RESONANCE
ASSET MANAGEMENT

Addressing the Energy Transition Funding Gap
November 2024

Key Takeaways

1. Climate tech startups face two critical funding gaps: the Technology Valley of Death (concept to prototype) and the Commercialisation Valley of Death (prototype to market).
2. Late-stage funding for climate tech has significantly declined, with Series C volumes dropping 35% and growth investments decreasing 41% in 2022-2023.
3. A structural misalignment exists between venture capital preferences and energy transition climate tech characteristics, as climate tech typically requires longer-term, sometimes capital-intensive investments.
4. Major barriers to capital flow include insufficient government support leading to incomplete markets, short-termism of financing funds and their lack of expertise and sector knowledge, and incumbent competition from low-cost fossil fuel technologies.
5. Growth capital is essential for achieving system building across various technologies, necessitating strategic investments in low-carbon technologies and digital and resource efficiencies to accelerate progress toward a low-carbon energy transition.
6. Growth equity investors face the challenge of assessing a dynamic opportunity space across different geographies. Successful strategies will identify realistic, resilient, and scalable solutions that require growth capital to accelerate their development and the success of the transition.

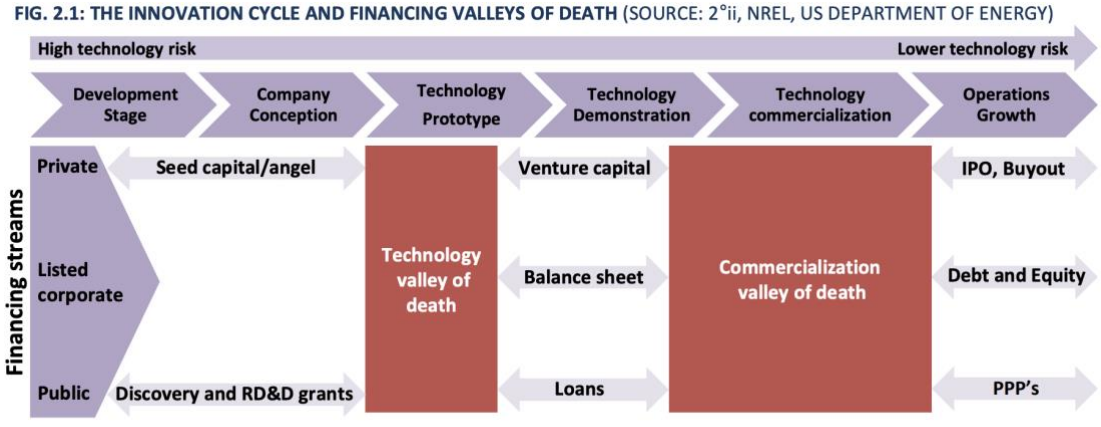
Energy Transition Funding Gaps

Technology start-ups supporting the energy transition navigate two critical 'valleys of death', potential funding gaps between development stages. The two are defined by the following:

1. **Technology 'Valley of Death'** - a new technology or idea needs to be transformed from a concept into a working prototype.

2. **Commercialisation 'Valley of Death'** - a technology is ready to move from prototype to market.

