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The Future of Climate Tech

A Look at the Technologies Driving a Sustainable Future

2022

The Future of Climate Tech 2022

4 Disrupting Emissions:
Climate Goals and Technology

7 Deals and Dollars:
Capital Flows to Climate Tech

10 Benchmarking Growth:
Investment, Company Financials and Sector Trends

15 Breakout Technologies:
Carbon, Hydrogen, Agriculture and Green Cement

20 Outlook:
A Bright Future Not Without Challenges

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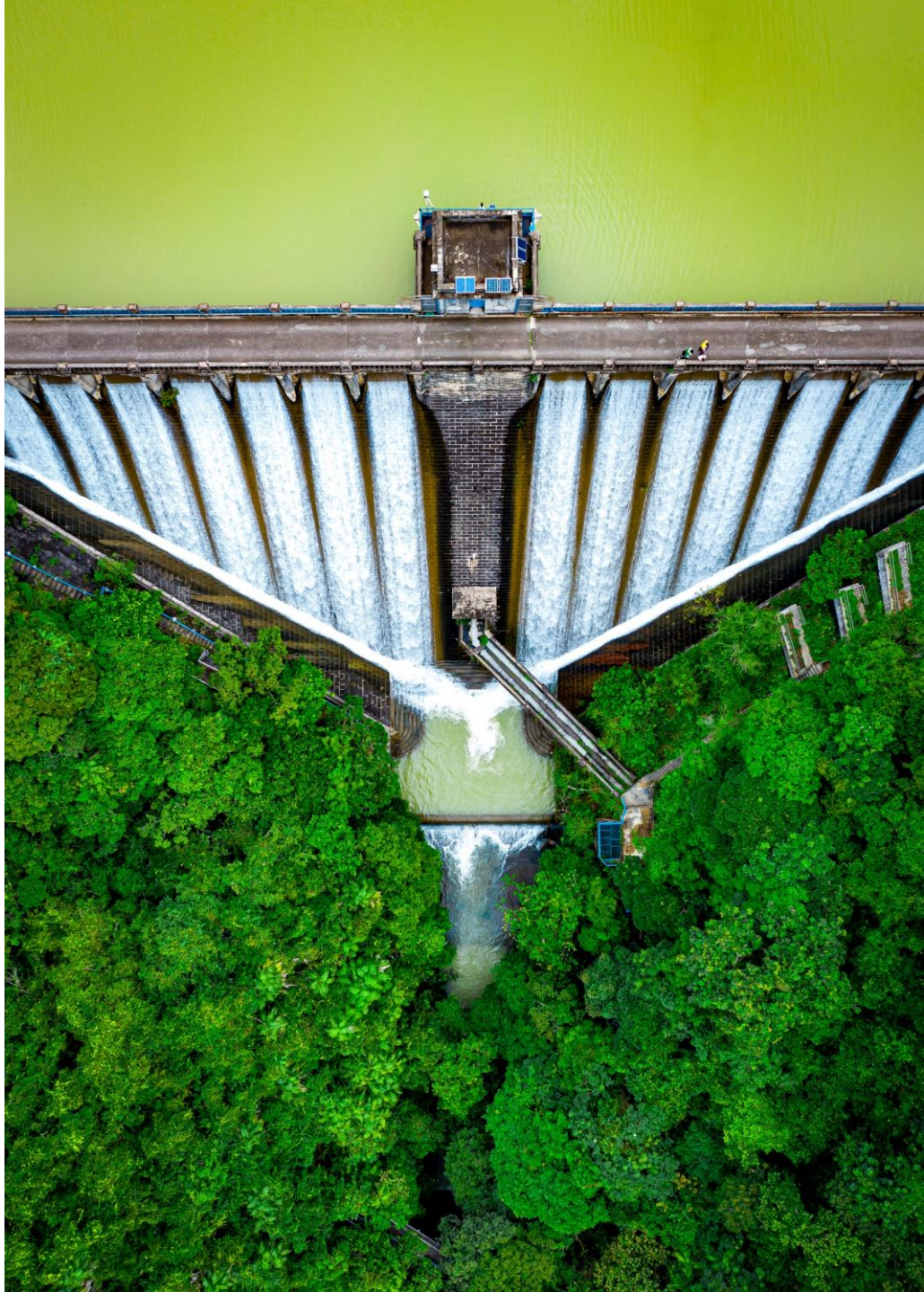

Executive Summary

Climate Tech Goes Mainstream

Countries and corporations are taking action to mitigate significant damages from anthropogenic climate change. Over the last several years, 49 countries and 93 Fortune 500 companies have committed to net-zero emissions targets or carbon neutrality. Even corporations whose businesses revolve around fossil fuels, such as Exxon, Delta and GM, have made commitments to reach net-zero emissions. In order to achieve “net-zero,” new technologies need to be developed and scaled, including sustainable aviation fuels (SAFs), carbon capture and sequestration (CCUS) systems and “green” cement.

Opportunities abound for companies to help deliver climate goals. Entrepreneurs are diving in to develop climate tech solutions. Electric vehicle (EV) and alternative protein companies are early pacesetters. Notable exits include Tesla and Rivian in the EV space and Beyond Meat in the alternative protein sector. These successes speak to the potential of climate tech solutions to both heal the planet and create viable, lasting companies.

Investors are recognizing the climate tech opportunity and doubling down on both fundraising and capital deployment. US venture capital investment in climate tech companies increased 80% between 2020 and 2021, reaching $56B. The energy and power sector experienced the fastest growth, increasing 180% year-over-year. Non-traditional climate tech investors are quickly exerting dominance; Alumni Ventures, Insight Partners and Tiger Global are among the most active. A cautionary note: the climate tech sector does not come without its challenges. Timelines for companies to scale are typically longer, talent is in short supply, infrastructure is lagging plus inflation and supply-chain pressures are increasing the cost of operations.

Kelly Belcher
Managing Director,
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Disrupting Emissions:

Climate Goals and Technology

Please Mind the (Emissions) Gap

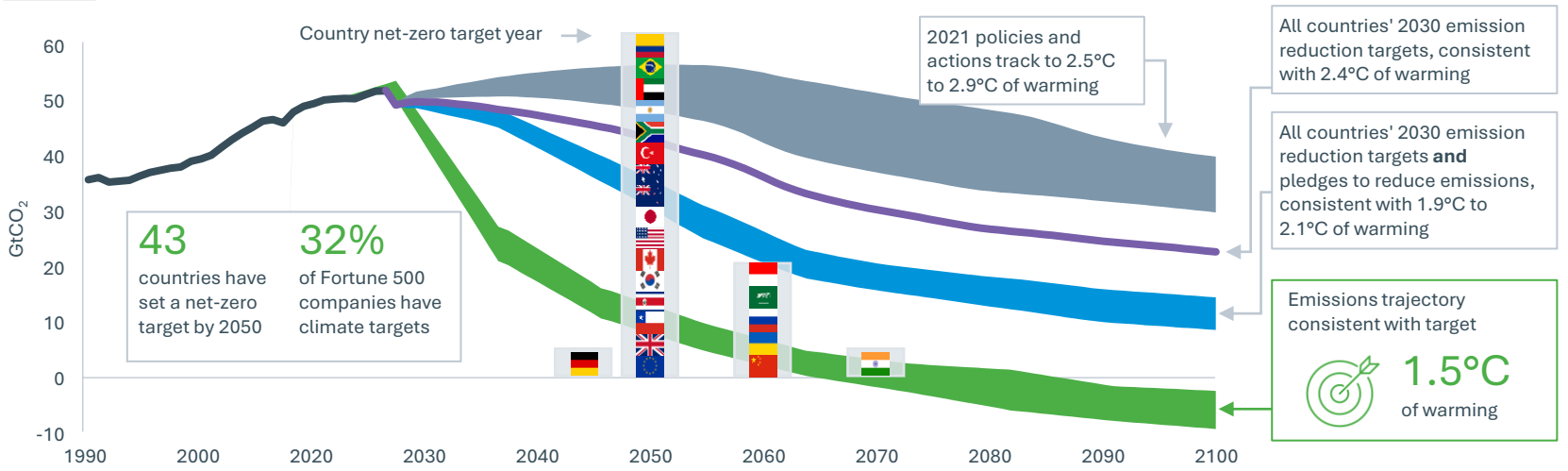
Negative consequences from climate change are inevitable. The question is to what extent will the general populace be adversely impacted. The Intergovernmental Panel on Climate Change (IPCC) warns that half the global population lives in areas highly vulnerable to climate change and the climate warming above 1.5°C will create irreversible damages that are a threat to human wellbeing.

In light of this, 49 countries made commitments to reach net-zero emissions, the top three of which account for over 50% of all global emissions. These commitments benefit climate technology development as they incent governments to create policies to reduce greenhouse gas (GHG) emissions. For instance, the state Washington's emissions trading system will encourage innovation in carbon-reducing technology.

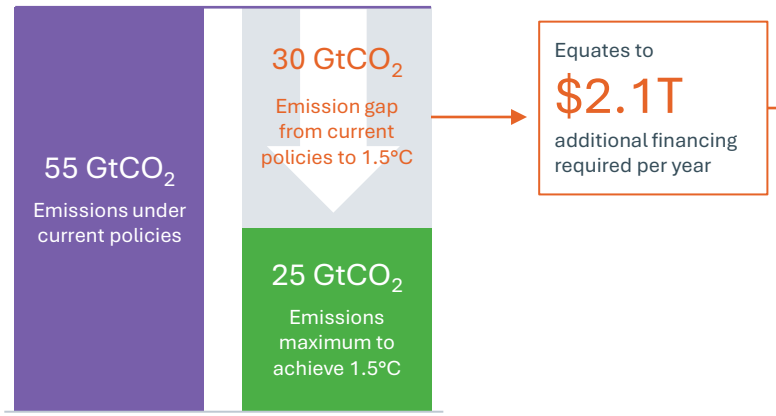
Twelve of the world's major oil companies,[3] including Shell and ExxonMobil, have set net-zero targets and agreed to fund emission-reducing technologies. Large corporations are key early adopters and channel partners for climate tech startups. Airlines, for example, committed to buy sustainable aviation fuels from startups and in some cases also became investors – such as Honeywell and United Airlines' investment in Alder Fuels.

Despite countries and companies setting ambitious goals, our current policies put us on pace to hit 2.9°C of warming, which puts humans at risk of experiencing the severe events, such as marine ecosystem collapse and over 23 feet of sea level rise by 2100. Technology is no silver bullet but is a key tool in reducing GHG emissions.

