

The State of Climate Finance in India 2023



April 2023

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2022: A Recap

It was the best of years, it was the worst of years...

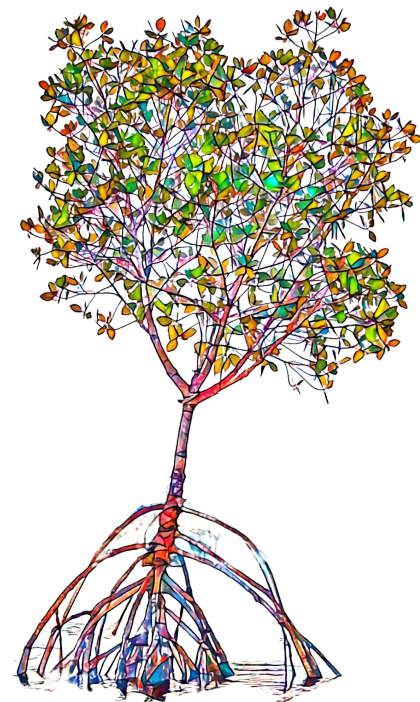
In many ways, 2022 ended on a bleak note for those trying to save this planet. The IPCC [published](#) its most dire warning to date, offering little hope that temperature rise will stay below 2 degrees by the end of this century. This was a warning that most countries shrugged off, in what turned out to be the weakest COP in many years, ending with vague promises and very little progress on ground. Even smart financial structures like carbon offsets that were all the hype last year came under scrutiny, resulting in buyers and project developers backing off into a wait and watch mode.

However, there was much good that came off the year as well. Almost all countries and public corporations in the world are now committed to net-zero targets. While the goals vary and, are indeed, far in the future, there is definite movement towards building a more climate resilient economy, globally.

Climate investments has seen a [resurgence](#). Trillions of dollars are being invested in renewable energy, grids, storage and electric mobility. Some of this investment has also gone into the next-generation of breakthrough technologies to advance our climate transition, like compact nuclear reactors and sustainable aviation fuel. Policy also moved favourably, with big changes in most of the world, including the [US](#), [Europe](#), India. With so much happening in climate action and climate finance, it is becoming an increasingly complex field to navigate.

With this report, the third annual edition of our series of 'The State of Climate Finance In India', we delve deeper into what is happening with climate investments in the country. And just like the end of the famous [Dickens](#) novel that we have borrowed the title from, we hope this report leaves you with optimism and hope, and a renewed sense that the choices we make today still have the potential to make a difference for future generations.

- Simmi Sareen & Shravan Shankar



The state of greenhouse gas emissions in India in 2022

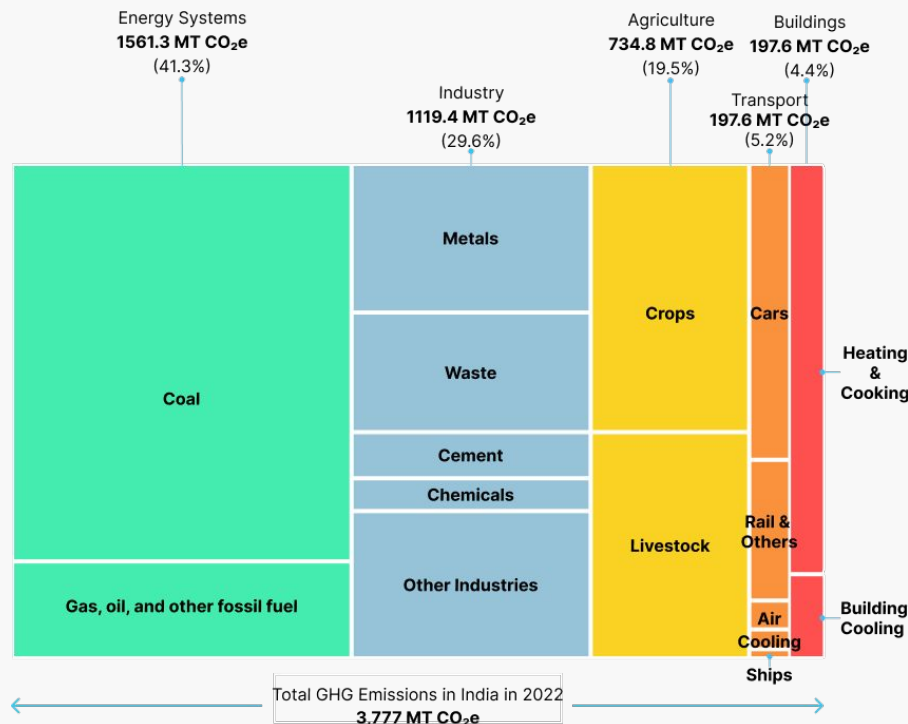
India had the highest GHG emissions growth, globally

India witnessed a **6% increase in greenhouse gas (GHG) emissions in 2022**, the highest growth rate among major countries. **Figure 1** gives a breakdown of GHG emissions across sources in 2022. The share of emissions is little changed from previous years, while amounts have increased. This is reflective of difficulties in aligning low-carbon pathways with the country's development needs.

India's renewed NDC pledges and a net-zero target are purported to align these two points. However, they will take a long time to take effect, and do not account for **carbon inequality** - the top **10%** of India's population, by income, emits almost **9 times** more emissions per capita as compared to the bottom **50%**.

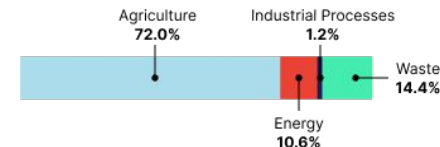
If current policy and initiatives are enacted, India will reach **peak emissions far too late, by 2040**. For India's fair-share contribution to limiting warming to **1.5°C**, emissions need to have already **peaked before 2030**.

Figure 1: Sector-wise breakdown of total GHG emissions for India in 2022 (Source: [World Data Lab](#))



Tackling methane offers significant opportunity

Figure 2: Source of methane emissions in India in 2022 (Source: [UNFCCC](#))



Methane accounts for **20% of India's GHG emissions** - the **3rd highest** globally.

Methane mitigation is a low priority, and India is not even a signatory to the [Global Methane Pledge](#). Focus on methane needs a relook, due to the **outsized effects** which can reduce the rise in global temperature quickly: methane traps up to **84X** more heat than CO₂ and exists in the atmosphere for **12 years** compared to the **100 years** for CO₂.

More needs to be done to tackle methane's largest source: livestock and paddy farming. Current interventions are too few or too expensive; unlike in waste management, where abatement initiatives, such as biogas, offer a quick payback opportunity.

Climate equity funding reduced but diversified in 2022

India's climate tech bets are diversifying

Equity funding for climate tech in 2022 reduced **34%** compared to the previous year; however, 2021 numbers were skewed by **8** large strategic, IPO and post-IPO deals worth over **USD 5 billion**.

Investments in sectors beyond renewables, which urgently need to grow, increased. Agritech grew **20%**, and waste and circularity increased **5X**. Electric vehicles (EV) saw funding across the ecosystem, even as total funding dipped by **12%** - largely due to 1 strategic deal accounting for **60%** of EV funding in 2021.

Total climate tech investment in 2022 was around **USD 22.5 billion**, as debt financing picked up in renewables, EV financing, and the waste management, with lenders becoming more confident in climate tech. Renewables accounted for **USD 12 billion** of debt, likely resulting from companies with large equity rounds in 2021 focused on leveraging debt in 2022.

