

# Investing at the Vanguard of Climate Tech

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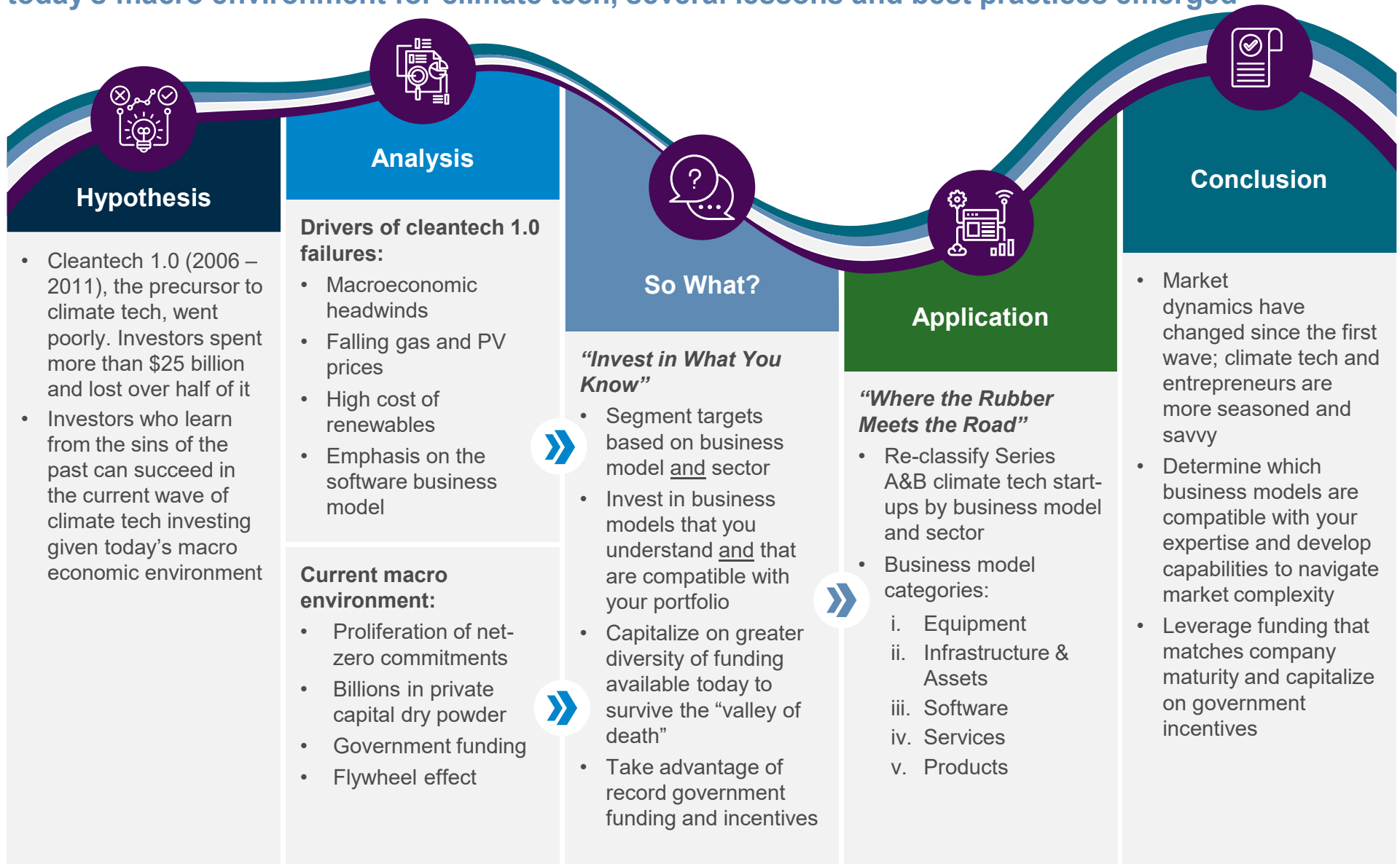
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# Investing at the vanguard of climate tech

