



Centre for Financing a  
**Sustainable Future**

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# WORKSHOP WHITE PAPER

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FINANCING NET ZERO:  
RISK, RESILIENCE AND THE  
FUTURE OF THE  
TRANSITION

Prepared by  
**Centre for Financing a  
Sustainable Future**

## Executive Summary

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This white paper synthesises the key insights from a workshop bringing together leading academic researchers and industry practitioners to examine the challenges of financing the transition to net zero. The event convened an open, critical, and candid exchange of views, producing a more nuanced and practice-oriented discussion of the transition challenges.

A reoccurring theme throughout the workshop highlights that the barriers to net zero are not primarily technological, but they are rooted in coordination, behaviour, and finance. We have many of the technologies we need. Capital, in aggregate, is available. However, the systems, incentives, and institutional mechanisms needed to connect capital with deployment are still not working effectively.

"The challenge is no longer invention — it is execution. The real work is building the systems, behaviours, and trust that allow capital to flow where it is needed."

---- Prof. Bing Xu

*Director of Centre for Financing a Sustainable Future*

The paper is structured around **five interconnected** themes:

- The transition is reshaping economic decisions today, not just in the future.
- Net zero is fundamentally a coordination problem, not a technological one.
- A 'missing middle' in finance leaves the most promising technologies stranded.
- Capital allocation is driven by behaviour, networks, and trust as much as by economics.
- Closing the evidence gap requires new capabilities and ecosystems, not just more money.

## 1. The Transition is Already Reshaping Economic Decisions

Transition risk is often framed primarily as a long-term, abstract concern and something to be managed in the decades ahead. The research presented at the workshop challenges this view directly.

Empirical evidence shows that firms are already responding to transition risk, particularly those linked to biodiversity exposure and tightening regulation (Bolton and Kacperczyk, 2023; Nguyen et al., 2025). Rather than waiting for policy to take full effect, businesses are acting now: reducing hiring in regions with greater regulatory exposure, shifting activity to less exposed locations, and increasing demand for compliance and sustainability roles.

Crucially, this is not a story of contraction. Organisations are adapting, not withdrawing. The transition is therefore reshaping economic activity as much as it is reducing emissions. It is also redefining how firms respond to interconnected physical, regulatory, and biodiversity-related risks (Giglio et al., 2026; Giglio et al., 2021). Those that recognise this shift are already repositioning themselves; those that do not risk being left behind.

However, there is an important caveat. The evidence suggests that many of these responses are self-protective rather than genuinely contributing to systemic decarbonisation. Firms are managing their own exposure to risk but not necessarily addressing the underlying problem. This points to a need for regulatory frameworks that incentivise firms to contribute to system-wide resilience, instead of merely to protect their own balance sheets.

***Transition risks are not long-term strategy items – they are already influencing real economic decisions. today.***

## 2. Net Zero as a Coordination Problem

The most important conceptual insight from the workshop is that net zero is not primarily a technology problem, but a **coordination problem**.

A useful distinction emerged between two categories of technology:

- **Mature technologies:** such as renewables, electrification, and energy efficiency are available now and can deliver meaningful emissions reductions in the near term.
- **Emerging technologies:** include hydrogen, advanced semiconductors, and AI-driven energy systems, which are essential for long-term transformation but are not yet ready for large-scale deployment.

Both categories are necessary and offer distinct advantages and limitations. Together, they provide a broad portfolio of solutions capable of supporting the evolving and dynamic demands of the transition. However, the challenge is not simply technological; it is the absence of sufficient coordination between the actors, institutions, and incentive structures required to deploy and scale these solutions effectively.

***Without better systemic alignment, even well-developed technologies will struggle to scale at the pace required.***

Policy frameworks remain fragmented, incentives are frequently misaligned, and key actors across finance, industry, government, and research, can still operate in silos. This framing has important implications for policy. It suggests that the priority should not be further investment in technology development alone, but in building the institutional infrastructure,

i.e., the rules, relationships, and shared expectations, which allows coordinated action to take place (Egli et al., 2022; IEA, 2023).