Figure 3: Sectoral breakup of equity funding in climate tech in 2022 (Source: Industry data)

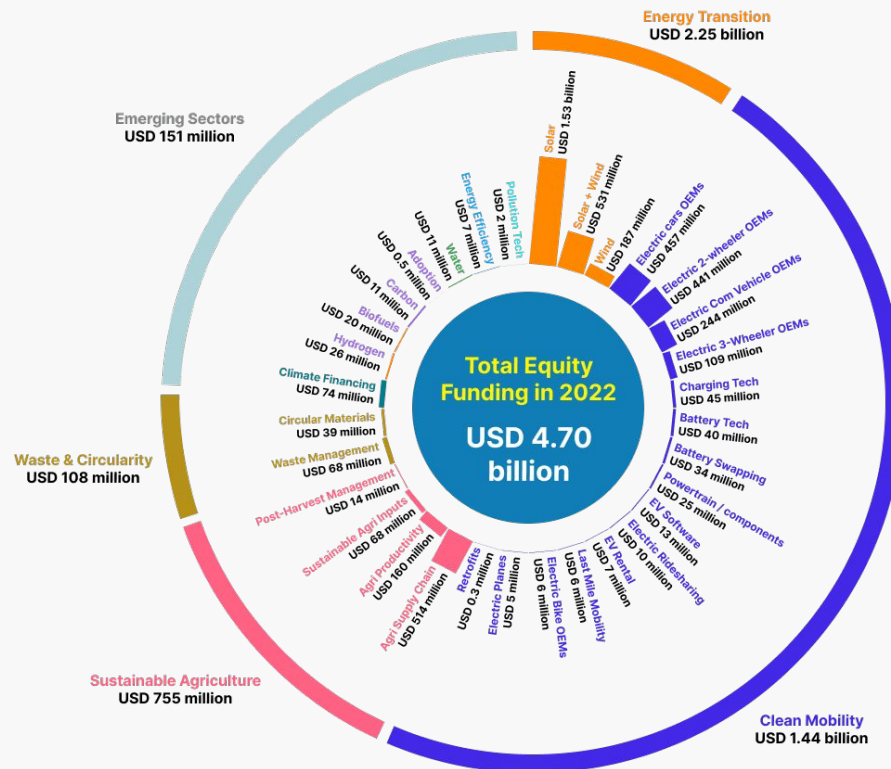
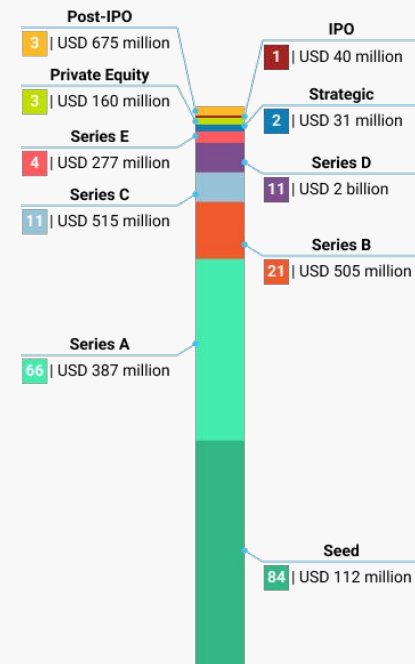


Figure 4: Climate tech equity deals and funding rounds in 2022 (Source: Industry data)



India's slow road to net-zero emissions

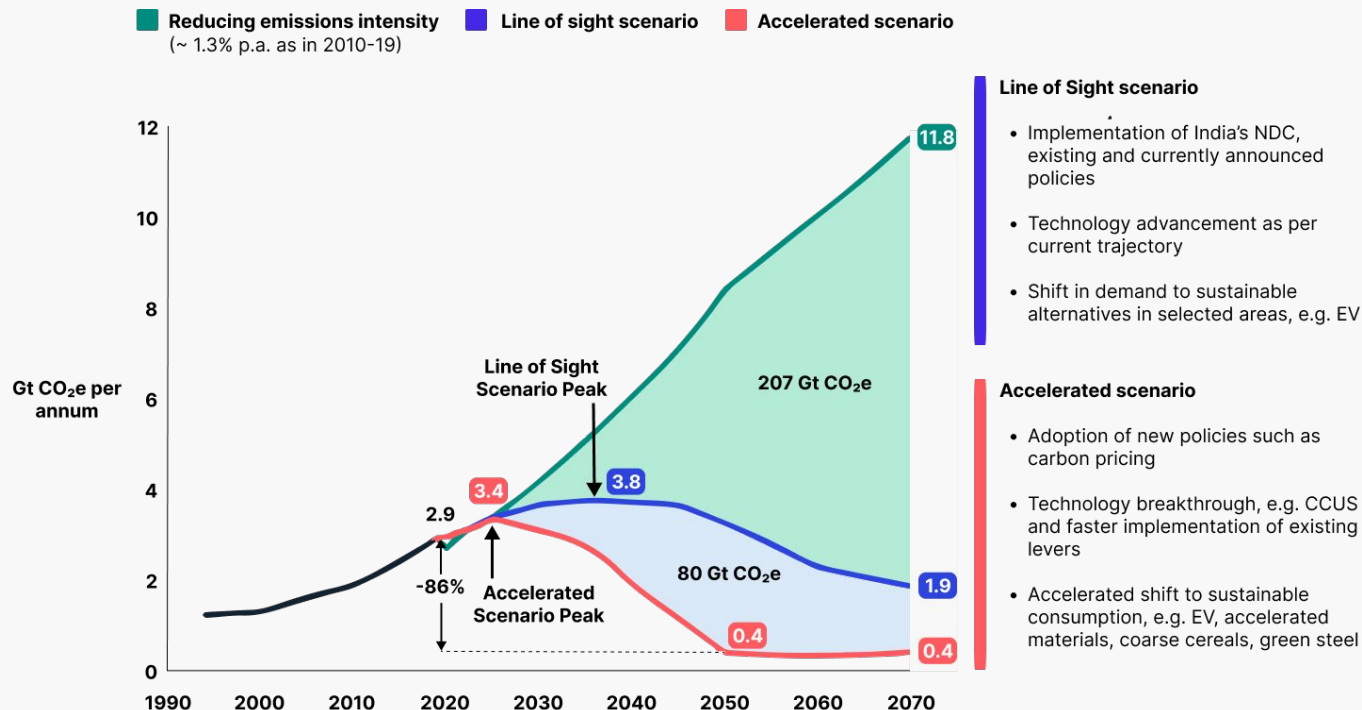
India's policy is changing, but much too slowly

The pathways for reducing India's overall emissions rest on 3 axes: (a) willing customers, both businesses and households, to adopt climate-positive solutions; (b) climate tech businesses that are providing such solutions, and (c) a supportive policy environment.

In this, we believe the policy remains a laggard. India's climate policies have shown positive trends in multiple areas, including renewables, electric mobility and circular economy, in 2022. But these are all targeting net-zero emissions in 2070. Climate innovations today exist to achieve net-zero emissions sooner.

Financing is another barrier to adoption and scale. [Last year](#), we estimated a **1 trillion** dollar financing gap to meet India's climate goals. The pages that follow track how the needle has moved for each climate action segment, and whether funding is keeping pace. We believe that the overall climate finance trend still points to about **USD 120 billion** gap a year until 2030 for mitigation activities, but with policy delays, adaptation spends would likely be higher.

Figure 5: India's projected GHG emissions trends until 2070 (Source: [McKinsey](#))



India's Climate Sector Trends

Renewables will continue to be the largest climate play for a while

India's electricity demand will continue to rise

The country failed to meet its **175 GW** capacity target, ending 2022 with **120 GW** of renewable energy capacity. But the growth in electric mobility and green hydrogen - covered in detail later in this report - will need more *green* electricity. Solar and wind offer sustainable, commercial returns which will attract significant capital over the next decade. The **USD 220 billion** needed to get to **450 GW** in wind and solar energy capacity may seem a lot, but we expect this funding to be met by domestic lenders, development finance institutions (DFIs), and long term investors, like pension funds.