Through examination of the pitfalls of cleantech 1.0 and exploration of the opportunities within today's macro environment for climate tech, several lessons and best practices emerged

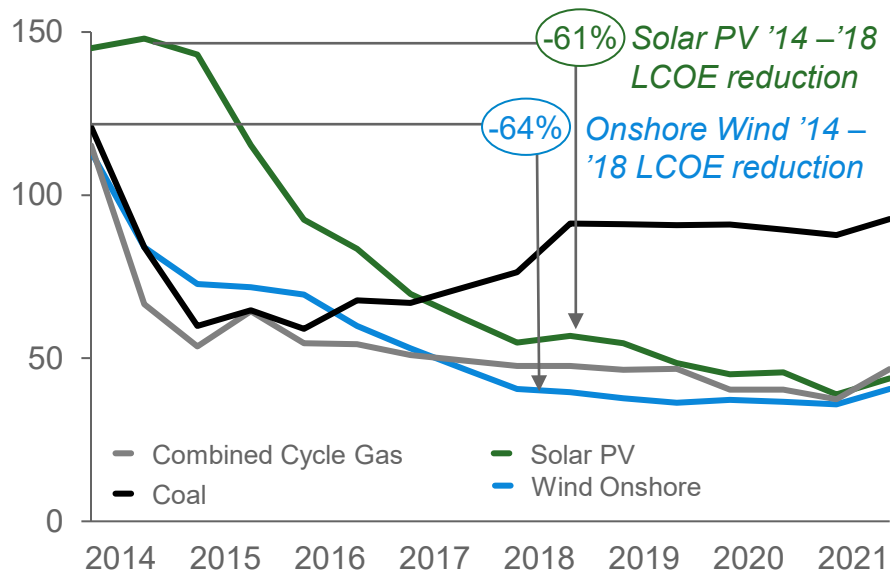


# Investors lost more than \$25 billion in the first wave of climate tech

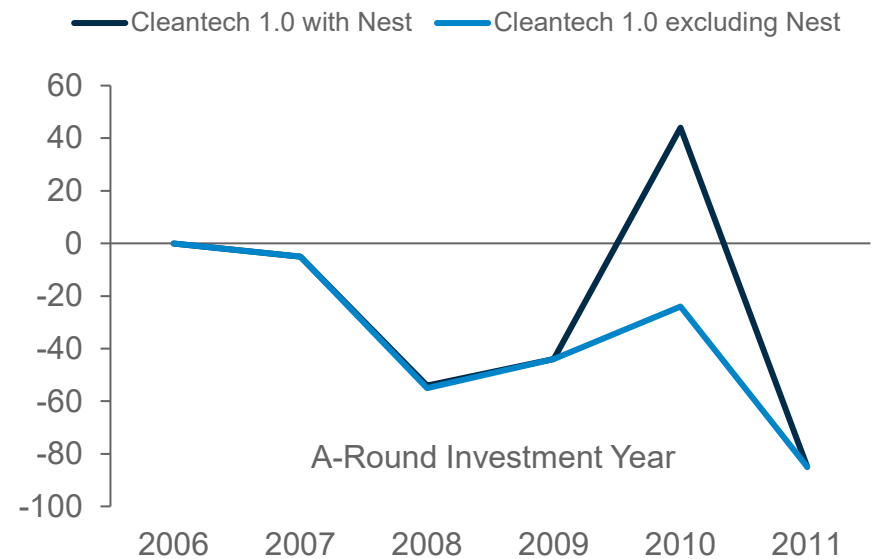
## Nest was the only cleantech 1.0 startup to defy the trend and sell to Google for \$3.2 billion in 2014

