



CLIMATE
TECHNOLOGY
ECOSYSTEM

Vision A habitable planet for all

Mission Accelerate entrepreneurship and cross-sector collaboration

Strategy Develop components of an ecosystem for collective action

Tactics Identify gaps and bridges in current climate ecosystem

Asks Challenge, support, collaborate, invest, share, act

Make Things Happen

The environmental movement constitutes roughly 70 years of abject failure.

First scientists, then NGOs, then citizens, then politicians and investors all signally failed to make material gains here. Markets preferred cheap, unsustainable energy: and society preferred not to care.

Times change.

We think climate change represents the biggest opportunity on the planet, as well as the greatest challenge we now face. We must unleash the transformative forces of entrepreneurship and collaboration to give ourselves the best chance to address it.

We have the tools: now we need to apply them.

What have we tried before?

What previous attempts have been made to foster technology ecosystems, with what success? New ideas are not in short supply: but how do we escape from the old ones? We cannot assume that what worked once can work again, and will scale again - every challenge is unique.

Short-termist commercial manoeuvres and intense political polarisation conspire against us. Next, in any crisis, the most disadvantaged suffer first. That is, those closest to a problem typically have the best direct insight into its. Yet they are often not attended to, or able to access practical resources to solve it. Why?

This document is therefore the start of a conversation, if not an argument. To build new pathways, we need robust challenges to business-as-usual, more and better collective thinking.

We invite both, from you. Life is short, the planet's getting hotter, and we're in a hurry.

Let's go.

New Pathways Needed

Gaps and Bridges

A robust technology ecosystem should benefit all of its members, and accelerate our collective response to the climate crisis.

But the climate ecosystem is too busy and fragmented. In particular we have identified *gaps* in three areas: investment, knowledge and narrative.

Now we want your help to explore *bridges* to cross these gaps.

NARRATIVE

How can we shift our mindset and **flip the script** on climate?

KNOWLEDGE

How do we foster **more collaboration** and open innovation?

INVESTMENT

How will we support **good ideas and new ventures** to scale?

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Motivation

Climate innovation is the number one problem on planet Earth: yet the very scale of the issue is demotivating for some, and prompts people and organisations to de-prioritise action. One result is that demand for new products and services from the ecosystem may trail supply. Ultimately, markets pick winners: we need to educate buyers and excite them about real, tangible upsides.

[Rethinking Humanity - Rethinkx \(2020\) ↗](#)

[Why People Aren't Motivated To Address Climate Change ↗](#)

[Hyperbolic Discounting ↗](#)

[Decarbonisation Is Too Expensive' – How To Sell Climate Change Action To Bean Counters ↗](#)

[When Will Companies Finally Step Up To Fight Climate Change? ↗](#)

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How might we promote climate innovation as the number one opportunity for innovation and investment for founders, funders and companies?

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Why wait for the next crisis to trigger demand?

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Distraction

Technologists are apt to pitch technical solutions to audiences liable to believe them. New technologies that will not scale or offer real value may crowd out simpler efficiency gains. Some argue that distractions include: corn-ethanol biofuels, blockchains and vertical farms. Likewise, unproven battery materials, direct carbon capture or desalination solutions with unclear TRL's or seemingly unscalable approaches regularly cross our path.

Distractions are *hard to ignore*. They drain available capital and investor attention from more modest solutions. But which are distractions, and which are the real deal? Is 'green' hydrogen (for example) a bust or a must? Why did we wait so long for wind power? Innovation is fundamentally combinatorial, essentially unmanageable, and totally non-optional - the dilemma is that we have to try things that simply might not fly. Don't get distracted, do analyse the data.

[Carbon Capture Remains A Risky Investment For Achieving Decarbonisation ↗](#)

[Why Did We Wait So Long For Wind Power? ↗](#)

[No, Vertical Farms Won't Feed The World ↗](#)

[I Come Bringing Good News About Hydrogen ↗](#)

[Biomanufactured Materials Are Coming ↗](#)

[Advanced Research And Invention Agency \(Aria\): Policy Statement ↗](#)

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How can investors, businesses and policymakers do better triage or deep-technical due diligence?

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Why is money routinely invested in predictable and predicted failures?

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How do investors balance or stage bets between technical long-shots and near-term credible solutions?