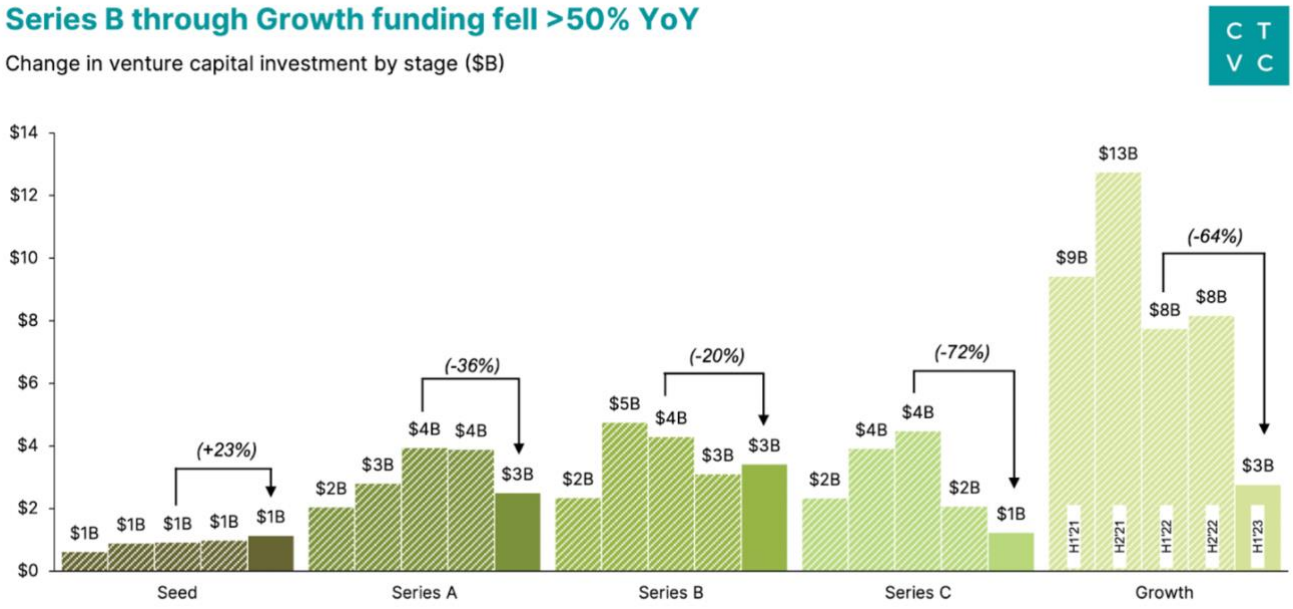
FIG. 2.1: THE INNOVATION CYCLE AND FINANCING VALLEYS OF DEATH (SOURCE: 2°ii, NREL, US DEPARTMENT OF ENERGY)



2.2 SOURCES AND VEHICLES OF FINANCING FOR LOW CARBON INNOVATION

The first 'valley of death' is somewhat mitigated by advancements in R&D and the availability of early-stage venture funding, as well as financing from academic institutions, government grants, and incubators that help bring new technologies to the prototype phase. The second 'valley' is where companies see critical constraints; the stage where they have built their pilot, proven it, and require further capital to scale.

In 2022 and 2023, climate technology companies experienced a significant decline in Series B, C, and later growth-stage funding, with Series C volumes dropping by 35% and growth investments decreasing by 41%.[1] The number of deals in both categories also fell by 30%.[2] The ratio of supply to demand for late-stage funding in 2023 hit a high of $1 to $3.24.[3]



The challenging macroeconomic environment of increasing interest rates increased the barriers to capital deployment; however, the figures reflect a structural issue in capital markets concerning climate tech investments.[4] This is evidenced by only 20% of the $270bn private capital raised between 2017 and 2022 for energy-transition-focused being dedicated to late-stage venture and growth-focused funds.[5]

Venture capital does not align well with climate and energy transition tech – VCs prefer asset-light innovations with short time frames for development and exit. Climate technology businesses can be more capital-intensive, operating in the energy / industrial space and its adjacent sectors, requiring a longer-term view and larger ticket size to achieve commercialisation.

On the other hand, large-scale private equity infrastructure funds in the sustainability space find the investment sizes of these climate tech ventures too small and the risks too high due to the lack of operational data.[6] This misalignment in investment models and risk profiles creates a financing gap for firms seeking to bridge the commercialisation gap and scale their innovations effectively.

Significant barriers are restricting the flow of capital and exacerbating the funding gap:

1. **Short-termism of financing funds –** most PE funds have short-term investment horizons; there is little financial incentive to invest in innovations that take time to scale up.
2. **Lack of skill set –** climate technology requires an understanding of the energy and industrial sectors and their associated infrastructure; this knowledge is not typical for tech VCs.[7]
3. **Insufficient government support** – targets and road maps are insufficient incentives to create certainty, on the other hand, policy dependence also threatens some new tech.[8]
4. **Incomplete markets –** Lack of market certainty increases the overall risk of long-term viability, reducing the attractiveness of the opportunity in the near term.