### 3. The 'Missing Middle' in Climate Finance

From a practitioner perspective, the most urgent challenge identified at the workshop is not the absence of capital, but **where that capital is willing to flow**.

A persistent financing gap exists between early-stage innovation and fully bankable, investment-ready projects. At one end of the spectrum, venture capital can support start-ups exploring novel technologies. At the other end, banks and infrastructure funds are well-equipped to finance proven, low-risk assets with established revenue models. However, technologies in between, often those with the greatest potential for transformative impact, struggle to secure funding.

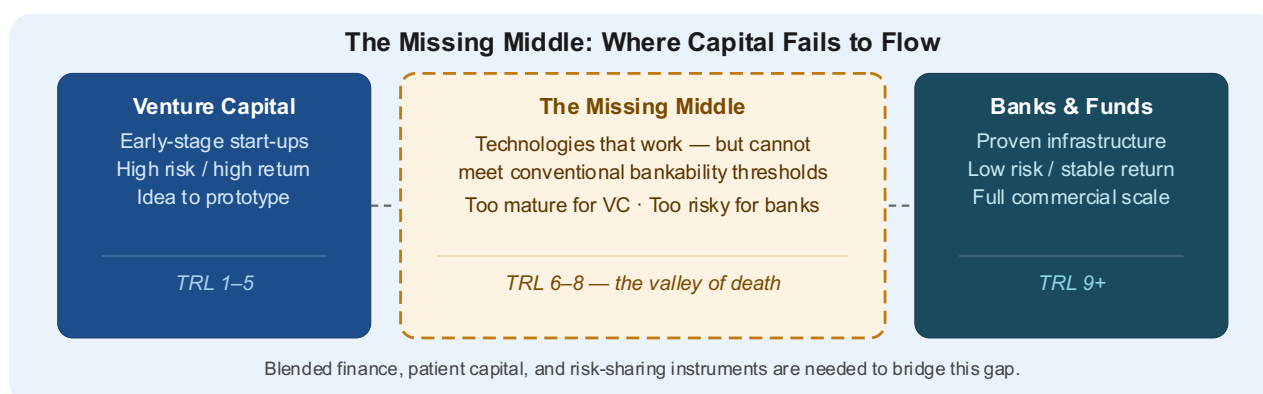


Figure 1: The 'Missing Middle': technologies that work but cannot meet conventional bankability thresholds (source: author)

This 'missing middle' is reinforced by how bankability is conventionally defined. To attract institutional finance, projects are typically expected to demonstrate technology readiness at or near commercial maturity, a complete and credible value chain, experienced management teams with a track record, high barriers to entry, established supply chain relationships, and robust commercial structures.

Many promising clean technology ventures cannot meet these thresholds. This is not because the underlying technologies are unsound, but because they do not yet fit the risk frameworks that existing financial institutions are built to manage (Gaddy et al., 2017; van den Heuvel and Popp, 2023). Risk appetite also varies significantly across capital providers, creating a structural mismatch. Debt financiers, particularly project finance lenders, tend to prioritise predictable revenue streams and shorter investment horizons, typically around 5-7 years. By contrast, long-term institutional investors such as pension funds may operate on horizons exceeding 20 years and assess investments at the portfolio level. Equity investors focus on broader risk-return profile.

Addressing the missing middle will require new financial instruments specifically designed for mid-stage technologies: blended finance structures, patient capital mechanisms, and risk-sharing vehicles that can absorb the uncertainty inherent in scaling novel solutions (Polzin and Sanders, 2020).

Equally important is building the internal capabilities of the companies seeking finance. Despite strong underlying science, many technology start-ups lack the business and management expertise needed to engage effectively with investors, structure compelling commercial cases, and navigate institutional due

***The problem is not a lack of capital. The problem is that capital cannot see where to go — or is not structured to go there.***

diligence. Providing targeted business development support to these ventures is a practical and high-leverage intervention.

## 4. Finance is Behaviour: Networks, Trust, and the Geography of Capital

A second major insight from the research is that capital allocation cannot be fully explained by financial economics alone. Finance is shaped by social norms such as behaviour, networks, and trust, and these factors create significant structural inequalities in access to investment (Sapienza & Zingales, 2011).