Other energy transition areas - storage and grid management - are garnering early interest but are a few years away from commercial funding. Grid modernisation, demand management and analytics will eventually become important. However, India is still far away from the tipping point where renewable energy gets significant enough to impact grid performance.

Wind re-emerges

Solar has been the leading technology and investment favourite for a few years. 2022, however, saw multiple investments in wind energy companies and platforms building a combination of solar and wind projects. This was driven by the emergence of solar/wind hybrid projects. In December, Adani Green became the world's largest solar/wind plant owner, with a capacity of **450 MW**. India is not likely to end its coal fascination soon, but hybrids offer better reliability and project economics when compared to standalone solar and wind projects. As storage becomes cheaper, the three combined can offer grid stability that round the clock power needs.

2023 might give another surprise entrant: biomass and waste-to-energy may have a less than **10%** share of installed renewable capacity, but in the last 3 months, just [one company](#) has managed to raise more than **USD 300 million** investment for waste to energy projects, based on paddy straw and agri residue. This is one sector to closely watch.

Figure 6: Expected Installed Energy Capacity in India (Source: [IEA World Energy Outlook 2022](#))

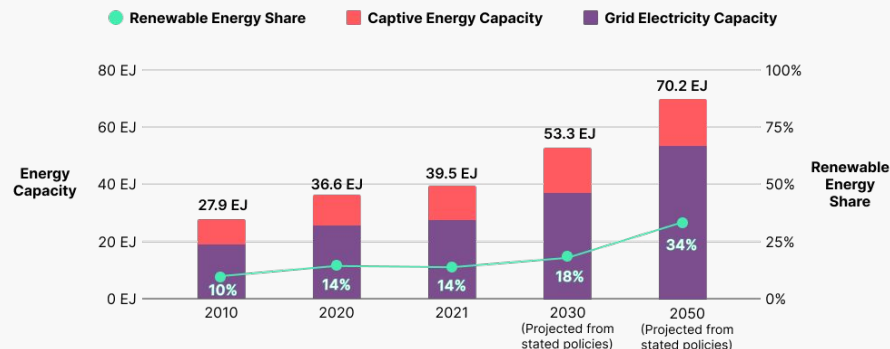
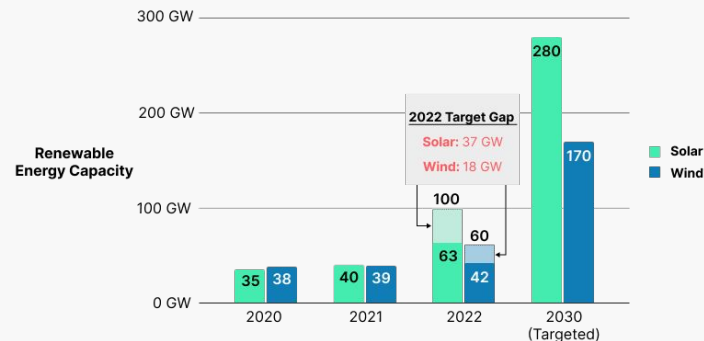


Figure 7: Renewable energy capacity trends in India (in GW) (Source: Ministry of New and Renewable Energy, Government of India)



Funding and innovation for electric mobility will move beyond OEMs

Figure 8: EV revenue potential opportunities in India by 2030 (Source: [Bain & Company](#))

Total revenue EV opportunity: USD 100 billion

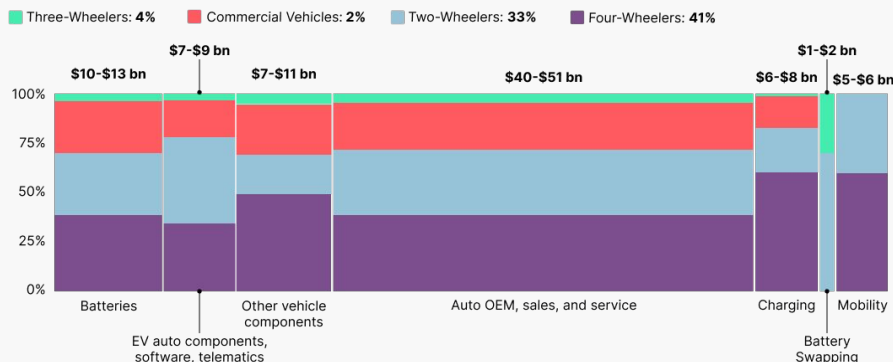
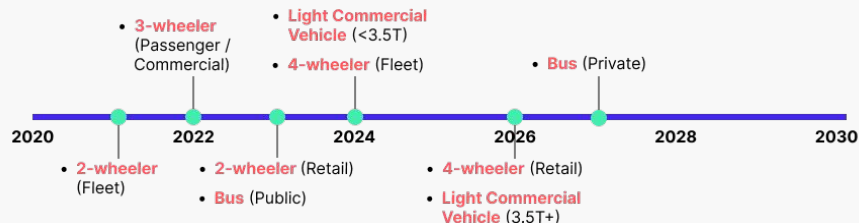


Figure 9: Inflection points of electric vehicle segments in India (Source: [Aventus](#))



The EV Ecosystem: Mobility's next frontier to increase EV adoption

EVs in India are largely a 2 and 3-wheeler story. In FY 2023, [591 brands sold EVs in India](#); 456 in 3-wheelers alone, contributing **53%** of all 3-wheeler sales. The scope for new OEMs to enter the market is now low, even as EV's share in the larger 2-wheeler (123 brands with a **5%** market share) and 4-wheeler segment (**1%**) is small. OEM funding - for innovation and scale - will focus on existing players. We believe that funding and innovation will shift to **four areas** of the EV ecosystem critical for scaling adoption.

EV charging infrastructure: By 2030, [4 million charging points](#) need to be installed. However, better connected experiences and revenue opportunities for charging operators and OEMs will be bigger success factors than just installing more charging points. Battery safety, charging for [new battery chemistries](#), and 4-wheeler public fast charging will be the main innovation focus. Battery swapping will be a 2 & 3-wheeler fleet story, a sizeable market, due to lacking at-home recharging options for fleet drivers.

Fleet and mobility-as-a-service solutions:

Fleet (passenger and goods transport) and mobility-as-a-service will be the main drivers for 2-, 3-, and 4-wheelers until EVs become more affordable for personal use (See [Figure 9](#)). Mobility-as-a-service, and EV financing, both key factors for scaling EV fleets, had among the highest growth rates in climate funding, which will continue.

BMS and battery cell manufacturing:

Battery Management Systems (BMS) and battery cell manufacturing will localise within India, as increased captive demand makes investments viable, along with the need to ensure batteries are suited to Indian conditions. Indian lithium-ion cell solutions are poised to [enter the market](#), becoming the **4th market**, after US, China, and the EU.

EV components, software and telematics:

This area builds on India's existing role as a global supply chain hub for the auto industry, with export opportunities, and a **USD 10 billion** opportunity in India alone by 2030.

Batteries are the common thread between energy transition and EVs

Battery storage's mainstream moment is still awaited

Battery tech's **85%** increase in funding in FY 2023, is representative of the potential of the segment, which is expected to increase **15 times** by 2030, to **160 GWh**. Mainstream adoption, in 2022, is still limited; largely restricted to the first generation of EVs due to the expense of batteries. Peak adoption of EVs as well has not been realised.

