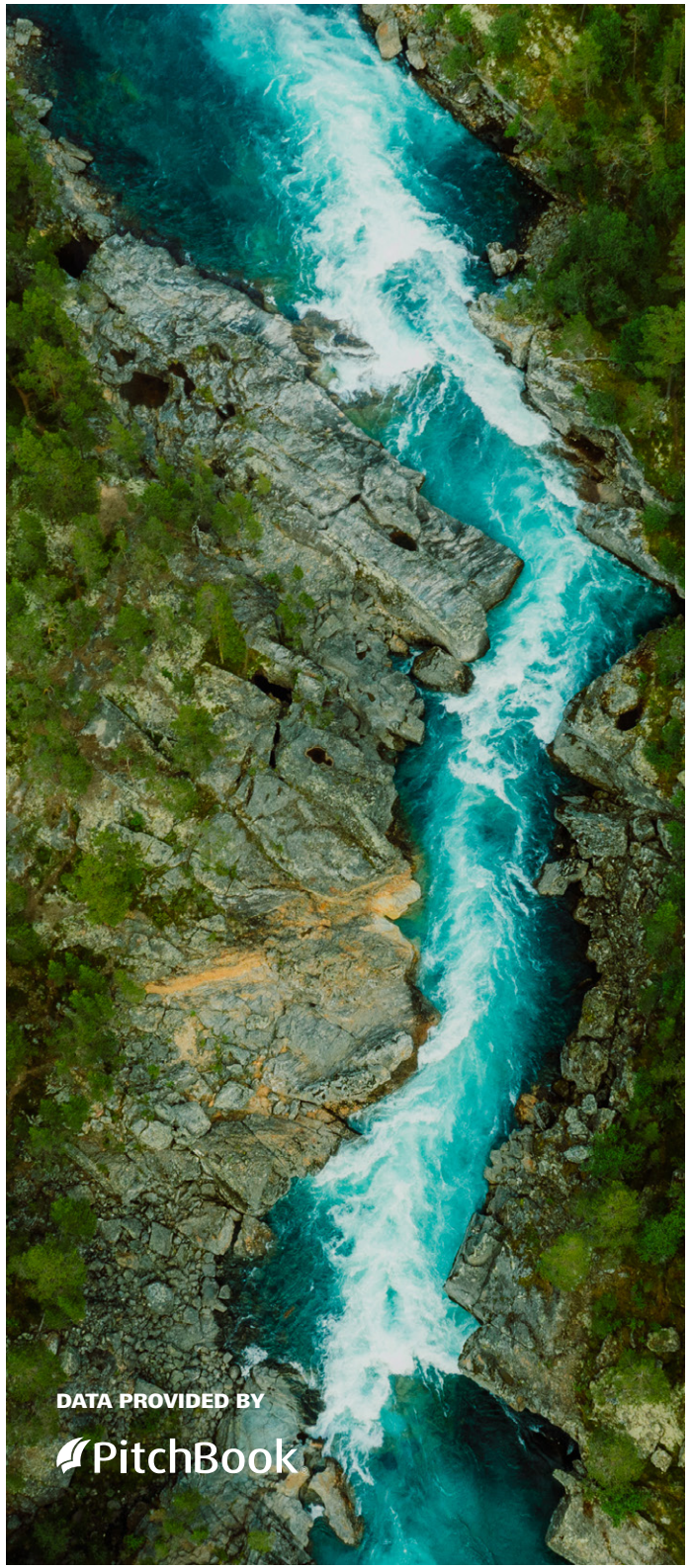
CLIMATETECH

2023 Year in Review

pillsbury



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Executive summary

Governments and economies around the world remain focused on developing and expanding sustainable approaches to decarbonization to drive the energy transition. In December 2023, the United Nations' COP28 climate conference punctuated a busy year for activists and innovators, with participants doubling down on pledges to address emissions and increase investment in clean energy solutions.

For emerging companies and venture capitalists in the climatetech space, 2023 deal volume was subdued in comparison to 2022's record-high deal count, but sector performance remains consistently elevated over pre-2021 metrics, as market stakeholders seek opportunities to impact the energy transition and leverage government incentives to develop decarbonization solutions. Select verticals, including manufacturing and renewable fuels, signal promising growth opportunities.

In the previous edition of this report, climatetech venture deal value reached $14.1 billion through the first half of 2023. A strong second half followed, bringing the year's total to $26.7 billion. Although venture dealmaking has faced headwinds since 2021's historic peak, opportunities remain as the market evolves. This report examines how dealmaking dynamics shifted across the climatetech venture economy throughout 2023.

