

# Climate Policy

Embedding a development-centric, climate-ready approach to policymaking

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SFC Perspectives  
are intended to  
stimulate discussion  
by providing an  
overview of key  
issues and avenues  
for action to inform  
India's sustainable  
development  
trajectory.

# Perspectives on Climate Policy

Embedding a development-centric,  
climate-ready approach to policymaking

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India is a rapidly growing country pursuing a range of challenging development objectives. Its continued growth and development – particularly in the face of a changing climate – will likely involve large structural shifts in its patterns of growth, urbanisation, and employment. Against the backdrop of this uncertain future pathway, India has also committed to decarbonising its economy over a multi-decadal timescale. To this end, it has instituted multiple targets and policies in relevant sectors, layering in further measures over time in response to evolving conditions. This approach has enabled the country to partially decouple its growth from emissions and grow its renewable electricity generation capacity over the last decade.

Like most countries, India has hitherto taken an opportunity-siezing approach to climate mitigation, green growth, and green industrialisation<sup>1</sup>. But realising greater climate and development benefits requires coalescing these efforts into a strategic approach to low-carbon development that also builds climate resilience. Doing so can present significant opportunities to synergistically achieve these environmental and developmental benefits – navigating shifts in global economic conditions and the ongoing energy transition. Because the

strategy-setting, coordination, and consensus-building requirements of such a transition are large, such a strategy requires a capable state with a development-centric, climate-ready approach to policymaking. Such a policymaking approach requires 1) modelling capacities to estimate low-carbon pathways and their development implications; 2) institutions capable of coordinating and mainstreaming climate considerations to achieve greater coherence; 3) bureaucracies that work with industry to devise green industrial policy strategies; and 4) the ability to nudge and harness a financing ecosystem to steer investments towards low-carbon development (See Figure 1). A development-centric climate-ready approach to policymaking also requires revisiting the relative roles of the state and markets in steering the country's low-carbon pathway and addressing problems of the global commons. The identification and appropriateness of these choices for the Indian context merits further study.

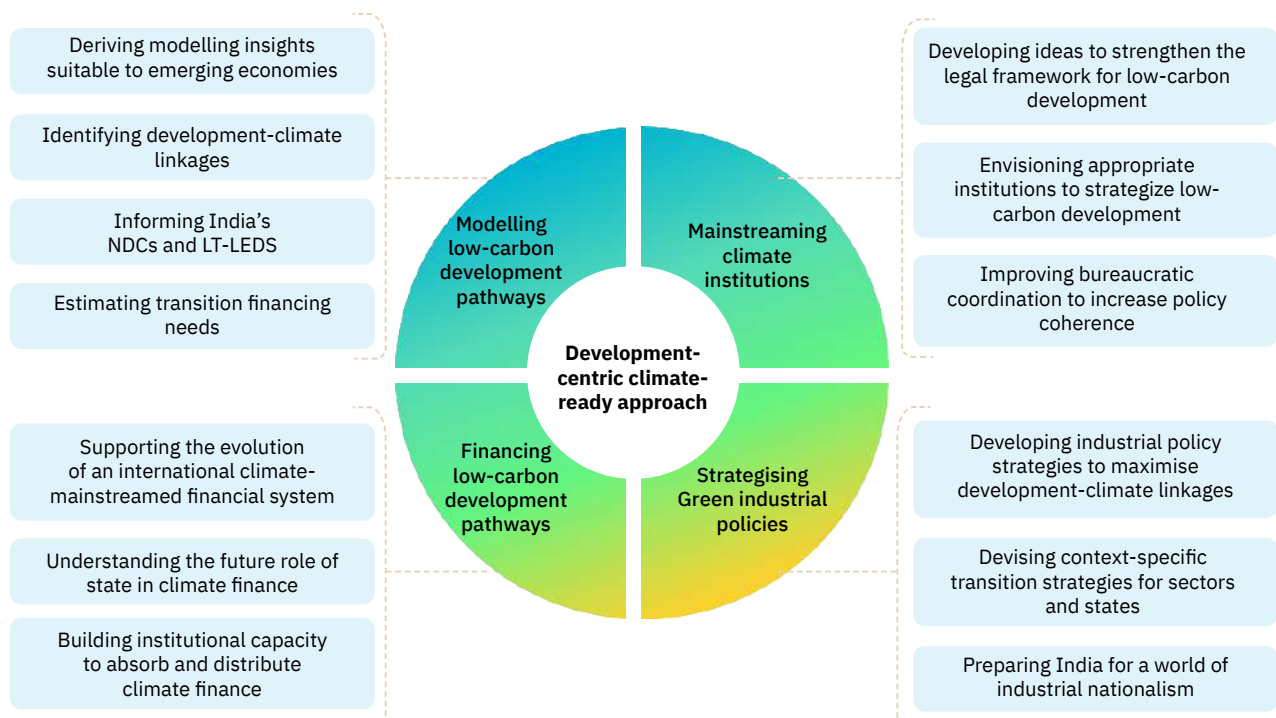
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## **The Climate Policy group within SFC approaches policy challenges through a strategic lens, aiming for long-term structural change by shifting discourse, building stronger institutions, and aligning conditions for implementation.**