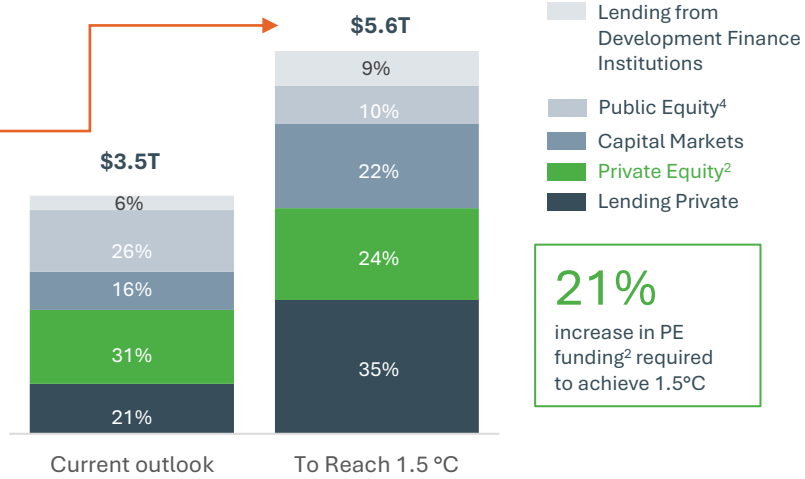
Global CO_2 Emissions Forecasts by Temperature Rise and Countries with Net-Zero Targets[1]



Global Emissions in 2030 ($GtCO_2$)[5]



Global Annual Financing for the Energy Transition by Source and Type (2021-2030)[2]



Notes: 1) 2045: Germany. 2050: EU (27 countries), UK, Chile, Costa Rica, South Korea, Canada, US, Japan, New Zealand, Australia, Turkey (2053), South Africa, Argentina, UAE, Brazil, Columbia. 2060: China, Ukraine, Russia, Saudi Arabia, 2070: India, 2) All forms of private equity including venture capital. 3) The Oil and Gas Climate Initiative includes BP, Chevron, CNPC, Eni, Equinor, ExxonMobil, Occidental, Petrobras, Repsol, Saudi Aramco, Shell and Total. 4) Equity funding from public/government sources distinct form capital markets. 5) Gigatons (billions of ton) of CO_2 ($GtCO_2$).

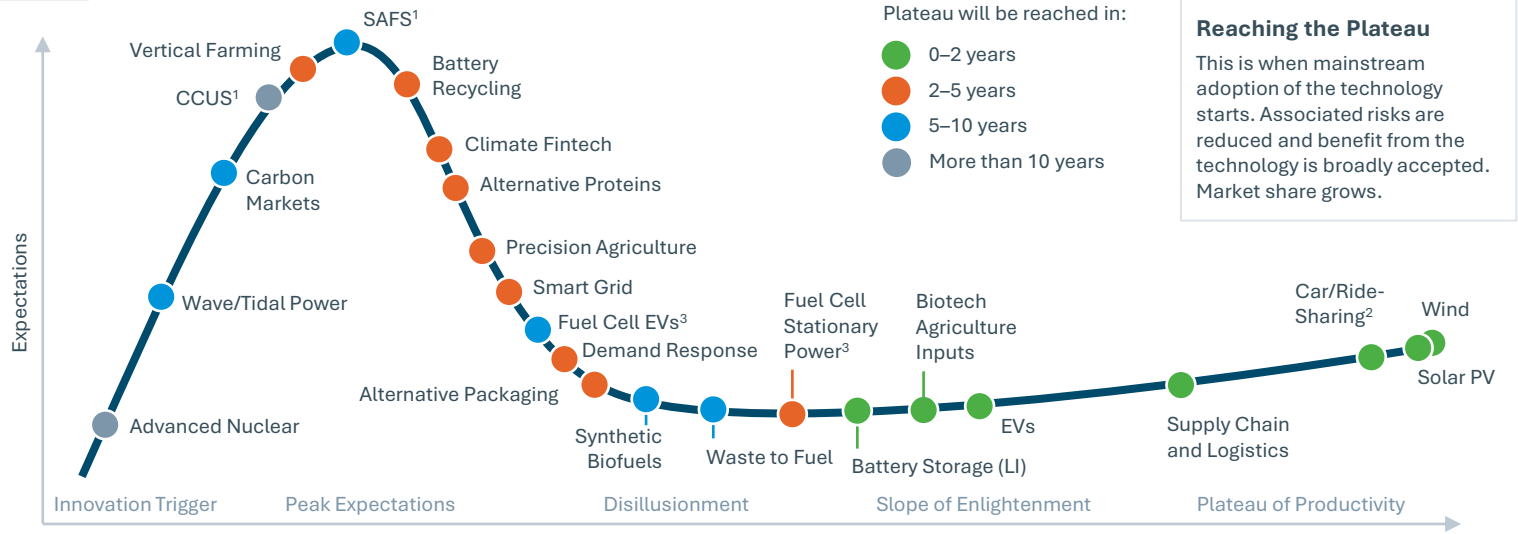
Source: United Nations Environment Programme, Climate Action Tracker, Fortune, IRENA, S&P Global, IPCC and SVB Analysis.

Get Hyped for Climate Tech

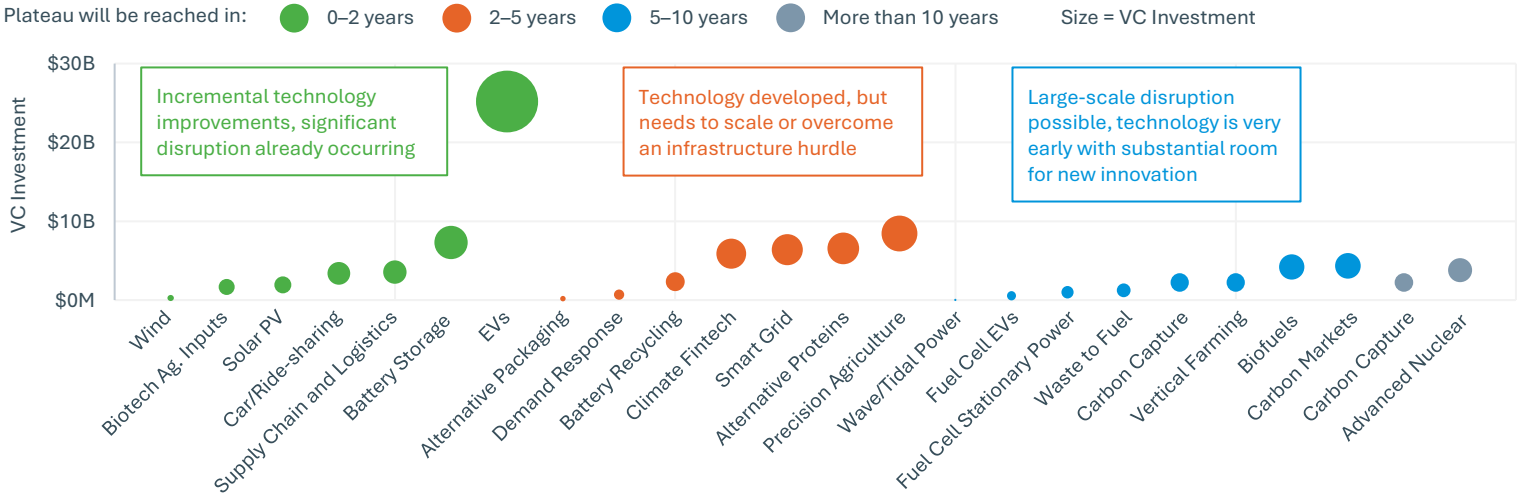
Climate tech has matured significantly since the "cleantech 1.0" boom. Then long, complicated and costly technology development cycles coupled with falling natural gas prices, strong overseas competition and investor short-termism meant things didn't work out well. Today, battery, wind and solar energy technologies have achieved scale to provide power at costs commensurate with fossil fuel energy. The advancement of these renewable energy technologies has laid the foundation for many climate tech innovations that require significant energy usage — a good example being green hydrogen production or electric transportation.

Climate tech is currently at an inflection point. Nearly all climate-related technologies existing today are positioned to achieve scale in the next 10 years. Electric Vehicles (EVs) epitomize the future trajectory of many climate technologies. The enabling technology, batteries, has been improved and scaled over the last 15 years. Once the battery technology matured, significant Venture Capital (VC) investment ($25B since 2017) followed, seeding a pool of fast followers to Tesla (like Rivian and Lucid Motors) and generating significant hype along the way. The EV trend has become too big to ignore, with nearly all major automakers following suit. Some added electric models to their lineup while others, like General Motors, made plans to only produce electric vehicles after a certain date. Significant progress has been made over the last two decades, however, infrastructure and supply chains need continued investment to scale to support this industry transition.

Select Climate Tech Innovation Hype Curve



Total US Venture Funding by Technology Maturity (2017-2021)



Notes: 1) Carbon capture utilization and storage (CCUS); sustainable aviation fuels (SAFs); Hydrogen fuel cells.
2) Car/ride sharing excludes companies such as Uber that effectively operate as a taxi service and do not reduce GHG emissions.
Source: Cleantech Group, PitchBook, International Energy Agency, MIT 2021 Global Change Outlook and SVB Analysis.

Deals and Dollars:

Capital Flows to Climate Tech

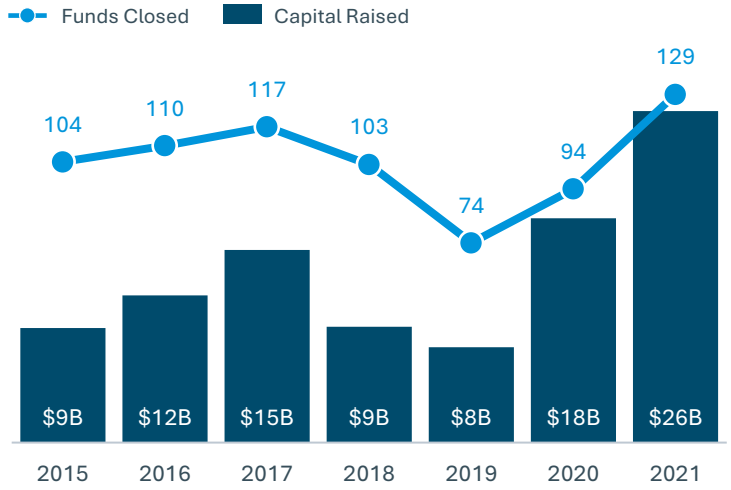
Climate Tech on a Hot Streak

In the mid- to late 2000s, funding for climate tech (formerly named cleantech) increased rapidly, as early-stage VCs rushed to invest in promising new technologies. As costs of alternatives fell, like natural gas and solar, growth was hard to achieve for US cleantech companies. This led to poor returns on investment and a reduced interest in the space. Today, we are again seeing climate tech reemerge, with VC fundraising increasing nearly 3x and investment increasing more than 5x between 2015 and 2021. VC investment in 2021 was 8x the last peak in 2008 of $7B.

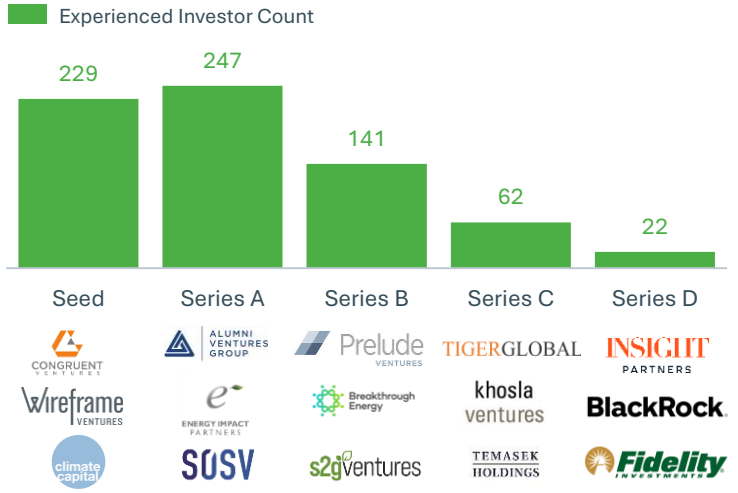
Early-stage investments are dominated by climate tech-specific investors, whereas late-stage investments have a high level of participation from large, generalist investors such as Tiger Global and Temasek Holdings. These investors have the ability to deploy more capital at a time, so push deal sizes higher. The median deal size for Tiger Global and Temasek Holdings in 2021 was $100M and $207M respectively, compared to the median Series C deal size of $52M for all investors.

