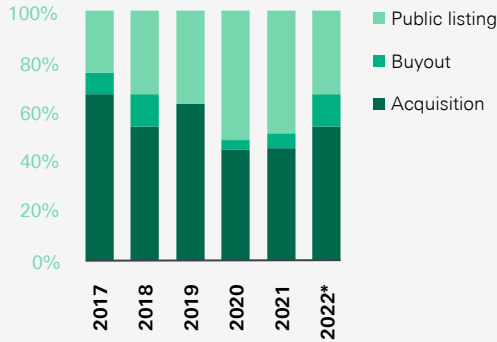
Source: PitchBook Geography: Global  
\*As of March 31, 2022

### Climatetech VC exit activity



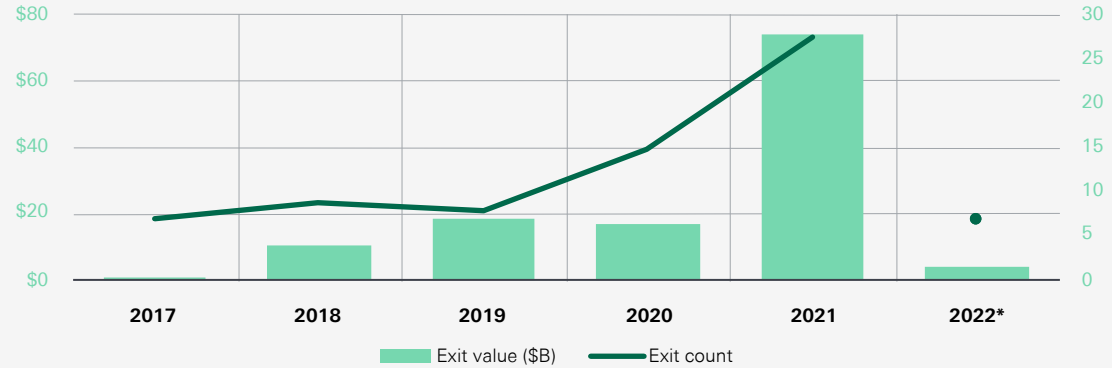
Source: PitchBook Geography: Global  
\*As of March 31, 2022

### Share of climatetech VC exit count by type



Source: PitchBook Geography: Global  
\*As of March 31, 2022

### Climatetech and mobilitytech VC exit activity



Source: PitchBook Geography: Global  
\*As of March 31, 2022

Note: Companies are tagged as both climatetech and mobilitytech, which is a smaller population than general climatetech.

# METHODOLOGY

All private companies that form the population underlying the datasets in this report were tagged with PitchBook's dedicated vertical of climatetech. PitchBook's standard venture methodology was applied for all relevant transactions, which can be found in the PitchBook-NVCA Venture Monitor section [here](#). Only completed transactions were included. The geographical scope was global unless otherwise noted. For breakouts by industry or other verticals, each company had to be tagged with at least one other relevant vertical; for example, a company had to be tagged to both climatetech and mobilitytech verticals. Given the overlap between segments, it is possible double counting occurred, which is why relative proportions rather than actual figures were utilized to minimize its impact on trend analysis.





# ABOUT PILLSBURY

Pillsbury Winthrop Shaw Pittman LLP is an international law firm with a particular focus on the technology & media, energy, financial, and real estate & construction sectors. Recognized as one of the most innovative law firms by Financial Times and one of the top firms for client service by BTI Consulting, Pillsbury and its lawyers are highly regarded for their forward-thinking approach, their enthusiasm for collaborating across disciplines, and their authoritative commercial awareness.

Pillsbury's energy insights inform companies around the world and across industries as they evolve and adapt to the challenges of the energy transition. From advancing new technologies to developing strategies for established companies to meet decarbonization goals, we provide energy stakeholders with comprehensive guidance based on vast industry experience and a track record of innovation and success. Visit our [Energy Industry Group page](#) to learn more about our capabilities.