

Time to Venture: Scaling up Transformational Climate Tech in India

India is currently undergoing a significant energy transition, fuelled by the urgency of addressing climate change and ensuring energy security. India's net-zero targets for 2070 and its interim climate commitments for 2030 augur a period of rapid low-carbon economic growth. While India does heavily rely on fossil fuels, it has also set up ambitious renewable energy targets, aiming to achieve 450 GW of renewable energy by 2030. This push towards renewables is a fundamental part of India's strategy to reduce its carbon footprint. India's energy landscape is characterised by diversity and complexity, with the unique imperative of balancing between environmental sustainability, energy security, and economic growth.

Within this context, climate tech ecosystems are a crucial lever in India's energy transition strategy, with the aim to facilitate innovation and business models that disrupt traditional energy systems and drive the adoption of clean technologies. India is witnessing a significant growth of climate tech startups and the facilitating environment that is emerging to support them. As per an Impact Investors Council (IIC) report, India has over 120 funded climate technology startups, which have collectively raised funding from over 272 different investors from across the country. Globally, India holds the 9th position in terms of venture capital (VC) funding for climate technology. Furthermore, investments in climate technology in India have seen a substantial surge, rising to an impressive US\$3.7 billion in 2022 from around US\$100 million in 2015. This has been facilitated by growing government support through conducive regulations and incentives, coupled with the rising commercial viability of climate-tech investments.

In a business-as-usual scenario, climate change can cost the Indian economy over US\$ 33 trillion in the next 50 years, however, investing in climate solutions can add almost US\$ 11 trillion to the economy in the same time frame, according to a study by Deloitte. These solutions have the potential to foster innovation, promote market competition, encourage job creation, and create employment opportunities while addressing serious social challenges. This becomes particularly salient in a developing economy context, helping to advance a people positive energy transition. It is becoming increasingly clear that investing in climate tech solutions is crucial for both environmental sustainability as well as socio-economic development. A report by Unitus Capital and Climake suggests that India is projected to invest around US\$ 1.01 trillion in climate action initiatives from 2022 to 2030, with an average annual investment of approximately US \$112 billion.

Despite these promising developments, the climate tech ecosystem in India is at an incipient stage and leaves much to be desired. The lack of substantial risk capital continues to remain the most persistent challenge. Furthermore, there continues to be a sectoral bias towards renewables and electric vehicles for instance, with other emerging sectors struggling to attract substantial investments. To illustrate, investments of around US\$ 300 billion are needed for sustainable food value chains by 2030, while approximately US\$ 200 billion is required for water and solid waste management, and about US\$ 60 billion for demand-side energy management, according to the State of Climate Finance in India report. The private equity and venture capital community must recognise the vast potential in investing in these emerging sectors and across different stages.

This compendium is an effort to showcase some success stories from India's diverse climate tech ecosystem, providing inspiration and valuable insights to encourage the proliferation of climate tech start-ups and stimulate increased VC and Private Equity (PE) investments in this sector. It brings together perspectives from both startup founders and venture capital funds in India, operating and investing in climate technologies.

The first set of essays profiles 11 early-stage companies that are part of a fast-evolving climate tech ecosystem in India, which are innovating on business models across multiple sectors. These range from energy efficiency, climate risk analytics, carbon markets, water tech, green hydrogen, electric mobility, grid infrastructure, solar panel hardware, and microbial fermentation for methane gas

conversion. Each company highlights the current market landscape, where decades of excessive reliance on fossil fuel-enabled products and manufacturing practices have led to rising temperatures and carbon emissions. This has created urgency to find long-term, sustainable alternatives to combat climate change, in particular, deep science-based technology tools, which can have the potential to disrupt the petrochemical and hydrocarbon-fuelled status quo.

These start-ups showcase, through the description of their technology solutions, the widespread social impact of their models on communities that are most vulnerable to the effects of rising carbon emissions. Moreover, they discuss the challenges faced when building and deploying these solutions in the Indian market, including the low availability of a diverse capital base to underwrite the risk of these technologies, as well as customer awareness and adoption, particularly among industrial houses. The essays in this compendium also underscore the role of various stakeholders, such as governments, think tanks, industry organisations and academia, to address these challenges. Suggested solutions include: i) unlocking the flow of public and private capital to support early-stage ventures; ii) improving awareness of greener substitutes for commercial and industrial customers; and iii) providing inputs into policy recommendations to achieve a successful transition to a low-carbon economy.

Furthermore, in the second set of essays, six venture capital funds discuss a wide range of emerging opportunities in the climate tech venture ecosystem in India, which have the potential to both i) create outsized financial returns; and ii) catalyse these companies to build solutions that mitigate or adapt to the effects of climate change. These funds dive into the formulation of their investment strategy, which typically cuts across various sectors to constitute a climate tech mandate, as well as their preferences for deep tech ventures with large capex overlays, compared with asset-light models akin to traditional software investing. Additionally, these funds engage with the challenges associated with deploying capital into this space, citing the need for effective collaboration between other capital providers such as banks, philanthropic (risk-free) capital, industrial players, university R&D labs, and the government.

This publication therefore aims to bring to the forefront the wide range of opportunities for practitioners and capital providers alike to drive private sector involvement in climate action solutions. India is uniquely placed to be at the forefront of the net zero climate transition, due to a confluence of positive factors encouraging the growth of early-stage venture activity. These include a highly skilled pool of talent, both in scientific research and in investing expertise, as well as a large landmass of natural resources. Furthermore, supportive government regulations such as the notable Electricity Amendment Act, the Green Hydrogen Policy, and the National Policy on Biofuels represent critical steps towards advancing the green growth agenda. Furthermore, the narrative of “Make in India for the World” presents an immense opportunity for India to become a hub of climate tech solutions. Nevertheless, India still has a long way to go to create a truly organic enabling environment for deep tech climate startups to operate, particularly when it comes to optimising the role of academic institutions to foster cutting-edge research; encouraging industry actors to support prototype development through engaging with start-ups; and developing differentiated capital asset classes to allocate funding to climate tech venture growth.

Given the state of the climate emergency, it is crucial to create an actionable blueprint to tackle these challenges through innovative climate tech solutions and investments so India can stay on course to meet its set climate targets. This will in turn help early-stage companies galvanise the tools they need to achieve scale and thereby widespread adoption of their solutions. It is, therefore, ORF and Theia Ventures’ aim that this collection of essays helps frame current discussions on lending active support to this vibrant and burgeoning climate tech ecosystem in India. We hope you enjoy the read!

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