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Incentives

Disinformation pollutes markets, distorts strategic decisions: real data is valuable. We need ratings and rankings that are credible and actionable, but there is little-to-no incentive for many businesses to be transparent about climate targets. On the contrary, organisations are incentivised for exaggerating compliance. Climate ratings, carbon trading, emissions or carbon offsetting methodologies are complex, opaque and easily gamed.

Corporate ESG fraud is on the rise - with ratings agencies visibly colluding - while SMEs (being smaller, poorer and much more numerous) are harder to regulate, and much less able to bear additional compliance costs. Performative corporate action for PR purposes is rewarded, and trivial initiatives are heralded. We have a clear incentives problem.

[The Secret Diary Of A 'sustainable Investor'](#) ↗

[Democratic Dominoes: How Crises Tip The Political Agenda](#) ↗

[Esg Ratings Are Not What They Seem - Bloomberg \(2021\)](#) ↗

[The Esg Mirage - Bloomberg \(2021\)](#) ↗

[Esg Expectations: An Incentive For... Corporate Fraud? - Grant Thornton \(2022\)](#) ↗

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How can we create tangible incentives within organisations that reward transparency as a requirement for success?

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How can we speak clearly, in order to build a common understanding of intentions and outcomes?

Language

Climate change is a complex, technical subject: solutions likewise. Discussion relies first on subject experts, then on influencers and peers to communicate clearly and persuasively. We need shared understanding and clarity from business leaders and policymakers. Lastly, considerable uncertainty exists in both predictive models and their proposed solutions - uncertainty plus complexity makes for a tough sell.

[Understanding And Acting On The Complexity Of Climate Change \(2021\) ↗](#)

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Fragmentation

Many problems may have already been (partially) solved by somebody else, somewhere else. Rework is rife: reuse is not. An oversupply of ought-to frameworks exists, an undersupply of can-do models. Current IP regimes demonstrably prevent practical knowledge-sharing: a balance needs to be struck between extracting value from IP/R&D and sharing it.

[How Intellectual Property Can Help or Hinder Innovation - Kauffmann Foundation \(2015\)](#) ↗

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How do we connect sectors and organisations to reuse and repurpose intellectual property, practices and technology that already exists, rather than recreating it from scratch?

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What part can open data, open software and patent pools play?

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Risk/Reward

Leading carries risks. Climate innovation may be localised to a public or private organisation that is willing to lead, or take on early investment risk. Followers watch and learn from the sidelines, hoping to gain either second-mover advantage, or wait for positive outcomes, but we need to accelerate the process.

Learnings (tools, data, policy, practice) should be better shared and socialised as quickly as possible, such that other places or organisations can learn from them.

[Net Zero: Copenhagen's Failure To Meet Its 2025 Target Casts Doubt On Other Major Climate Plans ↗](#)

[Designing Transitions - Liminal \(2021\) ↗](#)

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How can we share more innovation risk and reward between people, places and organisations?

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Talent

Not enough of the best and brightest people are working on climate issues. While the climate tech sector expands rapidly, there remains a double problem: limited opportunities and insufficient demand. Education systems, perennially underfunded, are still siloed in narrow categories and not geared up to provide the next generation of talent. There is an insufficient number of formal entrepreneurship educators, fewer interdisciplinary climate education centres.

Raw population demographics has a direct and measurable impact on entrepreneurship. This is therefore a multi-threaded, multi-headed, multi-generational problem. Solving the climate crisis needs people from a range of diverse backgrounds, skill sets and experiences to address the varied and complex issues facing us all.

[The Climate Talent Gap - Louise Boucher \(2022\)](#) ↗

[Demographics and Entrepreneurship - Uni of Chicago \(2018\)](#) ↗

[Interdisciplinary Training as a Means to Combating Climate Change - Georgetown University \(2016\)](#) ↗

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How might we attract, retain, educate or retrain a range of the best people to work on climate innovation?

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How do we coordinate the entire 'supply chain' of talent?

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Geography

Location matters. Even in a wired world, geography is not history. From Silicon Fen to Silicon Valley, from Bletchley Park to Xerox PARC, physical concentrations of money, energy and talent are proven to be the key difference that confers advantage. Such clusters are a proven source of practical magic.

[Conjuring Scenius ↗](#)

[Tech guru raises \\$500m to invest in Camden, the 'New Palo Alto' - TechCrunch \(2022\) ↗](#)



How might we create a network of hubs in the ecosystem that become the new 'Palo Alto' of climate innovation and action?

