2023 Australian Climate Tech Industry Report

Innovating to solve global climate challenges





In the spirit of reconciliation, Climate Salad acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea and community.

We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.





Key Numbers

The Australian climate tech sector in a snapshot

The Basics

228 climate tech companies

Currently

Ambition for

the Next 12

Months

\$553M

capital raised in the past 12 months

\$1.5B

planned capital

to be raised

2M Tonnes

of CO₂-e already reduced or removed from the atmosphere

3,000+

jobs currently in climate tech

2,400+jobs to be created

1,300+ GT

of CO₂-e projected to have been reduced or removed by 2030

44%

of founding teams include at least one female founder

47%

of companies already operate internationally

72%

of companies intend to expand into a new international market

6%

of companies intend to operate in all major international markets

Global Reach



\$435M

international investment to date

\$4.12B

total valuation of climate tech companies

\$385M

existing annual revenue

88%

average revenue growth

11%

of existing revenue already comes from international customers

2023 Climate Tech Industry Report

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Executive Summary

Key Takeaways

The ecosystem must collaborate to work for founders



Founders intend to raise \$1.5 billion in the next 12 months

- Market downturn has made raising capital more difficult
- Total capital raised increased from \$338 million in 2021 to \$553 million in 2022
- More capital is needed at all stages



3,000+ new jobs have been created in Australia, with 2,400 coming soon

- Jobs in climate tech are predicted to increase by more than 80% in the next 12 months
- 17% of these jobs will be in regional areas
- All sectors of climate tech are hiring



47% of Australian climate tech companies are already global

- 94% of Australian climate tech companies have global ambitions
- Australia must embrace local solutions, while supporting global expansion
- By investing now, Australia can be a global hub and net exporter of climate solutions



- and remains a challenge
- 34% of companies are already making a positive, measurable impact
- 18% of companies are yet to establish a framework to measure impact, and many have difficulty voicing long-term goals



Climate tech is diverse, but more support is needed

- Ventures with at least one female founder have grown from 39% in 2021 to 44% in 2022
- Founders of diverse cultural backgrounds are also well represented
- More needs to be done to support First Nations and gender diverse founders

Partners and Supporters

Major Partners



This report was made possible thanks to the following supporters:

Companies in this Report

This report was made possible thanks to the following climate tech companies:

The most important part of this ecosystem are the people within these companies. At Climate Salad, supporting them is our primary focus.

See the Climate Solutions Directory for more information.







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A Year for Action

Our planet is heading towards an epic catastrophe. Many of those who will suffer the most are almost helpless to avoid it. And many of those who can bring about the most change are going on as if nothing is happening. If we want to avoid significant climate issues, then this is the year to get involved, increase our contributions, and invest in our future.

It's easy to get lost in anxiety and apathy. We need to change everything. The systems, infrastructure, industries, behaviours and mindsets we've slowly built up over 5,000 years. The 100 trillion dollars of self-interested systems that caused the problems in the first place.

But there is hope and, more importantly, action.

A group of people have seen the problem, picked up their tools and got to work. They are building climate technology, which we define as scalable tech-enabled solutions to environmental problems.

Climate tech founders are strong, courageous, smart, collaborative and ambitious. Yet, they need help, they need it now, and they need it from you. Through Climate Salad you can be a customer, mentor, investor or even just a supporter to one or hundreds of amazing climate tech companies. I have never in my life seen a new industry come together like this. It's exciting and it's worth supporting.

You can help. Be a customer, mentor, investor or even just a supporter of these amazing climate tech companies.

Speaking of support, I want to thank the Climate Salad team. They work so hard, amongst an under-resourced, still-developing landscape to make an impact. It's sometimes hard, but I truly believe the work you do is critical.



Purpose

Guiding Principles

2030 Missions



Climate Salad's Vision and Mission

Help Australia have an outsized impact on global climate problems

We build for impact

We design for diversity We work for founders

Support 1000+ Australian climate tech companies

Help create at least 10 globally successful ventures

Climate Salad is a community of more than 380 climate tech startups, and more than 800 founders, investors, mentors and ecosystem supporters.



You can join the community using the QR code

The 2023 Report

Welcome to the 2023 Australian Climate Tech Industry Report, a comprehensive deep-dive into the Australian climate tech innovation ecosystem.

Building on the data showcased in the 2022 report, this second annual report addresses the challenges and celebrates the growth of Australian climate tech startups. This year's release confirms the strength, breadth and depth of the industry.

We are enormously grateful to the 228 founders who completed our survey. This report would literally not exist without you. We collect, analyse and showcase this data each year to help founders by increasing the collaboration and growth of the Australian climate tech ecosystem.

We only have a few years to create a huge climate impact.

In this report, we explore each climate tech sub-sector, and reveal the global growth ambitions of Australian founders and shed light on the diversity and inclusivity shaping the ecosystem. Despite the recent market downturn, the sector's ability to raise capital remains strong, and we explore how these capital inflows are driving innovation, propelling impact, and creating pathways for scalable climate solutions.



The Australian climate tech sector continues to grow and develop, propelled by the shared vision of a net-zero, resilient future.

We invite you to immerse yourself in this report, embracing the wealth of knowledge and insights it offers. Let it guide us as we navigate the challenges and seize the opportunities of the Australian climate tech industry.



Mariel Keaney Data Lead

Olivia Utharntharm Industry Report Director

Australia can absolutely become a global climate tech leader.

This year's report confirms the strength, breadth, depth and opportunity of the Australian climate tech ecosystem.

The Year Gone By

In the past year, climate tech has evolved beyond building literacy around the sector, to building an ecosystem, and one that is really thriving.

Unlike other tech movements, this wave is not just a passing trend, but a revolutionary force. It tackles not only customer problems, but the greatest challenge of our time. What started as ripples has now become a tsunami of optimism, opportunity, hope, and solutions that impact us all.

In constructing this ecosystem, our role was crucial in shaping future leaders and the economy. We purposefully prioritised diversity in our community of climate tech solutions, supporters, enablers, and investors. Our aim was to create a future that is just, equitable, diverse, and inclusive.

By empowering underrepresented groups and providing resources for women in climate tech, we have established a safe and inclusive environment where women feel a sense of belonging. We are proud of the diversity on display in this report (teaser alert for juicy data ahead). While it's challenging to compare this data to the general population, we recognise that solutions created by only one demographic cannot serve everyone. Building an inclusive and diverse ecosystem is an ongoing journey, and we are committed to collecting data and asking the right questions.

Climate Salad has facilitated more than 3,000 introductions and connections with mentors, customers, investors, and potential talent within the community. Yet, what truly excites and inspires us about this ecosystem are the countless everyday connections made between members that I am not directly involved in. This network is a vibrant hive of climate tech action, activity, and collaboration.



Charlotte Connell Ecosystem Director

The Year Ahead

Consumers, businesses, and governments worldwide are recognising the urgent need to invest in climate solutions to achieve a sustainable future. With the scale and complexity of the challenge, the next 12 months are critical for the Australian climate tech sector.

Collaboration, knowledge sharing and strategic investments will become increasingly important to ensure effective and sustainable outcomes as the sector expands.

environments.

This can support the 228 Australian climate tech companies in this report to reach their 12-month goals of collectively raising \$1.5B in capital, creating 2,400 additional jobs, and expanding internationally. Climate Salad is super-charging this global ambition through our new Global Growth Program, which assists Australian climate tech companies to take their solutions to new markets. A shared understanding of climate impact is also required for Australia's solutions to scale effectively. Companies face significant challenges in achieving robust impact measurement while striving to meet their ambitious 2030 impact goals. This presents another key collaboration opportunity.

Our hope is that this report serves as a valuable tool for quantifying the potential of the climate tech sector, offering insights into different technologies and sectors, and highlighting key areas for collaboration in the year ahead.



We need industry, government and investors to collaborate with climate tech companies. We must strengthen our ecosystem, attract diverse talent, expand markets, and foster favourable regulatory



Audrey Jean-Baptiste Director of Impact

The Big Picture

A critical industry with exciting momentum and incredible potential



As we confront the urgent challenges of climate change, we need innovative ways to drive sustainable practices, reduce emissions, restore our natural capital and create a greener future. Supporting the growth of Australian climate tech industry is a strategic move to accelerate critical climate solutions.

This report confirms that the Australian climate tech industry offers a wealth of talent, ideas, and technologies that can pave the way towards a more sustainable and resilient world.

Collaboration is the key to unleashing the full potential of the climate tech industry. The report evidences the need for concerted action to create an enabling environment focused on climate tech that encourages entrepreneurship, attracts talent, investment and propels Australia to the forefront of the global climate tech movement. It will take governments, businesses, investors, innovators and individuals coming together to actively support this growing climate tech industry.

Together, we can empower and finance researchers and entrepreneurs to scale their ideas and solutions, accelerate innovation, to create substantial businesses with region-wide and global impact.