Empirical analysis of cleantech investment patterns shows that seed funding tends to remain highly localised, and that investor syndication is geographically concentrated (Dekker et al., 2026). The networks through which information flows, relationships are built, and trust is established play a decisive role in determining which projects receive funding and which do not.

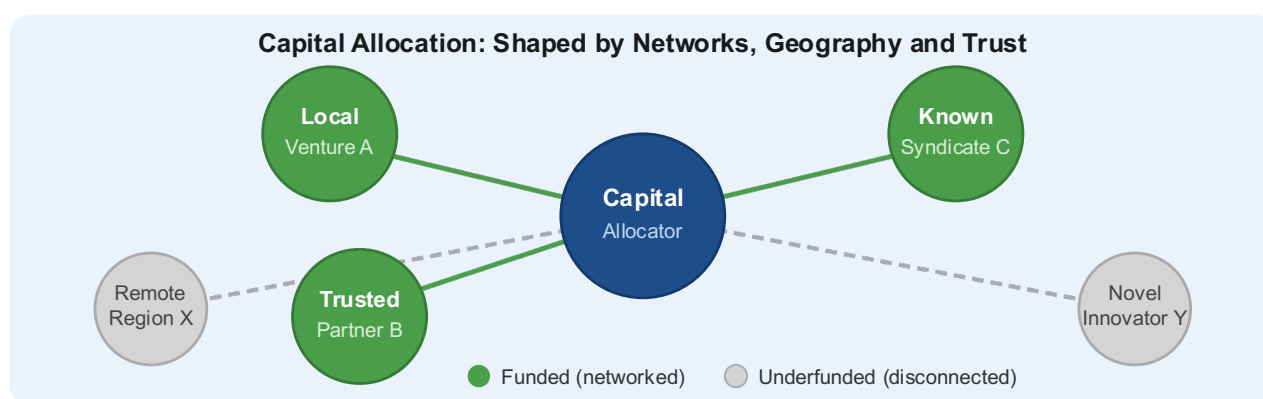


Figure 2: Capital flows are network dependent. Well-connected ventures attract funding; disconnected innovators remain starved of capital regardless of technical merit. (Source: adapted from Dekker et al. 2026)

This finding has important implications for regional equity. Areas without strong investor ecosystems, whether due to history, culture, or institutional capacity, face a structural disadvantage in attracting capital, regardless of the quality of their innovations. A technically excellent project in a region with weak investor networks may receive less funding than a mediocre project in a well-networked hub.

If capital allocation is network-dependent, then efforts to direct finance toward underserved regions or under-resourced ventures must address the ecosystem conditions, beyond just the financial incentives. This includes building local investor capacity, supporting intermediaries that bridge the information gap between innovators and investors, and creating forums that allow relationships and trust to develop across boundaries.

***Geography, relationships, and local culture shape investment as much as financial fundamentals. Capital does not flow on merit***

## 5. Is Finance Ready for Net Zero?

The panel discussion at the workshop asked a deceptively simple question: Is finance actually ready for net zero? The answer, participants concluded, is mixed and context dependent. There is no single answer that applies uniformly across sectors, firm types, or geographies. There is clear **willingness**. Regulatory frameworks are evolving, and sustainability remains firmly on the agenda, however, readiness is another matter. United

Nations Environmental Programme (UNEP) (2025) underscores that, despite incremental progress, global readiness for net zero is inadequate, with current commitments and policies failing to align with a Paris-consistent pathway.

### What is working?

There are genuine reasons for cautious optimism. Regulatory frameworks are evolving rapidly. Sustainability has become a mainstream concern for institutional investors, not merely an ethical preference. New financial mechanisms are emerging, and early movers are beginning to demonstrate that green investment can deliver competitive returns.

