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Towards a Just Transition Finance Roadmap for India: Laying the foundations for practical action

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About this report

The India Just Transition Finance Roadmap (JTFR) project is part of an international collaboration with international partners including CDC Group, Harvard Kennedy School, and the London School of Economics (LSE). In India, the project has been led by Suranjali Tandon (National Institute of Public Finance and Policy) and Annapurna Mitra (IMF, formerly Observer Research Foundation), working together with Nick Robins of the LSE. A similar process is underway in South Africa, led by Trade & Industrial Policy Strategies (TIPS). Working on this initiative with partners in South Africa, the UK, and the US gives us the opportunity to share experiences and provide India's perspective on the global just transition agenda.

The goal of the JTFR is to identify the priority actions that can be taken by financial institutions to support climate action that also delivers positive results in terms of livelihoods and sustainable development. It involves a review of existing practices, an assessment of exposure by sector and region, and the development of a set of priority actions for finance.

This report presents the results of the first phase of the project which involved scoping the landscape and highlighting priorities for further work which will be presented ahead of the United Nations Climate Change Conference (COP26).

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Foreword from Jayant Sinha

India's position when it comes to climate action is unenviable. Our greenhouse gas emissions, both cumulative and per capita, are a fraction of those of major economies. Nonetheless, we are on the receiving end of an increasing number of extreme weather events triggered by global warming – from floods to droughts, forest fires to melting glaciers – which threaten life and livelihoods.

As the world's major economies shift to net zero emissions targets by mid-century, India's participation in this endeavour will be critical. More importantly, as green technologies become cheaper and more efficient, these can also be the path to economic growth, development and job creation. The COVID-19 pandemic has demonstrated the importance of resilience in the face of systemic risk, and the folly of prioritising short-term growth over long-term sustainability. I strongly believe the goal of Net Zero Bharat can transform the Indian economy into a hypercompetitive, environmentally sustainable and resilient economic powerhouse.

The main objective to such a goal, especially in a developing country like India, is ensuring that climate action does not conflict with development goals, especially those of eradicating poverty, ensuring access to energy, creating new jobs and livelihoods and replacing those destroyed. This requires careful policy sequencing, calibration and an awareness of both possible trade-offs, but also synergies between climate and development policies. Most crucially, climate action and economic development will depend on flows of finance, and all sectors of the financial system must be mobilised.

This report, therefore, is especially timely in providing a framework for assessing the social risks to livelihoods, energy access, public finance and economic vulnerability which arise as a consequence of the transition to low-carbon development. It also proposes a roadmap for the financial system to address these risks.

Regional prioritisation is particularly relevant to a continent-sized economy like India's, where the balance of risks and opportunities varies widely across different states. I represent a coal-producing district in the state of Jharkhand, which faces a number of risks from the net zero transition. From my experience and observation, a credible net zero target must be aligned with policies for developing human capital and providing alternate livelihoods, which in turn will only be possible if the requisite investments are mobilised.

I am pleased to see that researchers have started looking into these questions, and are working not just on defining the contours of a 'just transition' in India, but addressing the more practical question of how this just transition can be financed. I look forward to seeing this project develop over the coming years.



Jayant Sinha

Member of Indian Parliament, and Chair of the Parliamentary Standing Committee on Finance



Most crucially, climate action and economic development will depend on flows of finance, and all sectors of the financial system must be mobilised.

Foreword from CDC

A transition to net zero and resilient economies that is socially inclusive – a just transition – is essential if we are to limit global warming to 1.5°C and help countries adapt and be more resilient to the impacts of climate change. This is particularly important in emerging economies, many of which are heavily reliant on fossil fuels for electricity, industrial production, livelihoods and government revenues. In India, as key sectors of the economy are transformed, we must also create new and decent jobs so that no-one is left behind.

Considering the needs of workers, communities and consumers within climate action is therefore key. India has a large, diverse and growing population which adds to the scale and urgency of the task. In the wake of COVID-19, which is currently having a devastating economic and human impact in India, we need a green and inclusive recovery that delivers new jobs and livelihood opportunities, particularly for low-income workers, rural communities and women.

Finance has a critical role to play. As outlined in the IEA's Net Zero by 2050 report, we must radically increase the flow of finance into emerging markets to enable the transition to net zero emissions. As part of this, public finance – both domestic and international – alongside private investors should prioritise a place-based financing and investment approach that aims to replace livelihoods dependent on the fossil fuel value chain, support workers to gain new skills and jobs, and improve clean energy access in a way that has social co-benefits for workers and communities.

At CDC, we invest for clean and inclusive growth, and have always considered the importance of decent work for all. We're committed to considering the social implications of climate change alongside the environmental impacts – that's why just transition is a key pillar of our Climate Change Strategy.

In India, we're supporting the development of clean energy through Ayana Renewable Power, a renewable energy platform we launched in 2018, alongside investments in sectors such as agriculture and healthcare. In partnership with Ayana, we have supported skills development for rural youth to access solar jobs in Andhra Pradesh and Rajasthan to test new approaches to enabling a just transition.

But we know we can't deliver on these ambitions alone. With COP26 on the horizon, this report provides the finance community with the foundational research and stakeholder insights needed to agree next steps towards financing a just transition in India. We hope this report will stimulate engagement from international and domestic financial institutions, governments, policymakers, regulators, civil society and local communities on this agenda – as there is lots more work to be done.



Dr Amal-Lee Amin

*Director of Climate Change, CDC Group plc
and Senior Advisor to UK Government COP26 Unit*



We should prioritise a place-based financing and investment approach that aims to replace livelihoods dependent on the fossil fuel value chain, support workers to gain new skills and jobs, and improve clean energy access alongside social co-benefits.



Executive summary

India faces three transitions: urbanisation, digitalisation and climate

India simultaneously confronts the challenges of multiple economic transitions – urbanisation, digitalisation as well as the shift to zero carbon. While the Indian government has not legislated a net zero target as yet, this is being widely discussed by policymakers and experts, as well as the international community. Given India's status among the 10 largest economies in the world, net zero carbon in India by mid-century will be essential for the success of global climate ambition. In this context, ensuring a just transition has assumed significance. Embedded in the Paris Agreement on Climate Change, and elaborated in guidelines from the International Labour Organization (ILO), just transition expands the focus of climate policy so that communities and livelihoods are not left behind to bear the costs.

The just transition agenda provides a framework to ensure these transitions are aligned to SDGs

In our view, the just transition agenda is the “connective tissue” that binds climate goals with social outcomes.¹ On a number of dimensions, the objectives correspond closely to those of the United Nations Sustainable Development Goals (SDGs). Climate action, of course, is one of the SDGs, but a well-crafted agenda for a just transition will also support the achievement of SDG 7 (affordable and clean energy), SDG 8 (decent work and economic growth), and in the process, SDG 1 (eliminating poverty) and SDG 10 (reducing inequality). The SDGs, however, are defined in terms of desirable economic outcomes, and are agnostic to the process of achieving these outcomes. They do not take into account policy choices required, and the inherent trade-offs and synergies between the SDGs in the policymaking process.

Unsurprisingly, social risks arise predominantly in coal and agriculture dependent states

The just transition framework provides a starting point for evaluating and addressing these trade-offs. Sectors that will be impacted by the net zero transition include coal mining, electricity generation, agriculture, manufacturing and industry, and transportation. Given India's size and economic diversity, sectoral impacts will vary substantially across regions. We identify four dimensions of social risk arising from the net zero transition: to livelihoods, energy access, public finance and human development, which we identify as just transition risks. Mapping these risks to Indian states, we find that Madhya Pradesh, Jharkhand, Chattisgarh, Uttar Pradesh, Bihar, Odisha, Telangana and Rajasthan will be most affected by the zero carbon transition.

¹ LSE Grantham Research Institute: Why governments need to issue just transition sovereign bonds and how they could do it (2020)



As India moves towards a net zero economy, ensuring a just transition has assumed significance.

While the financial system is in the process of understanding climate challenges...

The investment required for India to reach net zero by mid-century is substantial, with the International Energy Agency (IEA) estimating an annual requirement of \$200 billion for all sectors. Achieving the SDGs alongside this requires additional investment, both private and public. While investor interest in India's energy transition has been substantial, mobilising such amounts will require a coordinated effort from policymakers, regulators, companies and the financial sector. In doing so it is critical that just transition is considered a core element of both sustainable finance and responsible investment.

India's financial system is gearing up to address the challenges of climate change. At the behest of international investors – an important source of foreign exchange and investment – regulatory practices in India have been adapting to international best practices. The Reserve Bank of India (RBI) joined the Network for Greening the Financial System in April 2021. Environmental, social and governance (ESG) reporting was embedded, albeit on voluntary basis, in the form of Business Responsibility Reporting. These disclosures are used by large institutional investors to make equity investments or even by private equity to drive change. Innovations in finance – green bonds and impact bonds – have also expanded the range of alternative debt offerings available to raise funds.

...the social risks which arise as a consequence must, simultaneously, be addressed

In this report, we describe mechanisms through which the financial sector can address the social risks arising because of climate change and decarbonisation of the economy. The just transition framework set forth for India can be used in two ways. First, it provides guidance for investors when reaching out to companies to understand whether they operate in vulnerable regions, and if there are any investment strategies capable of mitigating the risks in these regions. For example, under the Climate Action 100+ initiative, investors can engage companies on improving climate change governance, cutting emissions, and strengthening climate-related financial disclosures² and, from 2021, on just transition indicators linked to loss of livelihoods. Second, it provides guidance for investors seeking to align capital allocations to the just transition framework.

Laying the foundations for further work

This report aims to lay the foundations of a research agenda which can support practical action by investors and policymakers. To further develop this agenda, we identify three major areas of intervention:

1. Aligning investment opportunities and financial practices to just transition priorities;
2. Shaping financial policy and regulation to support a just transition; and
3. Financing projects that support communities and workers affected by the transition.

Over the next few years, we hope to further expand the scope of this agenda, engaging with different strands of the financial system, regulators, policymakers, workers and communities.



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² Climate Action 100+ (2021)



01

Introduction

As countries move towards net zero and resilient economies, just transition has assumed greater significance. Embedded in the Paris Agreement on Climate Change, and elaborated in the ILO's guidelines, it expands the focus of the transition to ensuring workers, communities and consumers are not left behind to bear the costs. In India, the concept of just transition is yet to gain a foothold in policy and finance. However, it is fundamental to India's development path as it confronts the challenges of multiple economic transitions – urbanisation, digitalisation, and the shift to zero carbon. This presents an opportunity to reset the continuing disparities through active stakeholder engagement to ensure the outcomes of the transition are aligned with the SDGs.

India has committed to reducing its carbon emissions, has led the international conversation on solar power and is recognising the importance of sustainable finance. The next step for India is to embed these climate actions within a just transition framework that also recognises the incidental social costs and opportunities. As the economy reduces its dependence on fossil fuels, builds up the clean economy and responds to increasing climate impacts, there will be profound effects on both public and private finance. Taxes, duties and royalties applicable to fossil fuels will alter the fiscal space. Similarly, private finance – in terms of banks, investors and capital markets – will need to reposition their portfolios, factoring in social risks linked to the transition while working through how the 'S' of ESG comes to life. Stakeholders will have to recalibrate their engagement with companies to mitigate the risks of double materiality³, and support individuals seeking new sources of livelihood and a more sustainable consumption basket. It is in the interest of each of these actors to anticipate the transition, pre-empt any costs, and engage better.



The next step for India is to embed these climate actions within a common framework of just transition that recognises the incidental social costs and opportunities.

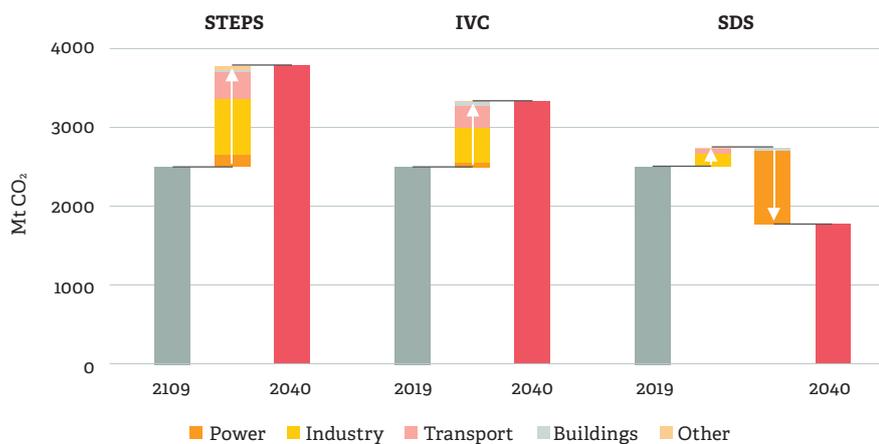
³ It is widely known that there are climate related impacts on companies and therefore companies must disclose non-financial information. However, companies too have a bearing on the environment and this is encapsulated in the concept of double materiality.

Both foreign and domestic institutional investors are starting to explore how just transition can be delivered in India through their engagement with listed companies and private equity. More importantly, financial regulators, including the central bank, can better articulate the need for just transition among the finance community. Just as regulators in the past have signalled priorities through regulatory shifts in India, it may perhaps be time for articulating a home-grown just transition agenda. In doing so, it is critical that just transition is considered the core element of both sustainable finance and responsible investment. Now is the time to formalise and embed the concept. This report seeks to identify pathways for the financial sector to support the just transition by driving climate action, while protecting those most vulnerable to the changes.

Understanding the Indian climate scenario

Since the Paris Agreement, India has taken the initiative to encourage the use of clean energy and is on track to meet its climate commitments.⁴ India has augmented its solar capacity from 2.63 gigawatts (GW) in 2014 to 36GW in 2020⁵ and currently leads the International Solar Alliance (ISA).⁶ Recently, Indian policymakers articulated a case for a net zero target for emissions by mid-century.⁷ Nevertheless, a commitment to a net zero future reflected in India's energy policy will have huge implications for the Indian economy and workforce.

According to the IEA, under current policies, India's CO₂ emissions will be 50 per cent higher in 2040 than in 2019.⁸ The IEA also describes a more ambitious "sustainable development scenario", under which emissions decline steadily in the 2030s, on track to reach net zero by the mid-2060s. However, this scenario will require tackling emissions from existing infrastructure, as well as making a decisive shift towards green infrastructure in future. In both scenarios, India will account for 9 per cent of global energy demand by 2040.



STEPS corresponds to the current set of policies. The India Vision Scenario (IVC) is more ambitious, but nonetheless leads to emissions rising up to and beyond 2040. The Sustainable Development Scenario (SDS), leads to a steady decline in emissions, reaching net zero by 2060.