Let us seize this opportunity to grow and propel the industry forward. We can harness the power of innovation and make a profound difference. Not only in mitigating the effects of climate change by reducing and removing emissions, but in adapting to our inevitably changing world, protecting our biodiversity and developing nature-based solutions. We hope this industry report serves as a vital tool in catalysing action, fostering collaboration, and inspiring change across sectors.





1.1 Sector Summary

The HolonIQ Global Climate Tech Landscape taxonomy used in this report reveals dominant and emerging sectors within Australian climate tech.

The Circular Economy (20.9%) sector aims to redesign our economy and includes evolving practices around waste and recycling. It has a broad range of products for different customer groups across consumer, business and government, and often involves hardware-based tech.

Data and Finance companies (16.9%) often use sophisticated climate data and AI modelling, and we predict demand to increase as more stringent global policy and regulation reporting requirements are introduced. These companies often indirectly affect climate problems and are not enough on their own.

Agri Food is understandably large (12.9%) given Australia's strong roots in agriculture, with the addition of multiple 'new food' companies, which are developing alternative protein sources as meat/dairy substitutes. The Agri Food sector is a large emitter and therefore these companies have significant impact potential.

As climate policy and regulation ramp up both locally and globally, we have seen an increase in the currently small Carbon Markets (7.6% in 2022 to 10.7% in 2023) and Biosphere (1.2% in 2022 to 4.4% in 2023) sectors. The Biosphere sector, focussed on nature-based solutions, remains underweight.

Renewables (9.8%), Storage (7.6%) and Mobility (5.3%) sectors focus on R&D heavy and capital intense solutions such as hydrogen, EVs and batteries. The increased uptake of EVs in Australia is promising for these sectors, but challenges remain around grid stability, EV supply and demand, and alternate storage solutions.

The Resources sector (1.8%) supports Australia's mining transition as the demand for cleaner resources and critical minerals grows. This remains a challenging area, but one of great opportunity. It is the smallest sector represented in this report, and therefore a large area of potential development in the next 12 months.



Climate tech is a scalable tech-enabled climate solution that either directly contributes, or helps a third party to:



Reduce emissions - preventing emissions from being released, including waste prevention and mitigation



Remove emissions - taking current emissions out of the atmosphere

Improve the environment, biodiversity and/or natural capital

Increase climate adaptation and resilience

Australian climate tech companies by sector



1.2 Company Demographics

What does the climate tech industry look like? The number of Australian climate tech companies has surged since 2015. Nearly half (49%) of companies have been founded since 2020, making them just three years old, and 18% have been founded since 2022, defying the recent market downturn. Three times as many climate tech companies have been founded in the past five years compared with the previous thirteen.

While many of the climate tech companies in this report are less than three years old, the ecosystem-wide median founding year (2019) remains the same as last year, and 23% of companies were founded in 2017 or earlier. This may reflect their climate solution only now seeing strong market demand, and overall sector-wide resilience. We expect to see older companies exit, expand or pivot in new directions as the demand for climate tech solutions grows in the years to 2030.



The number of Australian climate tech companies has surged in the past 10 years



The transition to a net zero economy is creating enormous opportunities for new technologies, new business models and rapid innovation and commercialisation. Opportunities exist across all areas of the economy, particularly in the high impact areas of renewable and distributed energy, mobility and smart cities, food and agriculture and new approaches to manufacturing and recycling.

With no single solution to the complex challenge of economy-wide emissions reduction, Australia's cleantech innovators and entrepreneurs are part of a global race to capitalise on the sustainable economy of the future. With Australia's unique climate challenges and abundant natural resources, Australia is well-positioned to drive innovation and lead in the field of climate tech. The commercialisation of new and emerging technologies and climate solutions requires risk capital to start up, scale and expand business establishment and growth.

As Australia's largest cleantech investor, the CEFC is proud to be working with clean tech investors Virescent Ventures, alongside innovators, investors, government and corporates, to expand the Australian cleantech industry and help companies to flourish. A strong and healthy ecosystem opens doors for collaborations, investments, and market expansion, not only bringing economic benefits but also a more sustainable and resilient future for Australia and the world.



1.3 Location of Climate Tech Operations and Jobs

There is a huge economic opportunity in transitioning to a net-zero economy, and climate tech can lead the jobs transition across Australia as companies scale and grow. Currently, there is a strong representation of NSW-based companies (39%). South Australia is also well-represented relative to its population. However, Victoria is underweight, sitting at 23% where we would expect about 28%. Western Australia is also under-represented, however, this probably doesn't capture the stronger resources sector based in WA. The Northern Territory is grossly under-represented in the Founders Survey.



Capital cities are home to the majority of current climate jobs, but the climate tech industry will play an integral role in supporting the economic transition of regional and rural communities usually dependent on traditional industries.

Regional hubs include NSW's Hunter Valley and North Coast. Regional Queensland is strongly represented, but spread across the large state instead of clustering into hubs. Regional companies aim to recruit 17% of total new jobs in the next 12 months, therefore we need to work hard to support regional companies scale and hire local staff.

Companies headquartered in
regional locations across Australia

We know from historic and projected climate data, that our regions across Australia will need to continue to innovate to remain resilient and viable in the face of climate change. We also know that the regions often have the answers to the world's problems, and innovation is an innate attribute with 19% of climate tech companies based in the regions and 6% of those in regional Queensland. The link between the climatic change (more severe droughts, more regular floods, more catastrophic fires, hotter days) and the impact on the quality of life for rural and regional Australians is also connected. This is not a global catastrophe happening elsewhere, it quite literally is occurring in our backyard.

Fostering the development of climate tech in the regions can mitigate the effects of climate change, as well as providing the opportunity for new industries, jobs and economic development in those same regions which have lost opportunities because of climate change. This is shown by the forecast that 17% of new jobs created in the next 12 months will be based in the regions. Local solutions for climate problems can have a global impact and as such can be exported internationally, to solve problems in other countries equally impacted by the climate crisis. The Brisbane 2032 Olympic and Paralympic Games are an incredible opportunity to showcase Australian climate solutions to the world.

Climate solutions help us to use our resources efficiently. A critical part of this is ensuring the development of efficient infrastructure, to support people in regional, rural, and remote areas, ensuring they remain living in viable and vibrant communities.

Australia, and Queensland, have the chance to solve the world's climate problems – climate tech innovation is the solution.



Office of the Queensland Chief Entrepreneur



Julia Spicer QLD Chief Entrepreneur

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1.4 Women in Climate Tech

Empowering diverse voices is not only a moral imperative, but also a strategic advantage in tackling complex global challenges. We're incredibly proud that female founder representation has increased by 5% this year. Almost 60% of climate tech companies have at least one female executive, and across the 228 companies surveyed, 13% are solely female founded.

If climate tech is to truly help solve the climate crisis, women and minority groups need to be empowered to create global, inclusive solutions. Female founders still face major barriers, particularly when raising capital and securing new customers, and a concerted effort needs to be made to empower women across the climate tech ecosystem.





It is critical to support and empower female founders. This acts as a transformative catalyst, fostering a vibrant climate tech ecosystem that nurtures brilliant ideas and propels positive change and climate impact in our world.



Yas Grigaliunas Founder and Chief Evangelist

circonomy



of companies are solely female founded

53% of companies have at least one female executive

of companies that raised in the 48% past 12 months have at least one female founder

1.5 Diversity in Climate Tech

We know that climate change most adversely affects women and minority groups, and that diversity cannot simply be measured by the number of female founders in the ecosystem. People of colour, gender diverse and First Nations representation is essential to improve global climate and societal outcomes.

There is still much to be done in this complex space. First Nations people, who have successfully cared for our lands for over 60,000 years, only represent 1.3% of founders. Strategies to increase First Nations representation, as well as non-binary and transgender founders, and those living with a disability, must be led by these groups and embraced by the wider ecosystem.



Percentages are relative to survey respondents who identified as either being born overseas or their parent/s were born overseas .6% of respondents identify as someone living with a disability



Supporting diversity is a strategic advantage. When people from different backgrounds, experiences and perspectives come together, they bring a wider range of ideas and approaches to the table, fostering greater innovation and delivering more robust solutions to complex climate challenges.

Climate change affects communities worldwide, and a diverse workforce that reflects these communities ensures a deeper understanding of their needs and perspectives. Inclusive representation also promotes fairness and equal opportunities. By actively supporting underrepresented groups, we can break down barriers and ensure that talented individuals from all backgrounds have an opportunity to contribute to and lead in this crucial field.

Embracing diversity in Australian climate tech results in enhanced creativity, innovation and problem solving capabilities, and ultimately helps to accelerate the impact and performance of climate positive companies. The stakes are too high to not have the best minds applied to it.



Amanda Goodman Partner



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Zooming In

Exploring the breadth and depth of the 10 sectors of climate tech



Gradually, then suddenly, climate tech is accelerating everywhere we look.

