# ClimateImpact Presents: **Accelerating Climate Tech**

CLIMATE IMPACT

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# Introduction

It is often said of the race to net zero that we already have the solutions we need, they just need to be adopted. This is increasingly true; even in the hardest-to-abate sectors, technologies are being developed that will one day constitute the foundations of a sustainable society.

But in a race, speed matters. Whether we stay below 1.5 degrees of warming or overshoot 3 will depend on the rate of deployment of these new technologies. The adoption of some climate technologies, such as renewables, have consistently surpassed every annual projection for the last 20 years. While forecasters have assumed linear progress, the reality is that progress is *exponential.*

A new wave of climate technology development is now breaking, and the question facing governments, businesses and investors alike is how to enable them to reproduce that same exponential success. Doing so will be key to meeting climate targets and to take advantage of the extraordinary benefits that these innovations will bring.

This report will hold a lens to that critical question, gathering the experience of 15 leading CEOs across the climate space — from alternative meat to nuclear fusion, green cement to sustainable fashion. It will shine a light on the obstacles to scale up, highlighting four key areas to address:

- Finance
- Business development
- Policy and regulation
- Talent acquisition

This report will act as a starting point for investors, policymakers and founders to understand these barriers and help build the momentum to overcome them.

Stephen Murphy
Founder & CEO, ClimateImpact

# Finance

Acquiring capital is the most consistently mentioned obstacle to scale up for climate tech founders. At a time when climate-focused funds are proliferating and clean technology increasingly dominates the market, why is this a problem?

## INVESTORS ARE CAUTIOUS

VC investment in climate technology reached record levels of over $70b, in 2022.[1] However, geopolitical events and challenging macroeconomic conditions have since prompted dramatic falls in investment across all sectors over the last two years. Despite climate tech proving more resilient to this downturn than other sectors,[2] there remains significant pressure on founders to have strong evidence of future financial success.

That pressure builds on residual caution from the CleanTech 1.0 experience between 2006—11, when American VCs lost considerable money in climate technology investments.[3] Although the new wave of technology is very different in nature and the global environment is now much more favorable the bar has been raised for startups seeking investment compared to 16 years ago. This is especially the case in newer and more niche fields where expert investors with the necessary technical knowledge are rare.

> *Over the past 18 months, securing funding for such ventures has been particularly challenging. Investors have become more cautious, demanding clear evidence of customer traction, product viability and unit economics* - **Notpla**

## THE FINANCIAL PROFILE OF CLIMATE TECH MISALIGNS WITH AVAILABLE FINANCE

The difficulties hit climate technologies particularly hard because many are hardware based, an attribute that carries two significant implications. Firstly, they often require high up-front capital expenditure to build physical infrastructure; financing a first-of-a-kind facility frequently costs $30m-$50m, this investment comes with significant risk when technologies are not yet commercially proven. Secondly, there are usually long time frames to profitability, and it can be 10 to 15 years before return on investment is realized.

This combination causes climate tech firms to fall between the cracks of the main capital providers:

- VCs are used to enable faster returns and lower capital intensity.
- Private equity normally invests in cash flow-positive companies, which doesn't apply to most climate tech scale-ups.
- Banks have a low tolerance for risk, and require proven track records before lending money.

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1. "Defying gravity, 2022 Climate Tech VC funding totals $70.1B, up 89% on 2021," Holon IQ, 3 January 2023
2. *"Climate tech," Dealroom.com, site accessed 7 September 2024*
3. *Di Tang, "Climate Tech's Evolution: The Maturation to a Competitive, Returns-Focused Thematic Investment Sector," Cambridge Associates, February 2023*

With all these traditional investors alienated from participation, there is dearth of funding between early-stage venture capital and mature, revenue-generating companies — an estimated £1.5b shortfall in the UK.[4]

The main remaining sources of capital are grants, incentives and sales. Scale-ups often don't have the resources to leverage the full suite of grants and incentives available, especially given the rapidly evolving and complex ecosystem across geographies and short application windows. Sales come with their own challenges, which will be explored in detail during the next section.