- Cleantech 1.0 refers to the first, narrower wave of climate tech investing between 2006 – 2011. During the five-year period, VCs invested over \$25 billion and lost more than half with high-profile failures like Solyndra
- Macroeconomic headwinds, including the global financial crisis, falling prices of natural gas, solar panel price collapse (the result of mass production), and the fact that renewables were not at parity with fossil generation, all contributed to the poor outcome of cleantech 1.0
- In cleantech 1.0, the predominant software/digital lens of Silicon Valley veterans distorted investor expectations. Revenue models for most companies in which they invested could not meet these expectations
- Nest, the only noteworthy success of the first wave, was as much a software play as a cleantech play. Excluding Nest, the average IRR of 2010 cleantech 1.0 investments drops from 50% to -25%

Estimated Levelized Cost of Energy (\$/MWh)



Cleantech 1.0 IRR 2006-2011 with & without Nest

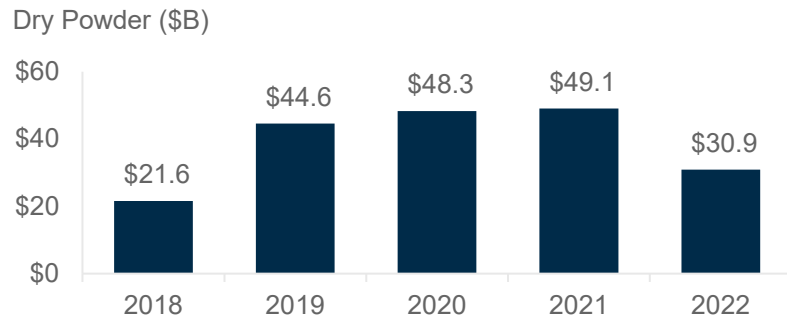


Source: MIT Energy Initiative

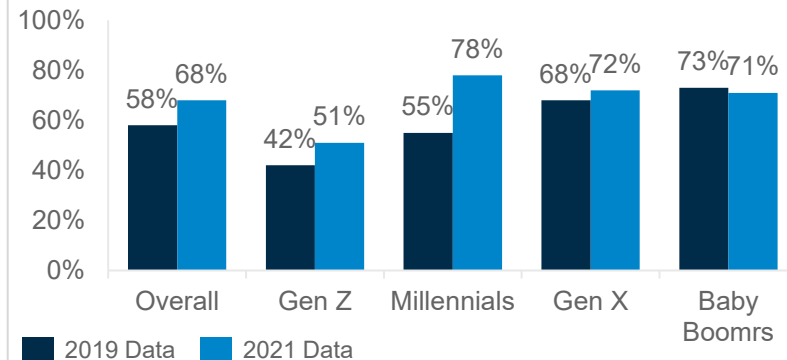
# Climate tech investors who learn from the sins of the past can succeed in the current macro environment

Billions in private capital and US government funding propel climate tech startups forward while consumer preferences for sustainability and decarbonization policies increase the size of the pie