Climate tech attracted A\$100B of global growth investment in 2022 and is defying gravity through 2023 as governments, investors, firms and institutions around the world progressively commit to unleashing the full potential of a diverse array of science and technology aimed at protecting our planet and advancing humanity.

Climate Salad stands out globally as a dedicated and determined driver of a diverse Australia having an outsized impact on global climate problems. This bold and courageous mission demands meticulous measurement and exceptional empathy.

Across such a broad and diverse landscape we need to 'zoom in' to identify where the challenges and opportunities, traction and gaps, wins and loses are happening and continuously adjust our strategy, talent, capital and energy to set Australia up for success. The Open-Source, Global Climate Landscape is emerging as the standard framework for classifying Climate Tech and identifying emerging patterns across all disciplines. From Bloomberg to Climate Salad and beyond, the Global Climate Landscape helps us all see the extensive diversity and incredible depth of Climate Tech. Launched in Glasgow at COP26 in 2021, Climate Salad's community deconstructed and fundamentally improved the Open Source Climate Tech Landscape in 2022 ahead of a new release in Sharm El Sheik at COP27 which forms the basis of our zoom-in here.

Zooming in, we'll see wonderful examples across the entire landscape across Agri Food, the Biosphere, the Built Environment, Carbon Markets, the Circular Economy, Data and Finance, Mobility, Renewables, Resources and Storage, all critical to a sustainable and prosperous future for the world. From an economic perspective, climate tech holds tremendous potential for job creation and economic growth. As economies invest in research, development, and implementation of climatefriendly technologies, new industries emerge and existing sectors undergo transformative changes.



Patrick Brothers Co-Founder and Co-CEO



Agri Food

Vertical and smart farming, crops, livestock, plant-based and cellular meat and seafood, plant-based and cellular dairy and egg.



rainBlick

It is well known that the agri food sector is a significant contributor to global emissions. Currently, work is being done to monitor emissions and incrementally improve current systems, but this has the potential to fall well short of 2030 and 2050 reduction targets. We instead believe the agri food sector must guickly adopt step change technologies developed and validated in market to enable a faster transition and reduce emissions.

Sometimes we need to look back to move forward. We have an amazing history of first nations traditional science and practices that allowed us to prosper during climate variations during the last 60,000 years.

Unfortunately, in today's agriculture system there has been no adoption of these practices to help ensure modern ag adapts to a changing and variable climate. Rainstick is an opportunity to look at the practices my ancestors, the Maiawali people, used to influence the weather system to create more thunderstorms, as they knew how important this was to produce more food each season.

We combined this ancient wisdom with modern technology to create the Rainstick solution. Rainstick mimics the effects of an electrical storm for cleaner, tailored food and bioproducts, and our interim results demonstrate my ancestors were right, showing remarkable additional yield and speed of growth. Plants and fungi are heavily influenced by environmental electrical charges, which hasn't been utilised in modern agriculture. Our novel Variable Electric Field (VEF) technology solution delivers specific frequencies to small biological switches inside plants and fungi to deliver targeted outcomes. We can increase mushroom yields while simultaneously inhibiting mould growth, eliminating the need for fungicides.

Our AI predictive models will bring the power of lightning to food, nutraceutical, pharma and climate friendly alternative products, and we believe the agri food sector can become a driver of climate positive change.





Darryl Lyons Co-Founder and Chief Rainmaker



A World Economic Forum study has found that \$44 trillion of economic value, half of the world's GDP, is reliant on ecosystem services. But during the past 50 years we've seen a 69% decline in global wildlife populations, putting our economy, food systems and planetary stability at risk. The biosphere is an incredibly important aspect of fighting climate change and stabilising our planet and includes naturepositive and nature-based solutions - working with nature to prevent the worst impacts of climate change, biodiversity and ecosystem loss. Preserving and restoring wildlife and wilderness areas improves natural carbon sinks in ecosystems, boosts natural methods of carbon capture and helps limit global warming to 1.5°C above pre-industrial levels.



Jada Anderson Co-Founder and CPO

Camille Goldstone-Henry Co-Founder and CEO



The biosphere sector is small, but growing rapidly, particularly with the development of the Taskforce for Nature-Related Financial Disclosures (TNFD). With increasing pressures from investors, consumers and regulators, including the TNFD framework, biodiversity is becoming a necessity for ESG reporting. However, property development and energy companies are struggling to take action on their biodiversity footprint due to its complex nature and lack of internal skill sets to do so.

Xylo Systems is a biodiversity intelligence platform for businesses to measure and manage their biodiversity footprint. We make it easier for businesses to assess their interface with nature by revolutionising the way sustainability professionals find, assess and design sites for biodiversity. We transform their months' long process into 20 minutes of simple site analysis. We exist to regenerate biodiversity globally through technological innovation.

By 2030, companies using our platform globally will be able to model how they can achieve a net biodiversity gain of at least 10% using real-time data to plan and monitor regeneration actions within their operations. We will make it possible for the world to reach the Nature Positive by 2030 goal.

Land (lithosphere), forests, water and oceans (hydrosphere), Ice and snow (cryosphere), air (atmosphere)



one female founder

30%

Biosphere

19

Built Environment

Design and construction, heating and cooling, residential buildings, commercial buildings, transport infrastructure.

68% of companies are already able predict their 2030 impact targets capital raised in primary reported \$16M the past 12 months challenge: securing predicted capital raise over the next \$67Minvestment 12 months 51% increase in jobs 10% of surveyed startups over the next 12 months 23% of companies have at least imate one female founder

HAL

We constantly interact with the built environment - from residential and commercial buildings through to urban areas and transport infrastructure. The operation of buildings is responsible for 30% of total global energy consumption.

In commercial buildings, 60-65% of the electricity used is typically consumed by HVAC (Heating, Ventilation & Air Conditioning). And the demand for HVAC is catching on. Since 2000, the amount of energy used to cool buildings worldwide has doubled. The International Energy Agency (IEA) is concerned that if we don't take action now, this figure will double again by 2040.

At Hal Systems, we have created HAL - a predictive climate control technology that delivers occupant comfort, while minimising energy use. Our solution is designed for existing commercial buildings with centrally controlled HVAC systems. HAL is a targeted product with lightweight integration, so we are fast and easy to deploy. We use transparent physics-based logic, not opaque black box AI, so you can see that its control decisions are intuitive.

Based on our data results, and analysing scientific studies and energy intensities across 9 different market sectors, we calculate that HAL can save 10-25% of HVAC energy use.

We are currently working with commercial building owners and industry experts to develop the next commercial iteration of our product, and install HAL in a fleet of commercial buildings.

The IEA sees buildings as an enormous source of untapped efficiency potential for reducing future emissions. And improving HVAC efficiency presents one of the biggest opportunities to make a difference.

By 2030, we project that HAL will be installed in around 1000 buildings. Which means HAL could deliver 260,000 MWh of total annual energy savings, which equates to 1191 metric tons of CO₂emissions emitted every year!



Vicky Featherston Co-Founder



The carbon market sector consists of companies that undertake physical operations and those that build on top of this through carbon credit marketplaces. This nascent industry is important because it is society's first real go at finding a middle ground between ignoring the problem and turning off critical energy systems tomorrow.

As we progress to 2030, the big end of town (2% of total companies) will increasingly be ring-fenced behind a tax regime, with the remainder of the market acting like most other commodity markets. While the crystal ball is out we believe that the 'carbon credit marketplace' model is an endangered species. The Carbonaught Protocol[™] is upgrading the global food system and setting the foundations for low-emission agriculture by supercharging the creation of fertile soils that also permanently lock up CO₂. Our north star metric refers to how much agricultural land we are rebuilding.



Andrew Pedley Co-Founder and CEO



We saw the entire market conflating Soil Total Carbon with Soil Organic Carbon. Soil Inorganic Carbon – the bit that delivers permanent CO_2 removal – has been ignored, as has the lack of viable emission reduction approaches specifically designed for use on intensively cropped/grazed agricultural land. We saw that so-called carbon markets were not much more than a tax in all, but name. So Carbonaught inverted the narrative: by allowing businesses to buy into a food security effort that yields premium carbon credits as a co-benefit.

Our credits pass Greenpeace's quality criteria (additional, permanent and no double counting risk) and pack an additional benefit of being a genuine negative emission technology. Our clients will be removing 1 Gt CO₂ permanently per year having restored 150M hectares of degraded agricultural land and delivering income and nutrition security to more than 80 million people worldwide.

Carbon Markets

Carbon capture and storage, B2B and B2C, carbon offset, carbon intelligence and accounting.



one female founder

Circular Economy

Sustainable materials, recycling, solid waste, water waste, textiles.



baresop.

Even if all existing climate pledges and national targets are achieved by 2030, emissions reduction alone won't be sufficient to limit warming to 1.5 degrees C, according to a paper released from PACE, WRI Chatham House and NREL ahead of COP27. Implementing circular economy strategies can help close that gap by complementing decarbonisation measures – reducing greenhouse gas emissions, enhancing adaptation to a changing climate and supporting the sustainable scaling of the clean energy transition.