Figure 1: Carbon Emissions under different policy scenarios. Source: International Energy Agency, India Energy Outlook 2021.

4 Times of India: India on track to exceed its Paris Agreement targets: PM Modi at Climate Ambition Summit (2020)

5 Times of India: India on track to exceed its Paris Agreement targets: PM Modi at Climate Ambition Summit (2020)

6 The Hindu: India re-elected as president of International Solar Alliance (2020)

7 The Economic Times: Opinion: Atmanirbhar net zero Bharat (2021)

8 International Energy Agency: India Energy Outlook 2021

At the same time, India is vulnerable to extreme climate events and changing weather patterns, and will need to invest in climate adaptation and resilience. There has been pronounced rise in the extreme weather events in recent years, such as floods, cyclones and heatwaves.⁹ Extreme weather events displace population, stoke inflation and exacerbate poverty. This has implications particularly for the agriculture sector, which supports 42.6 per cent of the Indian workforce.¹⁰

Investment needs to increase in line with policy ambition. While current policies require annual investment of \$160 billion through to 2030, this rises to \$200 billion annually under the sustainable development scenario. While investor interest in India's energy transition has been substantial, mobilising these amounts will require a coordinated effort from policymakers, regulators, companies, and the financial sector.

Finally, this transition will inevitably impact workers, as employment profiles, and the skills required for different jobs, change rapidly. Jobs will be lost in sectors like coal and thermal power, while new jobs will be created in clean energy and related sectors. The IEA's estimates show that jobs will increase rapidly with the shift to clean energy, particularly in sectors like electric mobility and energy efficiency, as well as power generation. Nevertheless, there is a regional dimension to this. Communities and labour displaced by the phasing out of coal may find it hard to relocate. As a result, the creation of jobs may not be where jobs and livelihoods are lost. Therefore, the transition must be managed carefully to avoid a large number of stranded workers and communities.

» ***This transition will inevitably impact workers, as employer needs, and the skills required for different jobs, change.***

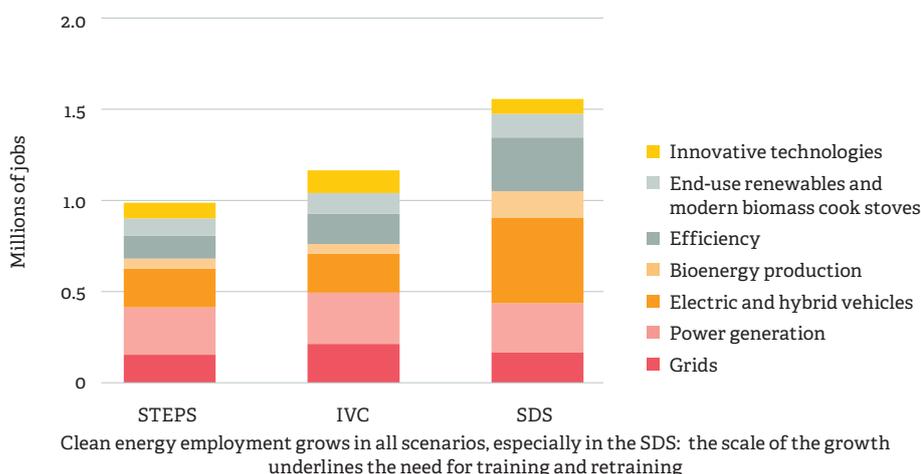


Figure 2: New full-time jobs added in each scenario
Source: International Energy Agency, India Energy Outlook 2021.

For a fair and inclusive net zero transition to succeed in India, far-ranging consequences – on livelihoods, consumption and finance – need to be estimated and effectively communicated. The just transition narrative therefore helps link interests of workers, communities and citizens with the energy transition.

9 Hindustan Times: Extreme weather events in India on the rise (2020)

10 World Bank Data: Employment in agriculture (% of total employment) (modeled ILO estimate) - India (2021)

What is a just transition?

In 2015, the Paris Agreement included the just transition, thereby recognising the importance of placing the interests of workers and communities at the forefront of decarbonisation efforts so that decent work and quality jobs can be pursued in parallel to climate action. The transition to a net zero pathway offers the potential to create both more and better jobs, especially in India, thereby addressing poverty and inequality. Since then, policymakers, businesses, civil society and financial institutions have all recognised that a just transition is a critical success factor for accelerating the transition to a resilient, net zero economy.¹¹

The key ingredients of what makes for a just transition are well-established: social dialogue (notably with workers and trade unions) in the workplace, along with respect for labour standards and human rights, economy-wide skills development and retraining, buttressed by social protection and safety nets.¹² As many of the core high-carbon sectors are clustered in specific places, community renewal and regional development are crucial, along with a macroeconomic strategy to connect the just transition with key climate policy levers. Carbon pricing, for instance, is an efficient mechanism to ensure the externalities of carbon emissions are taken into account. However, the resulting increase in energy prices could have consequences for equitable access to energy.

Financial institutions are starting to integrate the just transition into their climate strategies, recognising it as a way of connecting the environmental and social dimensions of the SDGs.¹³ Bringing together more than 500 global investors with over \$47 trillion in assets, Climate Action 100+, an investor-led initiative ensuring the world's largest corporate greenhouse gas (GHG) emitters take necessary action on climate change, has included the just transition as one of the ten focus areas in its Net Zero Carbon Benchmark.¹⁴

Several European countries are now exploring how the financial sector can support national efforts to deliver the just transition. In the UK, an investor roadmap¹⁵ has been drawn up together with a strategy for the banking sector.¹⁶ This is feeding into operational practices and being incorporated into shareholder engagement. For example, the UK energy utility SSE published its first corporate Just Transition Plan at the end of 2020.¹⁷

Multilateral Development Banks such as the European Bank for Reconstruction and Development¹⁸ and international Development Finance Institutions such as CDC Group¹⁹ are also coming forward with new initiatives. Indeed, in 2020, 450 public development banks pledged to “take into account the imperative of a just, inclusive and rights-based transition” as part of their strategy to build back better from COVID-19.²⁰



The transition to a net zero pathway offers the potential to create more and better jobs, especially in India, thereby addressing poverty and inequality.

11 LSE Grantham Research Institute: How a just transition can speed up the race to net zero (2020)

12 International Labour Organization: Guidelines for a just transition towards environmentally sustainable economies and societies for all (2015)

13 LSE Grantham Research Institute: Climate change and the just transition - A guide for investor action (2018)

14 Climate Action 100+

15 LSE Grantham Research Institute: Financing inclusive climate action in the UK: An investor roadmap for the just transition (2019)

16 LSE Grantham Research Institute: Financing climate action with positive social impact: How banking can support a just transition in the UK (2020)

17 SSE: SSE Publishes Just Transition Strategy (2020)

18 EBRD: The EBRD's Just Transition Initiative

19 CDC Group: Tackling the climate crisis in a just and inclusive way (2020)

20 Finance in Common: The first global summit of all Public Development Banks (2020)



02

Rooting the just transition in the Indian context and identifying social risks

Just transition principles, as defined for advanced economies, are designed to ensure that those impacted by the economic shift are not left to bear the costs. For a developing economy like India, the challenge is not limited to managing the transition, but also ensuring that sustainable development goals are achieved. For this, adequate finance must be made available to meet the targeted reduction in use of fossil fuels while securing livelihoods. Well-defined transition pathways are critical in countries where large numbers of workers, particularly in informal employment, are at risk of being pushed into poverty following brief periods of unemployment. Since the COVID-19 crisis began, 75 million people have fallen below the poverty line in India, accounting for 60 per cent of the global increase in poverty.²¹

In addition, the mass reverse migration of workers, from cities back to villages, in response to COVID lockdowns impacted companies which hired these workers. In rural areas, social safety nets were stretched, as government employment support programmes could not keep up with demand. Such shocks can have persistent effects on future growth potential and living standards, and are exacerbated by low investments in human capital. Climate change has the potential to create similar shocks: recent cyclones on both coasts have left millions homeless, and migration away from the coasts could lead to increased pressure on land and resources. Similarly, if the jobs lost due to climate risks are not replaced in the same regions, workers are likely to migrate in large numbers to cities, putting pressure on urban resources. Alternatively, where displaced communities do not move, the loss of livelihoods remains a serious concern.



For a developing economy like India, the challenge is not limited to managing the transition but also ensuring that sustainable development goals are achieved. For this, adequate finance must be made available.

²¹ Pew Research Centre: In the pandemic, India's middle class shrinks and poverty spreads while China sees smaller changes (2021)

Therefore, the just transition agenda is the “connective tissue” that binds climate goals with social outcomes.²² On a number of dimensions, the objectives correspond closely to those of the SDGs. Climate action, of course, is one of the SDGs, but a well-crafted agenda for a just transition will also support the achievement of SDG 7 (affordable and clean energy), SDG 8 (decent work and economic growth), and in the process, SDG 1 (eliminating poverty) and SDG 10 (reducing inequality).



Figure 3: the just transition and the Sustainable Development Goals

The SDGs, however, are defined in terms of desirable economic outcomes, and are agnostic to the process of achieving these outcomes. They do not take into account policy choices required, and the inherent trade-offs and synergies between the SDGs in the policy-making process. Climate action can conflict with other SDGs on several dimensions – the shift from brown energy and production methods could lead to the loss of livelihoods through the shutting down of coal mines and coal power plants. In India, where a large proportion of the population resides in states with low per capita incomes²³, unless support is provided to retrain and shift to new forms of employment, the loss of incomes could be permanent and lead to increasing poverty and inequality. The sectoral shifts required in energy and industry will have distributional effects, with certain regions, companies and workers benefitting, with others facing losses.

While green energy is increasingly becoming cheaper, infrastructure and technology need to be upgraded rapidly for it to be an affordable and continuous source of energy for all citizens. On the other hand, the clean energy transition has the potential to open up new and better avenues for employment. Similarly, the shift away from fossil fuels could lead to reduced pollution, one of the major risks to health in Indian cities.

» *In India, where a large proportion of the population resides in states with low per capita incomes, unless support is provided to retrain and shift to new forms of employment, the loss of incomes could be permanent and lead to increasing poverty and inequality.*

²² LSE Grantham Research Institute: Why governments need to issue just transition sovereign bonds and how they could do it (2020)

²³ International Energy Agency: India Energy Outlook 2021

The just transition framework provides a starting point for evaluating and addressing the trade-offs that arise in the process of shifting to a net zero economy. Given the size and diversity of the Indian economy, policy choices will affect regions, sectors and stakeholders differently. Therefore, we start by identifying the major social risks that arise as a result of the net zero transition and the trade-offs linked to them, and mapping them to Indian regions.

Table 1 provides a snapshot of the impacts of the transition on key stakeholders. Policymakers, both governments and financial regulators, will be required to balance the process of transitioning out of high-carbon sectors, while transitioning into green sectors. The transition will impact government finances, through changes in tax revenues, and will require new forms of subsidy and social security. The impact will differ across regions, and certain communities that are heavily reliant on fossil fuel value chains are likely to be severely impacted.

The financial sector will need to take into account the impact of climate risk on portfolios and finance new investments, while regulation should encourage the flow of capital to new, green sectors and fossil fuel-dependent regions. Businesses, both industry and agriculture, will be impacted by climate change and the zero carbon policy regime. As green sectors replace carbon-intensive sectors, old sources of livelihoods will be lost, and new skills will have to be acquired by the workforce.

Policies	Impact				
	Governments	Business	Financial sector	Workers	Consumers
Transitioning out of high-carbon sectors (e.g., transport, coal, oil and gas)	<ul style="list-style-type: none"> - Government revenues from high-carbon sources will be reduced - State and local government budgets will be impacted based on regional concentration of industry, as revenues are lost and social safety nets need strengthening 	<ul style="list-style-type: none"> - Risks arising as carbon-intensive activity is discouraged, leading to potential loss of revenues or stranded assets 	<ul style="list-style-type: none"> - Risks arising as carbon-intensive activity is discouraged, leading to stranded assets or volatility in returns 	<ul style="list-style-type: none"> - Potential loss of livelihoods 	<ul style="list-style-type: none"> - Energy access could be impacted if the transition to green energy doesn't proceed at pace - Distributional impacts of carbon taxation
Adapting to climate change in high-exposure sectors (e.g., agriculture)	<ul style="list-style-type: none"> - Social safety nets to be provided to the large population dependent on agriculture for livelihoods 	<ul style="list-style-type: none"> - Businesses in the agriculture value chain (particular food and textiles) will be impacted, leading potentially to lost jobs 	<ul style="list-style-type: none"> - Risk to assets, (e.g., frequent farm loan waivers in response to adverse weather events and poor agricultural yields) 	<ul style="list-style-type: none"> - Loss of livelihoods - Potential loss of assets as land resource are degraded 	<ul style="list-style-type: none"> - Food security
Transitioning into green sectors (e.g., renewable energy, climate-smart agriculture).	<ul style="list-style-type: none"> - Fiscal support to green sectors - Support to regional economies in transition 	<ul style="list-style-type: none"> - Aligning business strategies to new sectors - Re-training and deploying workers to new sectors 	<ul style="list-style-type: none"> - Directing investment flows to green sectors - Including ESG standards in accounting frameworks 	<ul style="list-style-type: none"> - Developing skills for the green economy - Relocating to take advantage of new opportunities 	<ul style="list-style-type: none"> - Access to sustainable energy - Lower levels of pollution

Table 1: The impact on stakeholders as high carbon sectors are replaced by green sectors



03

Regional prioritisation

Given India's vast size and regional diversity, we propose a ranking of Indian states, measured by the intensity of risks posed by the net zero transition. We start by identifying sectors at risk, and then regions where these sectors are concentrated.

Identifying sectors at risk

The majority of emissions in India (63.8 per cent) come from the energy sector, largely due to the use of coal in generating electricity. The cement and iron and steel industries account for a large proportion of industrial emissions, again due to the use of coal. Petroleum accounts for 26 per cent of India's energy consumption (mainly in the transport sector), and petroleum refining is an important export sector.²⁴ Unlike most industrialised countries, agriculture is a major contributor to emissions, accounting for around 16 per cent of emissions.



The majority of emissions in India (63.8%) comes from the energy sector, largely due to the use of coal in generating electricity.