The amount of capital required to fuel growth varies by sector. For example, transportation and logistics requires substantial capital to develop and build vehicles and/or infrastructure, as typified by companies like Tesla. By the time Tesla released its first car in July 2009, the company had raised nearly $950M (including $465M in debt).

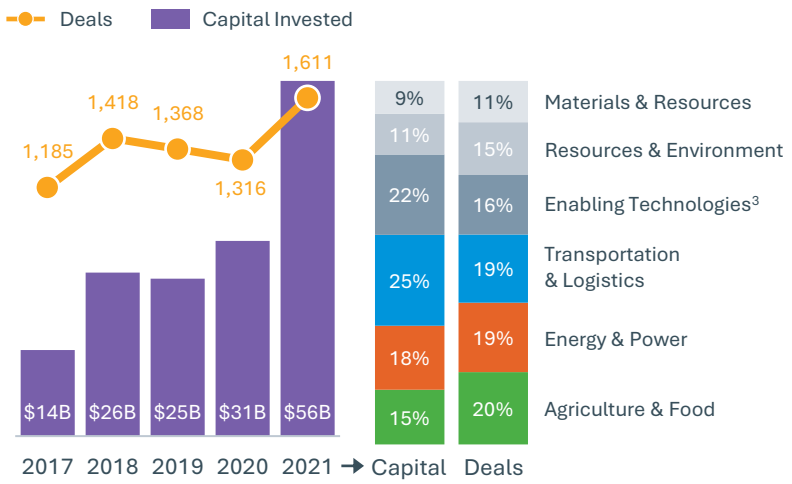
US VC Fundraising for Climate Tech[1]



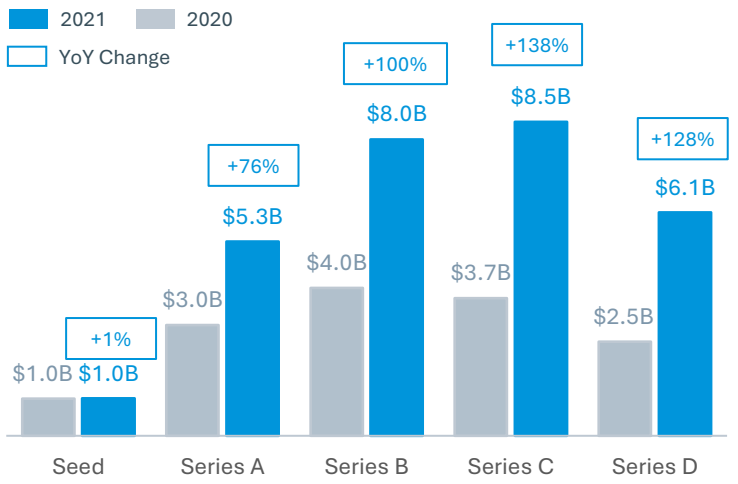
Experienced Climate Tech Investor[2] by Series



US VC Investment in Climate Tech Startups



US VC Investment in Climate Tech by Series



Notes: 1) For funds with a stated focus in cleantech, agtech or electric vehicles/hybrids. 2) Investors that have done at least five climate tech deals since January 1 2017.
3) Enabling technologies are technologies, such as AI, that can be applied to climate tech challenges, but may also serve oth er industries or serve multiple industries within climate tech.
Source: Preqin, PitchBook, Cleantech Group, and SVB Analysis.

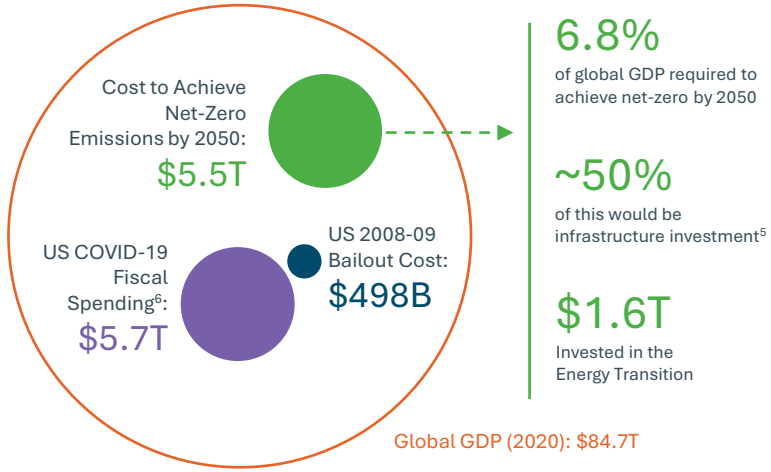
The Price is Right on Infrastructure

VC investment in climate tech is surging, but it is only part of the climate tech funding story. While VC is particularly effective at funding new technologies, significant infrastructure is needed to scale these new products and services. To illustrate, while VC has played a key role in funding new EV companies, significant infrastructure (e.g. charging stations) is required for widespread EV use. Simply, infrastructure investment must go hand in hand with climate tech investment.

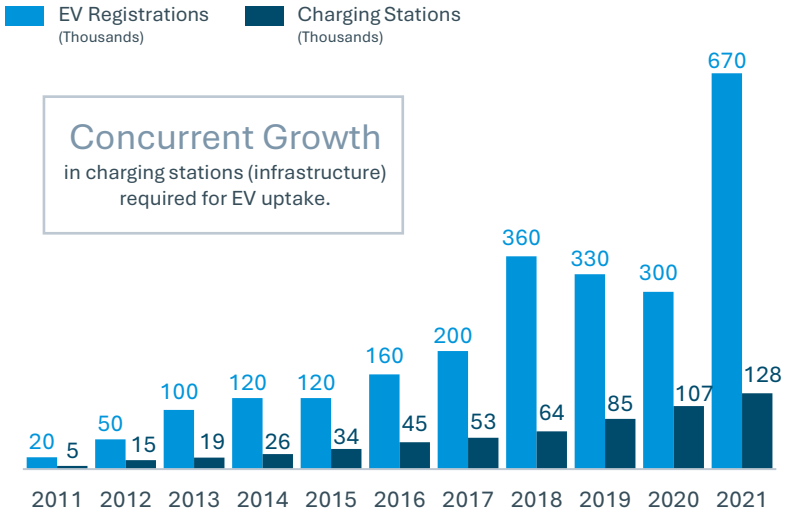
The amount of infrastructure investment needed globally can be difficult to pin down, but one estimate for the energy sector alone amounts to $1.6T annually. One of the largest areas of investment needed is the electricity network, where updates must be made to accommodate new renewable energy and efficiency technologies.

Large infrastructure investments are necessary to take full advantage of new clean energy investments, but funding for infrastructure projects can be challenging. Traditionally, bonds have been an important funding component for large infrastructure projects. The emergence and growth of green bonds therefore presents a promising funding mechanism. While governments have represented a large portion of green bond issuers, corporate green bond issuances have been increasing significantly, highlighting the importance of the private sector's role in infrastructure projects.

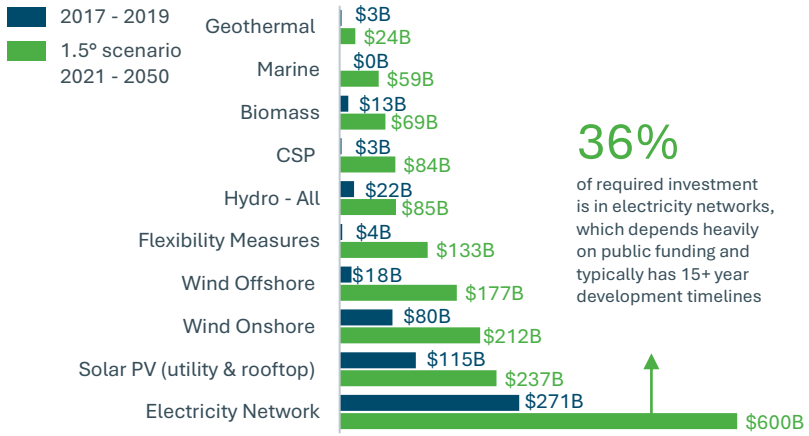
Annual Investment Required to Reach Net-Zero Emissions by 2050[1]



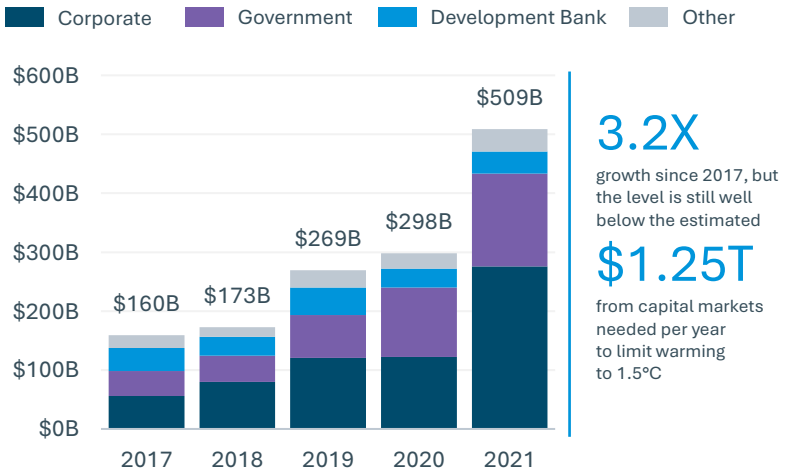
EV Adoption vs. Charging Infrastructure[3]



Global Average Annual Energy Investment to Reach Net-Zero[2]



Green Bond Issuances by Issuer Type[4]



Notes: 1) Meta analysis of average annual investment to reach net-zero carbon dioxide emissions by 2050. 2) Historical annual average investments compared to those needed to meet the 1.5°C scenario. 3) Data for the US; charging stations include both public and private electric vehicle. 4) Total amount raised by issuer type; "government" includes government-backed entity, local government and sovereign categories; "corporate" includes financial and non-financial corporations. 5) From Mckinsey Analysis of EU (27) countries. 6) Through Q1 2022.

Source: Bruegel, International Renewable Energy Agency, Climate Bonds Initiative, World Bank, MIT Sloan, ABC Today, International Energy Agency, US Department of Energy and SVB Analysis.