Circular economy strategies reduce the amount of energy used for making, transporting and ultimately disposing of new products. This lessened demand for raw materials and new products also helps reduce global emissions from the extraction and processing of materials. Upstream strategies include shifting consumption patterns and designing products that use materials more efficiently have a high potential to reduce emissions and waste.

The manufacturing, shipping and use of personal care products creates a chain of waste and excess emissions. This is a global problem, and the solution has to not only work with efficacy and convenience, but also be empathetic to modern-day customer experience. Our insights show that people are not going to swap to a sustainable solution for sustainability's sake, there has to be more thought on customer journey and experience for our solutions to impact at scale. We spent a year developing the Baresop solution, resulting in a concept that allows everyone to reuse in the most simplified, impactful and user friendly way.

Baresop removes unnecessary water and single-use plastic from personal care products to create a circular, zero-waste solution. Baresop will eliminate 1 billion single-use plastic bottles from landfill, 50,000 tonnes of CO₂ avoided from our atmosphere and 600,000L of water conserved by 2035.



Prisca Ongonga-Daehn Founder and CEO



The data and finance sector plays an essential role in the transition to a low-carbon economy. This sector provides critical data and analytics to support decision-making for climate mitigation and adaptation, as well as finance solutions that can help scale up climate-friendly technologies and infrastructure. This climate tech sector complements many others, and plays a critical role in addressing the urgent need for climate action.

Val.Ai is a climate property tech company which provides technical services and green data insights to the financial, insurance and property sectors, focussing on critical data insights on home sustainability, energy use & climate resilience. With homes being responsible for more than 10% of Australia's carbon emissions, we have a vision to increase the sustainability, comfort and resilience of 1M homes by 2030.





Our green data and behavior change insights are equipping key sectors to deliver meaningful action and reducing climate risk across their portfolios. 80% of Australian homes were built prior to energy rating standards, therefore there is a lack of key data on these assets. Finance and insurance institutions may be exposed to climate-related risk across their residential portfolios because the risk hasn't been measured and therefore they simply don't know their current exposure. Data enables our corporate customers to gain a more precise and comprehensive understanding of their exposure to such climate-related risks and opportunities, while also meeting their regulatory disclosure requirements efficiently.

Our data can help move an Australian home from a below 4 star sustainability rating to a higher 7 star property. This transition, including solar, can equate to more than \$825 million in energy bill savings and up to 1.25 gigatonnes of avoided carbon emissions. It is crucial that the climate tech ecosystem continues to invest in and support innovative solutions that can drive the transition to a sustainable future.

Internet of things (IoT), climate data, climate finance, climate risk, climate insurance.

Data and Finance



of companies have at least 51% one female founder

Mobility

Micro-mobility, vehicles, trains, boats and ships, fixed wing and rotary aircraft.

67% of companies have at least one founder who were born overseas capital raised in primary reported \$15M the past 12 months challenge: securing predicted capital raise over the next \$83M investment 12 months 123% increase in jobs of surveyed 5% startups over the next 12 months of companies have at least 8% one female founder

Good Care

The mobility sector is a major contributor to global emissions, and innovation in this space is critical to revolutionising transportation systems to reduce these carbon emissions. The sector focuses on developing sustainable alternatives to traditional modes of transportation, such as electric vehicles (EVs) and micro-mobility, shared mobility services, and intelligent transportation systems.

We can significantly reduce greenhouse gas emissions, combat air pollution, and mitigate the environmental impact of transportation by transitioning to low-carbon mobility. The sector promotes the adoption of EVs, which produce zero tailpipe emissions and contribute to cleaner air quality in cities. Shared mobility solutions encourage the efficient use of vehicles, reducing the need for private car ownership and decreasing traffic congestion. Intelligent transportation systems optimise traffic flow, minimise energy consumption, and improve overall transportation efficiency. EVs - large batteries on wheels, can be utilised to balance the electricity grid and transition to 100% renewables.

The Good Car Company is a certified social enterprise investing in education, community-led climate action, advocacy, cleantech innovation, and donates 50% of profits to social and environmental causes. We run national campaigns and EV bulk buys, partnered with communities and climate action groups.

The groundswell movement is an effective lever to influence policy and decision makers. The online marketplace offers easy access to second hand and new EVs including imported EVs providing choice and affordability. We also offer finance, fleet solutions for business, subscriptions and leasing.

The mobility climate tech sector not only plays a pivotal role in reducing carbon footprints, but also fosters innovation, job creation, and economic growth. It presents opportunities for technological advancements, the development of charging infrastructure, and the integration of renewable energy sources into transportation systems.

Overall, the sector's importance lies in its ability to transform the way we move people and goods, offering sustainable, efficient, and environmentally friendly alternatives. By embracing and scaling climate-friendly mobility solutions, we can make substantial progress in solving the climate crisis and building a greener future for generations to come.



Anthony Broese van Groenou Co-Founder and Director

S switchDin

The renewables climate tech sector focuses on harnessing and maximising the use of renewable energy sources such as solar, wind, hydropower, and geothermal, and plays a pivotal role in addressing the climate crisis by offering clean and sustainable alternatives to fossil fuels. Renewable energy technologies reduce greenhouse gas emissions, mitigate air pollution, and reduce reliance on fossil-fuel based energy systems. There are undoubtedly challenges in transitioning to a fully renewable grid, and the sector must solve for intermittency and supply and demand flexibility, while being supported with significant investments in grid infrastructure development. However, there are also many opportunities. The renewables sector drives innovation, job creation, and economic growth while enhancing energy security and resilience.





At SwitchDin, we are anticipating a 100% renewable energy future.

This requires smart software to improve the operation and real-time co-ordination of distributed energy resources, to enhance grid operations, and optimise electricity markets in the transition to a more decentralised system with renewable energy, battery storage, and electric vehicles. This is currently a \$3B market and will be \$12B by 2030 enabling grids to reach 100% renewable energy operations. By effectively integrating and managing these resources through advanced software solutions, we unlock numerous benefits, including improved reliability, cost-effectiveness, and reduced carbon emissions on a 24/7 basis. SwitchDin achieves this while enabling consumers to take more control of how they produce and consume electricity.

The renewables sector is perhaps one of the most well-known climate tech solutions, not only because Australia leads the world in household solar generation, but also because innovation has soared in this area since the early 2000s. Embracing renewables as a primary energy source is essential in achieving a sustainable and decarbonised future, paving the way for a more resilient and greener planet.

Solar, wind power, hydro, geothermal, biomass.



of companies have at least

one female founder

23%

Renewables

Resources

Hydrogen, nuclear, critical minerals, oil transition, gas transition.

100% of companies have adopted an impact measurement framework \$16M capital raised in primary reported the past 12 months challenge: securing predicted capital \$11M customers raise over the next 12 months 63% increase in jobs of surveyed 2% startups over the next 12 months 50% of companies have at least limate one female founder



HydGene Renewables aims to create a circular economy that meets net-zero targets by accelerating the adoption of green molecules, such as hydrogen. Our integrated biomass-to-hydrogen solution uses an engineered biocatalyst technology, turning biomass sources such as agricultural, forestry, and municipal waste, into green hydrogen.

Traditional methods of hydrogen production are neither sustainable nor cost-effective. New green hydrogen electrolysis technologies require complex and expensive transportation and storage systems to deliver the hydrogen to the end-user. At HydGene, we offer a sustainable alternative to fossil fuel-based processes, providing cost-effective green hydrogen, while simplifying the supply chain. Our decentralised solution enables hydrogen to be produced only "where and when it is needed", offering a flexible and efficient solution for all end-users.

By 2030, we plan to scale up our technology and increase the adoption of green hydrogen globally. We believe that our innovative use of biology can provide a bio-based alternative to fossil fuelbased processes, providing cost-effective chemical molecules and playing a critical role in creating a circular economy that meets our net-zero targets.

The resources sector is critical in the shift to a net-zero economy. This includes the sustainable procurement of critical minerals for batteries, and new technologies and resources to accelerate the oil and gas transition, including hydrogen. Hydrogen is rapidly emerging as a critical player in the resource sector due to its versatility as a clean energy carrier. It has the potential to decarbonise the way we power our homes, vehicles, and industrial processes such as fertiliser production and steel manufacturing. However, the current production and distribution of hydrogen are major obstacles to achieving a green hydrogen economy, as more than 99% of global hydrogen today is produced from fossil fuels. Despite these challenges, the market opportunity for green hydrogen is immense. It is expected to double to \$200 billion by 2025 and meet 18% of the world's final energy demand by 2050.



Louise Brown Founder and CEO

MGA THERMAL

MGA Thermal's breakthrough technology is an entirely new form of long-duration energy storage that is making 24/7 renewable energy a reality. Developing storage as a climate tech solution is crucial to bridge the intermittent nature of renewable energy sources. The future of energy storage is promising, and long-duration energy storage technologies are advancing to create a reliable energy supply, maximise the utilisation of renewables and ultimately end our reliance on fossil fuels.