Investment trends

Driven by more diversified investment and high levels of mid-year dealmaking, Climatetech VC activity remained strong in 2023.

Momentum in 2023 was concentrated in Q2 and Q3, which represented two-thirds of the year's $26.7 billion in total deal value, the third-highest yearly total on record. Corporate VCs and nontraditional investors followed similar trends, slowing their participation in the climatetech VC space compared to the prior two years but still maintaining strong levels of activity that outpaced annual levels prior to 2021's historic peak. More PE growth/expansion deals closed in 2023 compared to any year prior, underscoring a growing interest in climatetech plays among PE firms.

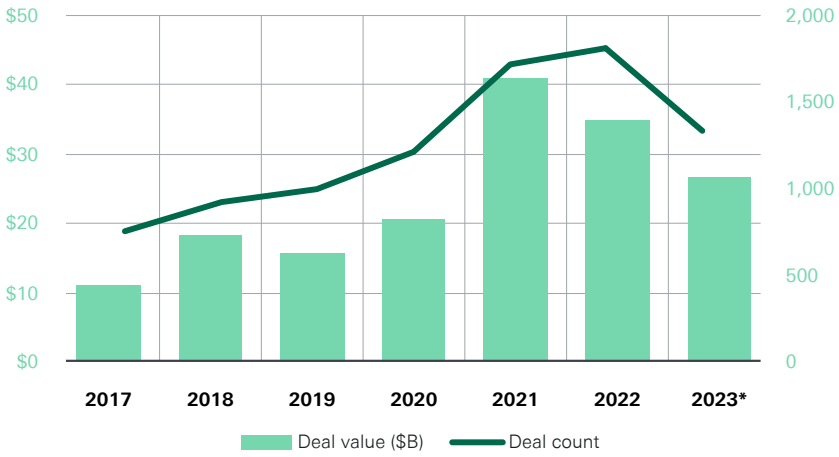
More than one-third of Q3's $9.5 billion in deal value was driven by three deals worth north of $900 million each: H2 Green Steel in Sweden, Redwood Materials in the US, and Neta Auto in China, showcasing larger opportunities across several global regions.

These large deals compensated in part for reduced year-over-year activity levels, which were unable to reach the record high of 2022. The proportion of total deal count attributed to transactions under $1 million fell for the fourth straight year, as companies vying for smaller checks face selective investors who are opting to direct resources to their strongest portfolio companies.

Deal sizes and valuations trended upward for climatetech companies across all company stages, with a few exceptions.

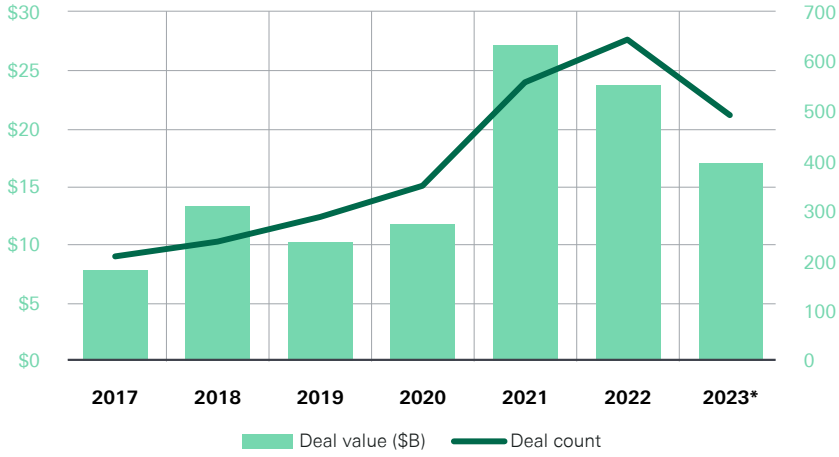
Deal size trends also vary according to company maturity. The late-stage VC category saw its median deal size grow by nearly one-third in 2023, exceeding $10 million for the first time, while the early-stage category had more measured growth of 13.4% in the same period. The venture-growth stage, which encompasses the smallest group of companies at the most mature stages, exhibits the greatest volatility in deal size trends. Last year, the median venture-growth deal size dropped by more than 20%, in contrast to the growth seen in all other categories.

Climatetech VC deal activity



Source: PitchBook **Geography:** Global
*As of December 31, 2023

Climatetech VC deal activity with CVC participation



Source: PitchBook **Geography:** Global
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The venture-growth stage also saw a steep decline in its median pre-money valuation, facing strain because of a prolonged difficult IPO window. Other stages fared better in this regard, with the median valuations for the pre-seed/seed and late stages growing by more than half by the end of the year, partly driven by the results of a more selective population of companies that managed to successfully raise. The early stage experienced a slight decline of 7.4%.