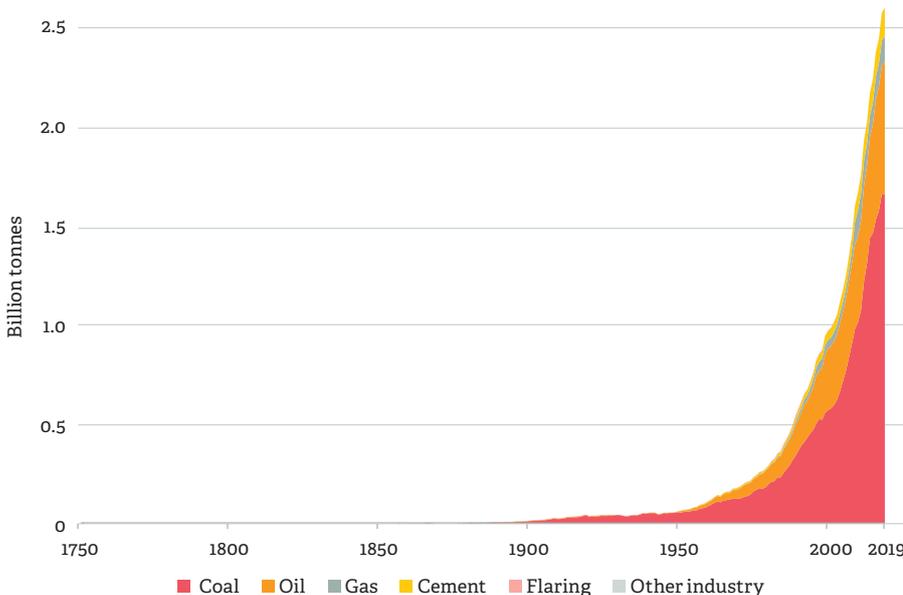


Figure 4: CO2 emissions by fuel type in India. Source: Global Carbon Project

²⁴ US Energy Information Administration: Country Analysis Executive Summary: India (2020)

Priority sectors in the net zero transition, therefore, include coal mining; electricity generation; agriculture; manufacturing and industry; and transportation.

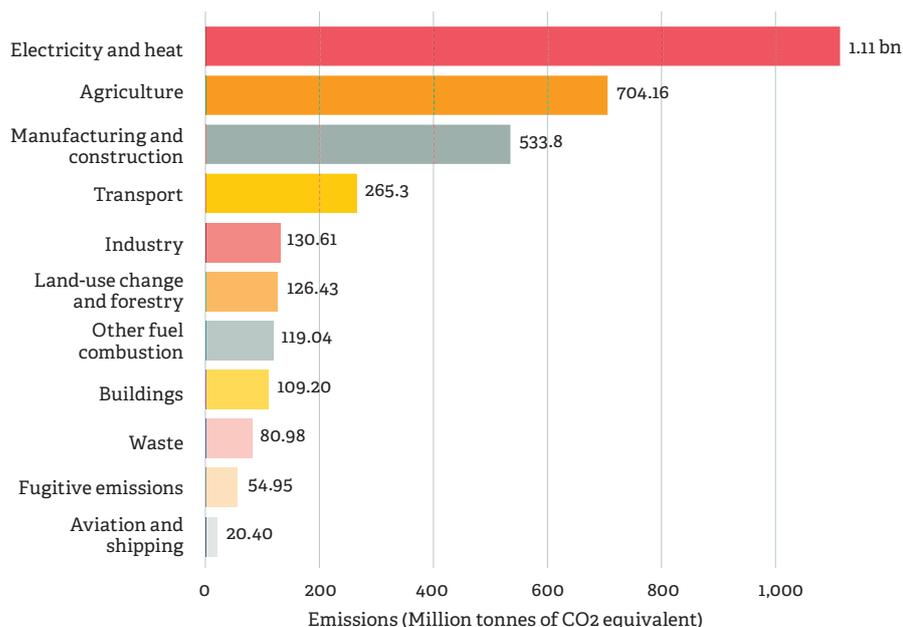


Figure 5: Greenhouse gas emissions by sector in India (2016)
Source: CAIT Climate Data Explorer via Climate Watch

India's economic growth and emissions have decoupled to a large extent, with energy intensity of gross domestic product (GDP) falling consistently over the last three decades. However, due to the use of coal in electricity generation, as well as the rapid increase in electricity access across the country, the carbon intensity of energy production has increased over the same period.

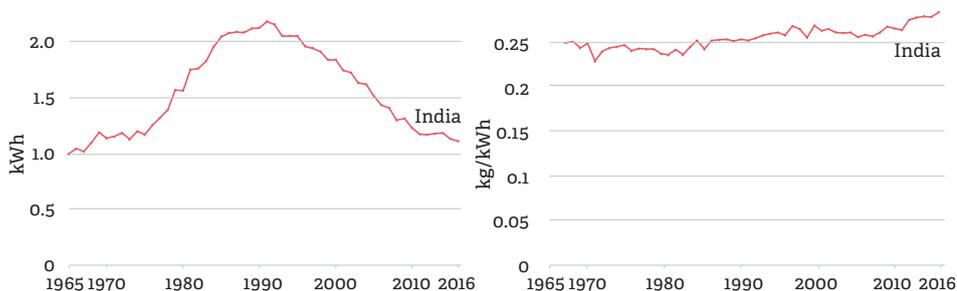


Figure 6: Energy intensity
Source: Our World in Data based on BP; World Bank; and Maddison Project Database

Figure 7: Carbon intensity of energy production
Source: Our World in Data based on Global Carbon Project; BP; IEA via the World Bank

From the IEA's analysis of India's energy outlook, we see that replacing petroleum and coal production/refining will be crucial to achieving the transition. Industrial processes like the production of iron, steel and cement will probably shift to greener forms of energy, with remaining emissions being offset, as demand for these commodities grows over the next two decades. Therefore, the major employment risks arise from the coal and petroleum refining sectors.

» **The major employment risks arise from the coal and petroleum refining sectors.**

India's agriculture sector employs almost half the working population, and is already facing adverse effects from climate change. Research shows an increase in high temperature days decreases agricultural yields and real wages, and increases annual mortality among rural populations by 7.3 per cent. Hari, Khare and Subramaniam (2018) show that climate change could reduce farm incomes by 15-18 per cent, and by 20-25 per cent in unirrigated areas.²⁵

²⁵ Ideas for India: Climate change and Indian agriculture (2018)

Further, extreme weather events have adversely affected economic activity in key agricultural states while also causing food price inflation.²⁶ Climate change could, therefore, lead to reduced life expectancy in rural India by the end of this decade.²⁷ This is likely to have knock-on effects to industries that depend on the agriculture sector for inputs. India's food processing and textile industries account for 8 per cent and 7 per cent of India's manufacturing output, respectively. At the same time, agriculture is also among the top GHG-emitting sectors. Therefore, a shift in agricultural practices is an added cost.

Metrics for regional prioritisation

In line with the sectoral shifts described above, we propose the following set of metrics for the purpose of regional prioritisation. This analysis is constrained by the lack of recent and reliable data. For high-carbon activity, we confine our analysis to coal for the moment, though this should be augmented by metrics on petroleum refining when possible. Similarly, when possible, sectors that rely heavily on water supplies, like textiles, should be included in high-exposure sectors.

Currently, work on location-specific and industry-specific climate risk atlases is underway, the first of which may be available by the end of 2021. The metrics for high-exposure sectors could then be updated for a more complete view on where jobs and livelihoods are most at risk.

Risk	Description	Metric(s)	Source
Livelihood	High-carbon: coal mining	Coal production by state	Pai, et al. (2021)
		Coal employment by states	Ministry of Statistics and Programme Implementation
	High-exposure: agriculture exposed to climate change	Number of districts per state with high exposure to climate risk	ATLAS on Vulnerability of Indian Agriculture to Climate Change
Consumption	Energy access	Total electrical energy consumption by ultimate consumers state-wise (per capita)	Central Electricity Authority
		% of households lacking power connections (state-wise)	IRES database (CEEW analysis)
Public finance	Dependence of public budgets on fossil fuel revenues	% of state revenues from petroleum and coal	State and centre budget documents
Vulnerability	Education	NITI Aayog Education Index	NITI Aayog
	Health	NITI Aayog Health Index	NITI Aayog
	Ability to weather temporary income shocks	State GDP per capita	Ministry of Statistics and Programme Implementation

Table 2: Metrics for regional prioritisation

²⁶ RBI Bulletin April 2020: Climate Change: Macroeconomic Impact and Policy Options for Mitigating Risks (2020)

²⁷ LSE: Weather, Climate Change and Death in India (2017)

Livelihoods

The transition to a zero carbon economy will reshape labour markets, both removing jobs in high-carbon sectors and creating jobs in new sectors. The choice of policies, and their timing, will have significant formal and informal implications for regional economies and labour markets. Changes may also have knock-on effects on other local sources of employment. Labour demand may be replaced in aggregate, but the composition is likely to change across sectors, skill levels and locations. These changes will interact with the rapid digitalisation of the Indian economy. Therefore, a complementary strategy to reskill labour may be necessary. The launch of the Skill Council for Green Jobs (SCGJ) in 2015 was an important step in this direction. The objective of the Council is to identify skills needs in the areas of renewable energy, energy efficiency and waste and water management. Over the years, several centres offering green skills development program have been set up across India²⁸. 58,000 workers were trained between FY16 and FY19, demonstrating that the SCGJ can expand skill sets in rural areas and smaller towns and expand the green energy market²⁹. Given the uncertainty surrounding future employment paths as the net zero transition interacts with the digital revolution and rapid urbanisation, policies and investments will have to be targeted to ensure workers have access to new opportunities.

We examine the livelihood impacts in two sectors: coal and agriculture, corresponding to India's mitigation and resilience needs. For both, the choice of metrics is limited by data availability. For coal, the latest data available (December 2020) is from a dataset on coal and lignite production in India. The state-level aggregates are in the table below, but this dataset can be easily used to drill down to district level. While employment would provide a more precise metric, data on employment is scattered and not easily comparable. Therefore, we propose coal production as a substitute.

For agriculture, we use the ATLAS on Vulnerability of Indian Agriculture to Climate Change, prepared by the Indian Council of Agriculture Research, to identify vulnerable districts.³⁰ This analysis considers both the sensitivity and exposure of different districts to climate change, as well as the capacity of local populations to adapt. At the level of states, we could prioritise states by the number of vulnerable districts in each state.

Consumption

Electricity (from coal), cooking fuels and petroleum (for transport) are important components of India's household energy consumption. While the shift to renewable energy, cooking gas and improved battery storage can provide alternative and cheaper sources of energy, this will require large investment. Second, the material needs of the clean energy transition are substantial, and require minerals (particularly rare earths) which are not easily available in India. Therefore, energy security will depend on the creation of reliable material value chains in partnership with resource-rich countries, enhanced cooperation with the private sector and the development of a recycling industry for both metals and minerals required for clean energy infrastructure.

We propose two alternative metrics for electricity consumption, to measure risks to energy access. Electricity used per capita measures relative energy access across states, while the percentage of households without electricity connections measures energy access gaps. A combination of these measures is used to identify states most at risk of losing energy access, and where clean energy investments should be prioritised.



While the shift to renewable energy, cooking gas and improved battery storage can provide alternative and cheaper sources of energy, this will require large quantities of investment.

28 Green Skills Development Program Network

29 CEEW: Powering Job Growth Through Green Energy (2019)

30 ATLAS on Vulnerability of Indian Agriculture to Climate Change (2013)

Public Finance

While government policy will be essential to facilitate the transition, the Indian government will also be impacted. Fossil fuels are a key source of government revenue, while state-owned enterprises have a strong presence in the coal mining, thermal power, petroleum and natural gas sectors. Taxes on coal include royalties on coal mining, import duties, value added taxes and an additional cess which accrues to the central government. Similarly for petroleum, nearly 50 per cent of the retail fuel price is taxes and other costs,³¹ and between 2000 and 2017, petroleum taxes accounted for 2.7 per cent of GDP.³² In fact, these collections form an important source of revenue for states such as Maharashtra, Andhra Pradesh, Tamil Nadu and Uttar Pradesh.

At the same time, central government subsidies to fossil fuels including energy transmission and distribution was INR 16280 billion in 2019.³³ Though lower than the taxes on fuels in that year³⁴, these subsidies are largely used to reduce prices for household and agriculture energy consumption. Therefore, even if cleaner sources of energy are adopted, the government may need to continue providing subsidies to facilitate affordable energy access. Alongside energy subsidies, the provision of public goods, such as health and education, may be restricted due to budget constraints. Fiscal stresses also have the potential to push up borrowing and debt service costs in the medium to long term, putting further pressure on state budgets.

We measure the risks to state budgets using the percentage of revenues from fossil fuels. Once state action plans include an assessment of costs, this could be supplemented by the amount of investment required for the net zero transition.

Vulnerability

Indian states diverge widely in terms of economic outcomes. The 12 wealthiest states have an average per capita income at least twice as high as the bottom eight states, and have much higher rates of urbanisation. Nearly 40 per cent of Indians live in states with low per capita incomes.³⁵ The ability for workers and households to manage the transition will be determined by their ability to withstand short-term income shocks, and also to retrain and shift to new forms of employment. The World Bank defines vulnerable populations as those with incomes above the poverty line, but less than twice the poverty line. While poverty rate estimates are readily available, data on income distributions and the percentage of vulnerable populations is not available at the state level. We measure the resilience to loss of employment using state per-capita incomes, and we measure the capacity to transition by the level of human capital development using health and education indices.



Fossil fuels are a key source of government revenue, while state-owned enterprises have a strong presence in the coal mining, thermal power, petroleum and natural gas sectors.

31 India Today: Petrol and diesel prices: How much tax you pay on your fuel (2020)

32 NIPFP Working Paper: Estimation and Projection of Petroleum Demand and Tax Collection from Petroleum Sector in India (2019)

33 International Institute for Sustainable Development: Mapping India's Energy Subsidies (2020)

34 At INR 23,738 billion.

35 International Energy Agency: India Energy Outlook 2021

Priority states for just transition investments

To identify those states most at risk, we first identify states in the bottom quartile (25 per cent of states with the highest risk) with respect to each of the risk metrics. A complete table with indicators for India's 28 major states is in the Appendix. States in the last quartile with respect to each indicator are highlighted in red. For risks with multiple metrics, we identify states as high risk if they are in the last quartile with respect to any one metric.

States	Just transition risk factors			
	Livelihoods	Energy access	Public finance	Vulnerability
Madhya Pradesh, Jharkhand	High risk	High risk	High risk	High risk
Chhattisgarh	High risk	High risk	High risk	High risk
Uttar Pradesh, Bihar	High risk	High risk	High risk	High risk
Odisha, Telangana, Rajasthan	High risk	High risk	High risk	High risk
Manipur, Assam, Nagaland	High risk	High risk	High risk	High risk
Maharashtra, Tamil Nadu	High risk	High risk	High risk	High risk
Arunachal Pradesh, Meghalaya, Sikkim, Tripura, Uttarakhand	High risk	High risk	High risk	High risk
Gujarat, Haryana	High risk	High risk	High risk	High risk
Mizoram, Karnataka	High risk	High risk	High risk	High risk
Himachal Pradesh, Goa, Andhra Pradesh, Kerala, Punjab, West Bengal	High risk	High risk	High risk	High risk

Table 3: State prioritisation (orange shaded cells imply high risk)

Based on this prioritisation, we identify eight high risk states: Madhya Pradesh, Jharkhand, Chhattisgarh, Uttar Pradesh, Bihar, Odisha, Telangana and Rajasthan. They are in the highest risk category for at least three of the four metrics (livelihoods, energy access, public finance and vulnerability) of risk. Madhya Pradesh and Jharkhand are at risk across all four metrics.