Most of the energy in Australia's industry is still supplied by coal or natural gas combustion because renewables only produce energy when the sun shines or the wind blows. Some 51% of that energy is for process heat, which is an essential component of manufacturing, including refining raw materials, smelting, and chemical production.



Dr Alexander Post Co-Founder and CTO

> **Prof. Erich Kisi** Co-Founder and CEO



Thermal Energy Storage (TES) provides rapid decarbonisation for many industrial processes and a rapid economic return on investment. MGA Thermal's Energy Storage System can discharge and charge simultaneously, charging from intermittent renewables and discharging continuously. In the scale of MWhs to GWhs, MGA can provide 24/7 heat or steam for industrial processes and replace boilers in gas or thermal power stations, repowering them into grid-scale energy storage.

A stack of 1,000 MGA Blocks, the size of a small car, is enough energy stored to power 27 homes for 24 hours. The blocks store and deliver thermal energy while remaining outwardly solid. They are safe, low risk, can be made with recycled materials, and are designed for a long operational lifetime. We are aiming to abate approximately 30 million tonnes of CO₂ by 2030: that's 33,816 commercial flights from Sydney to Los Angeles.

MGA Thermal is the missing piece of grid decarbonisation, turning renewable energy into clean steam and power that's available any time of the day.

Batteries, alternative storage, grids, EV charging, peer-to-peer storage systems

7%

Storage



of companies have at least 35% of companies have one female founder

3

Outsized Impact

Targeting, measuring, and achieving climate positive outcomes



Australia is a rising force in the realm of climate tech and green innovation.

We are a big country with a small population, which means our best chance at solving the climate crisis is to take our tech to bigger international markets.

Australian climate tech companies are developing groundbreaking solutions to combat climate change, revolutionise our economy and promote sustainability.

Whether it's renewable energy technologies, carbon capture and storage, sustainable agriculture, or developing alternate foods, these companies are driving meaningful change.

Their contributions not only have the potential to transform Australia's domestic economy, but also lead the world with their innovative approaches. The positive impact of Australian climate tech is already being felt globally. Some 47% of companies already operate in at least one international market and 39% intend to expand into a new market in 2023. Many of these companies have garnered international recognition, attracting investment and partnerships from around the world. By providing scalable and effective solutions, Australian climate tech companies have the potential to play a crucial role in addressing the urgent challenges posed by climate change on a broader scale.

We now need to nurture and expand this sector, so the country can attract and retain top talent, foster research collaborations, and drive technological advancements. Being a strong hub would not only accelerate the development and deployment of climate solutions, but also create economic opportunities and job growth.

We absolutely believe that Australian climate tech can create outsized global impact.





3.1 Impact Measurement

All companies have a north star qualitative impact goal

Generally, companies are able to describe their climate impact ambitions well. This is their qualitative impact goal, and 52% of companies directly solve an environmental or climate problem, while 47% enable third parties to do so. See chapter 6.2 for more information on direct and indirect impact.

They quantify their impact in different ways

Impact metrics are more challenging to articulate, and refer to how companies intend to measure, or quantify, their impact goals.

There are layers of complexity in climate impact measurement. Although measuring emissions reduction or removal is the leading measurement approach, many solutions cannot be quantified in this way, and often involve more complex and multifaceted impact measurements. Removing emissions must go hand in hand with other quantitative measure such as protecting biodiversity, reducing waste of all kinds, and enhancing our natural ecosystems.

Accurately measuring climate impact remains a significant challenge, and 66% of companies are unable to quantify their climate impact. More than 18% of companies do not yet have any impact measurement frameworks. Urgent progress is needed in this area so total climate impact can be accurately assessed.



Quantitative company impact metrics



Support is needed to help founders understand and measure impact





of companies can't measure their climate impact

of companies do not have any type of impact measurement framework



Understanding the impact metrics of climate tech companies is crucial as it illuminates their transformative role in combating climate change. Tracking emissions across all scopes not only reveals a company's direct efforts, but also showcases the broader influence they wield within the global ecosystem. However, we know there are many different impact measurement frameworks in climate tech, including waste mitigation, adaptation strategies and biodiversity protection and enhancement.

Many organisations struggle to prioritise corporate sustainability due to a lack of expertise, resources, and ability to measure impact. However, it is crucial to be able to measure impact. Misio uses AI to simplify the complex task of tracking and communicating sustainability data, empowering businesses to measure the impact of their unique sustainability projects.

Tech must be designed for global scale to ensure transparent and comprehensive communication of sustainability progress to all stakeholders. By 2030, we hope that millions of companies worldwide are able to leverage technology such as Misio's, to understand and implement complex impact frameworks and metrics across all impact areas of climate tech.



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3.2 Current and Future Impact

Within the broader impact measurement frameworks shown in the tree map in chapter 3.1, there are tangible metrics already used by climate tech companies to quantify their positive impact. The dominant metric remains emission reduction, and the companies surveyed have already removed at least 2M tonnes of carbon from the atmosphere. The visual below shows some of the specific metrics across all climate tech sectors used to quantify current impact.

Future impact is harder to forecast. Only 51% of companies surveyed were able to quantify their climate impact to 2030. Founders who can, and are working to reduce or remove emissions, are very optimistic and aim to reduce or remove more than 1000 gigatonnes of carbon emissions by 2030. This figure may seem high, but the industry needs to be overly ambitious. Founders need multi-faceted support to scale their businesses and create this mass impact.

34%

51%



As we prepare to enter the 7th year of the decisive decade, the time we have left to mitigate emissions and avoid serious damage to our climate, environment and society will soon expire. We have seen devastating fires and two once-in-a-millenium floods in less than a decade.

Today I'm a farmer. Different to the kind I thought I'd be because the Australia I knew as a child has changed. In the beginning, I was trying to create a feed that farmers could use, that wouldn't be impacted by successive 1 in 100-year weather events. Maggots could do that and reduce emissions by 97%. With technology, we just had to figure out how to automate that process so we could commercialise mother nature and maybe help save the world.

Saving the world and climate change are interesting things. It could be easy to believe that there's no hope. But we are surrounded by a formidable cohort of Australians creating new innovation that presents huge economic opportunities, better jobs, better quality of life and food security for our future. There is an increasing group of forward-thinking investors who are committed to progressing these innovations and creating opportunities for real outcomes. The Australian climate tech ecosystem is more connected than ever, but there is still work to do - we need to work together and make the handful of years we have left in this decade count.



3

3.3 Sustainable Development Goals

Percentage impact on each of the United Nation Sustainable Development Goals (SDGs) by Australian climate tech companies



The SDGs are an important cross-disciplinary tool to further gauge the impact of Australian climate tech companies. As expected, SDG 13: Climate Action, is the top metric, but interestingly only 80% of companies which completed the founders' survey reported impacting this goal. SDG 11: Sustainable Cities and Communities, and SDG12: Responsible Consumption and Production, round out the top three. The percentages in the chart above do not add up to 100 because companies, on average, impact five SDGs.





Emissions reduction is undoubtedly a critical climate solution, but to live sustainably, we need to move beyond carbon tunnel vision and consider a broader spectrum of environmental and social impacts – such as biodiversity loss, gender equality and responsible production and consumption.

The 17 SDGs remind us of the importance of multifaceted, diverse climate solutions.



Tina Funder Co-Founder



The City of Melbourne is committed to the United Nations Sustainable Development Goals. Achieving these goals will create opportunities for new industries and jobs while creating resilient places to live, work and play.

This will build the economy of the future, a healthy CITY OF Melbourne environment and an inclusive society.



Sally Capp Lord Mayor of Melbourne

3.4 Creating New Climate Jobs

Data from the 2022 Industry Report predicted the sector to grow by 2,000 jobs, but numbers this year don't reflect this prediction. Instead, job numbers remain steady. Placed in the context of the market downturn and wider tech sector layoffs, this is perhaps unsurprising. Recruiting and retaining talented staff is also reported as the third leading challenge for founders today.

Companies moving from traction to scale created the largest amount of new jobs at any one time. Currently, 33% of companies are at traction and only 9% at scale, so we expect to see these companies significantly increase headcount as they scale.

Overall, research-stage, prototype-stage and launched companies with less than 20 staff are looking to recruit for 63% of new jobs in the next 12 months.

This seemingly high number is due to the fact more companies in these stages completed the 2023 founders survey.

Only 7.5% of companies aren't intending to hire in the next 12 months, indicating strong expansion of the industry and optimistic economic growth.





The scale of the climate transition is immense, and that means we need the best brains working on the most innovative solutions. To do that, we need not only phenomenal founders chasing big ideas, but teams of smart, motivated and skilled people to bring those ideas to life. What's exciting to see is that there is no shortage of people keen to dedicate their working lives to these challenges. We're seeing this through the Startmate Climate Fellowship, and through the data in this report.