Battery prices are reducing rapidly though, and will catalyse adoption. Indian battery prices are expected to reach global parity by 2030. (See **Figure 11**). Enabling factors already exist: we are seeing improved economies of scale across the manufacturing value chain as production capacity scales globally, as well as increased localization of manufacturing components such as fuel cells. Even as established players look to set up gigafactories, there is a substantial role for startups with the benefit of extensive R&D to create higher performance products to compete, especially in non-EV applications.

The potential for other battery chemistries

Lithium-ion batteries are the main form of battery chemistry in the market today, and will likely remain so until demand in stationary storage and other non-EV applications increases. The EV ecosystem is setting up and investing in infrastructure around lithium-ion batteries, which will make it the dominant battery chemistry for EVs.

The development of other battery chemistries - flow, metal-air, etc. - is driven by a need to reduce dependencies on rare materials - such as lithium and cobalt - and the potential for other materials to offer better energy capacities and performance. New, non-lithium-ion battery chemistries will likely find initial adoption in stationary storage applications; by 2030, this is expected to be the main demand driver for battery storage (EVs are only expected to account for **33%**), if India's efforts to build **500 GW** of installed power capacity from non-fossil fuel sources are to be met.

Figure 10: Indian battery demand outlook (Source: [Rocky Mountain Institute](#))

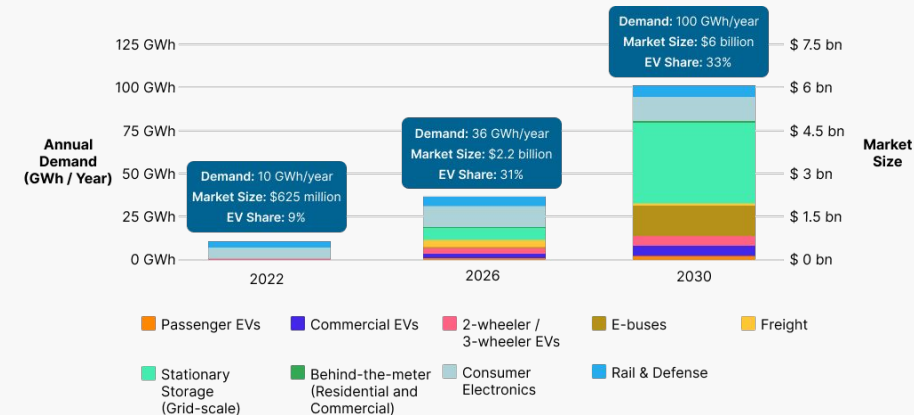
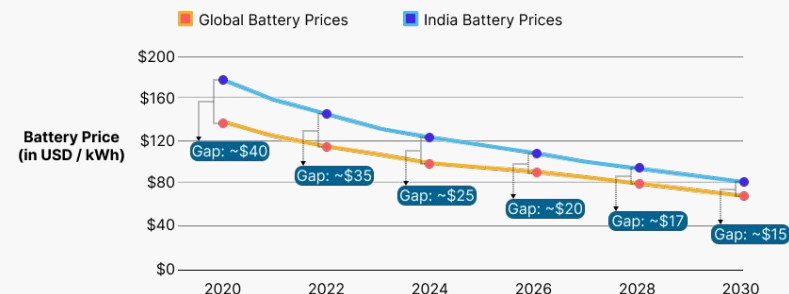
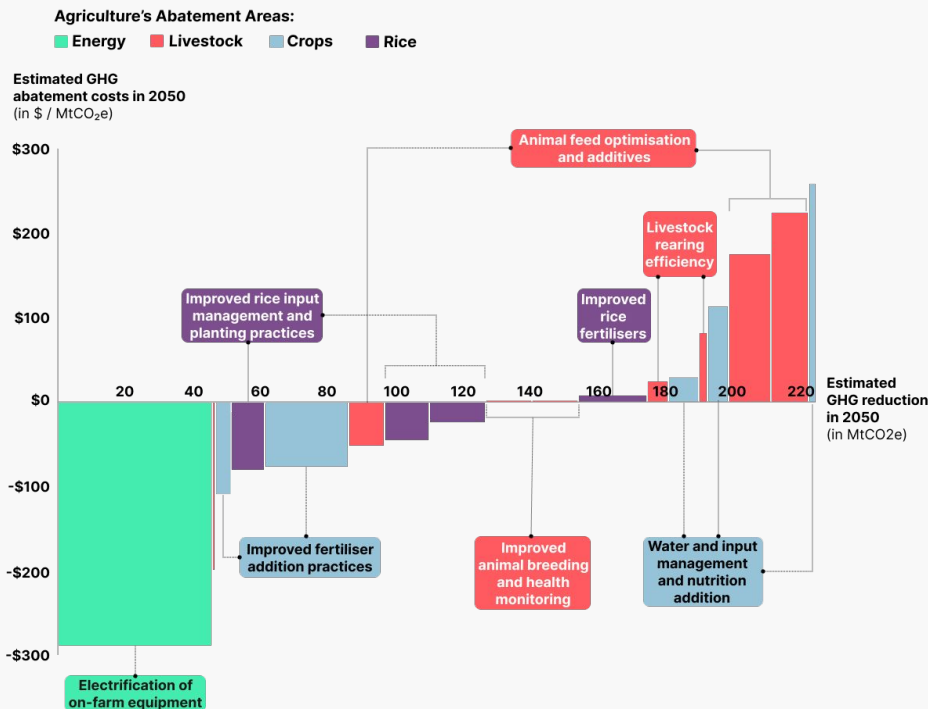


Figure 11: Projected global and Indian lithium-ion EV battery prices (Source: [Aventus](#))



Agritech's on-farm growth highlights untapped climate opportunities

Figure 12: GHG Abatement opportunities and overall costs in agritech by 2050 (Source: [McKinsey](#))



On-farm agritech's moment is emerging

Supply chain startups continue to be the main focus for Indian agri-tech investors, accounting for **73%** of the 2022's **USD 755 million** funding. On-farm solutions - *post-harvest / farmgate, farm productivity, and sustainable farming practices* - are emerging. The number of deals almost doubled to **44** in 2022, with a **90%** increase in funding. Half the deals were at seed stage, reflecting future potential in these segments.

On-farm solutions - e.g. *soil and crop monitoring, precision agriculture, input automation systems* - have faced issues of affordability and effectiveness in the past. However, they become more attractive when combined with the business models and large market access of supply chain players. Agritech platforms need to ensure quality of supplied produce; labour shortages are making automation attractive, while the need to future-proof produce will likely encourage climate-smart and resilient practices.

Most of agri's climate mitigation opportunities are untapped

Even as adaptation and climate-smart agriculture becomes prominent, climate mitigation in Indian food and agriculture is largely untapped, see **Figure 12**.

Electrification of farm equipment, offers up to **20%** of agriculture's decarbonization opportunity, along with cost advantages. This is largely driven by decentralized renewable energy solutions - solar pumps, solar dehydrators - with policy supporting more widespread deployment.

The remaining **80%** directly related to growing and harvesting crops and rearing livestock, and all its associated inputs and practices, has been barely scratched into.

Constraints range from changing generational practices of farmers, the expense of adopting on-farm solutions, and the need to research and develop inputs that mitigate GHG-emissions. Financing entities and B2B companies to support on-farm interventions will be critical for this adoption.