### What is NOT working?

Despite this, implementation remains deeply challenging. Several structural barriers continue to prevent capital from flowing at the scale and pace required:

- Climate-related assets are not yet consistently attractive against conventional alternatives on a risk-adjusted basis.
- The cost of capital for many clean investments remains prohibitively high.
- Climate risks are not yet fully priced into financial markets, reducing the relative urgency of acting.
- Carbon pricing and public incentive mechanisms remain insufficient in most jurisdictions.
- Short-termism in financial systems continues to disadvantage investments with long payback horizons.

A 'wait and see' mentality persists among many investors — a rational response to genuine uncertainty, but one that collectively perpetuates the problem. Meanwhile, even high-profile events such as corporate withdrawals from net zero alliances have had limited impact on market behaviour, underscoring that markets continue to prioritise financial performance above stated climate commitments.

### The evidence gap

Underlying many of these challenges is what practitioners described as an evidence gap. Capital is available, but it does not flow; because the opportunities are not yet sufficiently well-articulated, structured, or de-risked. Improving the quality and accessibility of information about climate investment opportunities is as important as developing the financial instruments themselves.

## 6. From Capital to Capability: What Needs to Change

The workshop concluded with a forward-looking discussion on what is needed to close the gap between ambition and execution. Several priorities emerged.



Figure 3: Five priorities for closing the gap between ambition and execution (source: author)

## Financial system reforms

- Develop blended finance models, combining public, philanthropic, and private capital to share risk at the critical mid-stage of technology development.
- Create new financial instruments specifically designed for technologies in the 'missing middle'.
- Reduce the cost of capital for clean investments through targeted guarantees, subsidies, and risk-sharing mechanisms.
- Strengthen policy alignment and regulatory clarity to reduce investor uncertainty.
- Develop credible green asset markets so that low-carbon projects can compete effectively for institutional capital.

## Ecosystem and capability development

- Invest in skills and leadership development within the clean technology sector, including business and management training for science-led ventures.
- Expand entrepreneurial support through mentoring, accelerators, and venture-building programmes.
- Strengthen communication and relationship-building between innovators and investors.
- Build local investor ecosystems in regions that currently lack them.

In this context, 'soft infrastructure', namely the ecosystems, relationships, capabilities, and institutions that enable capital to flow effectively, becomes as important as the financial capital itself (Pástor et al., 2021; IRENA, 2024).

## Repurposing assets and enabling a just transition

***A just and economically viable transition is not a moral add-on – it is a precondition for maintaining the political and financial support that the transition depends upon.***

The transition is not only about building new systems. It also requires making better use of existing infrastructure. Legacy assets in sectors such as oil and gas offer significant opportunities for repurposing, e.g., into renewable energy infrastructure or carbon capture and storage. In regions such as the North Sea, this could play a meaningful role in the transition pathway.

Critically, the transition must deliver genuine economic and social value: job creation, regional development, and a credible pathway for workers and communities currently dependent on fossil fuel industries. A transition that does not address these concerns will struggle to maintain the political and social legitimacy it requires.

## 7. Conclusion: From Ambition to Execution

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The discussions at this workshop reinforced a message that is at once encouraging and sobering. We have many of the technologies that net zero requires. Capital, in aggregate, is available. The regulatory direction of travel is broadly supportive. And there is genuine willingness among researchers, investors, policymakers, and practitioners to see the transition succeed.

Yet the systems that connect these elements, channelling capital toward the right technologies, in the right places, at the right time, are still not working effectively. The challenge is execution.

Bridging this gap will require action on multiple fronts simultaneously:

- Better alignment across policy, finance, and industry, so that incentive structures reinforce rather than undermine one another.
- More effective risk-sharing mechanisms that allow capital to flow to technologies that cannot yet meet conventional bankability thresholds.
- Stronger ecosystems, built on relationships, trust, and capability, to support innovation from early stage through to commercial scale.
- A shift in financial thinking toward long-term value creation, and away from short-termism that systematically underprices climate risk and opportunity alike.

Ultimately, success will depend not on whether solutions exist, but on whether we can scale them effectively, efficiently, and in time. That requires not just capital and technology, but coordination, trust, and the institutional capacity to act together at pace.

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This white paper was produced following the Financing Net Zero workshop, synthesising insights from academic researchers and industry practitioners. It does not represent the official position of any individual participant or institution.

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