We have an opportunity as a country to be leaders, not followers, in this next wave of climate tech. From energy to agriculture, fashion to transport, every industry is affected, and every industry has opportunity. And that means the skills needed span the whole economy.



Kate Glazebrook Head of Impact and **Operating Principal**

BLACKBIRD



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Tech and Innovation

The nuts and bolts of climate tech solutions



Cultivating the type of economy in which homegrown future-critical deep tech companies flourish requires business, investment and community to align on a grand vision. In Australia it's very clear that we are already focusing this vision on one of our biggest challenges - climate change.

A growing alignment between policy, investment and breakthrough science and technology means Australia is in a position to take hold of the \$680B climate opportunity and become a world leader in bringing science and engineering solutions to market to support a global shift in priorities.

We often equate climate tech with energy transition solutions such as renewable power generation or storage. But climate tech is far broader and more exciting than just energy.

Not only can these solutions come from anywhere, but they are applicable almost everywhere. Seaweed replacing plastic and reducing methane emissions in livestock. Manufacturing process for fabrics using no water or harsh chemicals. Endless recycling of materials - from fabric to precious metals. New materials to 10x hydrogen storage to solve wicked challenges in transportation.

All these solutions rest in new companies, home grown here in Australia. With the right support patient capital, patient policy and engaged industry we can build a more robust future for us all - and provide pathways of opportunity in which all Australians can participate.

We have an unprecedented opportunity to rebuild the entire material world sustainably using deep tech solutions covering transport, agriculture, space, manufacturing, infrastructure, new materials, and the circular economy.



Sally-Ann Williams CEO



2023 Climate Tech Industry Report

4.1 Developing New Tech

Complex climate problems require unique and innovative climate solutions.

Companies developing new climate tech (44%) face high risk, but also potentially high reward. Research and development, commercialisation, and dealing with policy and regulation all present challenges. In particular, companies developing new hardware-based tech need targeted support from investors, mentors and ecosystem supporters.

While new tech is critical to solving the climate crisis, the 34% of companies further developing existing technology have quicker pathways to scale and greater chance for immediate climate impact.

New tech companies have a lower average capital valuation compared to companies who are further developing existing tech (\$16.6M compared to \$20.1M). Conversely, \$338M has been raised by new tech companies compared to only \$164M raised by companies further developing existing tech.

We know that the technology that exists today needs to be deployed as quickly as possible, alongside the simultaneous development of new technologies. The climate tech industry, and the world, will benefit from this mixedtechnology approach.





Technology innovation stage across climate tech

Climate tech founders are no strangers to thinking big. After all, the entrepreneurs in this ecosystem are courageous enough to take on the largest challenge in human history. However, with this large-scale thinking comes large-scale challenges – proven by the fact that nearly half of all climate techs are developing a new technology from scratch.

There is no playbook, which is why having support around you is critical as you grow. This might start out as funding to bring your technology to market, then guickly becomes complex as you seek investment, take on corporate clients, or expand overseas.

The way we see it for climate tech founders, sustainability has a dual meaning. It means preserving our planet, but also building a venture that delivers the greatest impact possible – and that means balancing growth with profitability.

Here at KPMG High Growth Ventures, we firmly believe that having the foundations for finance and governance from day one enables climate techs to confidently innovate at speed and scale. We're committed to supporting climate techs to build scalable, sustainable businesses with a team of ESG specialists that provide services specifically designed for the unique journey climate tech founders go through. From R&D and grant applications to outsourced finance function and ESG, we save founders time and money so they can focus on what matters: impact.



Amanda Price Partner KPMG Enterprise Co-lead Transactions and Ventures



KPMG

High Growth

Ventures

4.2 Hardware and Software

We cannot solve the climate crisis with software alone - many climate tech companies use hardware solutions or tech-enabled products. While 34% of companies solely offer software, almost half of companies (42%) employ multiple product offerings, and the variety of offerings shown below highlights the multi-faceted approach of climate tech companies.



Product offerings in climate tech companies



Companies may include multiple product offerings



We can't solve the climate crisis without solving the plastics crisis. The climate is in crisis, yet we continue fuelling environmental disaster through the creation of new plastics derived from fossil fuels. We're creating more, but we need to stop and use what we already have - to never make new plastics from fossil fuels ever again. Australia produces 3M tonnes of plastic per year, of which only 12% is recycled (at most). We need both software and hardware to solve the issue (because our current recycling tech and infrastructure just isn't cutting it).

At Samsara Eco, we have invented an enzymatic infinite recycling process capable of breaking plastic back down to its original chemical building blocks and making new, virgin-grade plastics without ever needing fossil fuels again.

This technology has a low carbon impact and can infinitely recycle a range of plastics from your supermarket-shelf packaging to clothing and textiles.

We are planning to have our first commercial facility operating within the next two years and to process 1.5 million tonnes of plastic by 2030 – a tiny fraction of the world market and the problem we're facing.



4.3 Product and Stage - Supporting to Scale

It is impressive to see so many companies in the traction (33%) and scale (9%) stage of growth despite the relatively young median age of companies (2019). There is a huge jump when moving from a prototype, preproduct market fit (PMF), to confirming they do have PMF. This leap in growth recurs when companies become a scaled market leader.

Jumping from traction to scale requires the biggest team hires, capital raises and customer growth and, as such, there is currently a bottleneck of companies at traction stage. The ecosystem can engage with these companies as customers, potential team members, mentors, investors and collaborators to help move them into scale.



Research Prototype Launched Traction Scale

Climate tech companies by product stage and capital raised in the past 12 months(\$)







I'm an engineer, so I see the climate problem as a set of machines. A car is a machine. A water heater is a machine. A coal-fired generator is a machine. A green steel-maker will use a machine. Which machines do we want and how do we incentivise the Big Switch at every level of society?



Saul Griffith Founder and Chief Scientist



5

Growth

Australian solutions to global climate problems



As a nation that pioneered rooftop solar photo-voltaic technology, it is not hard to see the potential for Australia to be a leader in the global race to create, deploy and scale technology solutions to meet the challenges of climate change.

But maximising the impact of great Australian ideas on the world stage does not just happen, as the mixed success of the solar photo-voltaic story makes clear. Instead, it requires the right combination of settings and partnerships, enablers and expertise.

Going global starts with intent and ambition, but that is not enough: 72 per cent of Australian climate tech companies say they plan to expand internationally in the next two years, but only 15 per cent have done this so far. Backing innovation and scaling it globally is a core objective for Pollination.

In a world where climate challenges are urgent, accelerating the wide rollout of effective solutions is the fastest path to the decarbonisation the world needs.

We partner with and invest in innovators to commercialise and scale great Australian ideas all over the world.

Through our advisory and investment platforms, Pollination is backing early-stage companies with technologies and innovations that have the potential to decarbonise global industry. We bring access to capital and market connections through our teams in Australia, Singapore, the UK and the US, to scale the most compelling opportunities.



Brer Adams Managing Director

2023 Climate Tech Industry Report

5.1 Current Markets

Australia is home to world-class climate tech, and 53% of companies only operating in Australia confirms a strong domestic market. Currently, fewer than half of all companies operate in at least one international market (47%), with strong international representation in the larger Agri Food, Circular Economy and Data and Finance sectors.

Australia is a big country, but a relatively small market and to achieve maximum climate impact, Australian companies must take their products overseas. Almost all surveyed companies (94%) want to expand into new markets and we look forward to seeing this map increase in the coming years. Support needs to come from the broader ecosystem because Australian climate tech companies can absolutely successfully scale overseas. Some 47% of surveyed companies are already doing so.

Percentage of climate tech companies operating in each market. Companies may operate in multiple markets.



Direct investment is a critical strategic lever for hard-to-abate sectors, such as aviation, to manage their climate transition. As the market for climate solutions becomes increasingly competitive, simply being an end-user or an off-taker increases risk.

That is why the Qantas Group has established the Qantas Climate Fund. The fund is a AU\$400M investment initiative dedicated to developing the solutions we need to meet our climate targets and help protect the future of travel.

Catalysing and integrating new, low-carbon technologies into our operations helps us drive progress toward our targets and become more efficient. For prospective investments, Qantas Group direct investment carries significant strategic benefits including leveraging the strength of the Qantas brands, our industry expertise, Australia's largest SAF offtake volumes and an engaging leader in end-consumer solutions.

We are optimistic about Australia's significant potential to be a global climate technology leader – with an abundance of natural capital and world-leading talent – which is why we're seeking gamechanging Australian technology, project and partnership opportunities aligned to our investment priorities.

47%



Andrew Parker Chief Sustainability Officer



5.2 Future Markets

Climate tech companies are looking beyond Australia to capitalise on the growing global need for climate solutions. North America, the EU and Asia are hotspots for international expansion, primarily due to their advanced policy and regulation. The IRA in the US is accelerating interest and investment into climate tech, while policy across the EU and UK has triggered significant growth in their climate economies. These sophisticated economies are also experiencing a high demand for climate tech solutions by an increasingly climate-literate society. In Asia, there is strong intent from Australian founders to expand into South-East Asia, primarily due to its geographic proximity with Australia, high-density population hubs, and the growing in-market demand for affordable, mass-adopted climate tech.