It's worth noting that across all eight states are prioritised as high risk, **livelihoods are a common risk factor**. Within the category of livelihoods, seven of these eight states are coal-dependent states. Livelihoods are at risk in Madhya Pradesh and Uttar Pradesh, in both coal and agriculture, while Bihar is the one state in the high risk category with only agricultural livelihoods at risk.

All states in the highest-risk category for coal livelihoods also face at least two other risks. This highlights the 'resource curse' which has led to these states not developing despite a large endowment of natural resources.

Seven of these eight states lack the capacity to adapt to changing circumstances (in other words, are vulnerable due to either low per-capita incomes or human development). In this context, the wide variation across states is striking. Bihar's per capita income, the lowest across all states, is a tenth of Goa's (the highest). Similarly, energy consumption per capita is a seventh of Goa's.

Our findings highlight the negative impacts of the existing energy infrastructure on quality of life and livelihood choices. States like Jharkhand and Chhattisgarh, for instance, which rely on coal for around 10 per cent of GDP, are far behind the Indian average on income and human development indicators. Experiences from these states suggest mining activity is not equitable even now. For example, indigenous communities are displaced when new mines are opened, and mining can have adverse consequences for health. Therefore it is important to frame the just transition agenda, not just in terms of maintaining the status quo with respect to livelihoods, but expanding the scope to economic and human development and the SDG agenda. Other studies identify the challenges to just transition, which include vested interests benefiting from the status quo.³⁶ In this report, we highlight the incentives and actions required to break away from this status quo.

» Across all eight states prioritised as high risk, livelihoods are a common risk factor.

» It is important to frame the just transition agenda not in terms of maintaining the status quo with respect to livelihoods, but expanding the scope to economic and human development and the SDG agenda.

36 Climate Investment Funds: Supporting Just Transitions in India (2021)



04

Connecting the just transition with India's financial system

Both climate change and the net zero transition in India have the potential to adversely impact workers and communities. Through the Just Transition Finance Roadmap, we describe some mechanisms through which the financial sector can address the social risks that arise because of climate change and decarbonisation. Through this approach, we identify three major areas of intervention:

1. **Identifying investment opportunities and financial practises which address lost livelihoods, support the workforce to adapt through new skills and jobs, improve energy access and provide alternative revenue streams for governments;**
2. **Regulatory and policy interventions to ensure investment is aligned to just transition priorities; and**
3. **Supporting the real economy, both government and the corporate sector, in designing projects which are aligned to the just transition framework.**

This section details the existing landscape of the financial sector in India and identifies current initiatives to address the impact of climate change. Using the just transition framework outlined in this report, we also identify potential next steps to expand the scope beyond climate by linking these initiatives to the just transition agenda set forth in the previous section.

Key actors in the just transition

There are six key actors in India that must co-ordinate to pave the way for a just transition in India. Figure 8 lists these key actors as: government, business, the financial sector, financial system policymakers, international investors and social stakeholders. As described in Table 1, each actor has a role to play in setting the direction of climate policy, as well as facing the consequences of climate change and climate-related risks. The risks may be physical and transitional, where the former relate to exposure to extreme weather events and the latter arise from policy, technology, and shifting consumer preferences.³⁷ The risks can lead to loss of asset value and profit of corporates, loss of household wealth and lower growth and productivity conditions. It is, therefore, in the interest of the capital markets to price this risk appropriately and to influence corporate action.

The financial sector has also innovated hugely in the last decade, and is actively supporting the allocation of capital to new, green sectors. We propose, however, an increase in ambition beyond solely environmental factors, and suggest that regulators, policymakers, businesses and investors should factor the social impact of the climate transition into their portfolio decisions.

» **Regulators, policymakers, businesses and investors will need to factor the social impact of the climate transition into their portfolio decisions.**

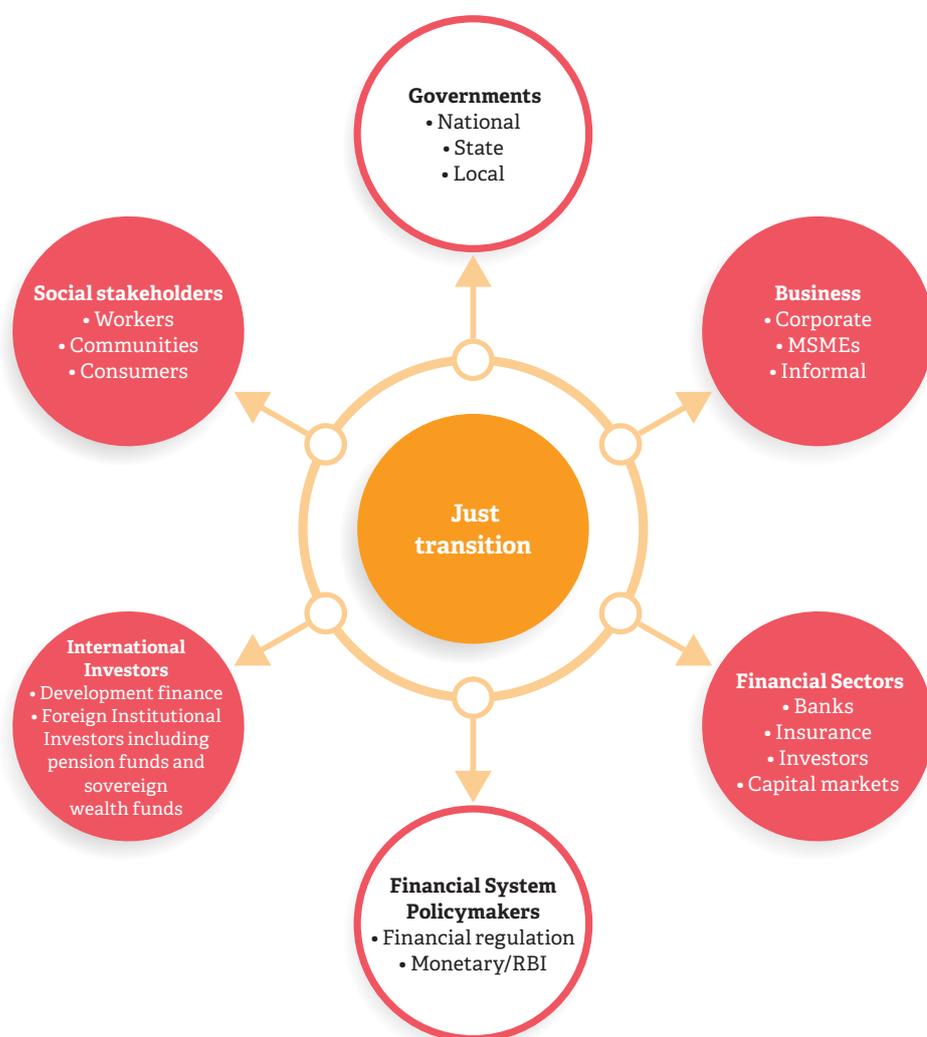


Figure 8: Key actors in the just transition

³⁷ International Monetary Fund: Physical and transition risks

The role of government

The government's regulatory and financial capacity will remain critical to ensuring the transition does not leave anyone behind. The estimated gap in funding for SDG goals is \$565 billion for India.³⁸ The Ministry of Finance also estimates that for India to meet its nationally determined contributions (NDCs) \$2.5 trillion will be required between 2015 and 2030.³⁹ The existing scope of public finance – and the potential adverse impact on government revenues from climate change – makes it imperative that innovative approaches to public finance are adopted in the future.

The recent launch of a green municipal bond by Ghaziabad Municipality in Uttar Pradesh is an example of sub-national or local sustainability-linked borrowing.⁴⁰ The size of required funding demands that private sector companies and investors assume a more proactive role. Private sector activities are organised around profitability, however double materiality – impact inwards measurable in financials and impact outwards on the environment and society – of risks to companies necessitates that a portfolio of investment and activities performed by corporates are in line with the SDGs.⁴¹ Therefore, “financial institutions need to understand and manage not only the risks that environmental factors pose for their balance sheets and operations, but also the risks that their activities create in terms of intensifying climate change”.⁴² Current disclosure requirements and regulatory standards for instruments linked to SDG goals bridge the gap for reporting. However, their success and reach must be assessed to determine whether they are holistic and fit broadly within the framework of a just transition.

Like any other development goal, central and state governments will need to share the costs of transition, either as the loss of revenue and/or cost of support to livelihoods. Such losses to state assets and revenues can translate into credit rating actions and divestment from such assets by institutional investors. While credit ratings may not always truly reflect the economic conditions, they are known to impact the flow of foreign portfolio flows.⁴³ Nevertheless, borrowings may be curtailed to the extent that costs may rise due to an adverse fiscal position. It will be important to design a comprehensive economy-wide net zero plan that can provide a pathway to transition. Such targets and definition of green activities, given effect through legislation, can aid a targeted regulatory approach towards capital markets. A part of this plan must be the desired mix of energy which takes into consideration the issues arising from property rights and rare earth mineral usage for battery storage, as potential challenges linked to the energy transition. Therefore, it is imperative to look beyond the climate action agenda to ensure the transition does not reinforce inequalities. For this reason, just transition is centrepiece.

India does not currently have formal national legislation that covers climate goals. Instead, it has a set of regulations that encourage voluntary disclosures, mandate sustainability spending and list a set of activities aligned with principles of sustainable practices that are to be fulfilled by targeted instruments. There are three significant regulators: Reserve Bank of India, Securities Exchange Board of India and Ministry of Corporate Affairs that can influence private action. In the following sections, the role of each of the actors, the regulatory framework and progress made are detailed. As outlined, the regulatory approach and corporate action are centred around green activities, and just transition has not yet been adopted.



The government's regulatory and financial capacity will remain critical to ensure that the transition does not leave anyone behind.

38 Devalt: Achieving the Sustainable Development Goals in India. A Study of Financial Requirements and Gaps (2015)

39 Department of Economic Affairs: Climate Summit for Enhanced Action: A Financial Perspective from India (2019)

40 Financial Express: Ghaziabad Municipal Corp lists first green bonds (2021)

41 BSR: Why Companies Should Assess Double Materiality (2021)

42 LSE Grantham Institute: Net zero central banking: A new phase in greening the financial system (2021)

43 Indian Ministry of Finance: Does India's Sovereign Credit Rating reflect its fundamentals No! (2021)

Role of the central bank

As India's central bank and regulatory body, the mandate of the Reserve Bank of India (RBI) provides an opportunity to align regulations with just transition priorities. It is increasingly suggested that central banks must account for climate change-related risks, since price and financial instability may result from transitional risk, physical risk and liability risk (Carney, 2015). That is, climate change and policies can impact macroeconomic variables such as output, inflation, interest rates and asset prices, while altering the underlying structure of the economies (Weidenn, 2021).⁴⁴ For this purpose, a central bank can be instrumental for system-wide risk assessment and can integrate transition goals into its mandate.

The RBI bears the responsibility of administering monetary policy, which includes inflation targeting, as well as conducting supervisory functions. The just transition agenda requires it to move beyond its traditional remit and focus to some extent on unemployment. For central banks around the world, employment creation is seen to have dropped off the immediate agenda⁴⁵, only to resume significance following the economic distress inflicted by COVID-19.

The RBI is permitted to carry out promotional functions to support national objectives.⁴⁶ At the moment, priority sector lending is allocated to activities such as agriculture that support livelihoods and remain a focal area for national policy. Similarly, recognition of the need for a just transition at the national level can allow for central bank activity based on an inclusive net zero plan.

As one would expect, this may potentially include the extension of loans to activity in sectors that support transition. In addition to the already prioritised renewables sector, this could include enterprises that reskill and employ displaced labour, as well as infrastructure projects that foster resilience. Withdrawing credit to fossil fuel-based sectors at the same time could exacerbate the existing risk of non-performing loans. The International Monetary Fund (IMF) reports that the carbon footprint-adjusted loans to total loans ratio has been on the rise in India since 2013, and remains among the highest in the world.⁴⁷ Therefore, the switch in lending practices needs to be gradual and calibrated.

In April 2021, the RBI joined the Central Banks and Supervisors Network for Greening the Financial System (NGFS) to learn from, and contribute to, global efforts on green finance.⁴⁸ This is a promising development, opening up the possibility of including the aforementioned priorities of just transition within the folds of mainstream central bank policy. For this, the four functions of the RBI must be suitably and carefully adapted for a 'climate-plus' approach. Although high frequency household employment and consumption statistics for India are not available, it is possible that a broad or inferred loss of livelihoods are built into models updated for climate risks.



Recognition of the need for a just transition at the national level can allow for central bank activity based on an inclusive net zero plan.

⁴⁴ Bank of International Settlements: Jens Weidmann: What role should central banks play in combating climate change? (2021).

⁴⁵ G-24 Policy Brief No. 14: Inflation Targeting, Employment Creation and Economic Development (2016).

⁴⁶ Reserve Bank of India: About Us.

⁴⁷ IMF Climate Change Indicators Dashboard - Country Data.