Benchmarking Growth:

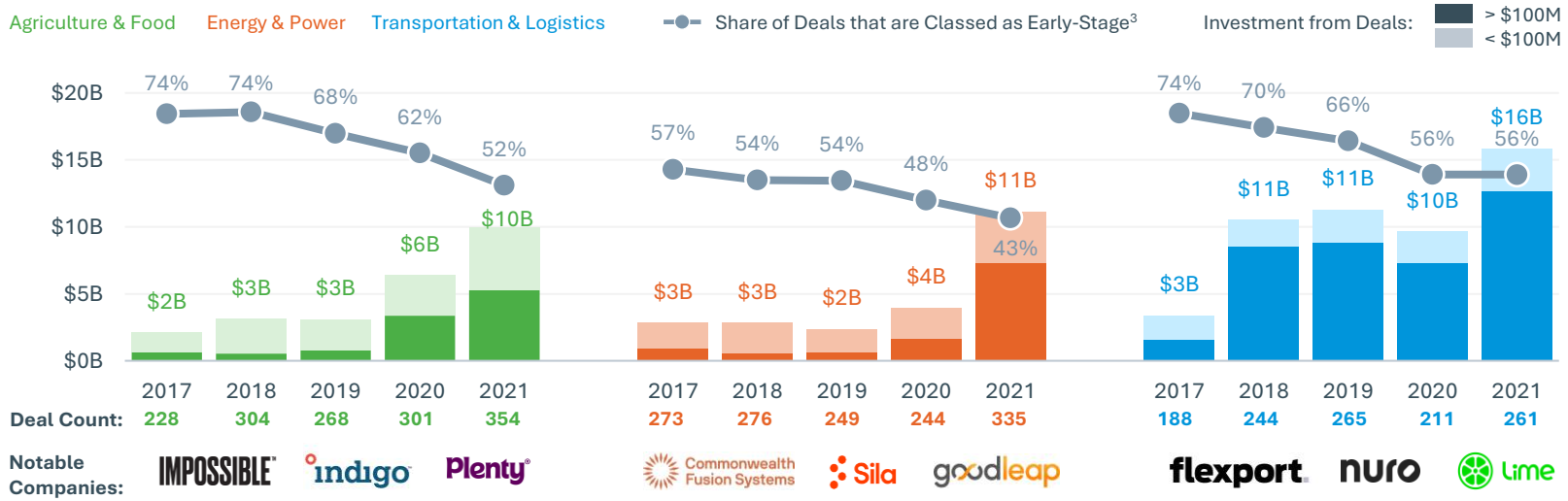
Investment, Company Financials and Sector Trends

Ventures' Rising Tide

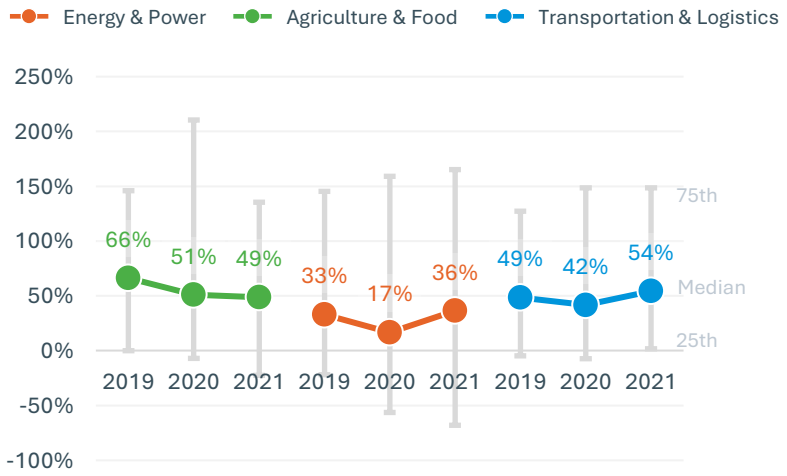
Climate tech is maturing, emphasized by the shift in investment over the last five years toward late-stage companies. New investors have entered the space as climate technologies have moved beyond proof of concept and started generating revenues. The share of deals over $100M has grown from 2% in 2017 to 8% in 2021. Energy and power saw the largest spike in investment last year, jumping from $4B in 2020 to $11B in 2021, driven by significant investment in nuclear fusion. The top three deals – Commonwealth Fusion Systems, Helion Energy and TAE Technologies – accounted for $2.6B of VC investment in 2021. Fusion has the potential to be a near-limitless source of clean energy without the dangerous fissile material byproducts. However, the tech is still a moonshot and requires immense capital to develop. Commonwealth, the most well-funded fusion startup, has raised $2.1B since opening in 2017.

In 2021, climate tech benefited from a strong year of venture capital investment. Revenues generally grew and valuations trended higher across all industries. However, macro trends had an outsized impact on climate tech. Upheaval in global supply chains caused pain to EV startups trying to secure key inputs like semiconductors. Conversely, gridlock offered opportunities for logistics startups. Flexport, a freight shipping platform, secured an $8B valuation in February 2022, after growing revenue 154%[4] during the pandemic. Russia's invasion of Ukraine has also had an impact. High oil and gas prices have spurred calls for renewables that would reduce the world's reliance on imported fossil fuels.

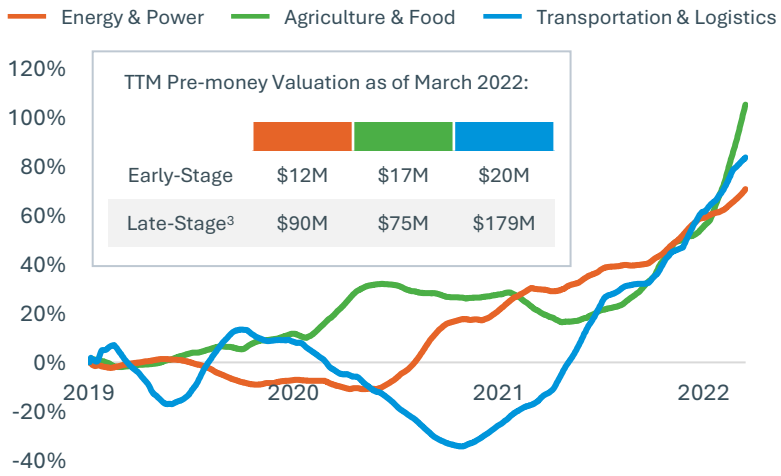
US Climate Tech Deals by Sector and Stage



Revenue Growth Rates by Sector[1]



Trailing Twelve Months Valuation Index[2]



Notes: 1) US companies with negative EBITDA and at least $1M in revenue. 2) Trailing 365-day median of early- and late-stage pre-money valuations equal weighted between early- and late-stage then applied 90-day trailing average to smooth index. 3) A later stage round of financing by a venture capital firm into a company. Late-stage is usually Series B to Series Z+ rounds and/or occurred more than five-years after the company's founding date. 4) As reported in Time (March 2022).

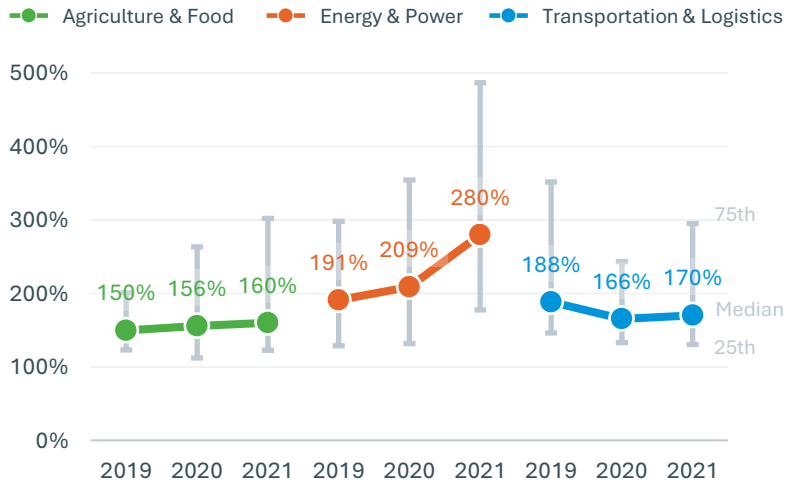
Source: Cleantech Group, PitchBook, SVB Proprietary Data, Time and SVB Analysis.

Growing a Climate Tech Company

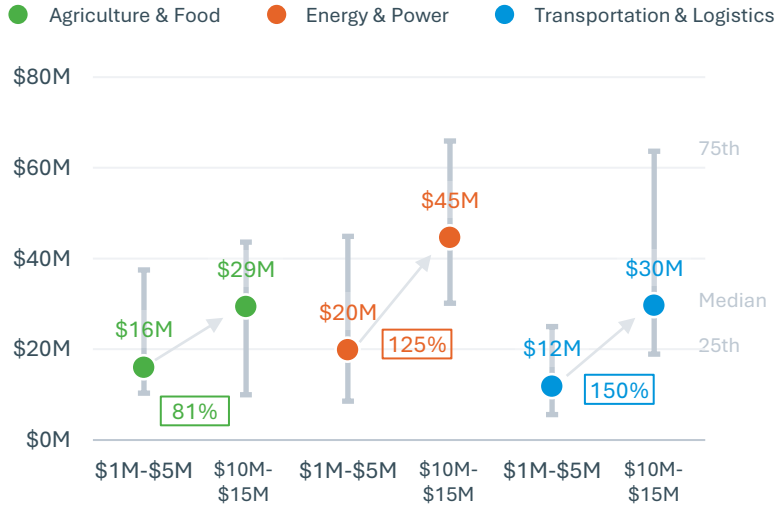
Scaling climate technologies is challenging. Extensive development timelines, capital intensive hardware and longer sales cycles are typical. This is especially true in the energy and power sector. For energy and power, the majority of deals (67%) are classified as "late-stage," yet the median private VC-backed company in the space only has $5M in revenue.

This is evident in the operating ratio trend. As the amount of capital required to scale revenues increases so does the operating ratio, which in turn decreases the EBITDA margin. The outcome is higher cash burn and a need to either raise more often and/or larger rounds. For energy and power companies working on renewable energy, EBITDA margins are sensitive to input costs and CapEx spend, which have both been impacted by supply chain disruptions and inflation. Energy and power companies at the early-stage had to raise roughly 1.5x more capital to reach the $10M-$15M revenue range than their peers in agriculture or transportation. Transportation and logistics companies had the largest step-up in capital raised (150%) to reach the next revenue threshold. This makes sense given prototypes of vehicles can rely on cheaper off-the-shelf components. However, to scale, these companies must build out supply chains and make substantial investments in production and logistics. Ensuring a healthy cash runway is critical, especially for industries with high expenses compared to revenues, like climate tech. The general rule of thumb is "12-18 months" cash runway, which the majority of companies in climate tech fall below. With such a high velocity of spend, having a strong fundraising strategy and committed investor base is critical.

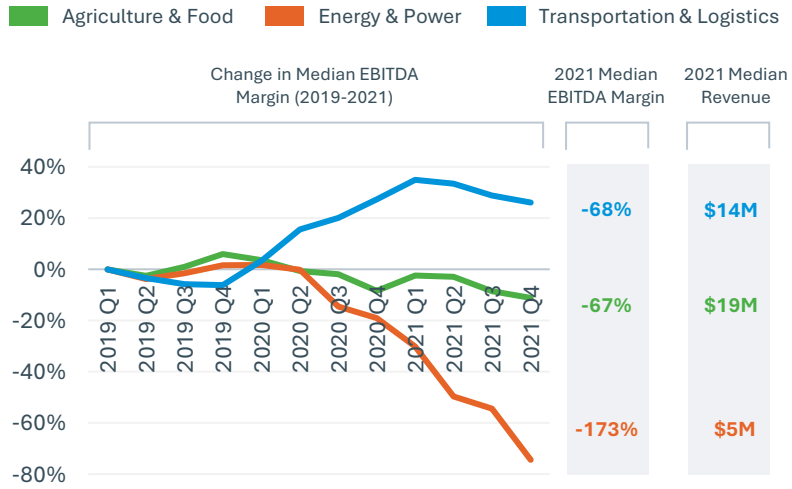
Operating Ratio by Sector[1,2]



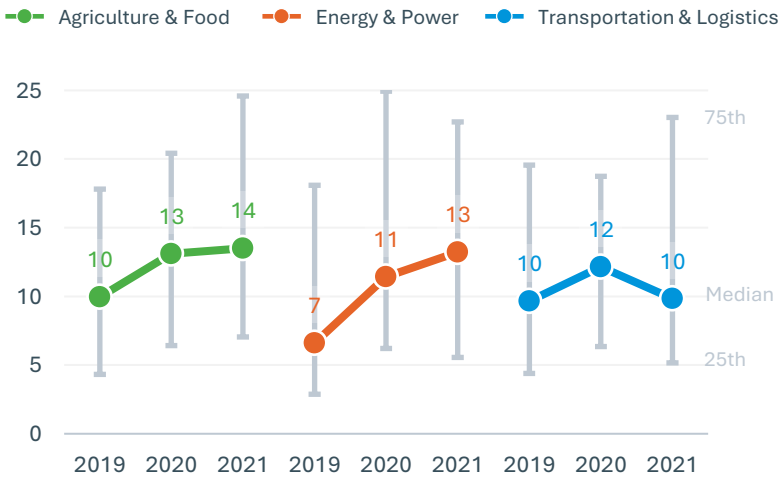
Capital Raised by Revenue Band: Early-Stage



EBITDA Margin Trend by Sector[1]



Cash Runway: Remaining Months Liquidity



Notes: 1) Cohorts consist of US companies with negative EBITDA and at least $1M in revenue; smoothed using four-quarter trailing average.
2) Operating ratio defined as operating expense plus cost of goods sold divided by net sales.
Source: SVB Proprietary Data and SVB Analysis.