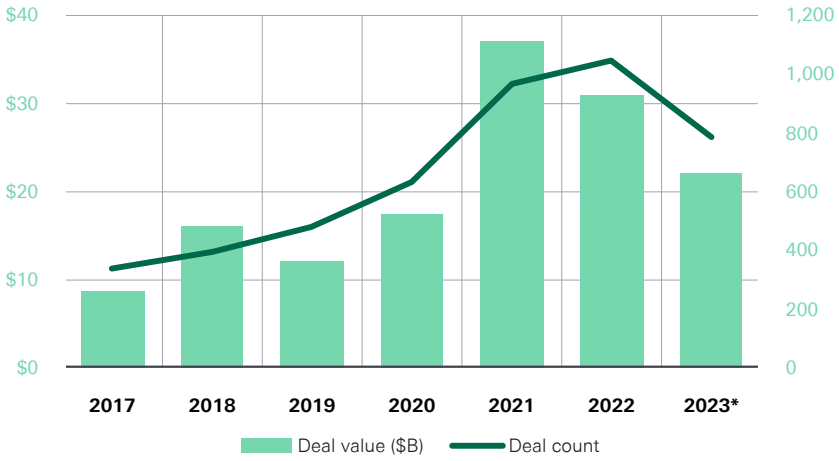
Vertical trends within climatetech reveal shifting priorities for dealmakers.

The manufacturing and LOHAS (lifestyles of health and sustainability) & wellness verticals together accounted for more than $14 billion in deal value in 2023, representing two of the top verticals within the space. When total climatetech deal value began to decline in 2022, these two areas were among the most resilient, bringing in more deals than in 2021. Both have felt the effects of slower dealmaking in 2023 but remain major drivers of climatetech activity overall.

The oil & gas vertical historically represents a smaller slice of climatetech VC activity, but renewable fuel innovation has contributed to an uptick in dollars invested over the past two years. Startups that address emissions monitoring and byproducts from traditional industry leaders drew interest from investors alongside emerging product expansion opportunities including biodiesel, clean hydrogen, and geothermal energy. Total deal value exceeded $1 billion for the first time in 2022 and grew an additional 22.7% in 2023 compared to many other verticals that saw declines in the same period.

On the other hand, mobilitytech dealmaking has largely stalled with the fewest number of deals closed in nearly a decade. Uphill battles for autonomous vehicle integration and the competitive landscape for electric vehicles have contributed to slower dealmaking.

Climatetech VC deal activity with nontraditional investor participation



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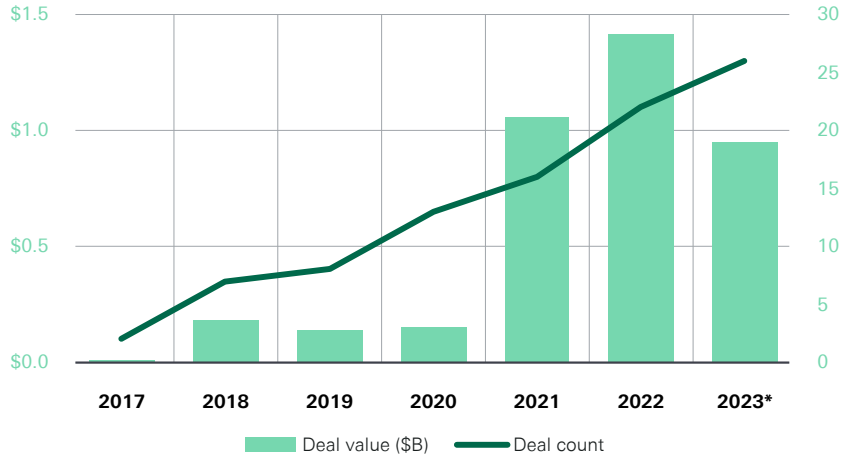
Climatetech PE growth deal activity