⁴⁸ Reserve Bank of India: RBI joins Network for Greening the Financial System (press release, 2021)

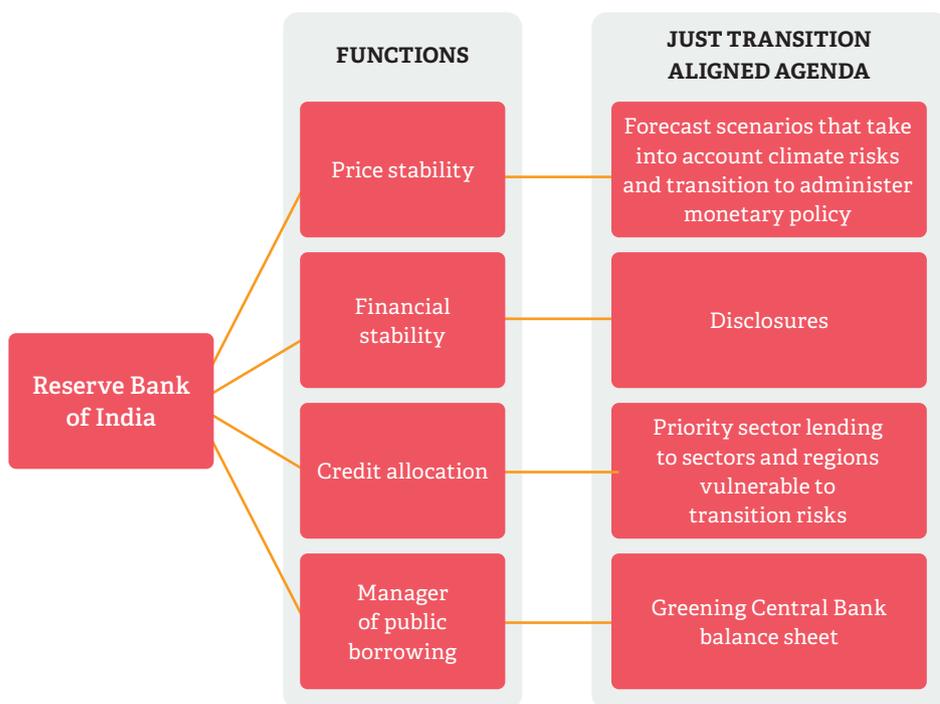


Figure 9: Functions of the central bank aligned with just transition

There are various approaches, outlined below, to re-orient banking and central bank regulation to a net zero pathway.

Central bank's portfolio strategy

First, the central bank can ensure its own portfolio is aligned with climate goals. For example, the European Central Bank (ECB) now accepts bonds linked to sustainability performance targets as eligible central bank collateral for Euro system credit operations, and for outright purchases for monetary policy purposes.⁴⁹ To ascertain qualifying bonds the European Union (EU) taxonomy would be relied on. There is currently no such taxonomy available for India, other than those inferred from the list of activities recognised as green under the green bond regulations or ESG reporting. The RBI acknowledges the merit of disclosures based on ESG for consolidated supervision of financial conglomerates.⁵⁰ However, it has not yet committed to a similar approach. Perusing the central bank's portfolio, other than central and state government securities that are used for monetary management, in 2016 RBI permitted oil bonds issued by the government as eligible securities for repos, reverse repos and marginal standing facility.⁵¹ Therefore, while there remains the potential to expand the scope to include green securities for monetary management, at the moment fossil fuel-based bonds are on the RBI's balance sheet.

Lending to just transition-aligned sectors

The next possible approach is to extend credit increasingly on the basis of sustainability criteria. This would require the inclusion of a positive list of activities or taxonomy to just transition-aligned sectors.

Renewable energy is the most objectively green sector. Therefore, priority sector lending – a tool used to direct credit to sectors considered critical for an overall economic objective – has been directed towards renewable energy. The RBI mandates that 40 per cent of Adjusted Net Bank Credit or Credit Equivalent

49 European Central Bank: ECB to accept sustainability-linked bonds as collateral (press release, 2020)

50 Reserve Bank of India: Annual Report 2020.

51 The Economic Times: RBI allows oil bonds as collateral for liquidity operations (2016)

Amount of Off-Balance Sheet Exposure (whichever is higher) is extended to the list of sectors identified. Renewable energy was introduced to the list of eligible sectors in 2015.⁵² In 2019, the Minister for New and Renewable Energy called for the removal of the cap on priority sector lending to this sector⁵³, after which the lending limit was doubled to INR 300 million in 2020.

Prioritisation of the renewable energy sector signals a commitment to channel finance to sectors that the economy is expected to transition into from fossil fuels. As of March 2020, 7.9 per cent of the outstanding bank lending was to non-conventional energy. The exclusive focus on the renewable energy in the banking sector is also evident from the initiatives taken by banks in India. In 2016, Canara Bank received \$250 million from New Development Bank to lend on to projects in order generate 500 megawatts (MW) of additional renewable energy capacity.⁵⁴ In 2017, Yes Bank committed to financing 5GW of renewable energy projects by 2019,⁵⁵ although in subsequent years it went through financial stress.

Monetary policy

As a conventional mandate of any central bank is the need to maintain price stability, a proper assessment of risks associated with climate action and climate change is necessary. The RBI's 2020 study details the connection between food price inflation and volatile weather patterns, such as rainfall.⁵⁶ In its 2020 annual report, it notes that "in recent years, the impact of climate change in terms of volatile rainfall intensity, increase in extreme events and rising temperature has implications for the outlook of agriculture".⁵⁷ Average temperatures have risen as well as average rainfall has declined, resulting in price volatility. Therefore, to manage its fundamental inflation targeting mandate, the key shift in thinking required is to introduce a risk assessment associated with climate change. For this, the RBI would need to set out a disclosure framework that allows banks to assess exposure to sectors that will be impacted by the transition, or which are currently prone to extreme weather conditions. There is a potential risk from climate-related bankruptcies exacerbating the current risk of financial instability. Therefore, given the existing risks in the Indian banking sector, it may be useful to adopt appropriate disclosures, including climate stress testing as well as greening of the portfolio.

The decision by the RBI to join the NGFS holds promise for the just transition agenda. The priority areas in this regard include better disclosure of risks, factoring in the cost of climate which includes loss of livelihoods and household assets, as well as expand lending to activities beyond renewables.



The RBI would need to set out a disclosure framework that allows banks to assess exposure to sectors that will be impacted by the transition or are currently prone to the extreme weather conditions.

⁵² Reserve Bank of India: Master Directions – Priority Sector Lending (PSL) – Targets and Classification (2021)

⁵³ ETEnergyWorld: Renewable energy: Power minister pushes for removal of priority sector lending limit (2019)

⁵⁴ Hindustan Times: Canara Bank gets first loan from BRICS bank for renewable energy (2016)

⁵⁵ Yes Bank: Yes Bank Commits to Financing 5 GW of Renewable Energy Projects by 2019 (Press Release, 2015)

⁵⁶ RBI Bulletin April 2020: Climate Change: Macroeconomic Impact and Policy Options for Mitigating Risks (2020)

⁵⁷ Reserve Bank of India: Annual Report 2020

Corporate action

Select Indian companies – Coal India, NTPC, ONGC, Reliance Industries – have been identified as amongst the 160 highest carbon emitters in the world. In response, these companies have undertaken corporate action either addressing climate change or transition risk. The alignment of strategies with sustainable practice is the result of investor engagement. A sector-specific approach, as outlined in section 2, may therefore be useful and can pave the way for engagement on just transition.

Coal India

A large fraction of the electricity generated in India comes from coal. The share of coal in the energy mix has been volatile, rising close to 80 per cent periodically from the lows of 60 per cent, as was observed during September 2020.⁵⁸ Coal India is India's largest coal supplier. Although the debate around the continued importance of coal in the energy mix continues, any low-carbon transition will adversely impact Coal India's employees, shareholders as well as local economies associated with the company.

To adapt to changing needs, Coal India has announced a plan to invest INR 1260 billion until 2023-24, of which INR 578 billion will be invested in mine infrastructure, project development and social infrastructure. A further INR 235 billion and INR 105 billion will be invested in clean coal initiatives and diversification plans respectively. The new investment plan signals a shift in the company's balance sheet. Nevertheless, large asset exposure to coal remain and cannot be simply be written down to achieve a swift transition.

At the same time there is phased plan to systematically reduce employee numbers to an optimum level. The employee strength of Coal India will reduce by 14000-15000 officers per year. Moreover, it will not give thrust to labour intensive mines in the coming years. Coal India has also announced plans to diversify into the aluminium and solar sectors. In 2020, the company proposed investing INR 455 billion in solar wafer manufacturing facility. Therefore, the costs to employment may be realised in the near term.

National Thermal Power Corporation (NTPC)

NTPC is the largest coal-based power provider in India. As part of its diversification strategy away from coal, the company has taken various steps to set up significant renewable energy capacity by 2032. It intends to achieve its target of 32GW capacity through additions to own capacity as well as an intermediary procurer. NTPC has already commissioned 920MW of renewable energy projects and 1062MW projects have been implemented in the states of Uttar Pradesh, Madhya Pradesh, Rajasthan, Telangana, Odisha, Gujarat and Haryana.

The observed shifts away from coal or coal-based production are in line with India's climate goals. From the just transition perspective it is equally important to inquire if the current manpower will be reskilled and deployed within the organisation. Pai, et al. (2020) find that workers in coal mines do not migrate when they lose their jobs. Therefore, the planned reduction in employment at Coal India presents a risk of unabsorbed labour. A further question for such companies is if the wages and working conditions will remain the same or improve.

» *From the just transition perspective, it is equally important to inquire if the current manpower will be reskilled and redeployed.*

⁵⁸ Institute of Physics: Solar has greater techno-economic resource suitability than wind for replacing coal mining jobs (2020)

Reliance

Reliance Industries is a major producer and supplier of oil and gas in India. As a significant fossil fuel, petroleum assumes macroeconomic significance. It accounts for 21 per cent of the imports and 10 per cent of exports. Moreover, it is a source of revenue for central and state governments. A shift away from fossil fuels would also require India to reduce its dependence on petroleum. It recently announced it will become a net carbon zero company by 2035. Over the course of 15 years, Reliance intends to convert the carbon emissions from its refineries into high-value proteins, nutraceuticals, advanced materials and fuels, by developing carbon capture and storage technologies. It further plans to replace transportation fuels with clean electricity and hydrogen. The employment cost of this shift may need to be ascertained.

Electric freight vehicles

In India, 24 per cent of energy consumption is consumed by the transport sector.⁵⁹ As a result, transport is considered a 'key risk' sector. Within this sector, road vehicles – cars, trucks, buses and two- and three-wheelers – account for nearly three-quarters of transport CO₂ emissions.

In the section on green bonds below, we show how the transportation sector has raised finance through the issuance of green bonds. Automobile companies form a part of the National Stock Exchange's ESG index, which indicates the commitment among companies to change behaviour and switch to vehicles operated on alternative fuels. Companies such as Tata Motors⁶⁰ and Infaprime logistics⁶¹ have launched electric trucks. While these can save operating costs of 60 per cent over diesel vehicles⁶², making clean transport fully operational involves solving the challenge of long-distance travel and setting up available charging facilities, which currently depend on energy sourced from coal.⁶³

Companies such as Tata Motors, Mahindra, Ashok Leyland, MG Motors, Maruti Suzuki, and Hero offer products in the electric vehicle (EV) segment. Recently, Bajaj Auto, a leading motorcycle and three-wheeler manufacturer, announced that it will launch electric rickshaws in 2022.⁶⁴ The product offerings in the passenger vehicle segment demonstrate that the shift in consumption practices is likely if cost efficiencies are maintained.

Niti Ayog estimates that India will need 10GWh of battery cells by 2022 and 50GWh by 2025.⁶⁵ This would require a significant expansion in manufacturing capacity of cells, which in turn makes it necessary to secure the materials used in Lithium-ion batteries, including lithium, cobalt, nickel, manganese, and graphite.⁶⁶ It is therefore important that the shift to clean transport does not expose consumers and industry to pricing risk, as has been observed for oil, from shortages of minerals such as Lithium.

59 EIA: Transportation sector energy consumption (2016)

60 Trak.In: Tata Launches India's 1st Electric Truck: Tata Ultra T7 Can Run 100 Kms In Single Charge! (2020)

61 ETAuto: Infraprime Logistics to rollout 1,000 heavy electric trucks in India (2020)

62 ETAuto: Infraprime Logistics to rollout 1,000 heavy electric trucks in India (2020)

63 The Print: How commercial vehicles are leading India's electric vehicle revolution (2020)

64 Electric Vehicle Web: Bajaj electric autorickshaw (Bajaj RE EV) launching next financial year (2021)

65 NITI Aayog: Zero Emission Vehicles (ZEVs): Towards a Policy Framework (2018)

66 NITI Aayog: Zero Emission Vehicles (ZEVs): Towards a Policy Framework (2018)

Cement

The cement sector is the third largest consumer of energy⁶⁷ and accounts for 8 per cent of the world's carbon dioxide emissions.⁶⁸ At 340 million metric tonnes, India is world's second largest producer of cement. It is imperative, therefore, that a sector which is critical for the construction of infrastructure and residential buildings responds to the need to reduce its carbon footprint.

Indian cement companies have been pro-active. For example, top cement producers such as ACC, Ambuja Cements, CRH, Dalmia Cement (Bharat), Heidelberg Cement, Orient Cement, Shree Cement, UltraTech and Votorantim Cimentos and Dalmia Bharat are members of the Cement Sustainability Initiative (CSI).⁶⁹ This initiative aims to reduce emissions by stepping up energy efficiency, encourage co-processing of alternative fuels, and considering options such as carbon capture and storage, among other measures.

India's cement companies are considered well on track to meet their commitments to reduce carbon emission intensity by 2030.⁷⁰ Companies such as Dalmia⁷¹ and JSW Cement⁷² have announced plans to use fly ash and slag, which helps utilise waste from sectors such as steel. Aditya Birla Group's Ultratech has reduced its water footprint and moved to alternative fuels, including refuse-derived fuel, by setting up a municipal solid waste processing plant in Jaipur.

Each of these case studies reflects a corporate commitment to transition, and some do not necessarily present a trade-off in terms of employment. However, the impact on employment and livelihoods is not yet part of the strategies of corporates making the transition.

Company	Action	Relevance to just transition
Coal India	Coal India has announced a plan to invest INR 235 billion and INR 105 billion in clean coal initiatives and diversification plans.	Investment in renewable energy. Reduction in employment by 14000-15000 per year.
NTPC	NTPC intends to achieve its target of 32GW capacity through additions to own capacity as well as an intermediary procurer. It has already commissioned 920 MW of renewable energy projects and 1062MW projects have been implemented in Uttar Pradesh, Madhya Pradesh, Rajasthan, Telangana, Odisha, Gujarat and Haryana.	Investment in renewable energy and in vulnerable regions
Reliance Industries	Reliance recently announced it will become a net carbon zero company by 2035. Over 15 years it intends to convert carbon emissions from its refineries into high-value proteins, nutraceuticals, advanced materials and fuels, by developing a carbon capture and storage technologies. It further plans to replace transportation fuels with clean electricity and hydrogen.	Carbon capture and clean energy for transportation
Tata Motors, Mahindra, Ashok Leyland, MG Motors, Maruti Suzuki, and Hero	Manufacturing electric vehicles.	Change in consumption
Tata Motors and Infaprim Logistics	Manufacturing electric trucks.	Change in consumption
ACC, Ambuja Cements, CRH, Dalmia Cement (Bharat), Heidelberg Cement, Orient Cement, Shree Cement, UltraTech, Votorantim Cimentos and Dalmia Bharat	Reducing emissions by stepping up energy efficiency, encourage co-processing of alternative fuels and considering options such as carbon capture and storage among other measures. Cement companies in India are well on track to meet their commitments to reduce carbon emission intensity by 2030.	Emission reduction through carbon capture

Table 4: Case study companies, actions and relevance to just transition

67 Business Standard: Dalmia Cement aims to be carbon negative by 2040: Group CEO (2018)

68 BBC News: Climate change: The massive CO2 emitter you may not know about (2018)

69 Global Cement: Cement Sustainability Initiative report shows Indian cement industry meeting 2030 carbon emission targets (2018)

70 World Business Council for Sustainable Development: Indian cement industry on track to meet 2030 carbon emissions intensity-reduction objectives (2018)

71 Business Standard: Dalmia Cement aims to be carbon negative by 2040: Group CEO (2018)

72 JSW Cement: Sustainability

Financial system policy and regulation

Green bonds

Issuances by Indian entities

In recent years, green bonds have gained traction as a way to finance projects and assets exclusively for the purpose of climate change mitigation or adaptation. These instruments provide an opportunity to expand the scope of end-use of funds, by bundling green financial instruments with those which address the social risks identified in section 2. The regulatory framework reviewed in this section allows for the potential expansion of such scope.