Waste management & circularity: India's next climate breakout sector

Municipal solid waste is cleaning up its act

India generated **58.4 million tonnes** of municipal solid waste (MSW) waste in 2022. Even as private enterprises are engaged to tackle it - led by cities like [Indore](#) - MSW will remain a government-dependent activity. Policy is moving in the right direction though. Effective waste collection and efficient recycling of fresh MSW - targeted to reach 90% through [Swachh Bharat 2.0](#) - is expected to make the market worth **USD 3.5 billion by 2030**, 7 times more than today.

India has **3,159 landfills with legacy waste** - **10,000** hectares of urban land that needs to be cleaned up. Biomining - the cleanup and remediation of legacy landfills - has emerged as MSW's hottest sector on the back of the government's target to clear **2,200** landfills by 2026. Incumbents are diversifying and new entrants are expected, but MSW will likely feature few equity plays. Biomining equipment and projects are largely getting funded by debt and will continue to do so, as would fresh waste segregation projects.

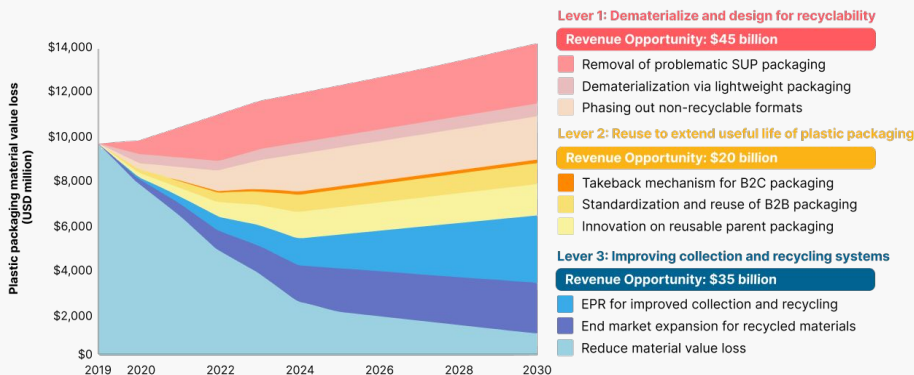
Plastic and e-waste show the benefits of good policy

Waste and circularity was a breakout sector for climate tech investments: **USD 108 million** raised in 2022, **3 times** more than in 2020 and 2021 combined. Mainly driven by India's progress in plastic and electronic waste recycling, the progress is reflective of how policy can catalyse climate innovation and funding.

Policies like Extended Producer Responsibility are driving corporations to invest in strengthening the waste value chain to be compliant. While improving waste collection and segregation remains a key focus, 2022's policy steps will incentivize innovation and investment in two areas with the potential to lead to near-fully circular products: *the breakdown of wastes to raw materials*, and *high quality recycled outputs*.

Software-only traceability, without on-ground presence, will have little value unless data gathering and analytics becomes more intuitive and real-time; a difficult to achieve prospect in a fragmented waste value chain.

Figure 13: Plastic packaging circularity market opportunity in India (Source: [FICCI-Accenture](#))



Circularity solution plays are getting diverse

Natural alternative materials are largely in a nascent innovation phase. Plastic alternatives, and to a lesser extent, high value consumer segments such as fashion and cosmetics, are at early traction. Adoption is limited, with solutions yet to reach economies of scale. However, the segment will generate investor interest due to its future impact potential.

We see potential for near-term investments in plastic packaging alternatives, even though India's plastic extended producer responsibility (EPR) approach incentivizes recycling of plastic over replacement.

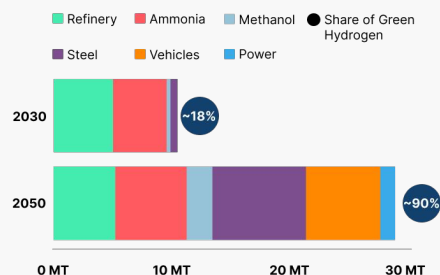
Refill and reuse solutions are even more nascent; brands and consumer acceptance is a larger barrier, although emerging players are showing scalable business models.

Industries' building blocks are starting their decarbonization journey

Industries' green building blocks

Steel and concrete, make up a **11% and 9%** of India's GHG emissions, respectively, a significant part of industry's non-power emission contribution. [Decarbonizing these sectors](#) needs to be prominent for India's net-zero path, but 2022 saw no funding in innovations necessary to directly decarbonize these sectors, even as [companies trialed foreign solutions](#). Still, early traction was seen in **three areas** that can be a [pathway](#) to reduce industrial emissions footprints.

Figure 14: Hydrogen demand by 2030 and 2050 (Source: [Rocky Mountain Institute](#))



Green hydrogen

Green hydrogen's potential is extensive, from a ready market of replacing grey hydrogen in ammonia and refinery applications, to replacing fossil-fuels in use cases that require high energy density fuel or intense heat, e.g. coal in steel making.

Green hydrogen's use as a transport fuel will be limited to heavy duty vehicles (HDVs) due to the significant investment and complexity for public refuelling infrastructure compared to recharging for EVs. HDVs, with captive refuelling, may find it a viable use case.

The focus, until 2030, will be on building the foundations for green hydrogen's exponential demand growth in the coming decades (see **Figure 14**), expected to account for 90% of all hydrogen demand in India. Electrolysers are the main focus, but innovation and investments across the ecosystem: digital twins, transport and supply mechanisms, and proof of origin technologies, will be opportunity areas for startups.

Biofuels

Biofuels, such as ethanol, are not new; India achieved **10%** of ethanol blended in petrol across the country in June 2022. First-generation biofuels, derived from vegetable oils, initially drove this adoption, but have faced constraints relating to affected food stocks. Second-generation biofuels, made from agriculture and biomass waste, have gained traction for their additional benefits of tackling waste and avoiding use of food stocks. All the **USD 20 million** raised towards biofuels in 2022 went towards startups working with second-generation biofuels.

[India's bioethanol policy](#) calls for expanding first-generation fuels to meet a target of **20%** of ethanol in petrol, which will be driven by the countries' oil majors. Second-generation biofuels will still have growth opportunities for their additional benefits and multi-fold applications beyond petrol and diesel blending, including waste-to-energy, especially if efficiencies around resource and market access are realised.

Carbon capture

Carbon capture has largely been driven by nature-based approaches, such as afforestation. 2022's **USD 11 million** raised towards carbon adoption was primarily from startups enabling carbon credit access for nature-based solutions. Industrial-based carbon capture has been minimal even if the need is high, primarily due to significant costs and unviable economics.

This will change. India's net-zero targets will create innovation and investment incentives for industrial carbon capture; especially in sectors where emission reductions are hard to achieve, e.g. fossil-fuel power plants, cement, or steel. The Indian government conservatively expects **20 million tonnes per annum of carbon capture and storage** infrastructure to be in place -, a small percentage of the total emissions in the country but foundational to start out the sector. Innovations for this are nascent, and financing - estimated to cost **USD 4 billion** - will need to be mobilized.

Adapting to our changing environment needs greater focus

Living in a changed world

Too little gets said and done about climate adaptation: *solutions that address how we live and operate against the effects of climate change*. Although adaptation solutions have made inroads in sectors like agriculture, they are largely not in focus.

Mitigation is easier to measure - *reduced GHG emissions* - and has been the main focus of climate finance activity so far. Adaptation activities, at times, also tends to extend beyond the purview of private finance. Areas like disaster management and primary healthcare are squarely in the public policy domain and will remain so.

However, we take a look at **three areas** around adapting to a changing climate, that are seeing early yet pivotal response from climate tech startups, and which we think have potential to scale. Policy is still key here, to create incentives for innovation and financing similar to what we have seen in areas like waste and circularity.

Heating and cooling

With parts of India already reaching [wet bulb](#) threshold, air conditioning is becoming a necessity instead of a luxury. India will likely need [1 billion](#) air conditioners by 2050, a **40X** growth compared to 2016.