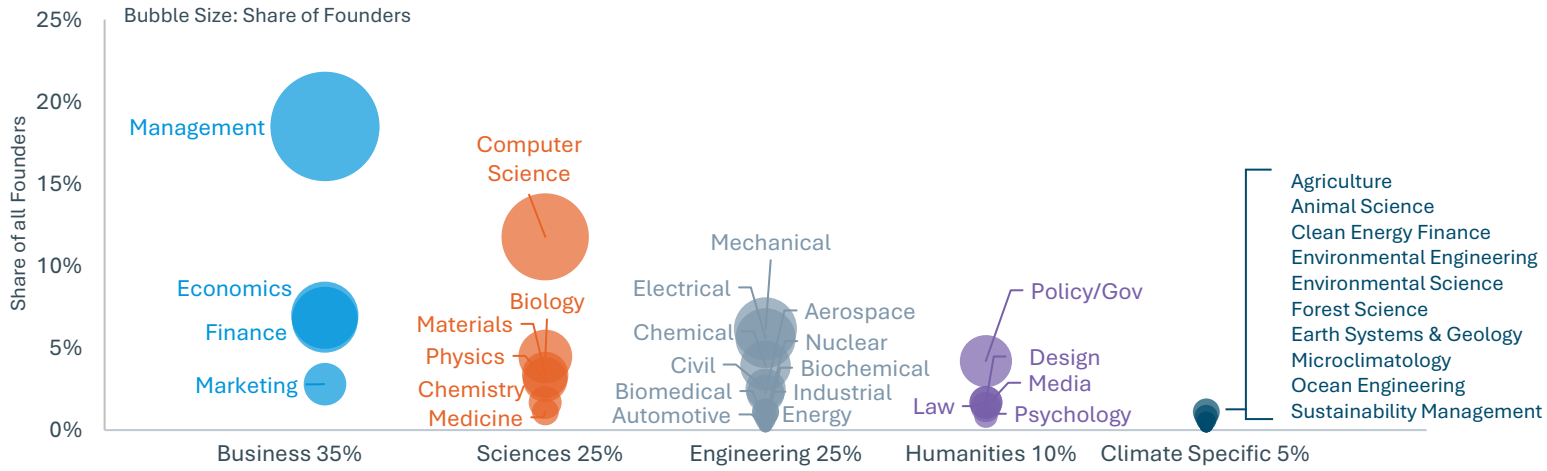
The Role of Academia in Climate Innovation

Climate tech is a broad field of interest, spanning advanced materials science, nuclear engineering and marine biology. Teams typically consist of engineers who have spun out of large tech firms accompanied by PhDs from various science and engineering disciplines aiming to build on their academic research. Then there are oil and gas veterans who are leveraging decades of traditional energy industry experience to bring renewables into the mainstream.

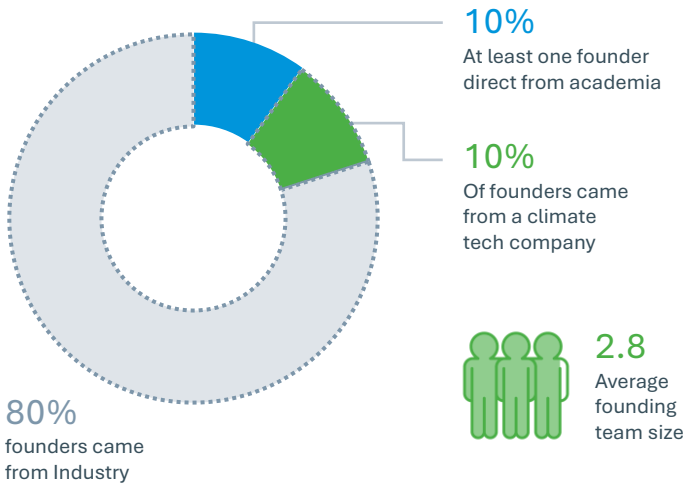
In 2015, the ratio of US oil and gas jobs to renewables and environment jobs was 5:1. By 2020, this ratio had contracted to 2:1. Universities are responding to this shift by introducing climate-specific degree programs. In 2006, Arizona State University established its School of Sustainability. Today, 96 universities in the US currently offer Sustainability Studies as a major. Stanford, a massive producer of budding entrepreneurs, is set to open a climate school in September 2022, bringing together and expanding on its existing initiatives.

Philanthropy is filling a key gap between research grants and private sector investment. Prime Coalition uses program-related investments to fund early-stage climate tech startups that would otherwise be too early for venture capital. Another example is The Slow Factory. Founded in 2011 as a nonprofit climate innovation lab and education institute, it offers open online courses and amplify sustainability initiatives happening across various fields.

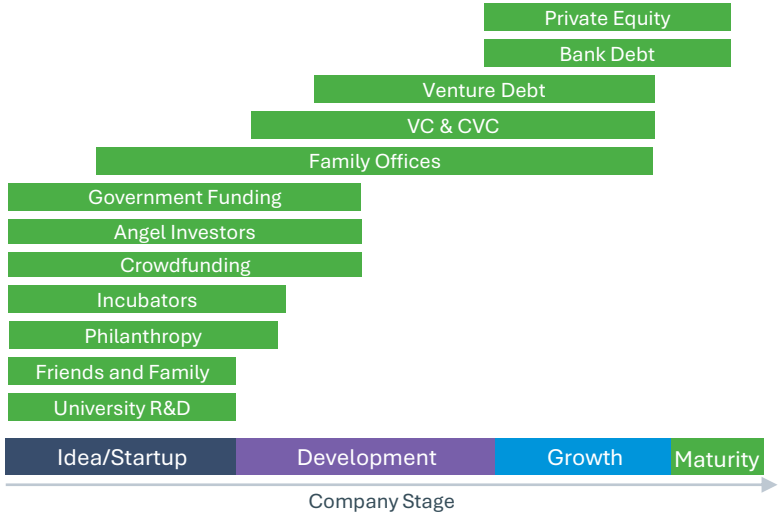
Climate Tech Founders of US Companies by Field of Study[1]



Founding Team's Background[1]



Funding Sources for Climate Tech Startups



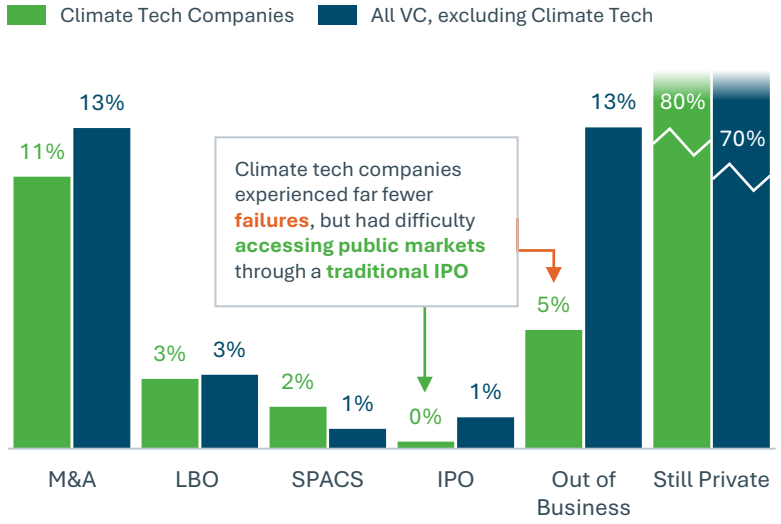
Notes: 1) Analysis of a cohort of Climate Tech founders' educational background and most recent academic degree and occupation.
Source: Pitchbook, LinkedIn and SVB Analysis.

Climate Tech Primed for Success?

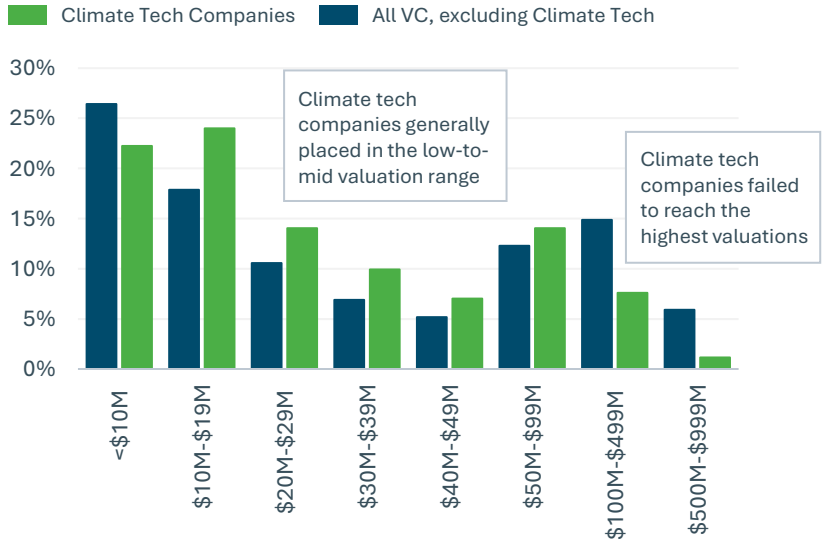
Climate tech solutions generally leverage so called "deep tech" — technology based on substantial scientific or engineering challenges (like nuclear fusion). Unlike software that underlies many VC-backed startups, deep tech solutions generally take significant time and capital to develop. In the case of climate tech, many solutions are also subject to a heightened regulatory environment, which adds time and cost. Furthermore, deep tech revenue models — mainly transactional — often aren't as scalable as subscription models. Many hardware companies are working around this by implementing hardware-as-a-service (HaaS) revenue models.

Based on an analysis of climate tech companies who first received VC investment in 2017, approximately 2% fewer had exited as of Q1 2022 than the overall tech ecosystem. A notable exception was the number that went public via a SPAC. Public market sentiment toward climate tech has been positive, with the Energy Impact Partners Climate Tech Index — which tracks public climate tech companies — outperforming the NASDAQ Composite Index since 2017. An increasing number of climate tech companies are becoming unicorns, with more than a 3x increase in the number of unicorns between 2019 and 2021 adding to the potential pool of companies looking to exit. In addition, more corporates and investors adding climate tech assets to their portfolios. As a result, exit activity soured in 2021 with 104 exits totaling $114B, more than any previous year. We expect the level of exit activity in the space to increase as climate and ESG trends come more into focus and the expectations of businesses grow.