[1] Sight Line, Climate Tech Investment Trends 2023
[2] Sight Line, Climate Tech Investment Trends 2023
[3] Pitchbook-NVCA Venture Monitor Q1 2023
[4] Sight Line, Climate Tech Investment Trends 2023
[5] Bloomberg, Climate Tech's Dangerous Trek across the Valley of Death, July 2024
[6] AWS, Bridging the Climate Tech Valley of Death, 2011
[7] Breakthrough Energy Ventures, State of the Transition, 2023
[8] 2degrees, Financing the Clean Billion, Role of Investors and Policymakers, 2015

5. **Competition from fossil fuel technologies -** Achieving the transition requires climate technologies to compete effectively with incumbent, cheap, and low-risk fossil-fuel systems.

An effective growth fund can overcome these barriers by applying an appropriate strategy with the following characteristics: (1) a *long-term strategy* to de-risk solutions contributing to the energy transition, (2) a *robust due diligence* process to identify solutions that will succeed without subsidy support with (3) the ability to pick the *most effective business model* and *technologies that have an economic value proposition*, not just sustainable, that will sell in the current fossil fuel system.

Beyond the Second Valley – Achieving the Energy Transition

The low-carbon energy system requires 'system building' – a concerted effort from actors, institutions, governments and technology to create and diffuse new products and services to a related industry/sector. [9] In the context of the energy transition, this starts with government support to align stakeholders, incubate companies and encourage industry growth by de-risking investment, eventually, private capital is crowded in, and a self-sustaining market is achieved. The second 'valley of death' inhibits this process as critical component technologies of a low-carbon energy system lack funding from growth capital, slowing progress towards achieving the energy transition.[10]

Taking electrification as an example, the energy transition requires significant electrification in industries, transport, and heating to replace fossil fuels. However, intermittency alters the structure of the energy system as we know it and threatens the new systems' viability.[11] To substitute fossil fuels effectively and manage the shift, strategic investment is required across production, storage, and transmission technologies that consequently enable innovators in usage, developing efficiency enhancements, the electrification of industry, and heating. Growth investors play a crucial role in assessing the winning technologies in this space and driving a concerted investment effort to grow companies that provide interconnections for the electrical energy system.

The sustainable hydrogen market is another example of an energy system with the potential for achieving a net zero future. However, this sector is at an earlier stage of development. The technology for producing green hydrogen is not currently economically viable, making hydrogen an unattractive substitute for other fuels, hence restricting demand for hydrogen outside of the chemicals and fertiliser use cases. In this case, governments need to take the lead on de-risk investment in the short term while the market and its technologies move through their early stages.

Conclusion

Bridging the second 'valley of death' is crucial for accelerating the energy transition and building sustainable clean energy systems. Strategic investments in growth-stage companies are essential for developing critical technologies for a low-carbon and efficient future. While government support is vital for incubating early-stage technologies, private growth capital plays a pivotal role in scaling these solutions.

Different transition technologies across geographies have varying levels of maturity and financial needs. The challenge for growth equity investors will be in assessing the dynamic opportunity space.

Resonance's strategy seeks to identify **realistic**, **resilient**, and **scalable** technologies that require growth capital and are economically viable now to enable a low-carbon energy system in the future.

[9] Research Paper, Cumulative causation in the formation of a technological innovation system: The case of biofuels in the Netherlands, 2009, taken from Research Paper, Mobilising mainstream finance for a future clean energy transition: Finland, 2021

[10] Research Paper, Mobilising mainstream finance for a future clean energy transition: Finland, 2021

[11] Research Paper, Mobilising mainstream finance for a future clean energy transition: Finland, 2021