## Reported Climate Tech PE and VC Dry Powder <sup>1</sup> Last 5 Years (\$Bs)

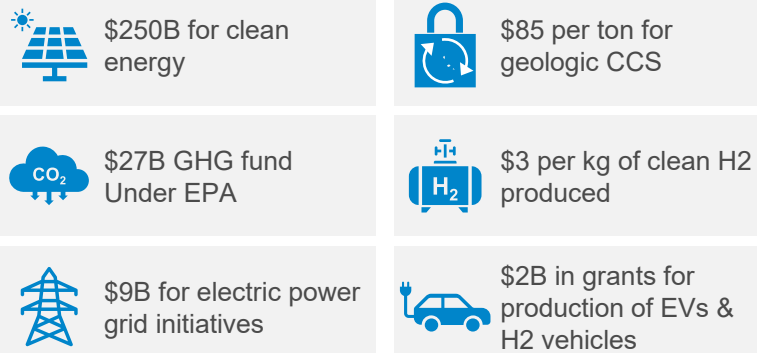


## Increasing Number of Consumers Willing to Pay More for Sustainability

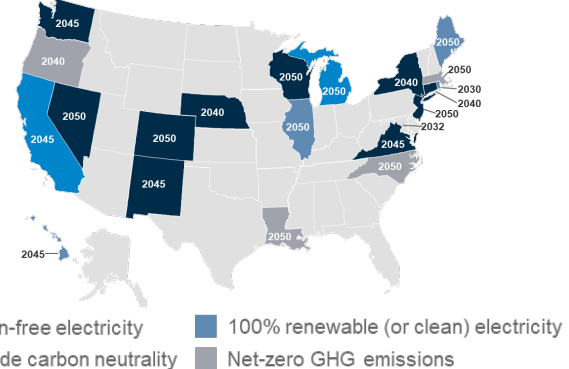


Source: First Insight & Wharton School

## Federal Funding Unlocks Hundreds of Billion for the Energy Transition



## State Commitments Driving Decarbonization

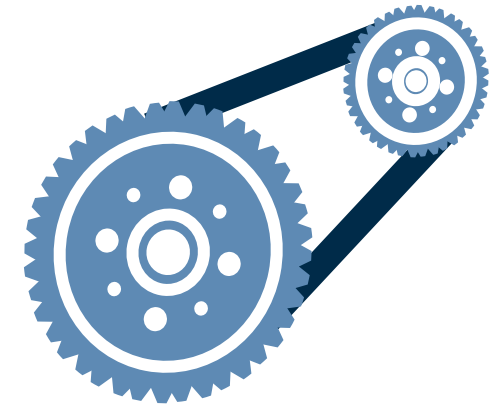


1. PE/VC dry power does not include corporate or public (stock market) capital being invested in the space

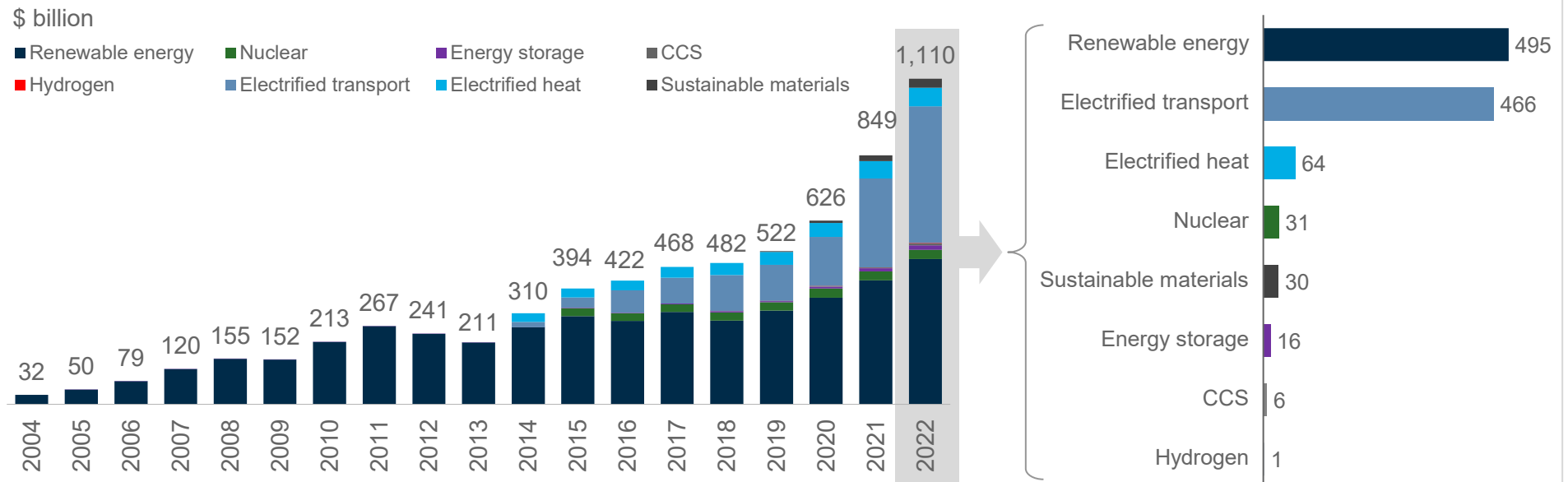
# Increasing capital deployment produces a flywheel effect