Green bonds are fixed income financial instruments issued either as self-labelled corporate bonds, asset-backed securities, green project bonds, or supranational/international bonds. They can also be issued at state level. It is believed that more than a third of such bonds issued globally consist of asset-backed securities of financial and non-financial corporates⁷³ followed by government-backed entities and development banks. It is also observed that more than 70 per cent of the user proceeds for these bonds have been invested in energy, buildings and transport.⁷⁴

Over the years, India has surpassed many emerging market economies to become the second largest emerging market issuer of green bonds after China.⁷⁵ The first green bond was issued by Yes Bank in February 2015, followed by the green masala bond by IFC⁷⁶ and IDBI's issuance in the same year. In 2016, Axis Bank⁷⁷ and NTPC⁷⁸ issued green bonds, and in the following year L&T, IREDA, Greenko, Azure Power, Jain International Trading and IRFC issued their green bonds. In 2018, State Bank of India followed suit and in 2019 green bonds were issued by Azure Power, Adani Energy⁷⁹ and ReNew⁸⁰. These issuances have been particularly successful in attracting new investors and were significantly over-subscribed. This in part is due to the tax exemption of the interest earned on these bonds under the Income Tax Act 1961.⁸¹

In contrast to global issuances that also include buildings, as of 2017, 83.4 per cent of the proceeds from green bonds in India were used in the energy sector and another 13.1 per cent in transport.⁸² The Energy Resources Institute (TERI) maps the use of issue proceeds, and found that renewables remained the focus.⁸³ There remains untapped potential for sectors such as water, agriculture, forestry, waste and land. TERI makes a case for attracting global investors such as pension funds that have a mandate to make sustainability-linked investments. However, the rate of return on these bonds is low and would require interventions to make such instruments attractive to investors. Beyond bonds, green loans are another debt instrument gaining traction. In 2020, IndoSpace Core – the largest industrial and logistics core real estate vehicle in India – announced an INR 10 billion loan facility to finance or refinance green certified projects.⁸⁴ Big ticket issuances of green bonds have continued despite the slowdown in COVID-19.



Green bonds provide an opportunity to expand the scope of end-use of funds to those which address social risks.

73 Green bonds market summary - Q3 2020 | Climate Bonds Initiative

74 Green bonds market summary - Q3 2020 | Climate Bonds Initiative

75 ETEnergyWorld: India becomes second-largest market for Green Bonds with \$10.3 billion transactions (2020)

76 IFC: IFC Issues First Green Masala Bond (2015)

77 Axis Bank: Axis Bank concludes the issue of US\$500 million, Asia's first certified Green Bonds by a Bank (press release, 2016)

78 The Economic Times: NTPC raises Rs 2,000 crore via green masala bonds (2016)

79 Mercom India: Adani Green Raises \$362.5 Million Through Issuance of Green Bonds (2019)

80 Mercom India: ReNew Raises \$375 Million Through Green Bond Issue (2019)

81 The Economic Times: What are tax-free bonds and how they work (2019)

82 Climate Bonds Initiative: India Country briefing (2018)

83 The Energy and Resources Institute: Unlocking the Green Bond Potential in India (2017)

84 Constro Facilitator: Indospace Core Issues Inaugural INR 1000 Crore Green Loan (2020)

More recent examples of green, social and sustainability-linked loans include:

- **March 2021:** Hero Future Energies (HFE) announced its first dollar-denominated bond issued in global markets, through Clean Renewable Power (Mauritius), a wholly-owned subsidiary. HFE's green bond received orders of over \$3 billion and was successfully priced at a coupon rate of 4.25 per cent for a six-year maturity period. The issuance was oversubscribed more than 8.5 times.
- **March 2021:** Greenko Energy Holdings raised \$940 million for refinancing through its latest green bond issue with the demand for Moody's Investors Service' Ba1 rated bond being over \$2.5 billion. At 3.85 per cent, this was the lowest priced and largest non-investment grade bond issued by any Indian corporate.
- **February 2021:** Continuum Wind Energy issued its maiden green bond of \$560 million, and listed it on the Singapore Exchange (SGX). The proceeds will be used to refinance the project debt at six of its operating entities and to set up wind projects in India.
- **February 2021:** UltraTech Cement raised \$400 million in the form of sustainability-linked bonds. Listed on SGX, the bonds are also the first in Asia's '144A/Reg S' markets category. The issue was oversubscribed more than seven times, a first for an Indian company. The ten-year tenured dollar bonds are due in February 2031. UltraTech Cement intends to use the proceeds to refinance existing rupee-denominated debt, fund ongoing capital expenditure requirements and for general corporate purposes. Under its sustainability performance target, UltraTech aims to reduce 22.2 per cent of carbon emissions for every tonne of cementitious material it produces by March 31, 2030, from the levels of March 2017. If it misses its target, the coupon will increase by 75 basis points in the penultimate year.
- **January 2021:** Shriram Transport Finance (STF) raised \$500 million at a coupon rate of 4.4 per cent via social bonds. STF's social bond was driven by its positive social impact through improved financial access for micro, small and medium enterprises (MSMEs) that are unable to access conventional financial services.

There are sustainability-linked bonds issued in various sectors such as the IFC Forest Bond in Kenya and The Blue Sovereign Bond for fisheries and marine resources in Seychelles. It is possible that such bonds are attractive for the identified countries since these sectors contribute more than a third to national GDP. This implies that the goal of sustainability is embedded in the overall economic objective of the bond, and any risk to the sector will have significant spill-over effects. While corporates have benefited from green bond issuances, similar access to finance is not currently available for sectors such as agriculture that are exposed to climate risk. It is possible that examples of bond issuances such as those of Kenya and Seychelles can be replicated for sectors such as agriculture in India. In fact, the list of recent issuances demonstrates the growing interest in sustainability-linked bonds in India.

Regulations applicable to green bonds in India: scope for green+?

Green bond issuances are regulated by Securities Exchange Board of India (SEBI). The Disclosure Requirements for Issuance and Listing of Green Debt Securities in 2017 specifies a list of activities that are considered "green". These are national guidelines that specify the categories of projects that qualify for use of proceeds from such green debt security, and include:

1. "Renewable and sustainable energy including wind, solar, bioenergy, other sources of energy which use clean technology
2. Clean transportation including mass/public transportation
3. Sustainable water management including clean and/or drinking water, water recycling
4. Climate change adaptation

5. Energy efficiency including efficient and green buildings
6. Sustainable waste management including recycling, waste to energy, efficient disposal of wastage
7. Sustainable land use including sustainable forestry and agriculture, afforestation
8. Biodiversity conservation”

The regulation ensures that the proceeds are used for the stated purpose through adequate disclosures that the issuer pre-commits to at the time of the issuance. The issuer is required to make additional disclosures along with the annual report on the project or asset to which proceeds have been allocated, as well as assessments of the project’s environmental impact. As in other parts of the world, we hope to see just transition embedded into regulations applicable to green bonds in India in future.

Challenges to an expanding green bond market

Disclosures for green bonds mark an important step towards developing a debt market for green projects and industries. However, considerable challenges remain. It is widely acknowledged that the Indian corporate bond market is shallow. Even today, large volumes of stock exchange transactions in the debt segment are in government securities.

Green bonds issued by corporates are a small segment within the corporate bond market. Therefore, to expand the domestic market for green bonds, efforts must be made to deal with the challenges already observed in the Indian corporate bond market, such as procedural difficulties and legal issues.⁸⁵ Moreover, coupon rates on various categories of bonds in the private placement market are influenced by factors such as tenor, ratings, type of issuance, movements in the ten-year government securities yield, and the overall market perception of riskiness.⁸⁶ This is also true for green bonds in India.⁸⁷ Frisari, Herve´-Mignucci, Micale and Mazza (2013) suggest that when it comes to green infrastructure, the political risks are amplified due to the increased reliance on public support; technological risks are complicated by the overwhelming presence of new, cutting-edge technology that is untested in markets to inspire sufficient confidence; and the long payback periods combined with high upfront costs increase the market and commercial risks.⁸⁸ In order to mitigate these risks, credit enhancement and guarantees are considered preferred approaches. Banks and multilateral development banks (MDBs) can therefore play an important role in mitigating these risks.

Bloomberg reports that Indian entities issued \$28 billion of green bonds between January 2014 and August 2020.⁸⁹ Though this is the second-largest issuance among emerging market countries since 2018, green bonds still constitute only 0.7 per cent of all bonds issued in India. As of March 2020, bank lending to the non-conventional energy sector constituted about 7.9 per cent of outstanding bank credit to the power sector overall. More than half of green bonds (\$17.5 billion) are unlabelled. Bonds to the valued at \$18.9 billion have been issued by private independent power producers (IPP) followed by \$3.7 billion by government lenders and \$3.3 billion by government IPPs.



Disclosures for green bonds mark an important step towards developing a debt market for green projects and industries.

85 Reserve Bank of India Occasional Papers: Corporate Bond Market in India: Issues and Challenges (2011)

86 The Economic Times: What are tax-free bonds and how they work (2019)

87 Climate Bonds Initiative: India Country briefing (2018)

88 The Energy and Resources Institute: Unlocking the Green Bond Potential in India (2017)

89 Constro Facilitator: Indospace Core Issues Inaugural INR 1000 Crore Green Loan (2020)

Because of foreign exchange conversion risks, the issuer's prefer rupee-denominated bonds. Further, such issues mostly carry a fixed coupon rate, and \$24.2 billion is fixed coupon. However, the time to maturity for these green bonds varies and close to half of the bonds feature call, put or sink options. Of the issuances between 2012 and 2020, \$20.7 billion were of maturity less than ten years, with five-ten year bonds most common. While the nature of investment in the sector requires a long term investment horizon, the tenure profile of bonds issues signal that long-term investment is not widely prevalent, although it is possible that such low tenure may reduce costs.⁹⁰

The green bond market in India has gathered further momentum following the launch of the India INX – an exchange at India's International Financial Services Centre in Gujarat. Companies such as the State Bank of India have chosen to issue and list their bonds in the offshore market.⁹¹ However, for the market to take off, existing challenges must be overcome, as well as a greater definition of those activities considered in line with a just transition agenda.

Impact bonds

Impact bonds are also gaining traction as a means to move beyond the conventional green bond space and finance projects linked to SDGs. The just transition agenda could be supported by the issuance of Development Impact Bonds (DIBs) and Social Impact Bonds (SIBs) linked to particular social or environmental outcomes that are pre-agreed and verified.⁹² These are particularly effective in servicing non-bankable sectors⁹³ through public-private co-operation. However, this would require a uniform framework for benchmarking, as with for green bonds, developed in line with just transition priorities.

There are three parties involved: the private investor, the outcome payer and the service provider. Investors, or a group of investors, provide capital that is to be deployed in a project managed by the service provider, usually a non-profit organisation.⁹⁴ If the outcome is achieved, investors are paid back capital with interest by the outcome payer. In the event of the outcome not being achieved, the terms negotiated at design stage apply, which could include repayment of risk capital without interest or with certain part of the capital forfeited.⁹⁵

The main difference between SIBs and DIBs is that in the case of the former, the government is an outcome payer. Between 2010 and 2018, India received \$5.2 billion in the impact investment space.⁹⁶ The returns in this sector are demonstrably attractive and in 2017 McKinsey estimated that median returns for 48 investor exits was 10 per cent.⁹⁷ Also, the median capital lock in this sector has been four to five years, comparable to conventional private equity investing.⁹⁸ Over time, the sectoral deployment of these funds has diversified, with a decline in the proportion of clean energy projects to 40 per cent of deal value by 2016, and expansion in sectors such as education, healthcare, and agriculture.⁹⁹



The just transition agenda could be supported by the issuance of Development Impact Bonds (DIBs) and Social Impact Bonds (SIBs) that are linked to particular social or environmental outcomes.

90 Reserve Bank of India Occasional Papers: Corporate Bond Market in India: Issues and Challenges (2011)

91 Reserve Bank of India: India's Corporate Bond Market: Issues in Market Microstructure (2019)

92 The Energy and Resources Institute: Unlocking the Green Bond Potential in India (2017)

93 International Institute for Sustainable Development: Credit Enhancement for Green Projects (2015)

94 Bloomberg: India's \$28 Billion of Green Bonds Are Under the Spotlight (2020)

95 Issue Paper: Green Bonds in India | Green Growth Knowledge Platform

96 Financial Express: SBI lists \$100 million green bonds on India INX (2020)

97 World Bank: Banking on Impact: What You Need to Know about Results-Based Financing (2019)

98 World Bank: Banking on Impact: What You Need to Know about Results-Based Financing (2019)

99 India Development Review: IDR Explains Development Impact Bonds (2018)

The first DIB was launched in India in 2015 to finance the Educate Girls' Programme in Rajasthan's Bhilwara district, which covered 166 schools in 144 villages. The programme ran until 2018 and resulted in substantial learning gains.¹⁰⁰ At the end of three years, it enrolled 768 out-of-school girls, 92 per cent of all identified out-of-school schoolgirls eligible for enrolment.¹⁰¹ The investors were offered an internal rate of return (IRR) of 15 per cent on top of the capital invested.¹⁰² These instruments have also been used to support health outcomes in the state of Rajasthan¹⁰³ and women entrepreneurs in agriculture and manufacturing.¹⁰⁴

The impact bond space has evolved and now covers sectors such as agriculture that are exposed to the risk of climate change. Considering that impact investments are aligned closely with SDGs, the just transition agenda is most relevant to this space. While the concept has not yet gained currency, Royston Braganza, CEO of Grameen Capital India, has said that any activity seeking to build back better post COVID-19 is a 'just transition'. Braganza suggests that SDG Impact Bonds have been truly ground-breaking, bringing in a diverse pool of capital with different motivations into a single micro-instrument. Impact bonds currently finance activities such as reskilling and sustainable agricultural practices that are critical for a just transition. These activities can play an important role in bridging the gap for financing local projects aligned with just transition.