Investments in cooling innovation have so far focused on making commercial buildings more efficient. Led by the likes of [Smart Joules](#), a revamp of HVAC systems in hotels and hospitals that is both highly impactful and profitable, making it the first market that climate tech can solve for at scale.

While the next focus should ideally be on building efficient ACs for the many new consumers, we will have to wait for more favourable policy action there. The next round of investments are likely to focus, instead, on cold chains. Keeping food and pharmaceuticals cool is an equally large challenge in a warming world, and early innovations there range from solar refrigeration to material science plays on better insulation.

Water

The last 3 years has seen a second round of water investments for India. **Water 1.0**, a decade ago, focused on solving drinking water via public-private partnerships. Many of these [water ATM companies](#) went the way of solar microgrids, unable to find the right business models. **Water 2.0**, just like solar, is being built on two axes:

- Large government projects to build public infrastructure - through legacy infrastructure companies - has received investment commitments of [USD 240 billion](#) in projects like Namami Gange and Jal Jeevan Mission.
- Innovation in B2B water technologies, both around reducing water usage and industrial waste water treatment.

Like most climate tech, B2B contracts and cash flows are easier for investors to understand and bet on. This will not solve the problem, but they are creating the basis for innovation that we hope will eventually drill down to the consumers.

Air quality

As atmospheric CO₂ concentration increases, air pollution has to be solved in [tandem with climate action](#). However, we identified only **8** early-stage investments in the sector over the last 3 years.

Startups that offer air filtration as their only product have generally struggled to find product market fit. Climate mitigation strategies that **also** solve for air quality can have a more far reaching impact. Two examples of this from this year are:

- Clean cooking is a difficult problem to solve as consumers who use firewood cannot often afford cleaner LPG. But 2022 saw a flood of carbon offset projects, making improved cookstoves affordable for these customers.
- BioCNG and biochar startups like [PRESPL](#), [GPS](#) and [Takachar](#) are primarily solving for agri-residue but also offer paddy burning alternatives, thus creating significant positive impact on air quality.

The Climate Investor Landscape

The climate equity investor universe expands significantly

310+ Investors

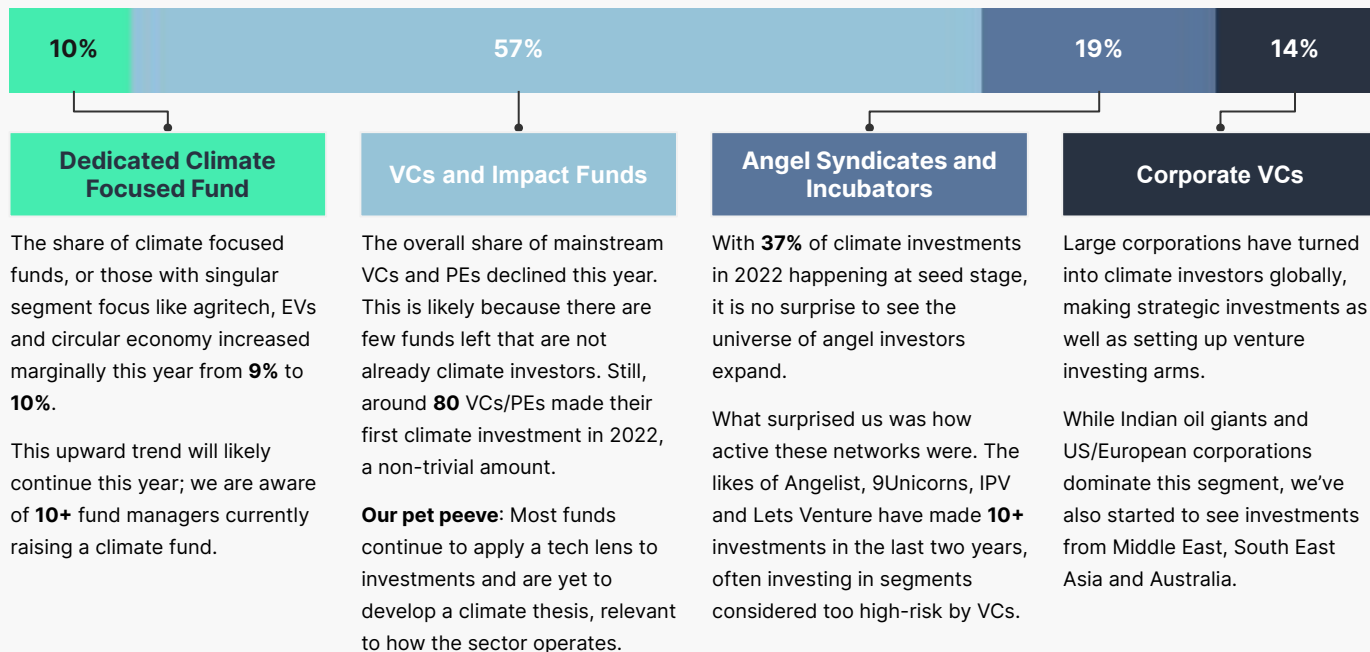
The most talked about number from our 2021 report was the size of the equity investor community. That universe has again expanded significantly this year.

We count **more than 310 institutional investors** (including angel syndicates and incubators who invest) that have made a climate-positive investment in the last 24 months. This is a surprisingly large increase (**40%**) from last year.

130 new investors emerged in 2022. While some are new dedicated climate funds, a majority comprises of investors who have expanded their thesis to include climate change. As we have been saying for a few months now, it feels like every investor is a climate investor.

Figure 15: Climate tech equity funders breakup, over the last 24 months (Source: Industry data and analysis)

Who are India's climate tech funders?



Three reasons why equity investments (and investors) will grow



Limited Partners (LPs) like climate

Climate investing is hard, at least when compared to SaaS or consumer plays. Most climate startups have long B2B sales cycles, and many are asset-heavy hardware plays, making it difficult for VCs to invest. But climate tech is likely to see multiple positive headwinds in the next **2-3 years**.

If one thing can change VC playbook, it is a prompt from their limited partners (LPs). In the last year, we have had meeting after meeting with pension funds, sovereign investors and family offices who want to commit capital to climate action.

And we are seeing the results of this interest today. As of early 2023, there are at least 10 Indian fund managers raising a climate focused fund. With mission-aligned LPs, these new funds can potentially make more relevant investments with longer horizons more suited for climate startups.



There is a significant pipeline of startups

One common refrain we have heard from investors in the last 2 years is that there just aren't enough interesting startups to invest in. That might be changing, and quite rapidly at that. 240 startups raised a seed round in the last 3 years. If even 30% of these go on to raise follow-on capital, there's enough deal flow to go round for the mid-to-late stage investors.

And new companies are coming into existence at the same time. There are **22,000 startups** working on renewable energy, agritech and green technologies in India - a large enough pipeline for the many general partners (GPs) out raising a climate fund.



Positive climate tech policies

A supportive policy environment is critical for investors coming in for the long haul (with climate tech investment horizons longer than the usual VC lifecycle). There were positive development this year on multiple fronts:

- Solar policy seems to have finally stabilised after the flip-flops on net metering and open access, and the [ALMM \(Approved List of Models and Manufacturers\) deadline](#) has been extended;
- Multiple [policy incentives](#) have been put in place for the EV industry, and;
- The previously mentioned EPR rules have been tightened for both [plastics](#) and [electronic waste](#), and are upcoming for batteries, which will likely pave the way for a strong circular economy.

Corporations are catalysing Indian climate investments



As strategic investors looking to transition

2022 saw an increasing trend of large companies making climate tech investments, either as a strategic play or via corporate venture equity arms.