As trillions flow into decarbonization, the total addressable market grows, creating more customers and a broader range of product-market fit (well beyond traditional software market)

- In 2022, \$1.1 trillion was invested in the energy transition, with renewables and electrified transport representing ~90%
- Meeting Paris goals requires \$1.5 – 5 trillion/year through 2050
- As more capital gets deployed into the energy transition, the growing market requires increased diversity of products and services
- For example, in 2009, there were only a few battery electric vehicle (EV) models on the market, today there are 179, driving demand for EV-specific parts, charging infrastructure, grid-connected renewables, residential solar/storage, software and other services to support all aspects of the EV market



## Investments in Energy Transition are Accelerating – Global Investment Trends [billions]



# Oil & gas majors committed billions in energy transition investments and will play a critical role in climate tech

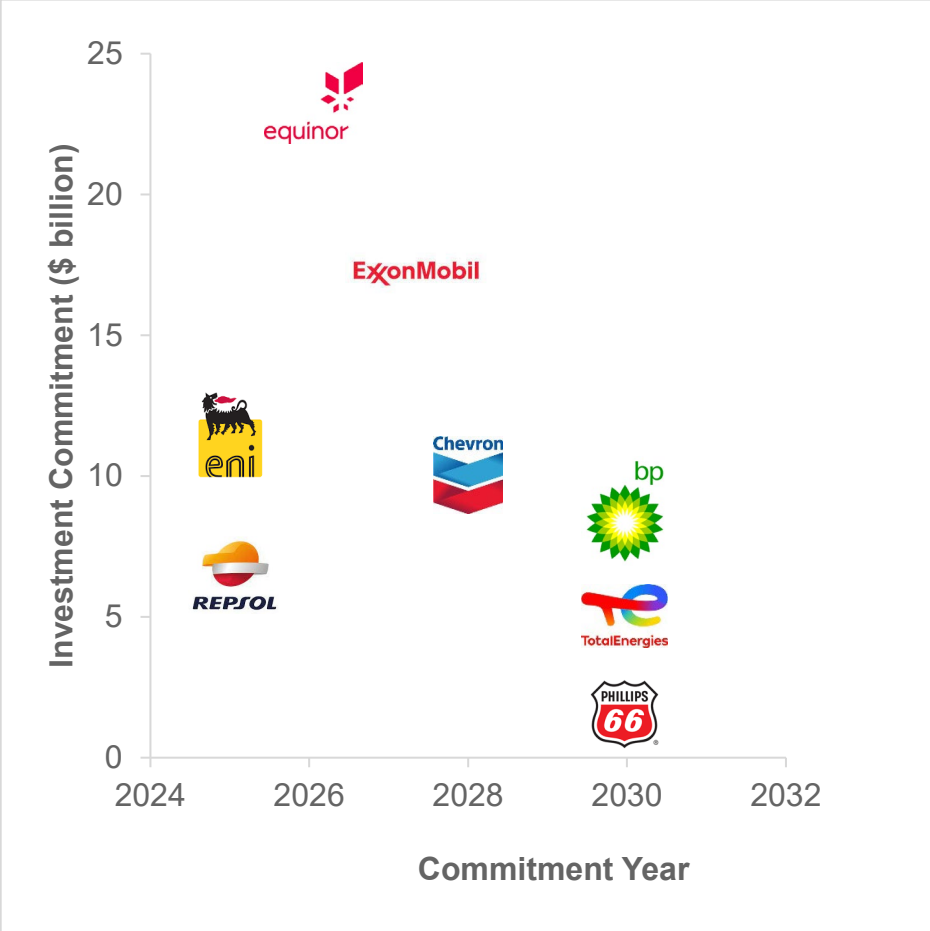
The role of oil & gas majors will accelerate as the funding requirements of climate tech grows and oil & gas majors deploy more of their multi-billion-dollar commitments