Disclosures: Regulation

Non-financial disclosures are another tool by which finance can be directed towards sectors that facilitate a just transition. In India the annual business responsibility reporting (BRR) is one such tool; we detail the regulation so as to evaluate its alignment with the just transition agenda.

Non-financial reporting by firms was first introduced in India in 2012, with the release of National Voluntary Guidelines (NVG) on Social, Environmental and Economic Responsibilities of Business by the Ministry of Corporate Affairs. Based on the NVG, the SEBI mandated BRR. The BRR now applies to 1,000 companies listed on the Indian stock exchange. The framework is based on nine principles for businesses:

- Businesses should conduct and govern themselves with ethics, transparency and accountability.
- Businesses should provide goods and services that are safe and contribute to sustainability throughout their life cycle
- Businesses should promote the wellbeing of all employees
- Businesses should respect the interests of, and be responsive towards all stakeholders, especially those who are disadvantaged, vulnerable and marginalised
- Businesses should respect and promote human rights
- Business should respect, protect, and make efforts to restore the environment
- Businesses, when engaged in influencing public and regulatory policy, should do so in a responsible manner
- Businesses should support inclusive growth and equitable development



Non-financial disclosures are another tool by which finance can be directed towards sectors that facilitate a just transition.

100 India Development Review: IDR Explains Development Impact Bonds (2018)

101 McKinsey: A closer look at impact investing (2018)

102 McKinsey: A closer look at impact investing (2018)

103 McKinsey: A closer look at impact investing (2018)

104 McKinsey: Impact investing finds its place in India (2017)

In addition to the BRR, some companies also provide sustainability reports, and the disclosures under BRR communicate a company's approach to ESG. Such non-financial reporting can be instrumental for stakeholders – including banks and investors as well as rating agencies – to understand whether and to what extent a company follows sustainable practices.

At present, no external audit and validation is necessary in India. Furthermore, the current reporting of non-financial information is considered insufficient. In 2020, the Ministry of Corporate Affairs released its *Report of the Committee on Business Responsibility Reporting*, which recommended a new reporting framework with two reporting formats. 'Comprehensive' and 'lite' would require sector-specific disclosures related to GHG or waste management. Looking through the lens of just transition, as defined in this report, the ESG framework in India covers aspects beyond climate change and has explicitly incorporated human rights and the wellbeing of employees among its core principles. However, it requires further work to assess the extent to which such information is objectively used and translates into investor action. The thrust on ESG disclosures is driven by the demand from foreign investors, such as pension funds, and institutional investors. In our interactions with investors, large foreign investors have expressed interest in the policy landscape, which signals the intent and priority. For the concept of just transition to become more widespread, a comprehensive policy that covers definitions rooted in a local context may prove useful.

ESG-based institutional investment

International institutional investors are increasingly conscious of a business's social impact and are adopting investment strategies linked to ESG objectives – Indian corporates complying with these standards could attract more international institutional capital. Investors may screen investments by eliminating certain companies or sectors that are associated with increased ESG risk or which violate the asset owner's values. Alternatively investors may increase exposure to positive ESG characteristics to align capital with certain behaviours or target specific positive social or environmental outcomes. In either case there is a need for definitions that align with the just transition that in turn requires a comprehensive government policy.

Responsible investment practices are gaining traction in India. Homegrown mutual funds in India have established ESG funds that actively track ESG disclosures for investment purposes. These include: State Bank of India Magnum ESG Fund; Axis ESG Fund; Mirae ESG; Aditya Birla Sun Life ESG Fund; Quantum ESG; Kotak ESG and ICICI Prudential ESG Fund. Some of these, such as Kotak AMC, SBI and private equity firm Ecube, have signed the UN's Principles of Responsible Investment (UNPRI) while others do not specify what ESG frameworks they are aligned to.

The assets under management of ESG funds have grown from INR 35,73 Cr in 2019 to more than Rs 105,09 Cr in 2021, equivalent to a 194 per cent increase in two years. Indian UNPRI signatories increased from two in 2018 to eight in 2021. This represents a small fraction of the overall size of the mutual fund market of INR 31 trillion. However, S&P estimates that only 10 per cent of the asset managers have embraced 'best-in-class' ESG practices and that gaps remain, including underdeveloped material frameworks, inadequate data competencies and insufficient specialists in ESG teams.¹⁰⁵ Harmonisation, or standardisation of reporting frameworks is also considered important, especially where foreign investment is crucial.¹⁰⁶



Indian corporates complying with the ESG standards of international institutional investors could attract more capital.

¹⁰⁵ Crisil: Rising to the ESG challenge (2020)

¹⁰⁶ Crisil: Hint of consensus in ESG reporting standard (2020)

Taking the portfolio of the existing ESG funds, of the 134 companies they hold, ten are from energy sector, nine are in the construction sector and eight are in the automobile sector.¹⁰⁷ Investor action will therefore be crucial to ensure that the investment strategies of ESG funds are aligned to the just transition.

Amundi has launched the world's first dedicated just transition fund.¹⁰⁸ The Just Transition for Climate Fund will give investors a unique opportunity to measure and integrate the financial risks associated with climate change, and use their investments for an inclusive transition in line with the Paris Agreement. It will maintain a carbon footprint that is 20 per cent lower than its benchmark. The new strategy will use a negative screening based on climate and social criteria to select issuers that have affirmed a goal to reduce their carbon footprint. In addition, bonds should have ESG rating and 'just transition' rating that are higher than or equal to 'E,' with 'A' being the highest and 'G' the lowest. Amundi's 'just transition' score will look at the different social aspects involved in the transition to a low-carbon economy, such as impact on employees, consumers, local communities, and society at large. In the same way, Indian ESG funds could be established to include a 'just transition' rating based on issuers impact on employment, livelihoods and local consumption risks, as articulated in this report. At the moment, specific corporate actions in India are available as examples of approaches to transition. Further work would need to be done to develop the definition of 'S' in ESG.

Our interactions with investors, summarised in Figure 10 below, provide insights on how the just transition framework can be embedded in institutional investment strategies in emerging markets such as India.



Amundi has launched its first Just Transition Fund which could be replicated in the Indian market.

¹⁰⁷ Value Research: The rise of ESG investing (2021)

¹⁰⁸ Citywire Selector: Amundi launches Just Transition for Climate fund (2021)

1. Just transition is still early-stage in India – and needs definition

- Just transition links the environmental and social pillars of the SDGs
- Job creation is only one concern of the just transition in an Indian context
- International frameworks such as Climate Action 100+ and World Benchmarking Alliance are helpful
- National application of these frameworks needs to take account of local context
- Just transition can be used to connect ESG with the sustainable taxonomy debate
- A just transition agenda is needed for each sector
- ESG rating agencies can play a key role in analysing company progress on just transition

2. Just transition needs to be placed in a core sustainable developmental context

- Challenge of a climate vs development trade-off still exists; it is important that just transition is not seen as a non-domestic issue or new topic
- Critical to place just transition as delivering social co-benefits alongside both net zero and resilience

3. Policy action is the catalyst for a just transition

- Companies move when governments set targets – and then often seek to over achieve: this is the emerging dynamic in China
- Policy elements could include:
 - Net zero target: Key catalyst would be for India to make a net zero commitment and design its strategy in the context of overall economic and development ambitions
 - Public finance: Crucial implications in terms of public spending (including blended finance) as well as public revenues (loss of fossil fuel revenues)
 - Public Sector Undertakings (PSU)/privatisations: Bring ESG including just transition into the divestiture debate
 - Sustainable finance: Opportunity to place the just transition as a cross-cutting theme in the Ministry of Finance's sustainable finance taskforce
 - Existing policies: Link across to CSR funds
 - Bonds: Issuance of municipal bonds can be bolstered by overcoming capacity constraints

4. Innovations in capital markets could help make the just transition granular

- Growth in interest in transition finance is a good place to incorporate the social dimension (e.g. ICMA; CBI)
- Green+ INR sovereign bond could link environment and social priorities
- Strong potential in green and sustainability-linked bonds
- Impact investors can drive innovation and build up scale through aggregation (e.g. Grameen Capital's SDG-linked bonds)

5. Shareholder engagement on just transition is starting: needs to find corporate champions

- Engagement is underway – starting to introduce the just transition concept to companies

Key sectors:

- High Carbon/Climate Action 100+ priorities
- Nifty 50: who could be the leaders
- Agriculture and tourism
- Banking and insurance

Figure 10: Inputs from investor consultations

Credit rating agencies and insurance

While there have been measures introduced to improve non-financial reporting by companies, it is important that such information translates into investment action aligned to just transition. As discussed earlier, mutual funds and foreign investors tend to focus on such disclosures while making investments, as well as nudging companies to shift to relatively sustainable practices. Corporate action across sectors signals the desire to make such a shift. However, to drive a system-wide impact, it is important that the risks and opportunities from the net zero pathway are made available to investors in a usable format.

To this end, credit rating agencies can play an important role in identifying and translating the risk into objective metrics. Agencies such as Fitch and S&P (as CRISIL) that operate in India, use ESG criteria for rating companies. In 2021, Acuite launched ESG Risk AI, India's first ESG ratings company.¹⁰⁹ Similarly, rating agencies can shift the focus of investment onto the 'S' of ESG which is aligned to just transition.

The other actor within capital markets that possesses the capacity to assess risk is the insurance sector. Extreme weather events pose a physical risk and the transition can lead to loss of asset value. Between 2000 and 2019, India lost an estimated \$80 billion from climate change.¹¹⁰ The Shakti Foundation found insurance agencies priced short-term weather risks, and that insurance agencies such as AXA, HDFC Ergo and Allianz can potentially take the lead in sharing their knowledge.¹¹¹ Moreover, it links back to the need for a disclosure framework.

Domestic Development Finance Institutions and Multilateral Development Banks

Domestic Development Finance Institutions (DFIs) are instrumental in raising private investment in developing countries through their financing, risk sharing and supporting activities.¹¹² The low rate of return expected from social investments – and the need for risk sharing – has been demonstrated in the case of green bonds. DFIs have a significant role to play, since they can provide the necessary credit enhancement or first loss support against a fee.¹¹³ In India, there are:

- National development banks such as the Small Industries Development Bank of India (SIDBI) and Industrial Development Bank of India
- Sector-specific financial institutions including EXIM Bank and the National Bank for Agriculture and Rural Development
- Investment institutions such as the Life Insurance Corporation
- State DFIs including State Finance Corporations and State Industrial Development Corporations

Among the DFIs, the SIDBI has raised money by issuing an impact bond whereas EXIM Bank issued a \$500 million dollar-denominated green bond to fund green transportation projects in Bangladesh and Sri Lanka.¹¹⁴ In 2021, India announced the setting up of a new DFI, with initial paid-up capital of around \$3 billion and a lending target of \$69 billion over the next three years. This DFI will raise money from private sector for long term infrastructure and development projects.¹¹⁵ The proceeds raised by the DFI can be deployed for activities aligned with the just transition agenda.



While there have been measures introduced to improve non-financial reporting by companies, it is important that such information translates into investment action aligned to just transition.

109 ESG Risk Assessments & Insights

110 Hindu Business Line: Climate change is taking its toll on India (2019)

111 Shakti Foundation: Climate Risk Mainstreaming Approaches for Indian Financial Institutions (2020)

112 Overseas Development Institute and the Association of European Development Finance Institutions: Impact of development finance institutions on sustainable development (2019)

113 The Economic Times: What would it take for private sector DFIs to succeed in today's India (2021).

114 India Exim Bank: Green Initiatives

115 Business Insider India: India sets up a new bank for big infrastructure projects as it aims to raise \$41 billion in a few years (2021)

Corporate Social Responsibility

Other than disclosures, corporations are expected to contribute to sustainable growth through Corporate Social Responsibility (CSR). CSR spending has been mandated since 2013, through an amendment to the Companies Act. As per the Act, a company with a net worth of INR 5 billion or more, or turnover of INR 10 billion or more, or a net profit of INR 50 million or more during any financial year is required to contribute 2 per cent of its average net profit over the past three financial years to a set of pre-specified activities. Such activities include initiatives to eradicate hunger or promote education and livelihood, health, gender and social equality, sustainable practices to protect the environment, rural and slum development which are aligned with the priorities identified for a just transition.

In its 2020 CSR survey, KPMG found that CSR allocation increased to INR 86.91 billion in the financial year 2018-19, while unspent balances have declined.¹¹⁶ Maharashtra, Uttar Pradesh, Kerala, Rajasthan and Odisha are the top five recipients of CSR funds. In terms of expenditure, the largest value was spent on education (INR 27.75 billion) followed by health (INR 21.45 billion) and rural development (INR 11.43 billion). The CSR offers an opportunity for companies to ensure that any externalities are compensated for through the spend. Therefore, the costs of transition can be allocated to CSR spend by corporates. Pre-empting the discussion of corporate action based on investor engagement has been helpful in bringing about shifts in production practices. However, there has not been equal or enough focus on the employment or livelihood as well as consumption changes with changing inputs and patterns of production. Recognising the just transition priorities in India is important, since these can then be translated to corporates by investors and through regulatory changes, ensuring CSR spend can be broadened to include these priorities.

Public sector initiatives¹¹⁷

The Indian government has set up a number of agencies engaged in mobilising investment for green infrastructure. These operate largely in the energy sector and have been effective in moving rapidly towards India's ambitious renewable energy targets. Most of the institutions are public sector initiatives which operate at the national level. The National Clean Energy Fund, set up in 2010, was the first of these. It was funded completely through government revenues and did not aim at catalysing private finance.