Most climate tech investors in the corporate world are either larger players in the industry, or incumbents (say oil and gas majors companies) looking to diversify. What is surprising though is the source of this capital. Only half the corporate investors were from developed countries (US, Canada, EU). **34%** were Indian corporations - from oil majors to large well-funded tech startups. Asia, both Middle East and Southeast Asia, accounts for the balance **16%**.

Strategic investments from corporations can offer advantages over venture equity: corporate investing teams often follow an “investment++” approach, championing their portfolio companies to internal business and carbon desks.



As carbon buyers to get to net-zero

For corporations who will struggle to achieve net-zero through direct operational reductions (primarily those in extractive and hard to mitigate sectors: e.g. *mining, aviation or shipping*), buying carbon offsets remains an attractive option.

Despite the controversies surrounding carbon credits and their topsy-turvy volatile pricing, Indian developers continue to build carbon projects for the future corporate buyers. Around **200** new carbon projects were conceptualized in India in 2022, a steady **30%** increase.

With this, India is one of the fastest growing sources of carbon credits, now accounting for **27%** of all projects registered with Verra - the leading carbon credit certifier - including those currently under validation. Several major European and Japanese corporations now have full-fledged carbon trading desks in India, a precursor to more active markets to come.

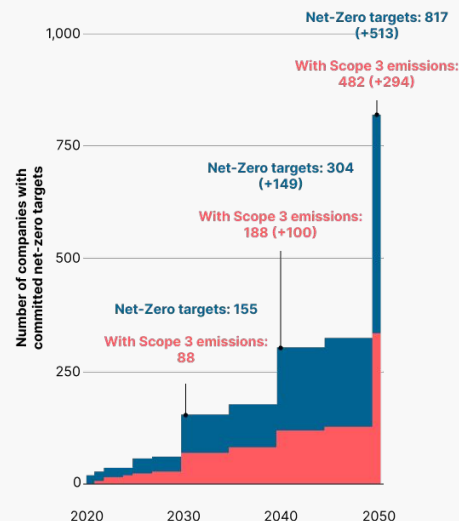


Towards their supply chains in India

483 of the largest global corporations have targets to reduce to eliminate emissions linked to their supply chains (see **Figure 16**). The driver is increasing recognition that a corporation's net-zero targets have to include their Scope 3 emissions - emissions from activities that occur across their value chain, which can account for between **65% to 95%** of a corporation's true total GHG emissions.

As more corporations near their target deadlines for net zero emissions, we expect increased investments in climate action not just in locations where they have direct operations, but wherever they have vendors and suppliers. Corporations are using a mix of compliance and incentives to encourage supply chains to invest in energy efficient equipment and renewable energy. This is a switch that is cross-sector and diverse: from technology campuses providing outsourced IT sources, to Indian auto component suppliers supply global auto OEMs.

Figure 16: Global companies' net-zero and Scope 3 emissions commitments (Source: [Net Zero Tracker](#))



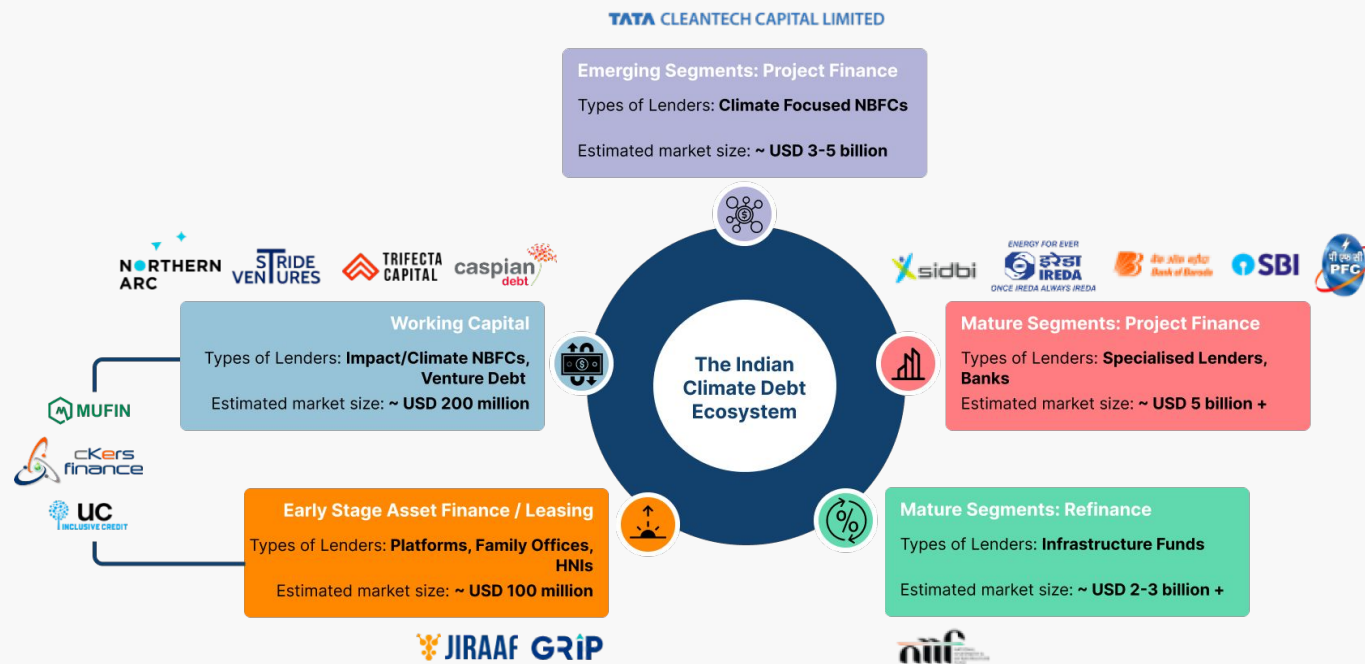
Debt Markets: Domestic lenders shine in 2022

Debt scales climate action

The last year was one of the most active years we have seen for domestic debt markets. Not only have traditional project financiers continued to grow and diversify into new areas like electric mobility, but we also saw a host of new solutions emerge.

EVs in particular seem to have mastered the art of converting an asset-heavy industry into something akin to a VC play, using a combination of lending, asset leasing and other off-balance sheet strategies. Working capital, which traditionally used to be a roadblock for climate tech's growth (given the long B2B collection cycles) seems to be solving itself as well, driven by a number of venture debt players that have emerged. Raising a successful equity round is still a precursor to debt, but once you are past that goal, lenders are able and willing to provide capital early and far ahead of profitability. Most lenders identified in **Figure 17** are well capitalized, and we expect them to continue to deploy additional debt this year.

Figure 17: The Indian Climate Debt Ecosystem, with examples of lenders in each lender type (Source: Industry data)

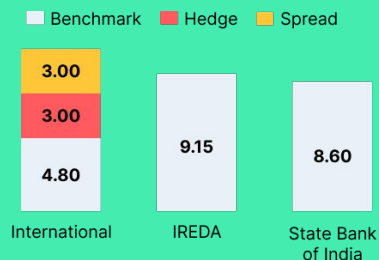


International debt: short term challenges, long term potential

External debt is costlier now

In a strange twist of financial markets, interest rates rose rapidly in US and Europe compared to India last year. International loans are now at least 100-150 basis points (bps) higher. Climate tech firms, especially in mature sectors like solar energy, chose to borrow domestically. But this is a trend we expect to reverse soon because: **(1)** interest rates will eventually even out, and; **(2)** there just is not enough capital in the Indian financial sector to meet the entire demand. In 2023, we will keep an eye out for **three trends**.