Oil & gas majors have made multi-billion-dollar commitments to decarbonization. They will play a critical role in climate tech through investments, know-how, partnerships, acquisitions and technology applications in their portfolios

Climate tech startups range from SaaS platforms to nitrogen-fixing bacteria, CO2 conversion, fusion power and everything in between, with widely different revenue models and innovation timelines

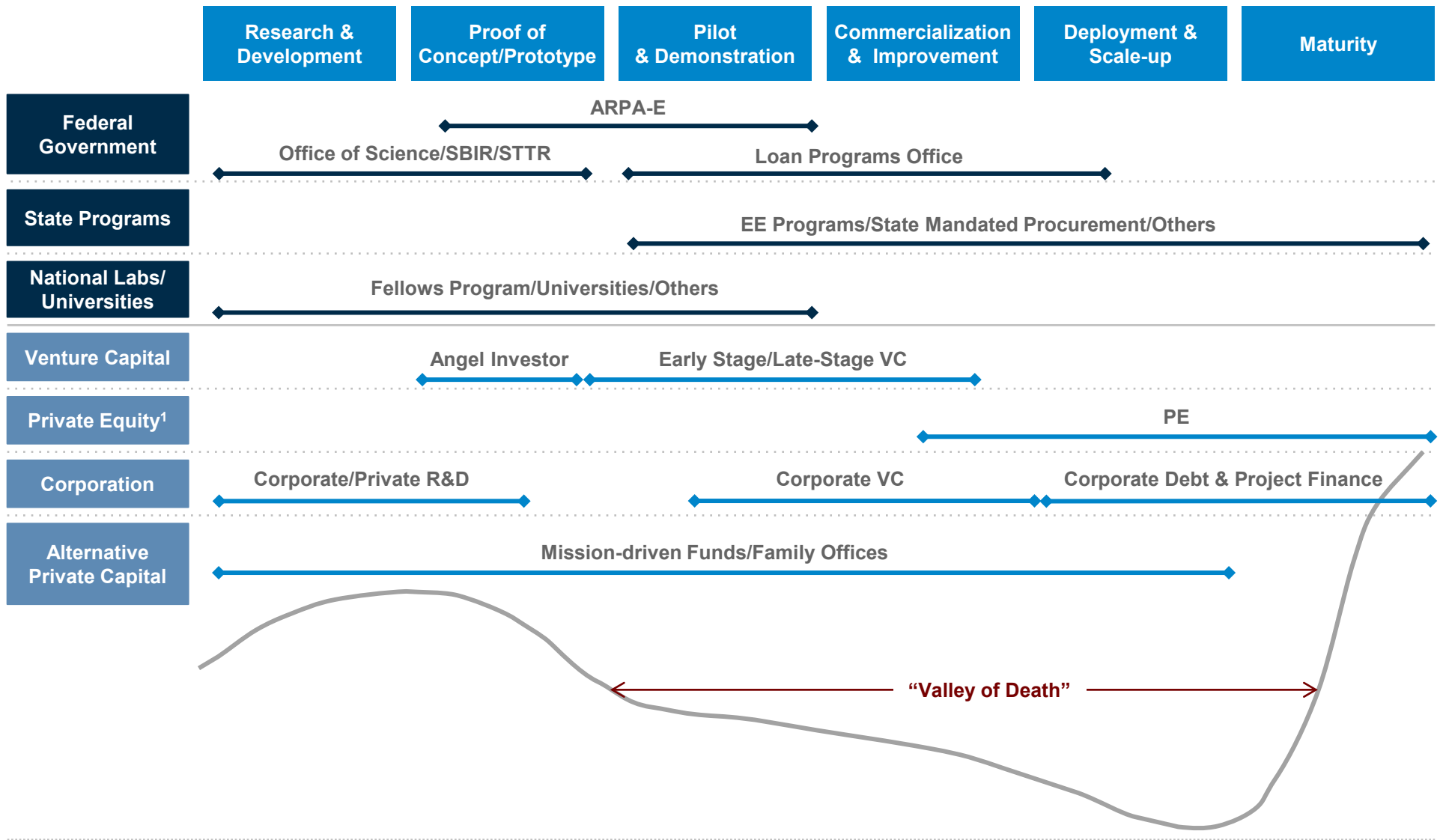
To achieve success, climate tech startups need a broader diversity of funding options as well as expertise, discipline, systems and market access, all things oil & gas majors can provide

## O&G Decarbonization Investment Commitments



Notes: Reflective of publicly announced commitments as of April 2023. Shell and Aramco have announced investment commitments without target year.