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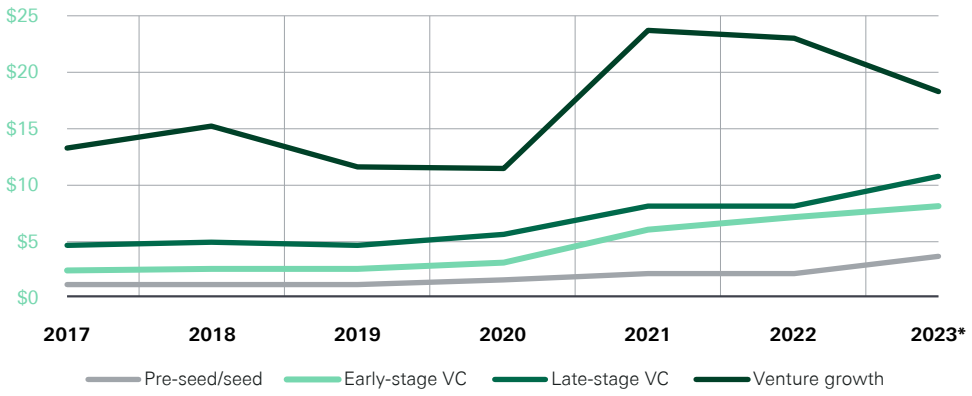
Median climatetech VC deal value ($M) by stage



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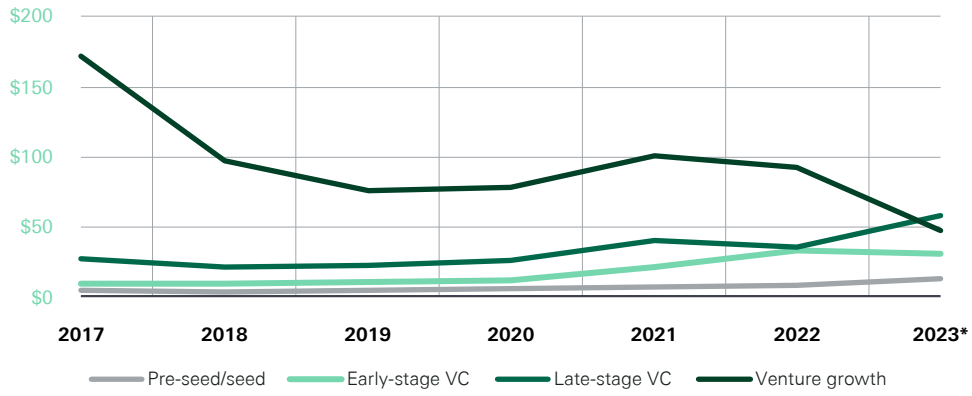
Median climatetech VC pre-money valuation ($M) by stage



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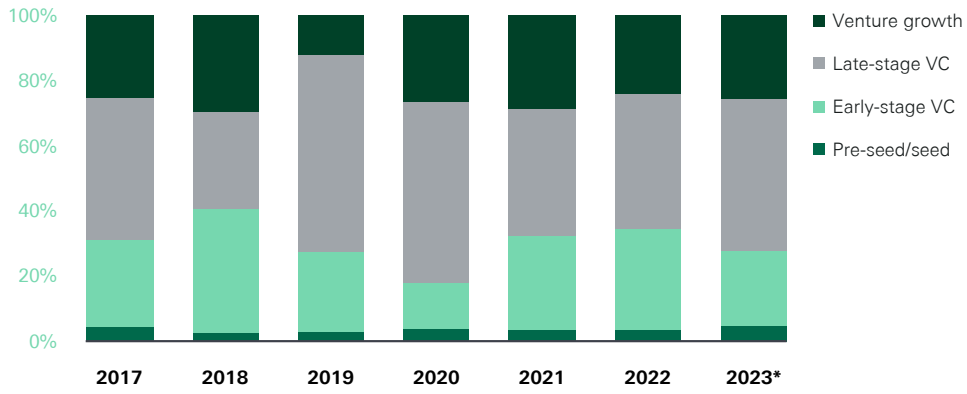
"The biggest challenge for innovators is trying to land in the middle of the three-part Venn diagram of what is a helpful technology, what is a commercially viable technology and what is a technology that can capture government benefits."

Steven Tepera
Intellectual Property Partner (Austin & Houston)