Figure 18: Interest rate comparison (Source: Industry data)



DFI Lending is set to rise

In February, [ADB](#) committed to invest **USD 25 billion** towards green growth in India over the next five years. Indian funding by ADB and other DFIs from the US (IFC, DFC) and Europe is not new. What has changed over the last two years is a single-minded focus on solving for climate change.

DFIs are best suited to fund large projects and as sectors beyond renewable energy start to mature, we expect significant funding coming towards electric mobility, sustainable food systems, waste management / circularity and energy efficiency. DFIs also provide capital to financial institutions and many are focused on co-creating and funding green NBFCs and funds.

Green bonds

While the **billion dollar** maiden issuance of [sovereign green bonds](#) was talk of the town in early 2023, overseas issuances of green bonds by Indian banks and climate tech firms seemed to have taken a pause with volumes for [H1-22](#) (the latest data we could find) significantly below 2021 numbers.

We believe that:

- this is a temporary break, and;
- possibly not even one since private bonds are becoming more popular and might not be getting captured in the data.

These unlisted bonds for deployment in energy transition, circular economy and agriculture attract a wider investor set and get priced at a discount to regular debt, thus making them an attractive option and one we believe will see a resurgence this year.

Blended financing options

India has some unique challenges that commercial finance simply cannot solve. Many climate solutions need to be adopted at scale by populations who cannot afford it, and that's where a combination of finance and philanthropy will shine.

Outcome-linked bonds (or any name you call these by) allow capital providers to fund what they would usually consider high risk with philanthropic capital either by adding a first loss guarantee or subdising part of the high cost such funders will expect, based on the impact outcomes.

This is a market that has seen a handful of early deals so far but our survey of capital providers shows this is one segment that will see rapid growth in the next **2-3 years** as climate tech innovations start to scale.

The future of climate finance: what the road to 2030 looks like

Who will fund climate action

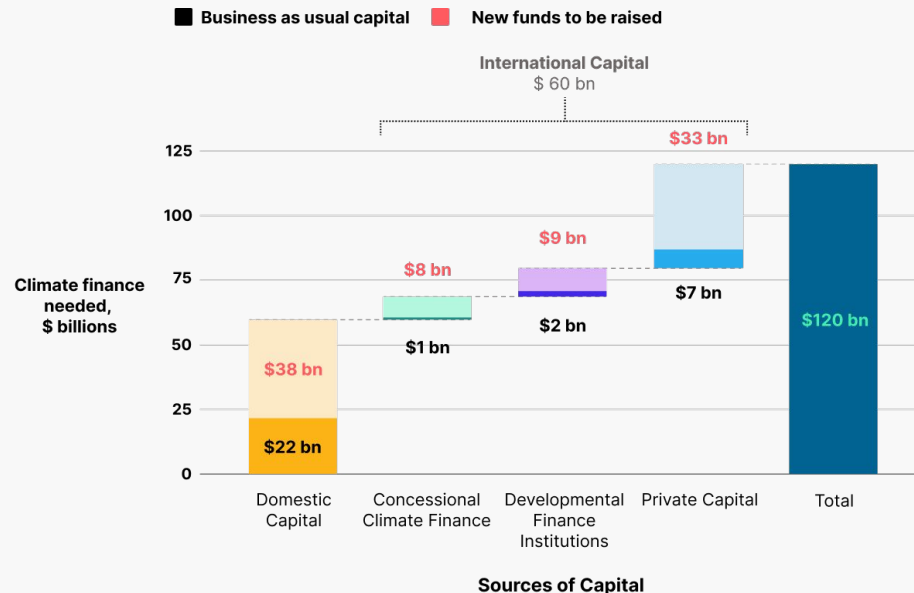
Last year, we estimated that India will need about a trillion dollars to meet its climate goals by 2030, or what now amounts to about **USD 120 billion** in new investments every year. Other reports put the gap even higher, at as much as **USD 170 billion** a year.

We are taking a stab at guessing who the funders for this **USD 120 billion** could be. The data, largely an extrapolation of work that [Bhattacharya et al \(2022\)](#) did for emerging markets as a whole, might not capture all of India-specific factors but we believe the larger trends will hold.

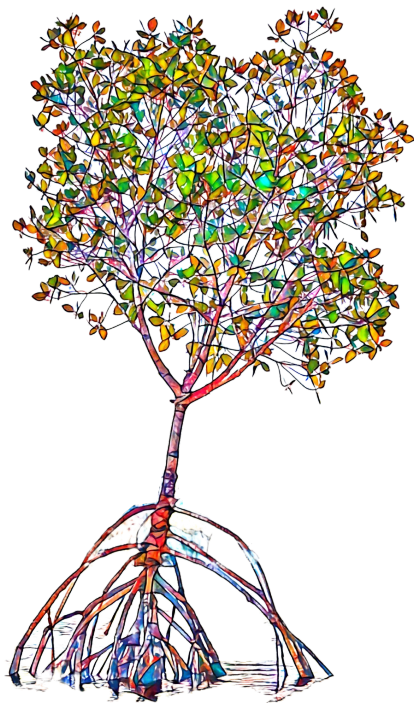
When broken up into potential sources of capital, the numbers do not look as daunting. Additional domestic capital is only about **1%** of India's GDP and as we mentioned on the previous page, DFI capital allocation is likely already in progress. The blended finance and private sector gaps are the most uncertain, though both are seeing signs of rapid growth.

It is entirely possible that our **USD 120 billion** estimate itself is understated - we do believe it captures climate mitigation adequately, but additional spends will likely be needed as adaptation becomes a priority. We intend to explore this further in our next report.

Figure 19: Climate financing needed with sources of financing in India (Source: Industry data)



Endnotes



“Talk of saving the planet is overstated, however. Earth will be fine, no matter what; so will life. It is humans who are in trouble. But since we got ourselves into this fix, we should be able to get ourselves out of it.”

— Stewart Brand, *Whole Earth Discipline: Why Dense Cities, Nuclear Power, Transgenic Crops, Restored Wildlands, and Geoengineering Are Necessary*

We have written this report as a curtain-raiser, a sort of ‘where are we right now in the world of climate finance’.

We intend to follow this up with a series of deep dives (intended to be sooner than our existing once-a-year output) into different segments of climate action and what we believe the future of fixing climate change will look like.

For thoughts, comments, or perspectives, on **The State of Climate Finance in India 2023** reach out to us at:

hello@climake.co

Stay tuned, and if you are not already signed up, do subscribe to our updates to receive the upcoming series at the link below:

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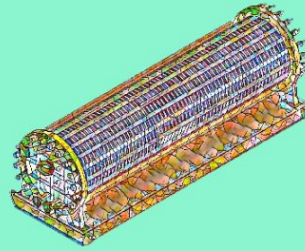
Climake was founded in 2020 as a growth platform to scale the innovation and finance ecosystem for climate action. Climake focuses on improving access to equity and non-dilutive capital, and access to customer markets, adopting a variety of ecosystem building approaches, including the development and adoption of innovative financing structures to mainstream climate innovations.

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Unitus Capital (UC) is an investment bank that arranges capital for companies positively impacting underserved communities and the environment. Since its launch in 2008, Unitus Capital has been committed to delivering best-in-class investment services that unlock the capital needed to fuel the rapid and sustainable growth of impact businesses. It focuses on three broad themes: technology, financial services, and climate solutions. With operations in Bengaluru and Mumbai, it delivers its services to clients across India, Southeast Asia, and Africa. To date, Unitus Capital has raised over USD 4 billion in capital for more than 150 enterprises.

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