# Best-fit funding for climate techs varies based on maturity



1. Includes Private Equity with VC funds

**Note:** scope of financing reflects predominant focus of each group/program and does not account for possible exceptions to the rule

# Exit opportunities for climate tech startups remain robust and the entrepreneurs at the helm are seasoned and savvy

Private equity and established players are acquiring climate tech startups at an increasing rate, partially due to availability of capital and partially as a result of strategic decisions to buy-vs-build

US climate tech M&A activities remained healthy in 2022 and through Q1 of 2023, despite slow down in other sectors

Today's climate tech entrepreneurs are more seasoned and business savvy than they were a decade ago

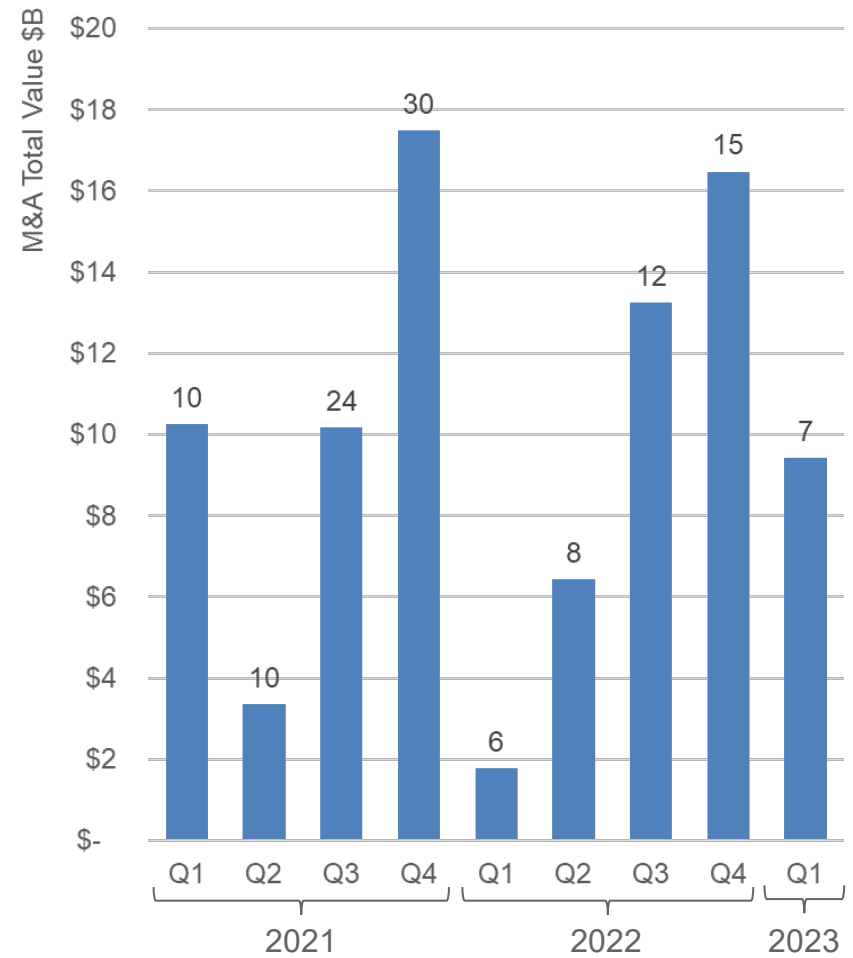
Dry powder in climate tech exceeds targets worthy of investment, creating enormous opportunities for successful exits, but risking over-valuation