> *Early-stage venture is really excited about breakthrough ideas and growth capital is excited to scale revenue-generating businesses, but physical businesses (unlike software) require more building time between breakthrough and revenue. There are few mechanisms well-suited to fund this challenge*
> - **Fork and Good**

# THREE SOLUTIONS

## SUPPORT FOUNDERS TO IDENTIFY AVAILABLE CAPITAL

To deal with the difficult financial profile of climate technologies, founders need to assemble a stack compiled from multiple sources, layering up government grants, VC funds, debt and project financing. Navigating the complexity of a fragmented landscape of capital is difficult, and founders need better support in this process.

## DEVELOP NEW ASSET CLASSES

Investors have a responsibility to convene and devise innovative ways of funding more difficult projects. Combining asset classes into new structured funds, or creating entirely new asset classes, could better align investor needs with the risk-return profile of climate technologies.

## DEPLOY MORE PUBLIC FUNDS TO DE-RISK INVESTMENT

Government use of blended finance instruments, such as guarantees, grants, concession-rate loans or other means, can attract support from private markets through de-risking investment. For example, the new UK government agenda has an explicit focus on leveraging public finance to attract private investment in green technologies, especially through the £7.3b, National Wealth Fund.[5]

4. Anita Hawser, "Barclays calls for UK climate tech fund to address £1.5bn shortfall," The Banker, 24 July 2024
5. "Boost for new National Wealth Fund to unlock private investment," GOV.UK, 9 July 2024

# Business Development

One setback that lies behind many of the issues in acquiring capital is the lack of sales. That represents missing revenue in itself, but additionally makes it difficult to secure debt, equity and project financing. Why is it so hard for climate scale-ups to gain customers?

## GREEN PREMIUMS HINDER ADOPTION

Green premiums represent a significant barrier to adoption; many businesses and consumers will not buy products that have a significant additional cost attached. Reaching cost-parity tipping points is key to unlocking exponential adoption of green technologies, but because many innovations are far from commercial maturity, that goal remains heavily dependent on government intervention.

> *Cultivated meat production is associated with significant economies of scale—just as was the case for solar panels and EV batteries. A challenge we are facing now is how to drive scale and volume fast enough to reduce costs and drive demand. As with other sustainable technologies, this will require public-private partnerships and strategic policymaking* - **Aleph Farms**

## TRUST IS DIFFICULT TO WIN

Founders find it hard to persuade clients to trust in new technologies, especially where doing so would involve considerable change or expenditure. For B2B firms, long sales cycles and testing and evaluation processes are typical, so gaining the first customer can be a major hurdle. B2C business models have shorter sales cycles, but still need to build brand awareness and credibility.

> *Potential buyers are unsure of their budgets towards carbon dioxide removal (CDR), how CDR fits into their wider sustainability strategy and how different CDR offerings weigh up. Educating our customers about the scientific basis and business model behind enhanced rock weathering takes a long time, especially given they don't have in-house science teams to diligence our solution* - **UNDO**

## ESTABLISHED RELATIONSHIPS IN LEGACY INDUSTRIES POSE BARRIERS

Incumbents have further advantages over green disruptors in the form of pre-existing relationships. As well as mutual trust, these ties can comprise long-term contracts, bundled services, tailored inter-organizational infrastructure and even close personal associations. This can make it very difficult for new businesses to gain significant market share quickly.

> *Cement is a legacy industry with many long-standing relationships between concrete players and their suppliers. These established partnerships can make it difficult for new entrants like us to break into the market* - **Material Evolution**

### LACK OF COHERENT REGULATION SLOWS MARKET EXPANSION

Divergent regulations across international jurisdictions means that additional resources are required to understand regional differences and engage policymakers. This slows expansion and makes it harder to unlock economies of scale to bring down costs.