Following this, several institutions were launched, including non-bank financial companies, public sector enterprises, and an equity fund for infrastructure investment (Table 5 provides an overview of these initiatives). Each aims to mobilise private investment using government funding as seed capital. In parallel, to enable job creation, the government has set up a Skill Council for Green Jobs, which since 2015 has trained over 400,000 workers in partnership with around 150 industry associates.¹¹⁸

¹¹⁶ KPMG: India's CSR reporting survey 2019 (2020)

¹¹⁷ Adapted from: Observer Research Foundation: A Green Investment Architecture for India: Building a Bridge for Global Capital (2020)

¹¹⁸ Skill Council for Green Jobs: Green Jobs Newsletter, April 2021

	IREDA		SECI	EESL	NIIF	GGEF	NCEF
Type	Green window	Non-bank financial company	PSE	PSE	Equity Fund	Equity fund (part of NIIF)	National climate fund
Inception	Announced December 2019	1987	2011	2009	2015	2017	2010
Sponsors	GoI	GoI	GoI	GoI	GoI	GoI + UK government	GoI
Funding	\$20m	GoI, masala bonds, funding for MDBs	Draws on the budget of MNRE		\$3bn	£240m	Funded out of coal cess revenue, INR 30,000 crore to date
Sectors	Renewable energy	Renewable energy	Solar energy	Energy efficiency	Infrastructure	Green infrastructure, so far renewable energy	Renewable energy and infrastructure
Instruments		Loans, credit guarantees	Direct investment, financial intermediation, payment guarantee	Direct investment	Equity finance	Equity finance	Grants
Finance mobilisation	Aim to leverage \$80m				Aim to leverage \$3bn	Aim to leverage £260m	
Emissions reduced				39 Mtoe CO ₂ annually			

Table 5: Overview of institutions financing green infrastructure in India

State government initiatives

The equity fund structure has also been used by the state governments of Tamil Nadu and Kerala.

Tamil Nadu Infrastructure Fund (TNIF)

The TNIF was founded in 2015 and is a targeted \$1 billion investment fund with the goal of mobilising and deploying non-public domestic and international capital into infrastructure projects within the state of Tamil Nadu. It is a professionally-managed investment vehicle operating on an arms-length basis from the Government of Tamil Nadu, and is managed independently by its fund manager, Tamil Nadu Infrastructure Fund Management Corporation Limited. Currently, the Government of Tamil Nadu holds a 49 per cent stake, which is expected to be diluted further. Key objectives of TNIF include catalysing private sector investment and successfully implementing public private partnerships in developing, funding and completing critical infrastructure projects. All projects are evaluated based on ESG criteria, however, they do not provide information on either financial or environmental outcomes.

Kerala Infrastructure Investment Fund (KIIF)

KIIF was set up in 1999 as an autonomous body to fund infrastructure development in Kerala. The role of KIIF was substantially amended in 2016, and it is now raising debt for critical infrastructure development against future receivables from the state government.

Revenues from the Fuel Cess and Motor Vehicle Tax are ear-marked for the KIIF, and the state government provides funds to meet any shortfalls in debt service requirements. The government has transferred around \$350 million as seed capital to the KIIF so far, which has been used to raise \$830 million (as of December 2018). Funds are raised through bank loans and debt, including a masala bond issuance on the London and Singapore stock exchanges last year. While the KIIF is not committed to financing only green infrastructure, it has undertaken several projects which meet these requirements, such as sustainable roads and flood-resilient cities.¹¹⁹

119 KIIFB website

Projects by sectors
 INR413.25 billion (≈USD5.9 billion) across 512 projects

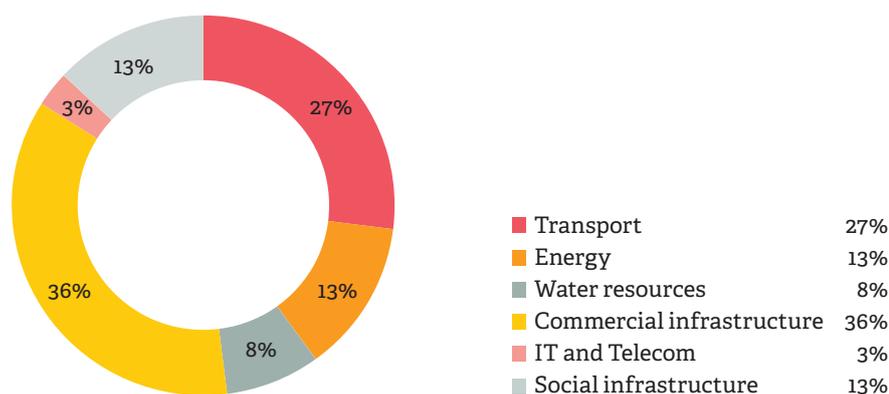


Figure 11: Sectoral distribution of KIIF funding

Local government initiatives

Local government finances have always been constrained by the federal model, whereby tax collection is centralised, and then devolved to state and local governments for undertaking expenditures. However, localised action will be crucial to ensure policies are aligned to regional priorities and risks.

Municipal bonds, in particular, can be used to supplement local government budgets, but so far remain under-utilised. However, during 2020, some municipal corporations expanded their bond issuance, and in April 2021, the Ghaziabad Municipal Corporation (GMC) became India's first municipal corporation to raise Rs 150 crore by issuing a green bond in the domestic market. GMC will construct a tertiary sewage treatment plant with this capital, which was raised at a coupon of 8.1 per cent on a ten-year note and listed on the Bombay Stock Exchange.

Multilateral Development Banks and international Development Finance Institutions

Multilateral banks have also raised finances to fund sustainable development activities in India, and have the potential to finance a just transition. For example, the IFC has been investing in financial inclusion, climate change and water scarcity. It made a \$29 million investment in Bandhan, the largest private sector investment in microfinance, and also raised INR 3.5 billion through the issuance of masala bonds to finance renewable energy and energy efficiency projects, mainly in the solar and wind sectors.¹²⁰ CDC Group, the UK government's DFI, has invested in a diverse range of sectors to provide clean energy, healthcare, jobs, access to basic goods and services, and financial inclusion. In 2018, CDC launched Ayana Renewable Power, a renewable energy platform which has a portfolio of 1.44 GW of solar generation capacity and plans to scale to over 4 GW over the new two years. CDC has a clear strategy for a just transition within its Paris Alignment approach and its investment criteria includes an exclusion for fossil fuel investments except under limited circumstances such as gas power consistent with a country's net zero pathway.¹²¹ Excluding fossil fuel investments can be useful in India, where fossil fuels such as coal are a mainstay for certain industries and regions.

¹²⁰ International Finance Corporation: India

¹²¹ CDC: Our fossil fuel policy (2020)



05

A just transition finance roadmap for India: next steps

The financial system in India is gearing up to address the challenges of climate change. Both the RBI's decision to join the NGFS in April 2021, and India's commitment to strengthen international relations to combat climate change through the ISA and other mechanisms, are positive developments.

For many years, at the behest of international investors – an important source of foreign exchange and investment – regulatory practices in India have been adapting to international best practices. ESG reporting was embedded, albeit on voluntary basis, in the form of Business Responsibility Reporting. These disclosures are used by large institutional investors to make equity investments or even by private equity to drive change.

Examples of corporate action corroborate this. Innovations in finances – green bonds and impact bonds – are expanding the options available for companies seeking to raise funds. Lastly, DFIs and MDBs are playing a significant role in making up for the lack of credit to sectors and regions. The setting up of the national DFI along with the successful sub-national DFIs can help further the just transition. Therefore, each segment of the financial market is functioning to fulfil a particular goal.

The just transition framework for India set forth in this report can be used in two ways. First, it provides guidance for investors when reaching out to companies to understand whether they operate in regions vulnerable to just transition risk and if there are any strategies to invest to mitigate risks in these regions. Select Indian companies: Coal India, NTPC, ONGC and Reliance Industries have been identified as among the 160 highest carbon emitters in the world. Under the Climate Action 100+ initiative, investors can engage with companies on improving climate change governance, cutting emissions and strengthening climate-related financial disclosures and, from 2021, on just transition indicators linked to loss of livelihoods.¹²²



A just transition framework provides guidance for investors when reaching out to companies to understand whether they operate in regions vulnerable to just transition risk.

¹²² About Climate Action 100+

Second, it provides guidance for investors seeking to align their capital allocations to just transition principles. Investments in human capital, social safety nets and social infrastructure projects that create new, decent jobs, will all be critical for a just transition. For countries such as India, the ILO finds that the top priorities among the labour dimension of climate change policies are skilling and capacity building for adaptation while creating new jobs.¹²³ Education, skills training and health infrastructure are all essential investments which will support the creation of a skilled labour force. Investments in labour-intensive manufacturing could replace livelihoods and create new sources of income. Green energy generation, grid upgradation and maintenance, and the transport sector could all be sources of new, decent jobs. In particular, green energy generation could also improve energy access. Finally, around a third of Indian states face significant risks to public finances (greater than 10 per cent), as result of the net zero transition. This will impact their ability to provide social safety nets and investments in education, health and productive infrastructure. State governments may need to explore new sources of finance including blended finance.

Table 6 shows a possible mapping of risks to investments, highlighting the role that financial sector players, regulators and policymakers need to play in ensuring the just transition is achieved.

» **Investments in human capital, social safety nets and social infrastructure projects that create new, decent jobs, will all be critical for a just transition.**

Risk	Institution	Instrument	Use of proceeds	Regulatory action	Policy support
Livelihoods and energy access	Banks	Lending	Project finance in just transition aligned sectors	Including just transition-aligned sectors in priority sector lending	Aligned taxonomy, skills training
	Institutional investors	Engagement with corporates to encourage change in production practices and diversification. While considering the livelihood impacts on their workforce	Just transition-aligned production practices	ESG disclosures aligned to just transition priorities	
	ESG Funds	Equity/debt	Financing companies in just transition sectors	ESG disclosures aligned to just transition priorities	Aligned taxonomy
	DFIs/MDBs	Equity, Lending, credit guarantees	Project finance in new/high-risk just transition aligned sectors		Aligned taxonomy
	Ratings agencies	ESG ratings used for directing equity investment in companies	Lead project finance in just transition aligned sectors		Aligned taxonomy
Vulnerability	Corporates	CSR spend	Health, education		
	Impact investors	DIBs/SIBs	Health, education		
Public finance	Government	Green/sustainable bond issuance and carbon pricing	Social security, health, education	Putting in place accounting and disclosure rules	

Table 6: Mapping risks to just transition investment opportunities

123 International Labour Organization: World Employment and Social Outlook 2018 – Greening with jobs, page 89 (2018).

To integrate just transition priorities into the broader objectives of the financial system, we identify three main areas of intervention: identifying investment opportunities; regulatory support; and real economy action. In line with these, the next phase of this project will be focused on the following broad strands of research and stakeholder outreach.

Investment opportunities and financial practices

For investors, the biggest challenge in aligning portfolios to just transition priorities is identifying businesses and projects that are aligned with just transition. The regional identification and risk assessment is a first step in supporting investors, but for more detailed guidance, research will be required on the following topics:

1. Expanding the market for green bonds to include a green+ approach, integrating both climate and social objectives, as well as new instruments including sustainability-linked and transition bonds.
2. Working with impact investors to understand their priorities and supporting just transition-aligned investments.
3. Expanding engagement with the banking sector and finding avenues to support just transition-aligned lending through banks.
4. Building engagement with DFIs, both domestic and international, to ensure just transition principles are built into their investments.

Financial policy and regulation

Supporting investment in just transition priority areas will require support from regulators, and an alignment for financial sector regulation to India's development challenges, keeping in mind international norms. To this end, we identify the following topics for research in the next phase of the project:

1. Exploring avenues for the RBI and regulators to integrate just transition priorities into their mandate.
2. Broadening the financial sector's understanding of climate risks to include transition and social risks, possibly by developing a taxonomy suited to India's development priorities and challenges.
3. Aligning CSR spending from large companies to just transition principles.
4. Identifying and supporting the engagement of a wider set of stakeholders in financial decision-making.

Financing real economy action

Given India's economic size and contribution to global emissions, climate policy can only succeed if Indian policy makers are engaged. Managing the net zero transition alongside development challenges, however, will require a national comprehensive plan, which aligns India's climate goals, SDGs and sustainable finance policy. Further research will be required on the following topics:

1. Building engagement with corporate leaders, particularly in India's large conglomerates, to support the integration of climate and social goals in their business plans.
2. Identifying place-based strategies, investors and financial instruments to address specific challenges in priority states.
3. Supporting local government in tapping new sources of finance, in particular, municipal and local government bonds.

Appendix

State/UT	Public finance			Livelihoods		Vulnerability			Energy access	
				Coal	Agriculture					
	Revenues from petroleum (%)	Revenues from coal (%)	Revenues from coal and petroleum (%)	Coal/lignite production (MT)	Number of districts vulnerable to climate change	State GDP per capita (INR)	NITI Aayog Education Index	NITI Aayog Health Index	Per capita electricity consumption (kWh)	Share of households without electricity supply (%)
	2019-20	2019-20	2019-20	2019-20	2014	2019-20	2016-17	2017-18	2019	2020
Andhra Pradesh	9%	0%	9%		22	113927	56.08	65.31	1480	
Arunachal Pradesh	0%	0%	0%		14	105064	28.42	46.07	703	
Assam	4%	0%	5%	1	23	62796	56.12	50.02	341	
Bihar	4%	0%	4%		37	31287	37.3	32.43	311	2.2
Chhattisgarh	5%	12%	17%	157	16	75278	54.94	53.97	1961	4.2
Goa	6%	0%	6%		1	367226	53.79	51.9	2274	
Gujarat	11%	0%	11%	11	25	165359	63.01	63.72	2378	1.0
Haryana	11%	0%	11%		19	176199	69.54	54.08	2082	
Himachal Pradesh	1%	0%	1%		12	142155	62.78	63.1	1418	
Jharkhand	5%	12%	17%	134	18	57863	30.65	53.67	938	2.4
Karnataka	9%	0%	9%		27	154861	52.95	61.77	1396	3.2
Kerala	8%	0%	8%		14	149563	82.17	74.65	757	
Madhya Pradesh	7%	5%	13%	97	45	62236	47.24	38.69	1084	3.1
Maharashtra	9%	1%	10%	55	33	152566	62.55	64.53	1424	
Manipur	1%	0%	1%		9	53930	46.87	60.59	371	
Meghalaya	0%	0%	0%		7	66153	38.43	55.95	881	
Mizoram	1%	0%	1%		8	148663	46.53	74.98	617	
Nagaland	1%	0%	1%		8	75951	35.89	38.51	356	
Odisha	5%	8%	13%	142	30	78680	60.23	36.35	1628	0.8
Punjab	8%	0%	8%		17	118848	59.06	63.41	2046	
Rajasthan	9%	0%	9%	8	32	78390	59.43	43.23	1282	4.0
Sikkim	2%	0%	2%		4	255772	43.02	50.5	873	
Tamil Nadu	10%	0%	10%	23	29	153853	73.35	60.5	1866	2.0
Telangana	9%	3%	12%	66		150641	39.02	59.42	1896	
Tripura	3%	0%	3%		4	89682	56.1	46.38	514	
Uttar Pradesh	6%	0%	6%	47	70	44618	46.45	29.16	606	6.8
Uttarakhand	4%	0%	4%		13	158919	48.15	39.61	1467	0.7
West Bengal	5%	2%	7%	32	17	71757			703	1.9

Note: The lowest quartile of states for each indicator have been identified as high risk, and highlighted in red. For a list of sources please see Table 2, pp. 17.

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