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Think big. We need approximately 5% of GDP annually to decarbonise the UK by 2050, assuming the 2019 US Green New Deal model. Other estimates (Smil) are 2x higher. For a healthy ecosystem, we also need a much more responsive marketplace where larger businesses can buy solutions from smaller ones: the so-called B2Big problem.

Corporate and government procurement is not optimised for innovation. Lastly, deeptech companies (fission, fusion, materials, carbon capture) are by their nature big or nothing: with CAPEX-heavy longterm funding requirements before they reach market-readiness.

[How Much Will The Green New Deal Cost - FactCheck.Org \(2019\) ↗](#)

[Taming the Climate Is Far Harder Than Getting People to the Moon ↗](#)

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Where is the committed capital required to decarbonise, and how will it be deployed?

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How can more flexible procurement (corporates and government) or more cooperative buying (SME's) support green technology businesses?

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Staging

There is a scale-up funding gap in the UK and EU for some sectors e.g. Ag Tech. In particular: energy, food and transport sectors are going through once in a century disruption this decade.

[The Future of Growth Capital Report - Scale Up Institute \(2022\)](#) ↗

[European Scale-Up Gap - European Commission \(2021\)](#) ↗

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Where do investors and innovators see gaps in funding and how can we address them?

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Are these gaps related to deal flow, competition, capital flows or other challenges?

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Allocation

Capital is being misallocated on a grand scale. Compare what we emit to what solutions investors actually fund. For example, PwC notes that mobility and transport investments are significantly overweight when compared to the emissions impacts of the construction industry.

According to the IPCC, there is “a persistent misallocation of global capital” in tackling climate change; *how* capital is allocated and *to whom* is just as important a consideration as how much.

[Net Zero Future50 - PwC \(2022\)](#) ↗

[Climate Change 2022: Mitigation of Climate Change \(2022\)](#) ↗

[A Persistent Misallocation of Global Capital \(2022\)](#) ↗

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Where are investors with the patient capital who can allocate resources to where it's needed over the medium-to-long term, rather than competing for the fastest returns?

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Instruments

The financial instruments we have are ill-designed to fund the change we need. What ought to be long term, large-scale capital is hampered by regulatory requirements: for example, pension funds and insurance companies must liability-match with assets marked to market, rather than on a future cash flow basis. Regulation stands in the way. Secondly, most VC funds run short-term/ inflexible structures (10 years, closed-ended funds).

We need better, more flexible instruments in climate tech. The growth-first VC backed by cheap capital that characterised earlier infotech booms, does not translate well here.

Climate tech investing will soon no longer be niche. More capital is good, but we also require a wider range of instruments to allow more investors to participate.

[The Pervasive, Head-Scratching, Risk-Exploding Problem With Venture Capital \(2020\)](#) ↗

[We Have Met The Enemy And He Is Us - Kauffman Foundation \(2012\)](#) ↗

[A Decade After The Bubble Burst, 5 Climate Tech Investors Explain Why They're All In - Techcrunch](#) ↗

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How can regulators help rather than hinder?

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How can innovation capital be more accessible, better allocated?

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What do generalist investors need to feel confident investing into climate?

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Scale

Staging

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1. Which of the **gaps** ring true with you? Why/why not?

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2. Which **questions** particularly resonated with you? Why/why not?

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3. What **solutions** already exist, or could we create together?

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4. What could **you** offer the climate tech ecosystem?

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5. What do you **need** in return for your participation?

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6. What specific **opportunities** are there to collaborate right now?

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7. What **else** would you like to ask or share?

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In Conversation With

We don't have all the answers. Nobody does.

But we *do* have informed questions, a diverse network of people, and direct experience in the field.

We are now putting the 'gaps and bridges' framework to the test - *in conversation with* individuals and organisations with skills and experience in the following areas: climate finance, government policy, intellectual property, community building and startup funding. Last but not least climate entrepreneurs - what do they need to succeed?

We ask: where is the opportunity? When do commercial and societal interests align, such that the proposed ecosystem is sustainable in the broadest sense of the word?

Are climate tech companies - a wildly diverse sector - well supplied with the opportunities, resources and services they need?

Ideal ecosystems don't just emerge: they are fostered.

Let's talk.

In Conversation With



Get In Touch

This document was developed by Liminal, the collective intelligence community.
We solve complex problems by connecting people, data and ideas.

Please get in touch to get involved.

Or join the discussion at: climate-tech.discourse.group

Thank you.

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