Percentage of companies intending to expand into each market. Companies may intend to expand into multiple markets.



Companies intending to expand into new international market/s in the next 12 months

37%

89%

36%

Companies intending to expand into new international market/s by 2025

South-East Asia is the biggest future market within Asia

Despite being regularly repainted with toxic paint, and cleaned by divers, most boats and ships are still heavily fouled, increasing fuel use by more than 25% and transporting invasive species. This is a global issue that requires international scale to solve!



Tom Loefler Co-founder and CEO



5.3 Revenue and Customers

Reliable, recurrent revenue is essential for company growth, and a sign of healthy growth among early-stage startups is the rapid increase in revenue over the first three years of operation. During the next 12 months, 24% of startups are predicting more than 500% revenue growth as they begin to scale their operations and launch into new markets.

Currently, 29% of companies are pre-revenue because they are in prototype and research stage. Of the companies generating revenue, only 14% have an ARR of less than \$100,000, compared to 53% of companies surveyed 12 months ago. Another 14% of companies report ARR between \$1-10 million and 2% enjoy revenue of more than \$10 million. Companies also reported that they are engaging with over 1.4 million customers per month.

Securing customers is the most important way to secure revenue. B2C companies have the highest number of customers, while B2B companies have the highest average revenue per customer. Although 47% of companies already operate in an international market, overseas customers only account for 11% of total revenue. We predict this will scale in the coming years as companies build out and expand their international operations.



Growth

As retailers, we care deeply about driving positive change for our planet, our consumers and our people.

Creating a better tomorrow is at the core of our business, and we are actively looking to partner with climate tech startups to help lead the way to sustainability as fast as we can.



Ingrid Maes Founder and Managing Director

88%

estimated revenue growth in the next 12 months

11%

of revenue is from overseas customers in 2022

\$385M

total annual revenue in 2022

Subscription 44%

> Supporting revenue growth in climate tech companies is crucial. It enables them to scale their solutions, attract investment, and have a greater impact in addressing climate change on a global scale.

> > tenacious ventures



Sarah Nolet Co-founder and Managing Director

5.4 Challenges

Climate tech founders are trying to do three hard things at once: build a company; create innovation; and, solve climate problems.

They simultaneously face all the typical challenges of building a team, developing a product, getting customers and managing finances.

By firstly doing well at building a team and successfully finding customers, founders should find it easier to raise capital (or not need to raise at all).

Despite this, finding investment was overwhelmingly identified as the biggest primary challenge. Finding customers is the second biggest primary challenge, followed by hiring talent.

Challenges reported this year remain similar to those reported 12 months ago - the top-four primary challenges remain identical. Despite the broader tech ecosystem job layoffs, recruiting talented technical staff remains a key issue. Dealing with regulation and government has risen from 7th place last year to 5th place.





79%



Climate tech founders face unique pressures - navigating the political landscape, slower market adoption and the pressure for urgent action. But most founders are driven to build a more sustainable world for humans and nature, motivating them to overcome these challenges.



Mark Rowland Chief Collaboration Officer

There is a common misconception that the clean technologies we need to cut emissions are still in development or do not yet exist. They do. In fact, we have solutions right now that can be deployed at scale to get Australia to meet our global decarbonisation commitments - which are twice our national target

Beyond Zero Emissions research shows that a massive rollout of renewable energies and clean technologies can create more than one million new jobs and support cities and regions to strengthen and diversify their local economies. But, more importantly, cleantech made right here in Australia can solve emissions challenges across the globe.

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ZERO

Heide Lee

CEO

5.5 Confidence in Overcoming Challenges

Reported founder confidence levels in overcoming future challenges, in each category, remain similar to our last survey. Overall, founders remain optimistic as indicated by 97% of participants reporting they are either highly or somewhat confident this year.

There is a relationship between capital and confidence. Businesses that have raised at least \$10M capital are highly confident they will weather future challenges.

We would like to highlight the finding that female-only founding teams are less confident in overcoming challenges compared to the wider sector, whereas mixed-gender founding teams are closer to the average. How can the wider ecosystem collaborate to ensure female-only founding teams are empowered to succeed?



Confidence across founding teams



Growth

Entrepreneurs and inventors are attracted to big challenges because they present the biggest opportunity for innovation and impact. In the next decade, climate change provides the biggest challenge – and conversely opportunity – of our lifetimes. However, the transition from a climate tech prototype to a scaleable, market-ready solution demands rigorous testing, optimisation, and validation. Securing customers, capital, and building a sustainable business can be a demanding process.

AWS Startups supports climate tech startups with a dedicated team of exfounders, CTOs, investors, and mentors to help them build and grow in the cloud. Many climate tech companies have scaled rapidly on AWS and subsequently secured investment to scale their world-class technology.

In addition to the AWS Activate program which provides up to \$100k of cloud credit for eligible startups among a host of benefits, the AWS Startups team runs talks, workshops and accelerators in the ecosystem – including the Clean Energy Accelerator, Sustainable Cities Accelerator and Amazon Sustainability Accelerator. MVP, Proof of Concept and Partner funding help startups accelerate their builds, while the \$2B Climate Pledge Fund has already invested into more than 26 climate tech startups.

If we are to solve the intricate and complex puzzle of the climate crisis, in the urgent timeframe we have now, we will need to use every tool at our disposal. AWS has the tech building blocks, scaleable infrastructure and startup program available to help every climate tech startup prove what's possible.



6

Capital Raising

Bold ambitions need bold investors at all stages



For many companies, raising capital is an essential way to grow their business, but can be a long and complicated process.

Despite facing more challenging conditions, Australian climate tech companies raised \$215M more in 2022 compared to 2021, raising a total of \$553M.

With an ambition to raise \$1.5B next year, they are poised to continue to drive the transition of the economy, both domestically and abroad.

The landscape is dominated by early-stage companies that are either self-funded or at the pre-seed and seed stages, where founders benefit from a large pool of investors. However, once funding requirements increase (especially to finance capex), the number of relevant investors decreases rapidly and fewer companies have access to the funding they need to scale.

This would see specialised climate funds, green banks, traditional banks and industry players working together to design, de-risk and deploy capital solutions that meet the unique needs of businesses. Wollemi is a global climate specialist investment firm looking to fund and support businesses creating the net-zero future. Our firm was purpose-built to address the funding gap at the growth stage, which we refer to as "bridge to bankability", and our flexible mandate allows us to offer alternative capital solutions to fund projects and growth.

By 2030, we aim to have a diversified portfolio of climate tech businesses and projects that are at the forefront of driving global decarbonisation.

To bridge companies from venture to maturity, we believe a collaborative ecosystem-wide approach is required.

> **Paul Hunyor** Co-Founder and Managing Director

Tim Bishop Co-Founder and Managing Director

WOLLEM

2023 Climate Tech Industry Report

6.1 \$553M Capital Raised in the Past 12 Months

Family office Crowd funded

Private equity

Debt

Non-government grants Corporate funding Prefer not to say

Capital raising figures have increased in both average and median value. This year, the average figure is skewed higher by the top-five capital raising companies, which completed raises totalling more than \$295M combined. Chart B displays all sources of capital - including the dominant self-funded (bootstrapped) funding model. Chart C highlights the increase in average capital value of raise rounds from small pre-seed to large Series B+.

Reported total capital raised has increased by \$215M from 2022 because more founders completed the Industry Report survey this year. However, average capital raised per round (\$2.4M) has also increased, representing a 4% total increase in raise value per company and demonstrating encouraging increases in raise value sector-wide.

Almost 90% of companies reported self-funded capital (40% primary and 49% secondary source). Venture is the second highest primary source of capital at 22%, but only accounts for 1% of secondary sources.



Companies using each source

of companies who responded to 53% the founders' survey successfully raised capital in the past 12 month \$1.5B total amount of capital founders intended to raise in 2022

sources

total capital \$553M actually raised



Average capital raise value increases substantially from Series B+ onwards

> Despite the changing market conditions, we have seen Australian companies continuing to raise strong rounds, particularly if they are on no-fail missions like decarbonisation. Access to capital at the right time can supercharge a company's journey, for founders it is critical to recognise that you may need to start raising sooner (as it will take longer) and have solid evidence on customer signals and tech build.



6.2 Capital Raising, Impact and Revenue

Implementing impact measurement frameworks are challenging for founders, particularly during the early stages of their company, and 45% of self-funded companies have no framework in place. However, this halves to 17% by seed stage. Implementing and communicating quantitative impact measurement is easier to do with more resources, experience and product in market - but is also critical in securing funding, especially impact or purpose led capital.