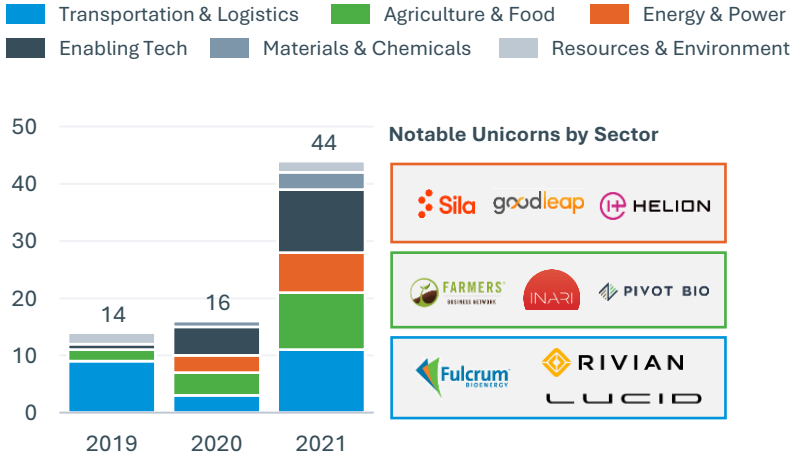
2017 Climate Tech Startup Cohort Outcomes[1]



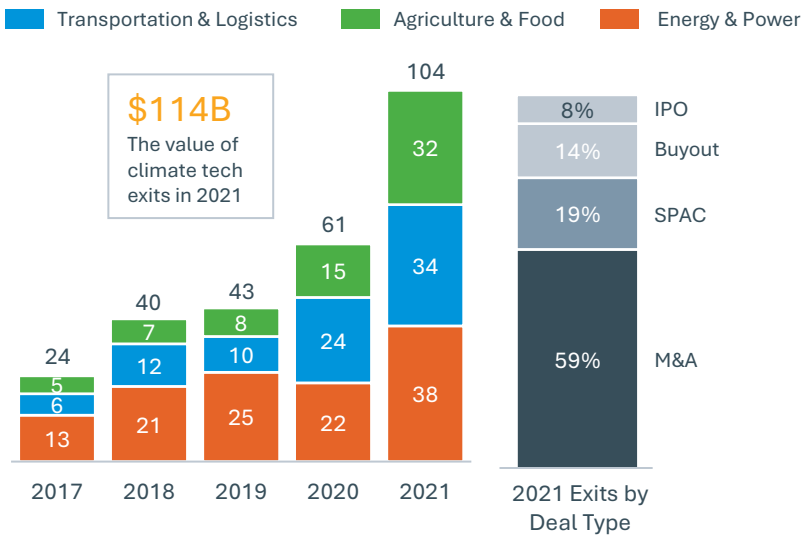
Valuation Distribution of 2017 Cohort[2]



US Climate Tech Unicorns[3] By Year and Sector



Climate Tech Exits by Sector and Deal Type



Notes: 1) US companies that raised a first venture round in 2017; out of business includes bankruptcy. 2) Companies that raised a first venture round in 2017 by last private valuation. 3) VC-backed company with a $1B post-money valuation.

Source: PitchBook, Cleantech Group, Energy Impact Partners and SVB Analysis.

Breakout Technologies:

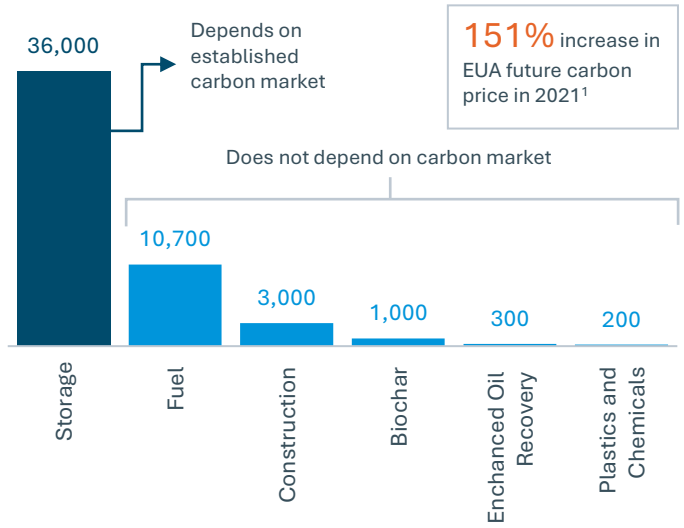
Carbon, Hydrogen, Agriculture and Green Cement

Carbon Capture Captures Investment

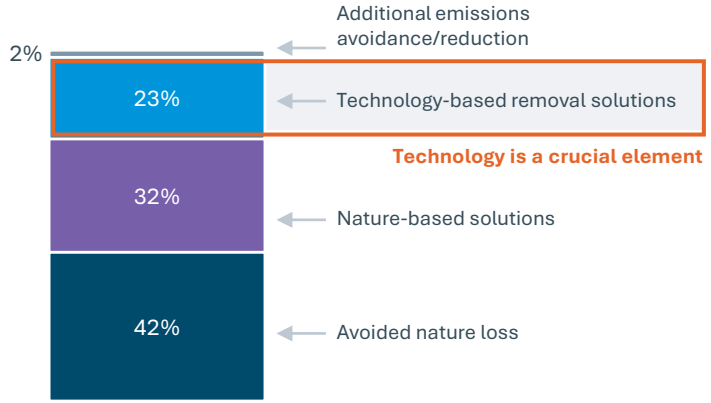
The majority of the carbon capture market today involves carbon storage, in the form of nature-based solutions, which leverage Earth's natural ecosystems to store carbon. Without effective carbon markets, storage alone isn't economically feasible. Carbon Capture Utilization and Storage will need to be a part of the solution to limit warming to 1.5°C. Technology-based solutions have the potential to upcycle carbon into useable products such as fuels, chemicals, and advanced materials. These technologies could scale to remove larger quantities of CO_2 than natural based solutions without the need for established carbon markets.

In 2021, nearly 100 new CCUS facilities were announced, up from just 38 in 2020. This growth is significant especially given the challenges of funding long-lived, capital intensive CCUS projects. However, the estimated current pipeline of projects would represent just 12% of the carbon capture needed to limit warming to 1.5°C. On the bright side, VCs are recognizing the opportunity in CCUS shown by a tripling of investment between 2020 and 2021. The most well-funded companies in the space have found ways to make use of carbon beyond sequestration, meaning their business models are viable without improvements to carbon markets. Oil and gas companies have embraced CCUS technology to offset their fossil fuel emissions and reach net-zero commitments. In 2021, Exxon proposed a $100B Gulf Coast project to capture 50M tons of CO_2 per year[2] – more than all CCUS projects currently operating. These types of large projects will be necessary to meet the growing demand for carbon offsets (credits) as major polluters commit to achieving net-zero emissions.

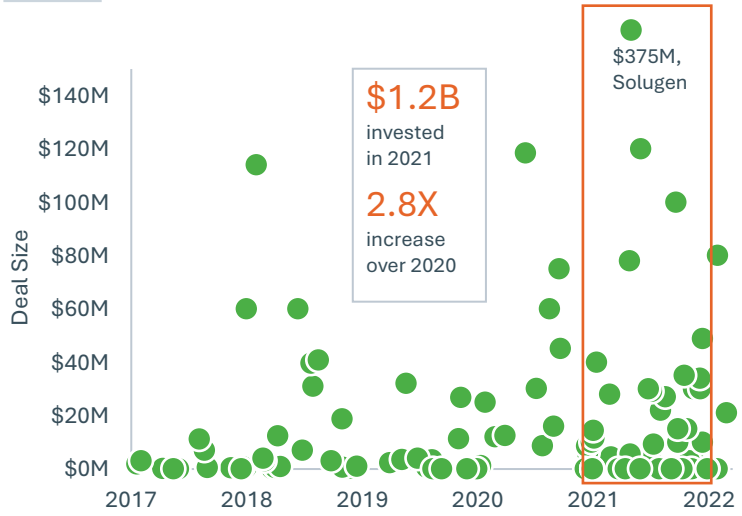
Potential for CCUS $MtCO_2$ in 2030[3]



Potential Carbon Credits Generated by Source (2030)



Carbon Capture: US VC Investment



Carbon Capture: Notable Companies

Company	Amount Raised	Use of Captured Carbon
LanzaTech	$580M	Fuels & materials
solugen	$440M	Materials & chemicals
monolith	$325M	Fuel & materials
SOLIDIA	$294M	Cement
NEWLIGHT	$214M	Advanced materials

Notes: 1) European Union Allowance (EUA) Between December 30, 2020 and December 30, 2021. 2) By 2030. Emissions would be captured from the Houston Ship Channel and pumped beneath the Gulf of Mexico. 3) Metric mega (million) tons CO2 (MtCO2).

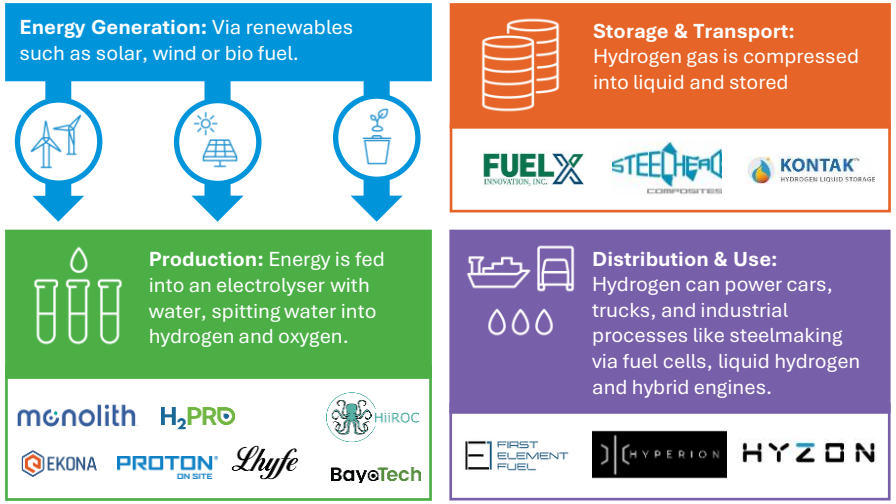
Source: Mckinsey, PitchBook, Cleantech Group, Bloomberg, IEA and SVB Analysis.

Hydrogen Gets the Green Light

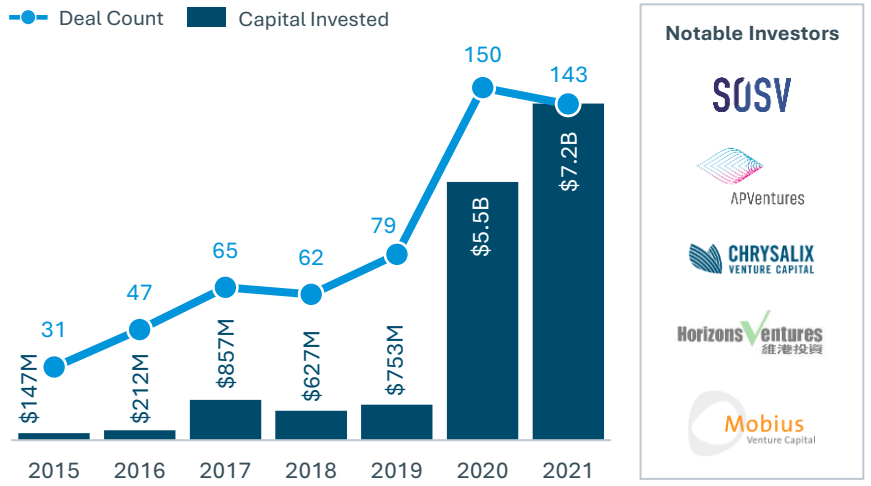
Cars, boats and aircraft powered completely by hydrogen have existed for decades, but going from concept to commercialization requires more than just perfecting the underlying technology. It needs to be affordable to a large enough market segment, infrastructure needs to be established to ensure ease of use, and production of the hydrogen fuel itself needs to be sustainable. Today, over 98% of hydrogen is produced by superheating methane or coal in a process called steam reforming. This is called "grey hydrogen", unless carbon capture is used, transforming the product into "blue hydrogen." Another method of deriving hydrogen is electrolysis, using electricity to split water into hydrogen and oxygen. If the electricity to do this comes from renewable sources, its referred to as "green hydrogen."