Share of climatetech VC deal value by stage



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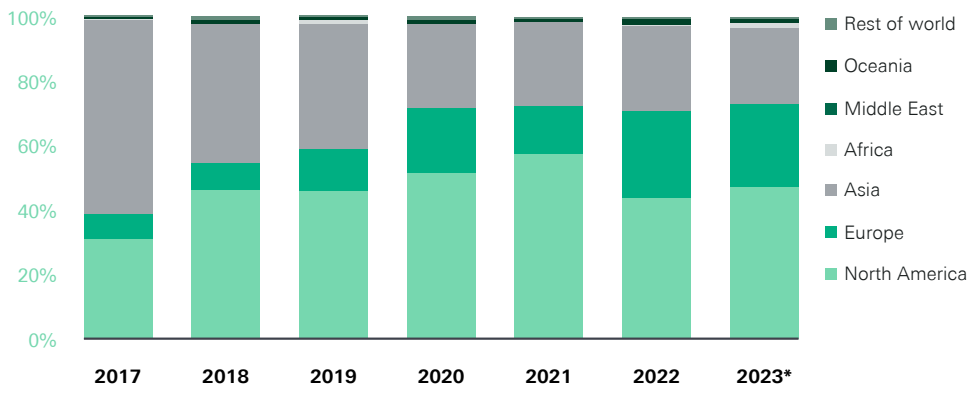
Share of climatetech VC deal value by region



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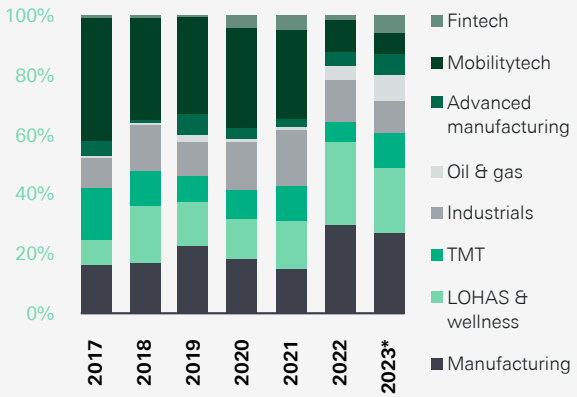
Share of climatetech VC deal value by select top verticals



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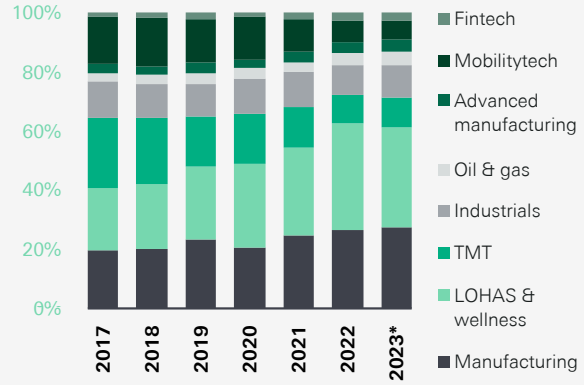
Share of climatetech VC deal count by select top verticals



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Don Lonczak
Tax Partner (Washington, DC)

Q&A

A healthy environment for innovation is essential to sustaining momentum in the energy transition. What legal and policy developments are helping to enable climatetech innovation right now?

TEPERA: The US government is definitely prioritizing climatetech. In my area of practice, the Climate Change Mitigation Pilot Program has contributed to driving the growth of the sector. The program launched two years ago and allows a patent on technology that is shown to contribute to decarbonization to be treated as a special application. The application is moved to the front of the line, and it ultimately results in a quicker patent process. The program is intended to help speed the real-time development of these technologies.

There also are policy developments that interact with the patent world in different ways to help sustain innovation. The patent system is designed to encourage innovation, but it does that by allowing a company to exclude others from using the patented technology. So there's a conflict there—how do you encourage mass adoption of climate technology so that it has a real impact through a process that limits others from using it?

But factors like some of the provisions in the Inflation Reduction Act help push through that tension. For instance, the IRA includes incentives for public-private partnerships, such that ordinary economic principles do not have to be the sole drivers. Another example is long-existing statutes that make the government the effective indemnitee in certain circumstances so an inventor can still profit from their innovation while another company also can use it without being on the hook for infringement. These different policy pieces work together to encourage innovation and investment in the technologies.

LONCZAK: Lenders stand willing to provide financing for innovative energy projects, based on the expectation of tax credits being available for them. The passage of the Inflation Reduction Act and its new benefits and requirements involved a considerable learning curve, both for stakeholders and their advisors, but two years later, industry participants are well-educated about how these incentives can help drive innovation.

These tax credits provide a valuable subsidy for renewable energy development, particularly with the IRA's introduction of cash sales and direct payments of the credits. Historically, the tax credit market was based on complicated tax structures, which still play an important role, but the new alternatives offer more opportunities to monetize credits. Tax credits are being taken into account in the financial modeling of projects, and in some cases, their value can mean the difference between a feasible project and one that isn't economically sustainable.

2023 data shows that the mobilitytech vertical is cooling off, while categories like advanced manufacturing and oil and gas, driven by renewable fuels developments, are showing consistent growth. What developments and trends stand out to you across the different climatetech verticals?