> **Direct Impact** using tech-enabled products to directly solve a climate problem

Indirect Impact enabling a third party to solve a climate problem

Despite a balanced number of direct and indirect impact companies completing the founders' survey, companies that are creating direct climate impact (52%) raise proportionally more capital (76% of total capital) compared to those making an indirect impact, and direct impact companies generate 81% of total sector revenue (\$311M). It seems that being able to demonstrate a direct climate impact may result in more successful capital raising and increased revenue.





The Australian startup ecosystem can support climate tech startups by fostering connections with investors, creating specific funding programs, establishing specialised incubators, and offering policy measures. Collaboration with established companies and institutions, along with education and market access, further aid their growth.

However, co-investing with angel investors is challenging due to regulatory factors and limited network access. Compliance requirements, sophisticated investor criteria, and small angel investor networks pose obstacles. Simplifying regulations and building stronger networks are necessary to overcome these challenges. Aussie Angels is a platform addressing regulatory issues, promoting collaboration, and increasing deal flow aussie angels and access to capital.

Cheryl Mack CEO

6.3 Climate Tech VC Deal Cycles

The Climate Salad founders' survey includes all types of capital moving into climate tech companies, such as grants, self-funding and angel support. To understand the detail behind climate tech venture capital deals, we have teamed up with Cut Through Venture, and this page and the next highlight the increased appetite of venture capital investing in climate tech.

Growth in number of \$20M and \$20M+ deals



Despite a general downturn in venture capital funding for Australian startups following its peak in 2021, the climate tech sector has shown pleasing resilience. This relative strength can be attributed to several factors, including the potential for returns which are uncorrelated to other asset classes, the pressing need to mitigate climate change, and the profound interest of strategic investors in solving the environmental challenges these startups address.

the past year.

of 2023.

The recent funding stats highlight the burgeoning momentum behind climate tech and imply that strategic investments in this sector are not only withstanding the broader downturn, but also surging forward with momentum. There is an overarching hope that these financial and strategic investments in climate tech will yield a future that is not only more sustainable, but also economically viable.

In Partnership with Cut Through Ventures

In contrast to most sectors, which experienced a decline in investment from 2021 to 2022, climate tech countered the trend with a noticeable uplift. This robust performance, coupled with a significant increase in deal sizes, underscores the sector's resilience and allure. A longer-term perspective highlights a monumental shift in investor interest towards this field. The total value of deals skyrocketed from \$57M in 2019 to \$564M during

Already in 2023, we've seen a year-on-year surge in deal value. The average deal size has surged from \$8.8M in 2022 to \$13.9M to date in 2023. The median deal size has risen from \$2.1M in 2022 to \$2.5M in 2023. Given the presence of several dedicated climatefocused venture capital investors in the market along with the dedicated set of strategic investors, it is a fair expectation that this strong momentum will persist in the second half



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6.3 VC Funding - Sector and Stage

Despite individual fluctuations in funding across the 10 sectors, shown by the increase/decrease arrows, overall the climate tech industry has seen an increase in year-on-year funding from 2021 to 2022. The 9.9x increase in VC investment from 2019 to 2022 shows an undoubtedly heightened appetite for climate tech solutions.

Data and Finance, Renewables, Circular Economy, Biosphere, Carbon Markets and Built Environment sectors enjoyed increases in total funding in 2022. Deal sizes vary across sectors and reflect the breadth of climate tech solutions and their diverse funding needs. For example, Agri Food's high total funding (\$182M) compared to average deal size (\$10M) indicates more activity, but less raise value compared to the storage sector's total funding (\$17M) and average deal size (\$15M).



2022 VC funding by sector

mate

In Partnership with Cut Through Ventures



Capital Raising

6.4 Projected Capital Raise and Founder Confidence

Founders have high ambitions for raising capital during the next 12 months. Collective raise ambitions total \$1.5B - an increase of more than 170% on the previous 12 months' total raise of \$553M. Only 6% of the 228 companies surveyed do not intend to raise, indicating that climate tech founders are resilient in the face of harder raise conditions induced by the past year's market downturn.

Despite their ambition, there has been a dip in capital raising confidence levels. For example, in 2022, 50% of founders were highly confident they would successfully raise their next funding round whereas this year that figure has dropped to 37%.

Only 4% of founders reported they were not confident in 2022 and this has more than doubled to 9% this year. Confidence levels worsen for female-only founding teams when compared to sector-wide sentiment. There is work to be done by investors and mentors to empower female founders to access capital.











Raising capital is one of the hardest, but most critical tasks a founder can undertake. While it's heartening to see confidence levels rising in general, it's not evenly distributed.

There's a huge opportunity to unlock better returns by investing in female-identifying and culturally diverse founders. To do this, we need to do more to support founders as they raise.



6.5 International Investment

Last year's international investment figure was reported at \$700M because of the high number of New Zealand companies successfully raising overseas. This year we have only surveyed Australian companies, and the reported \$435M is therefore a lesser figure. We know there are later stage companies successfully raising large international rounds, but we have not captured them in our survey. As expected, much of the reported international capital is flowing into later stages, when companies are established and ready for global expansion.

Agri Food received significantly more international capital (50.7% of total) compared to all other sectors. This highlights the opportunity gap for particularly for the smaller, developing sectors. We predict larger future international investment into sectors such as Resources and Biosphere as the demand for critical minerals, used in net-zero technologies, increases, as well as the general increase in funding appetite for climate tech solutions.





Percentages in the Sankey chart are all dollar figures. % of total capital raised to date



Global Investors are hungry for investments that contribute to climate mitigation and resilience goals. Supportive policies and growing demand in international markets create rich opportunities for Australian clean technology.

These are opportunities for investment capital, but also to scale operations, expand reach and accelerate the deployment of innovative climate solutions, contributing to climate goals on a larger scale.





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Nathan Fabian Chief Responsible Investment Officer Principles for Responsible Investment

2023 Climate Tech Industry Report



Thank You

An enormous, wonderful thank you if you have read to the end of this report. We hope that you can use this data to engage with the Australian climate tech ecosystem – from simply buying a product from a climate tech company, to investing in one, lending your skills as a mentor, or by taking the leap if you are considering a career change into this innovative, climate positive space.

Thank you to the 228 climate tech founders who spent valuable time completing our founders' survey – we hope most of all that this report benefits you. Whether that is a direct connection or the result of many smaller actions triggered by this report, we count that as success. Climate Salad will always be founder-first, and founder focussed.

An inter-planetary thank you to the Climate Salad team - Mick, Charlotte, Jacki, Audrey, Stefan, Michael and Christian - for proof-reading, brainstorming, graphgenerating and allowing Mariel and myself to spend days locked in data deep-dives. This report is a true team effort.

Thank you to our wonderful major partners, partners and ecosystem supporters. You are the reason that Climate Salad can do what we do.

Thank you also to Joel from Vibrant Insights for his help, insights and analysis with this project and wonderful Sustainable Development Goals graph in Chapter 3.



Olivia Utharntharm Industry Report Director

Thank you to the 228 climate tech founders who completed our founders' survey- we hope most of all that this report benefits you.

About this Report

The data which informs this report was taken from Climate Salad's 2023 Climate Tech founders' survey. The survey was shared widely through our Climate Salad networks, our Report Partners, on our website and LinkedIn. Thank you to the 228 companies who participated, we literally could not create this without you.

The 2022 Report included New Zealand companies and therefore data is not directly comparable across the two Industry Reports. For accurate comparable data please see our Data Dashboard using the QR code on the left of this page.

Some questions in the founders' survey were not compulsory, therefore some data points have less than 228 respondents. Data from the founders' census is all self-reported by respondents, and while the information in this report has been verified to the best of our abilities, we cannot guarantee that there are no mistakes or errors.

Data was rounded to the nearest whole number throughout the report, including percentages. All dollar values are reported in AUD. All efforts were made to include accurate sources within the company insights. Where possible, sources will be listed on the Climate Salad website.

The climate tech sector definitions are based on the HolonIQ Global Climate Tech Landscape 1.0. More information about this taxonomy can be found here: https://www.globalclimatelandscape.org/

The content within this report is not intended to be substituted for professional advice. This report is the intellectual property of Climate Salad. You may not reuse, republish or reprint this content without our written consent.



Data Dashboard

This report is only a small snapshot of the climate tech industry data that Climate Salad has collected. Express interest in the Climate Tech Data Dashboard, which includes all 2022 and 2023 comparative data, the ability to filter by state or sector, generate new graphs and more. It provides a deeper dive into the climate tech industry and is useful for investors, governments, founders and corporates.



Climate Solutions Directory

228 companies completed our Industry Report survey this year, and you can find more information about them in the Climate Solutions Directory. Useful for investors, governments, potential customers and potential team members.



Custom Reporting

Interested in custom reports or deep dives and analysis into a key area of Australian climate tech?

Contact us to find out more.





The Climate Salad Team

This report was completed with the hard work, dedication and team work of the Climate Salad family.

Thank you for your commitment to building this critical industry.





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2023 Climate Tech Industry Report



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