The infrastructure required to produce, transport, and use hydrogen is limited. Hydrogen cars have been commercially available in the US since 2013, but currently only 52 charging stations exist (all located in California). As part of the Bipartisan Infrastructure Law, $8 billion has been allocated for Regional Clean Hydrogen Hubs to expand the use of clean hydrogen in the industrial sector. The Department of Energy's Hydrogen Shot program seeks to reduce the cost of green hydrogen to $1 per kilogram within a decade through grants and programming to align key stakeholders. Today, according to European Energy Commission, grey hydrogen costs about $1.80/kg, blue hydrogen costs $2.40/kg. Green hydrogen, costs between $3/kg and $7/kg, a significant premium and headwind for commercialization and adoption.[3]

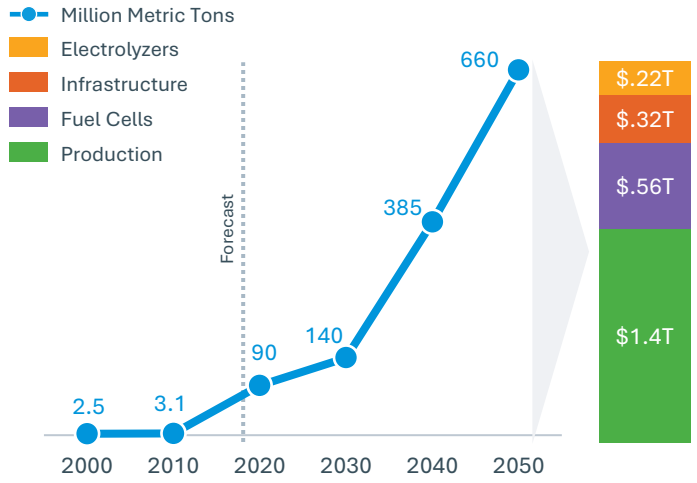
Green Hydrogen Supply Chain Landscape



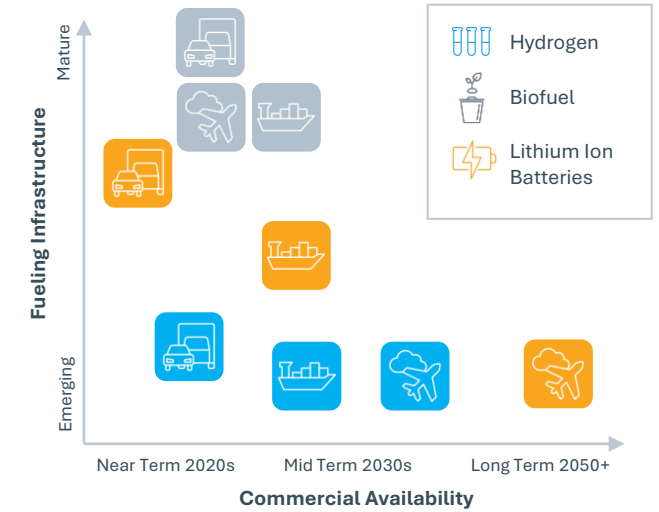
Hydrogen Global VC Investment[1]



Hydrogen Global Demand and Total Market



Alternative Fuel Commercialization by Transportation Type[2]



Notes: 1) Hydrogen includes companies facilitating hydrogen production, storage and transport, and distribution, fuel cells and components. 2) Transportation Types: Light to Heavy Duty Vehicles, Aviation, and Shipping. 3) Cost data s of July 2022.

Source: PitchBook, Bernstein, Hydrogen Council and SVB Analysis.

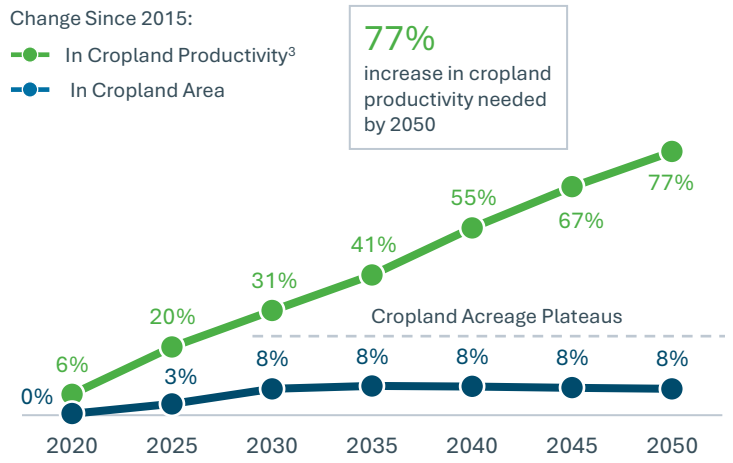
Agtech Crops up to Feed a Hungry Planet

Food systems contribute one-third of global GHG emissions, from land use, on-farm emissions, and pre- and post-production. The challenge is to reduce these emissions while feeding a growing global population with a finite amount of cropland. The solution to this problem is increasing crop yields using more efficient and sustainable production methods. MIT's Joint Program on Global Change estimates that a 1.5°C warming scenario requires a 77% increase in output per acre of cropland by 2050.

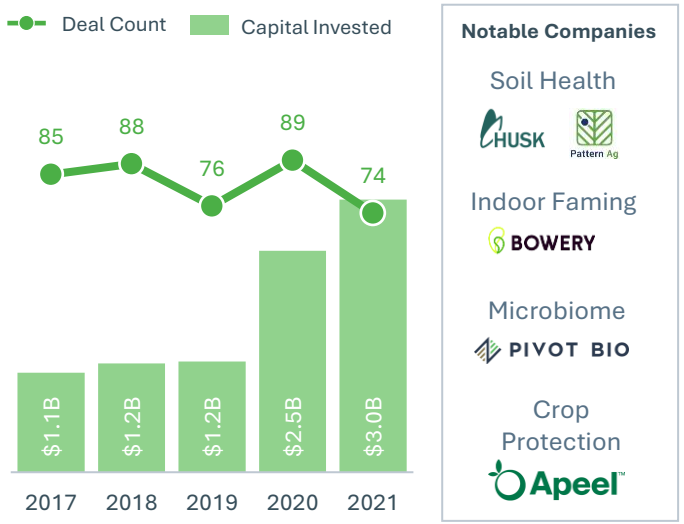
Technology developed for the agriculture industry, or AgTech, will play a key role in reducing GHG emissions and conserving limited resources. For example the development CRISPR gene editing technology can create plant varieties that are pest resistance and require less water. Another area is land management where firms, like Regrow, use a mix of satellite imagery and scientific models to produce real-time insights into how crops are performing.

Partnerships with large agribusinesses give startups the ability to scale using real use cases and help corporates meet sustainability goals. Farmers Business Network, for example, created a service called Gradable Carbon, which allows farmers to bank carbon credits and later sell them through their platform. Sound, a fertilizer company focused on reducing nitrogen, partnered with Shell to study how they can offset their emissions.

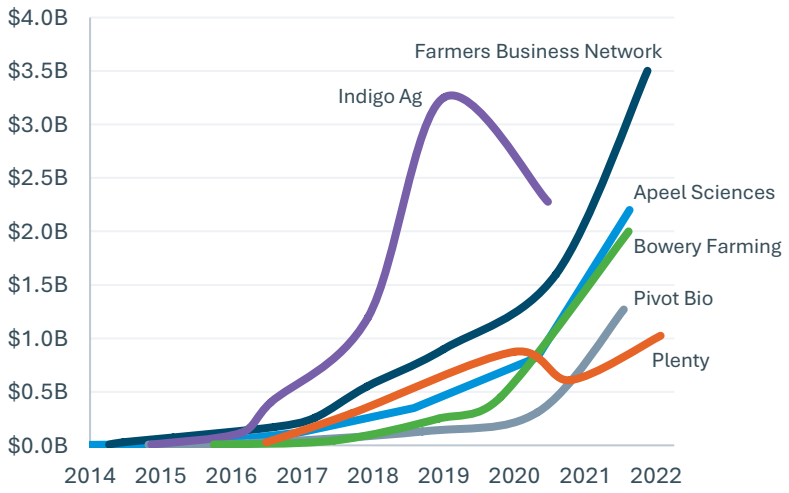
Global Cropland Productivity Required in a 1.5°C Warming Scenario[1]



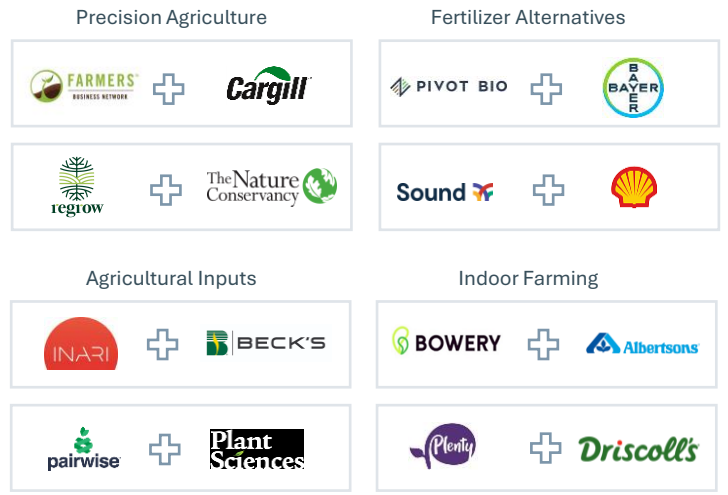
US VC Investment in AgTech



Select AgTech Unicorn Valuations[2]



Select AgTech Industry Partnerships



Notes: 1) Change since 2015; projections from MIT's Joint Program on Global Change "Accelerated Action" scenario.
2) Pre-money valuation. 3) Cropland productivity measured in $/unit area adjusted for inflation
Source: MIT Global Change Outlook 2021, PitchBook, Cleantech Group and SVB Analysis.