Investors face trade-offs between cultivating new ventures organically and pressure to accelerate growth through acquisition

## Recent Noteworthy Transactions

- **October 2022:** BP acquired Archaea, a renewable natural gas developer and producer, for \$4.1B
- **May 2022:** TotalEnergies Acquired 50% of Clearway Energy Group, a renewable development platform, from GIP for \$1.6B
- **March 2022:** Shell entered a joint venture with EKI Energy Services to invest \$1.6B over five years in carbon offsets

## US Climate Tech M&A Activity (>\$100 M transactions) 2021 – 2023<sup>1</sup>





















1. Number above bars represents total deal count



# Business model and sector segmentation

Segmenting climate tech startups by business model and sector enables investors to identify sweet spots for investing based on their expertise and existing portfolio

	Energy & Power	Agriculture & Food	Transportation & Logistics	Resources & Environment	Building, Construction & Industry
Equipment & Hardware <sup>1</sup>	 ANTORA	 CARBON ROBOTICS	 ZEROAVIA	 JETTI	 RONDO
Infrastructure & Assets	 BASELOAD CAPITAL	 PLANT POWER FAST FOOD	 TUW TeraWatt	 CEMVITA	 BLOC POWER
Software	 AMPERON	 THE YIELD TECHNOLOGY SOLUTIONS		 VALIDERE	 measurabl
Services <sup>2</sup>	 gridX	 mill	 CONVOY	 Pachama	 75F
Products	 INPIPE ENERGY	 PIVOT BIO	 AIR COMPANY	 twelve	 Sublime Systems

1. Including deep tech

2. Including AI and analytics

**Note:** not exhaustive and not intended to address hybrid business models or multiple business lines

# How to avoid mistakes of cleantech 1.0 and take advantage of the energy transition flywheel

There is no silver bullet, but the climate tech market has evolved since the first wave. Today, there is greater diversity of funding to survive the “valley of death” and entrepreneurs are more seasoned



Determine which business models are compatible with your expertise and develop capabilities to navigate market complexity



Leverage funding that matches company maturity and capitalize on government incentives



Do club deals with diverse partners to maximize expertise and capabilities



Conduct value mapping of target companies' products and services to fully assess minimum viable product (MVP) and total addressable market (TAM)

# Glossary of terms

Acronym	Definition
<b>ARPA-E</b>	Advanced Research Projects Agency–Energy - US government agency funding advanced energy technology R&D
<b>Cleantech 1.0</b>	The first wave of climate tech investing occurred between 2006-2011 and focused on renewable energy and related companies
<b>Decarbonization</b>	The process of reducing or eliminating carbon emissions to mitigate the impacts of climate change
<b>EE</b>	Energy Efficiency
<b>Energy Transition</b>	The decarbonization of the energy mix and of industrial activities
<b>LCOE</b>	Levelized Cost of Energy - the average cost of generating electricity from a particular source over its lifetime
<b>Net-zero</b>	The balance between the amount of greenhouse gas emissions produced and the amount removed from the atmosphere
<b>Paris Goals</b>	Goals set out in the Paris Agreement to limit global warming to well below 2 degrees Celsius above pre-industrial levels and pursue efforts to limit the increase to 1.5 degrees Celsius
<b>SBIR</b>	Small Business Innovation Research - US government program providing funding to small businesses for innovative technology R&D
<b>STTR</b>	Small Business Technology Transfer - US government program providing funding to small businesses in partnership with research institutions for innovative technology R&D
<b>Valley of Death</b>	The Valley of Death is a stage in startup maturity during which a company has started operations but has not yet generated sufficient revenue and additional funding is difficult to obtain

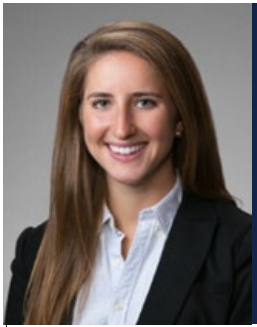


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