LONCZAK: The manufacturing category continues to show resilience, which may be connected to increased interest among investors on the basis of the generous incentives accessible under the IRA. These include investment-based credits for manufacturing based on the cost of a new or retrofitted facility, or per-component credits based on production.

Hydrogen is another area of the sector where there has been a lot going on. The US recently released new guidance predicating production credits for clean hydrogen projects on a complicated three-pillar scheme. While the proposed regulations clarify what is required to qualify for the clean hydrogen tax credit, the introduction of the new requirements has created uncertainty about their long-term value and may pose a hindrance for existing facilities seeking to take advantage of the new credits. So investors and developers in the clean hydrogen space are figuring out how to sustain innovation and drive adoption and ROI amid some complicated and still-evolving developments.

TEPERA: I think we may be over the initial peak for investment in the mobilitytech vertical because the activity there has already resulted in substantial adoption. We're at a point where the technology is developed and has been adopted and works well, so the environment is ripe for those investments to flow to other areas within climatetech.

One reason other verticals may not have ramped up quite as quickly as mobilitytech did initially is because the economic case for those technologies is harder to make—you're not simply plugging into a huge existing economic segment like consumer vehicles. For example, in heavy industry, it's harder to look at an existing facility and say it needs a particular, still-developing technology to reduce emissions. That's an entity—not an individual consumer—that now has to perform a complicated calculus to determine the value of purchasing that technology. So they need to rely much more on the types of motivations that come from government incentives.

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Intellectual Property Partner
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(Washington, DC)

An area that's exciting to me is what's happening with different kinds of electricity generation. There are a lot of new ideas about how to capture wasted energy and convert it into something that can be plugged into an existing grid. I've worked with companies that are doing things like trying to capture and utilize what would otherwise have been flared gasses produced when oil is extracted from the ground. The idea they're developing technology around is, instead of just burning off and effectively wasting that consumable fuel, how can we get it back onto the grid? The environmental benefit comes from the efficiency of the technique at removing methane that flaring doesn't completely accomplish. Innovative ideas like that that work in the margins—with existing infrastructure and readily available resources—seem ripe for rapid adoption.

Recent advancements in artificial intelligence technologies have seemingly impacted every aspect of society. In the energy sector specifically, are you seeing widespread deployment of AI technologies? And if so, how are those systems being leveraged?

LONCZAK: It's impossible to ignore the impact AI is having on the world as we know it, and the energy sector is certainly looking to use the technology to address some of its bigger operational challenges. As one example, a common issue for renewable energy developers, investors and other market participants is intermittency. Wind does not always blow and the sun does not always shine, but there are patterns that can be recognized, leading to decisions about siting, orientation and operation.

Energy storage encounters similar data-centric difficulties—how quickly will stored energy be released? How long will that take? Then how fast can a system be recharged? And what kind of degradation or loss will occur in the process? AI is well-suited to help improve efforts to predict this performance and optimize accordingly.

And while renewable energy is playing an important role in decarbonization efforts globally, there may still be times when more renewable energy is being potentially generated than the grid has room for, because of bottlenecks in the infrastructure or decreased demand. AI can generate forecasts for when that renewable energy is going to be in surplus.

From an IP standpoint, how can emerging companies shape their strategy to enable and protect climatetech innovations as the sector develops under pressure of time-sensitive decarbonization objectives?

TEPERA: Something I see frequently is a patent strategy that looks at patents as only an initial item to check off a list. Instead, for innovators developing clean energy technologies, it's beneficial to look at staging their patents at different times. Filing only one patent at the very beginning of the process will adequately protect the technology only in the rarest of circumstances.

A smart strategy is for a company to file a patent application very early, when the technology is still developing. As they make progress, they should readdress patenting such that future applications can be tweaked to dial into the nuances of what the technology ends up being. There are real benefits to that kind of approach, because the company frequently captures a lot of the different variations of how their technology could be deployed, which becomes very useful for the exclusion aspect. It's precisely because it is still a work in progress that the patent ends up being more valuable from a competitive standpoint.

Later patents end up having value because as the specifics of the invention get added in, the patent becomes more resilient to challenges. A combination of both types of patents is what will provide emerging companies with the strongest protection.

How can climatetech innovators strategize around fluctuating market conditions to keep driving the energy transition forward?

TEPERA: The biggest challenge for innovators is trying to land in the middle of the three-part Venn diagram of what is a helpful technology, what is a commercially viable technology and what is a technology that can capture government benefits.