> *Expanding into new markets often involves entry barriers such as high costs, cultural differences and legal restrictions. Conducting thorough market research and adapting business models to local conditions can mitigate these challenges. Forming partnerships or joint ventures with local entities can also facilitate smoother market entry* - **Eco Wave Power**

## THREE SOLUTIONS

### FOCUS ON GETTING DOWN THE COST CURVE

Until economies of scale are unlocked, scale-ups should ruthlessly identify and prioritize their main cost items. Best practices show that capex and opex reductions can be realized when targeted initiatives are set up with good governance, for example, developing operational excellence through replication and selecting sites and that will minimize costs incurred through energy usage or logistics while ensuring robust financing, or bringing in strategic advisors to reduce the burden on (and derive upside from) topics such as global mobility, grants and incentives scans and applications, and tax.

### INVEST IN CUSTOMER EDUCATION

Trust and brand recognition are important for new climate technologies, both in B2B and B2C models, so customer education is a necessity. Targeted education campaigns based on detailed market research pay off, as does earning certifications that bring credibility.

### PARTNER WITH LOCAL ENTITIES IN JOINT VENTURES

Collaboration can facilitate smoother market entry in a number of respects. Local partners have essential regional regulatory and cultural knowledge, established networks and pre-existing local infrastructure — all of which ease expansion when resources are strained and in-house capacity is limited. By accelerating critical capex and opex reductions, partnerships also help to bring down the green premium faster.

# Policy and Regulation

While market forces can accelerate the progress of climate solutions, policy support is vital to ensure it happens as quickly as possible. Where is government intervention falling short, and how can it be harnessed to give these solutions the help they need?

## INCENTIVES ARE NEEDED FOR CORPORATE ACTION

Most businesses want to move faster on sustainability, but until governments level the playing field with new policies, fewer are willing to invest in switching to clean alternative technologies. Building that fundamental demand is vital to scaling technology adoption.

> *Although the tides are clearly changing, we have yet to feel a wave of change from the fashion industry. Many companies are preparing for increased accountability and risks to their longevity, but until businesses are faced with imminent financial incentives or burdens, we don't expect to see the totality of the industry transition as is required* - **Keel Labs**

## INCONSISTENT POLICY HARMS INVESTMENT

Uncertainty in government policy kills momentum in the green transition. Without clear and consistent long-term support for industry decarbonization, companies lose the confidence to make bold investments in transitioning and investors lose confidence in the future success of green technologies.

> *The largest obstacle to scaling for us, by a mile, is changing government regulations — for example, the Conservative government rolling back proposed increases in the Minimum Energy Efficiency Standard and changing grant programs. It really hits both customer demand and investor confidence*
> **- Domna**

## REGULATORY APPROVAL TAKES TIME

Sometimes, regulation can not only fail to support clean technologies but can actively hinder their progress. Safety standards need to be met through extensive testing, lisenses need to be acquired, planning procedures followed and permits obtained. Each of these steps comes with its own delays and bureaucracy, holding back rollout. For some technologies, even the foundational policy surrounding implementation is yet to be created.

> *A major obstacle to scaling wave energy technology is the lack of policies and legal and regulatory frameworks. While the construction of an Eco Wave Power pilot can take as little as six months, the policy creation can take twenty-four. The gap between the technology readiness level and policymaking significantly hinders wave energy commercialization*
> - **Eco Wave Power**

## THREE SOLUTIONS

### STRENGTHEN SECTOR ENGAGEMENT WITH GOVERNMENT

Disruptors need to build new industry coalitions and work more actively with governments on their policy agendas. Notpla, for example, created the Natural Polymers Group[6] with eight fellow innovators. This has allowed them to highlight their potential as a nascent industry and push for more consideration in policy to advance natural polymers as substitutes for plastics.

### SET THE POLICY COMPASS TO NET ZERO

Government needs to set a clear, consistent and ambitious policy agenda that forces corporate change, de-risks investment in transitioning and lifts unnecessary barriers to deployment. Interventions to tackle the green premium can be particularly effective; for example, taxes and subsidization can tip the balance to make clean products cheaper than polluting ones, and government procurement can provide opportunities for scaling and development before commercial competitiveness is reached.