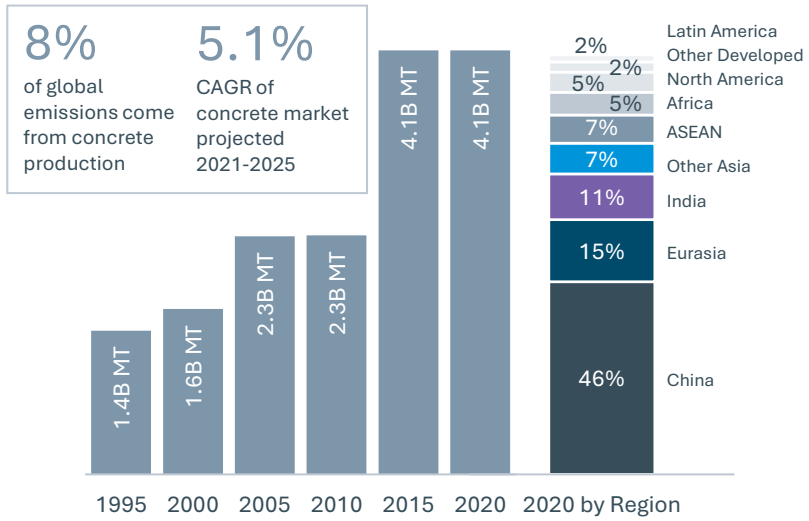
Green Cement Cures Climate Impacts

Second to water, concrete is the most consumed material in the world. The production of cement accounts for over 8% of total GHG emissions, and the market is forecast to grow around 5% a year between 2021 and 2025. Demand for concrete is highest from developing countries. China uses more cement every two years than the US used during the entire 20th century.[1]

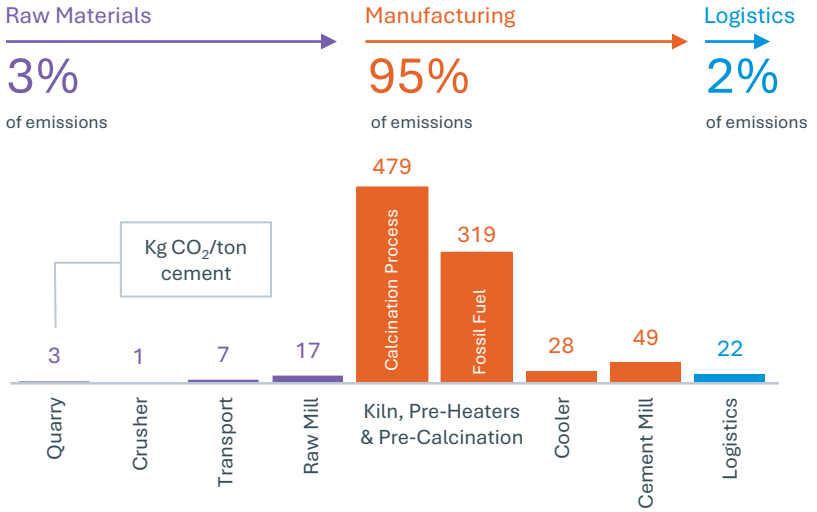
Yet the industry has the potential to decrease emissions by 76% through technological innovation. The majority of emissions from cement production (86%) comes from the kiln, pre-heaters and pre-calcination process, which involves high temperature industrial heating. By using hydrogen in this step instead of the traditional natural gas, cement production could realize a 30% reduction in GHG emissions. Other innovation in the green cement space include alternatives to cement such as Frotera that has developed active $CaCO_2$, which doesn't require the decomposition of limestone, or CarbonCure that sequesters CO_2 in concrete.

While growing rapidly, VC investment in the space is still relatively small. The majority of companies are still in their development stage with nine of the 12 deals in 2021 receiving early-stage VC or grant financing. Given the scale of the task to reduce greenhouse gas emissions, there is plenty of opportunity for startups. One cautionary note is the structure of the concrete industry makes it difficult to disrupt, with a few major players, such as Holcim and Anhui Conch, dominating the low-margin industry.

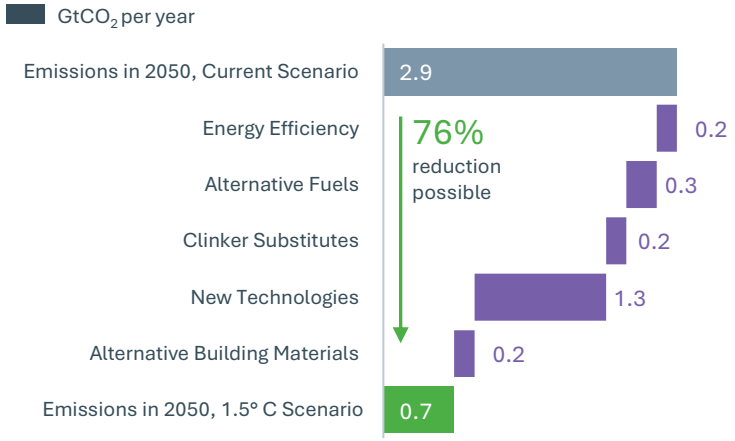
Global Cement Demand



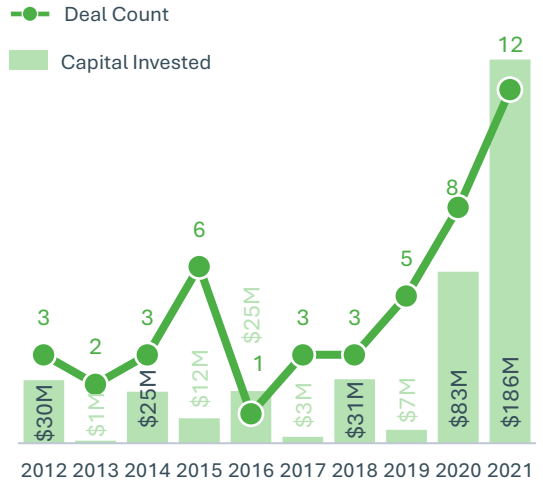
Cement Production Emissions Breakdown



Cement Emissions Reduction from Technological Innovations by 2050



Global Investment in Green Cement



Notable Companies
(Amount Raised)

SOLIDIA
$273M

BIOMASON
$98M

brimstone energy
$62M

Notes: 1) The US produced 4.4 gigatons of cement between 1900-1999, while China has averaged 2.4 gigatons per year since 2014.
Source: US Geological Survey, International Cement Review, Mckinsey, IEA, Research and Markets, Cleantech Group, PitchBook and SVB Analysis.

Outlook:

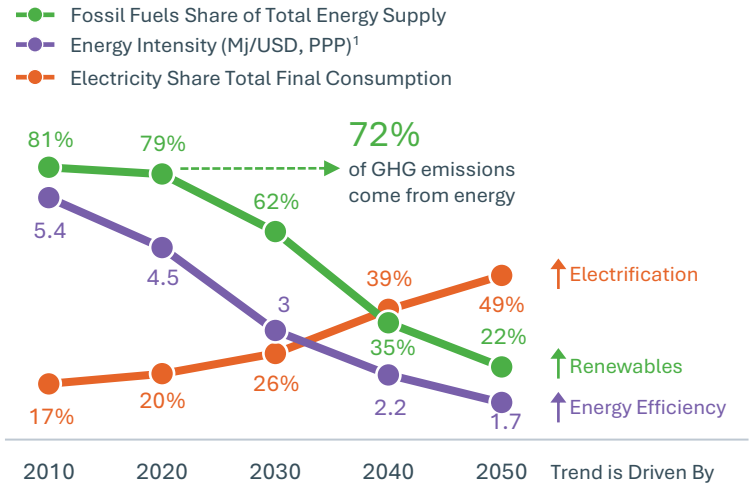
A Bright Future Not Without Challenges

A Bright Future Not Without Challenges

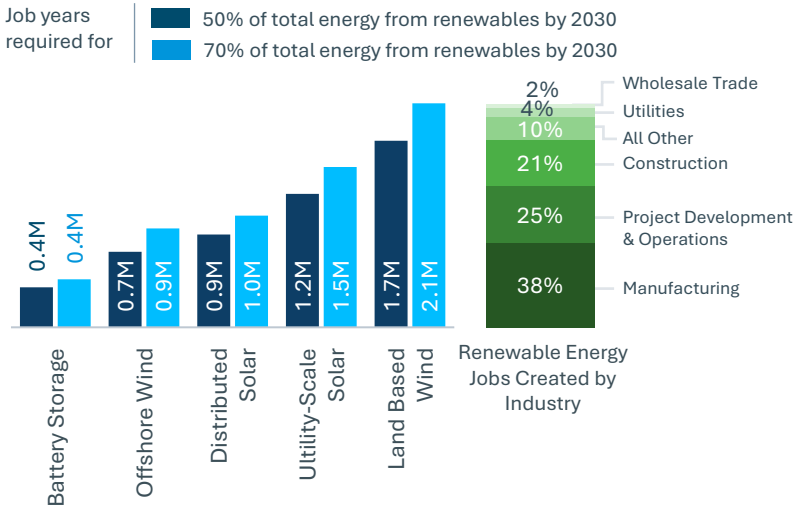
The energy transition is underway. Governments have ambitious climate targets in place and investment in the space is growing fast. Government targets are being accelerated and reinforced by geopolitical events that have illustrated the fragility of a fossil fuel-dependent energy system. Renewables accounted for 81% of new energy generation capacity in the US in 2021, increasing their share of total energy generation capacity to 25%. If we were to reach net-zero by 2050, electricity would need to account for nearly half of all consumption — nearly 30 percentage points higher than in 2020. The transition away from traditional energy production is a contentious issue as it puts livelihoods at risk. While not a simple transition, the growth in renewables presents a variety of new job types. Depending on the adoption of renewables, up to eight million new jobs could be created.

Electric Vehicles (EVs) are the most recent success story when it comes to changing consumer behavior to mitigate the progression of climate change. The current EV movement started in 2003 with Tesla, but has taken until recently to realize crucial economies of scale and broad market adoption, forcing legacy auto makers to follow suit. Further growth will come with challenges. Rising costs of inputs like semiconductors, caused by stressed supply chains, and the speed at which key infrastructure can be built, like charging stations, could hamper progress.

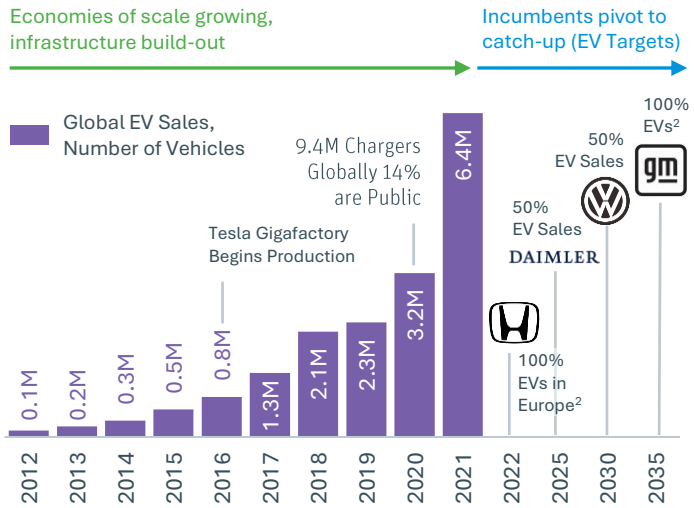
Energy Transition Under Net-Zero 2050



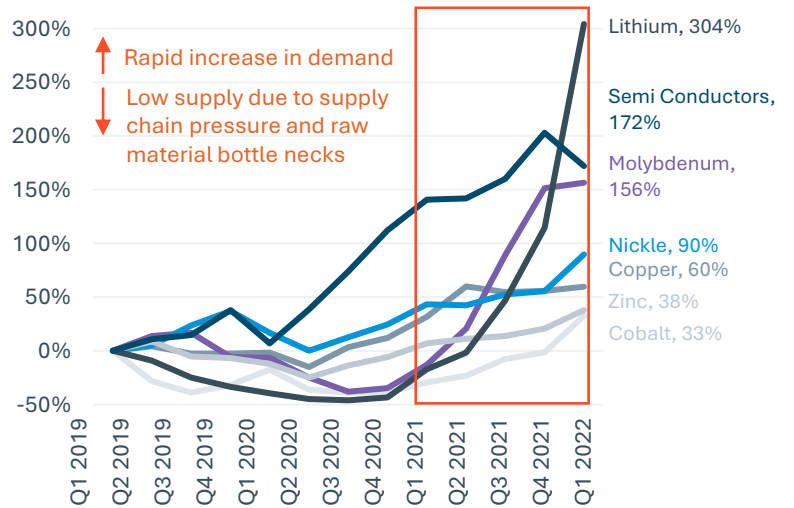
Renewable Energy Jobs Created in the US



Case Study: Electric Vehicles Adoption



Case Study: Select EV BOM Costs



Notes: 1) Megajoules per dollar GDP adjusted for purchasing power parity.2) exclusively Battery EV sales.
Source: BNEF, EV Volumes. Fortune, IEA, US BLS, S&P Capital IQ, Benchmark Minerals, Yahoo, CNBC and SVB Analysis.

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