It can be difficult to land in that spot where a technology ends up taking off, so developers need to make sure that their innovations fit into multiple circles at once to maximize its chances of success, and they need to think strategically about legislation like the Inflation Reduction Act and the different government incentives available so they can determine how to capture those benefits by making tweaks to the innovation.

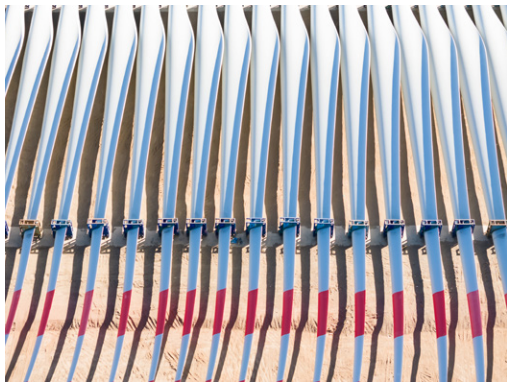
Exit trends

Acquisitions remain the favored track for climatetech VCs, although the few public listings that did close drove significant value.

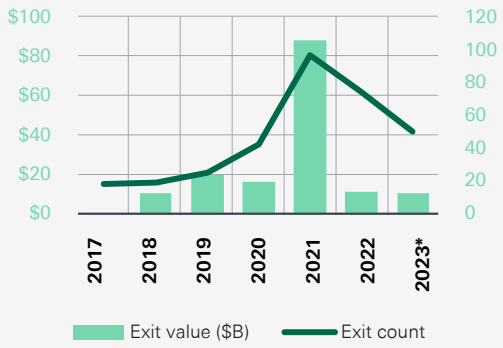
Tepid exit activity continued in 2023 across the venture ecosystem, and climatetech was no exception. The number of VC exits declined by one-third alongside a modest decline in total exit value.

Despite economic growth concerns, Chinese companies secured several of the largest climatetech IPOs last year. Lithium-ion battery manufacturer REPT Battero Energy's IPO in December created more than $5 billion in exit value alone, contributing nearly half of the year's total exit value.

Between 2021 and 2023, the number of climatetech public listings dropped by more than 75%, and the number of acquisitions declined by more than 25%, while the number of buyouts more than doubled. Although buyouts still represent just a handful of exits in the climatetech VC space, they underscore the growing interest from nontraditional players and shifting strategies for companies.



Climatetech VC exit activity



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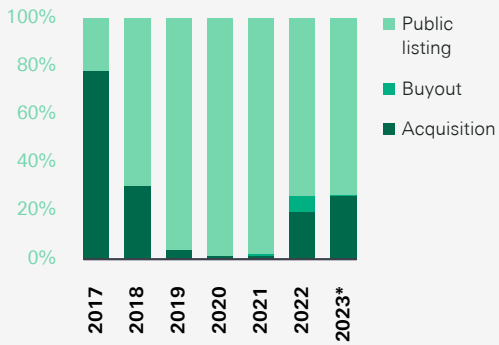
Share of climatetech VC exit value by type



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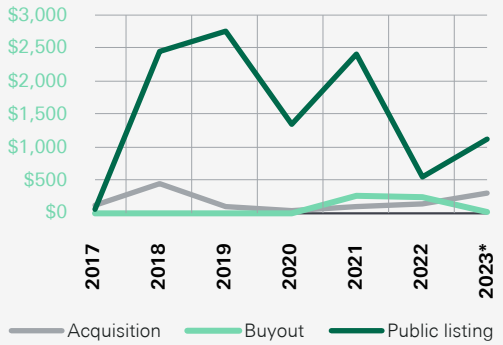
Share of climatetech VC exit count by type



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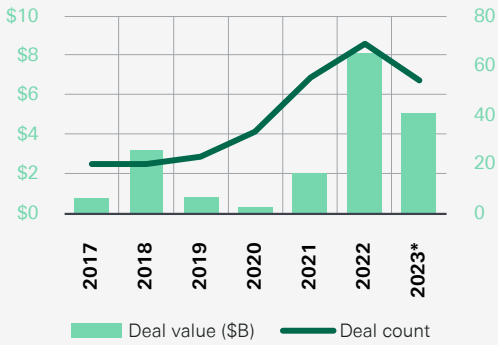
Climatetech M&A activity