### REDESIGN REGULATIONS AND STREAMLINE PROCESSES

Governments need to streamline permitting processes, give more resources and training to local and statutory authorities, and provide clear and internationally aligned regulations that are regularly updated to meet advances in technology. For example, the EU's Renewable Energy Directive mandates that permitting procedures for renewable energy projects should not exceed two years and encourages "renewables acceleration areas" with simplified assessment processes.[7]

*6. naturalpolymersgroup.com*
*7. Augustin Roth and Marian Bons, "Renewable energy directive: Three key measures to speed up deployment," Euractiv, 1 June 2023*

# Talent Acquisition

A final obstacle for many businesses in scale-up is in talent acquisition. While early-stage ventures can rely on the dedication of a few talented individuals to push through research and development, the demands placed on a team evolve and increase considerably at the growth stage.

### NEW INDUSTRIES LACK LARGE WORKFORCES

Because many of the industries and technologies in the climate sector are just emerging, there are relatively small pools of technical professionals with the capabilities to work on them. This is especially true in niche fields such as fusion and alternative meats.

The problem doesn't solely exist in technical professions and individual roles, but also at the management level. As a company scales, there is an increasing need for more experienced professionals who can manage projects and teams. Within the recruitment pool of senior professionals, the number of people with industry experience and understanding of the climate sector is highly limited. For these candidates, there are often high salary expectations and competition from large industry players can be difficult to match.

> *Scaling with people is a challenge. The sector needs both generalists and specialists. Of the specialists, we need graduates, masters and PhDs in various strands of physics, and they just don't exist in the numbers required to service the entire sector* - **First Light Fusion**

### RETRAINING REQUIRES MONEY AND NECESSITATES RETENTION

When there are candidates available to hire, they are often brought in from adjacent industries and require significant investment in training. This puts additional pressure on operational expenditure and makes retention critical.

> *Attracting and retaining skilled employees can be challenging, especially in a competitive job market. Building a strong employer brand, providing competitive compensation and benefits, and investing in employee development and a positive work culture can help attract and keep top talent. These strategies are crucial for maintaining a skilled and motivated workforce* - **Eco Wave Power**

### INTERNATIONAL RECRUITMENT OPERATIONS ADD COMPLEXITY

As companies grow, they experience ever-increasing complexity in global human resources operations. Contracting and taxation entail legal idiosyncrasies, work permits can be difficult to obtain, and effective recruitment demands building networks in new geographies. All of these operations demand more time, resources and expertise, posing a significant barrier to growth.

## THREE SOLUTIONS

### LEAN INTO PURPOSE-DRIVEN BRANDING

The younger generations that are moving into the workforce increasingly demand a sense of purpose and fulfillment in their work. For climate tech firms, being mission-led is an asset that can trump the higher salaries offered by multinational corporations, but only if it is on full display through the organization's branding.