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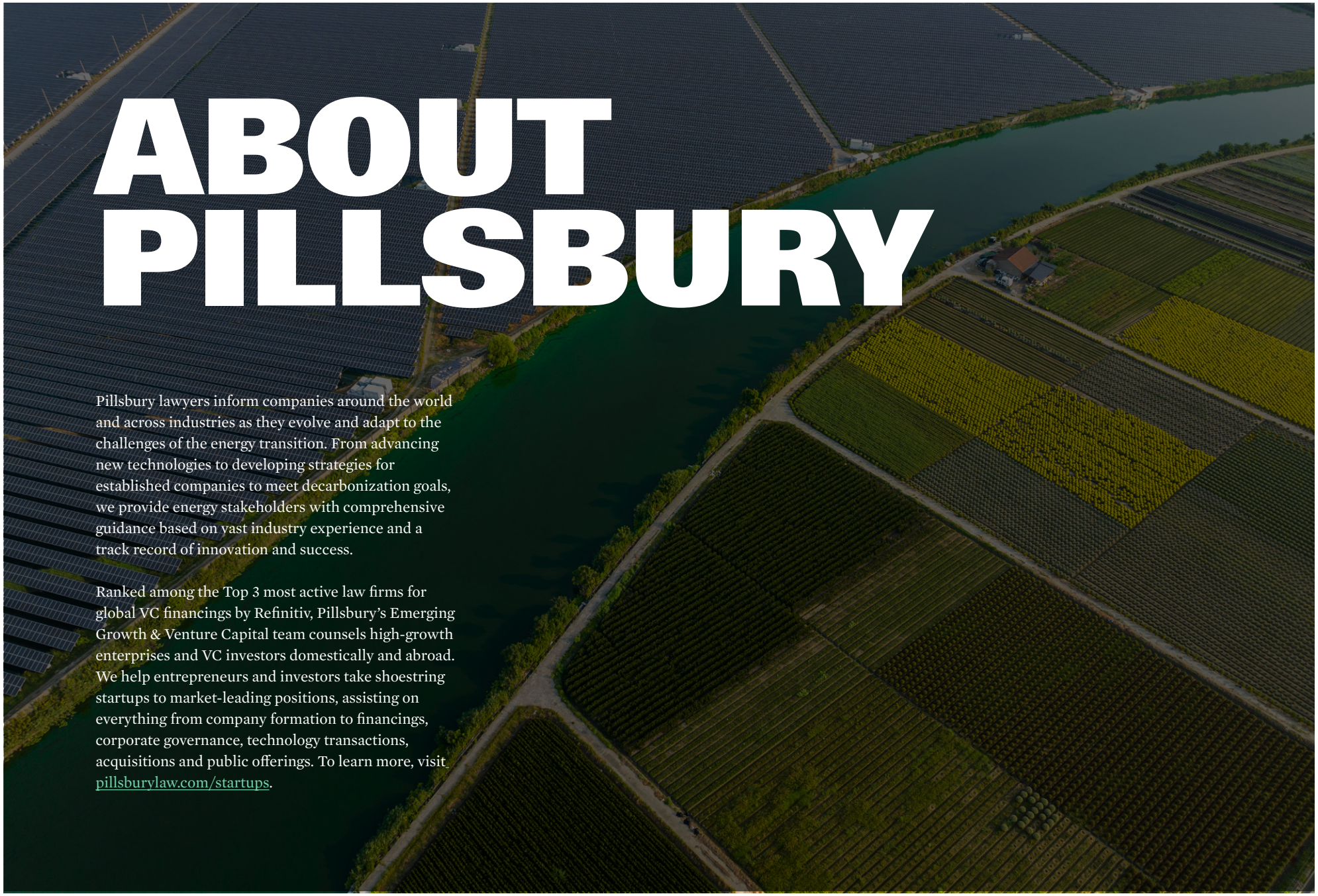
METHODOLOGY

All private companies forming the population underlying the datasets in this report were tagged with PitchBook's dedicated vertical of climate tech or select relevant keywords. PitchBook's standard venture methodology, which can be found in this PitchBook-NVCA Venture Monitor section, was applied for all relevant transactions. Only completed transactions were included. The geographic 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 overlap between segments, it is possible that double counting occurred, which is why relative proportions rather than actual figures were used to minimize the impact on trend analysis.

ABOUT PILLSBURY



Pillsbury lawyers 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.

Ranked among the Top 3 most active law firms for global VC financings by Refinitiv, Pillsbury's Emerging Growth & Venture Capital team counsels high-growth enterprises and VC investors domestically and abroad. We help entrepreneurs and investors take shoestring startups to market-leading positions, assisting on everything from company formation to financings, corporate governance, technology transactions, acquisitions and public offerings. To learn more, visit pillsburylaw.com/startups.