### PRIORITIZE EMPLOYEE HAPPINESS

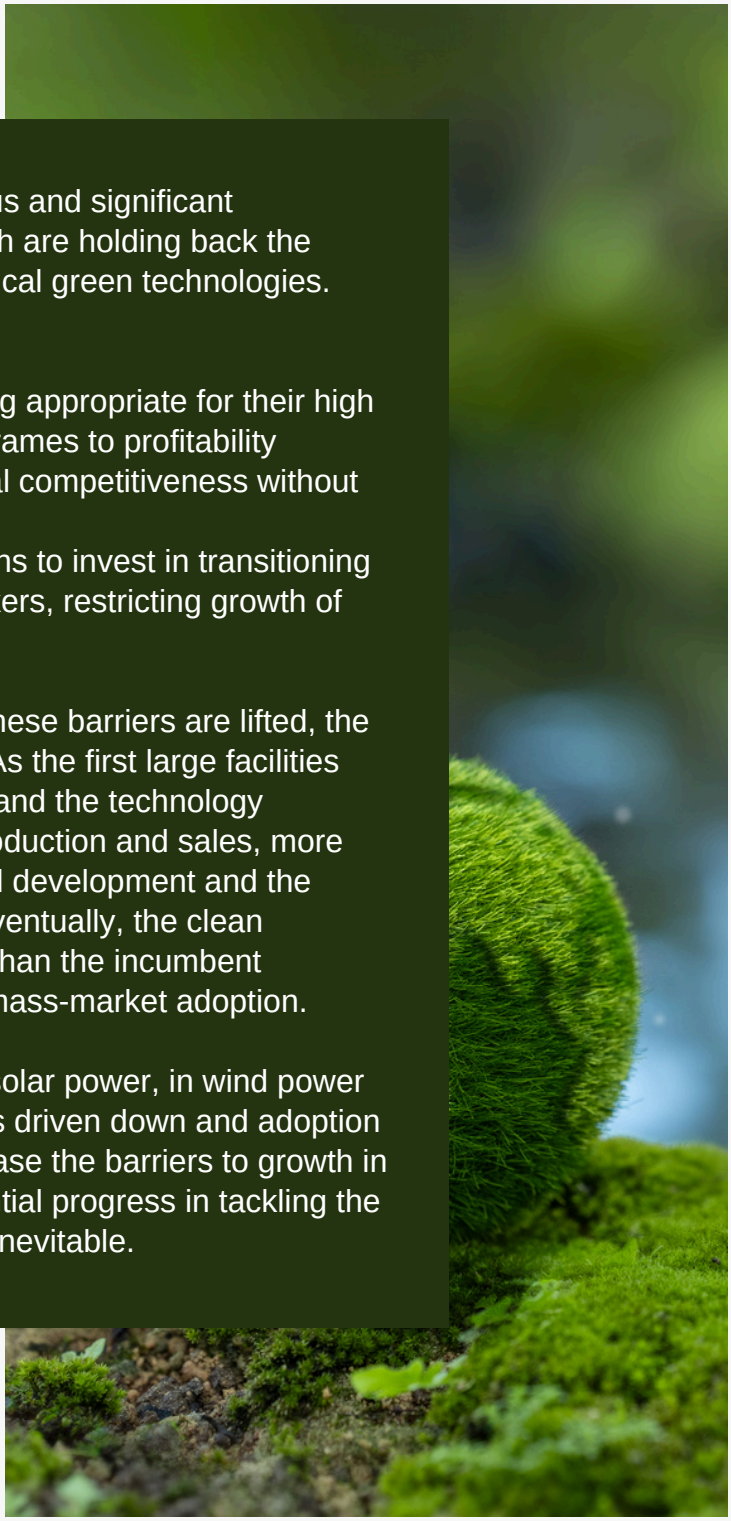
Given that retention is a top priority, so must be the wellbeing and satisfaction of employees. Scale-ups must ensure that compensation and personal development are competitive, but also that cultural and organizational challenges are solved as companies grow. Strong leadership, integrity and transparency are vital.

### RESKILL THE NATIONAL WORKFORCE

Without supporting retraining and reskilling of their workforces, governments will miss the opportunity to capture the industries of the future. Widening the pools of technical talent available is vital to scale these industries and to ensure that transitions don't leave workers behind. The Scottish Government, for example, established the Oil and Gas Transition Training Fund to help prepare workers in the oil and gas sector for labor in new industries.[8]

8. "Oil and Gas Transition Training Fund, Scotland," European Commission, 2019

# Conclusion



Climate tech companies face numerous and significant challenges in the scale-up stage, which are holding back the enormous potential for progress in critical green technologies.

These challenges include:

- A scarcity of growth-stage financing appropriate for their high capital expenditure and long timeframes to profitability
- Challenges in reaching commercial competitiveness without economies of scale
- Insufficient pressure on corporations to invest in transitioning
- A limited talent pool of skilled workers, restricting growth of operations

The promise of technology is that as these barriers are lifted, the solutions build their own momentum. As the first large facilities are built, economies of scale develop and the technology becomes cheaper. With increasing production and sales, more money gets pumped into research and development and the quality of the technologies improve. Eventually, the clean products become cheaper and better than the incumbent technologies they replace, unlocking mass-market adoption.

We have already seen this pattern in solar power, in wind power and now in electric vehicles, with costs driven down and adoption increasing dramatically. If we can release the barriers to growth in other emerging technologies, exponential progress in tackling the climate crisis is not only possible, but inevitable.

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Contact ClimateImpact (team@climateimpact.co) to find out more about the Growth Council and join the community.