<sup>1</sup> Parul Kumar and Abhayraj Naik, "India's Domestic Climate Policy Is Fragmented and Lacks Clarity," *Economics and Political Weekly*, February 2019, <https://www.epw.in/engage/article/indias-domestic-climate-policy-fragmented-lacks-clarity>.

Prior work of team members has sought to reframe the climate challenge around realising climate and development co-benefits<sup>2</sup> and recognising trade-offs in policy choices<sup>3</sup>. India has multiple possible development pathways ahead of it, and choices among these development pathways will affect the potential for locking-in low-carbon resilient futures. Indeed, development choices around urbanisation and industrialisation<sup>4</sup> are likely to be as significant as low-carbon energy infrastructures in shaping India's low-carbon development future. The task ahead is to envision and embed a development-centric climate-ready approach in

policymaking. To this end, we aim to continue to build capacity at the national and state levels to estimate and map the various possible low-carbon development pathways for the country, identify key leverage points, develop strategic approaches to policy implementation, including through the strengthening of institutional capacity, and enable their realisation through the judicious management of financial resources (Figure 1). We aim to achieve this by focusing on the following themes, which will be salient in addressing issues at the frontier of the climate and development challenge.



**Figure 1:** A development-centric climate-ready approach. Source: Author generated

<sup>2</sup> Navroz K. Dubash, "The Politics of Climate Change in India: Narratives of Equity and Cobenefits," *WIREs Climate Change* 4, no. 3 (2013): 191–201, <https://doi.org/10.1002/wcc.210>.

<sup>3</sup> Ankit Bhardwaj et al., "More Priorities, More Problems? Decision-Making with Multiple Energy, Development and Climate Objectives," *Energy Research & Social Science* 49 (March 2019): 143–57, <https://doi.org/10.1016/j.erss.2018.11.003>.

<sup>4</sup> Thomas Spencer and Navroz K. Dubash, "Scenarios for Different 'Future Indias': Sharpening Energy and Climate Modelling Tools," *Climate Policy* 22, no. 1 (January 14, 2022): 30–47, <https://doi.org/10.1080/14693062.2021.1973361>.

# Modelling Low-Carbon Development Pathways

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*Emissions-economy models have been extensively used to explore greenhouse gas emissions trajectories, and to thereby inform emission targets and policies for decarbonisation and the energy transition. How can India better use and complement such modelling efforts to further map possible decarbonisation pathways, recognising the deep uncertainties in – and incorporating interlinkages with – its future development trajectory?*

Long-term low-carbon development is contingent upon the deployment of green technologies and infrastructures, and significant amounts of finance. Equally, it should be compatible with the simultaneous pursuit of other objectives, such that employment, income, and quality of life can continue to grow in an equitable manner. Much of the planning towards these development-compatible low-carbon objectives stems from the use of emissions-economy models.

However, emissions-economy models have limits, and it is important to consider those limits while using their results and seek to strengthen their ability to inform policy. Emissions-economy models translate user inputs, such as on GDP and population growth rates and desired policies, into projected outputs, such as on emissions and energy use, using formulae based on historical data. Given India's evolving economy, however, these formulae are likely to become rapidly outdated, and these relationships need careful updating to yield results that are fit for purpose. Additionally, even with similar inputs, different models may yield diverging results due to underlying differences in modelling approaches. While such divergence can help reflect the uncertainties in India's future pathways, it can also - together with the outdated formulae and limited transparency around model design - lead to an unclear and limited set of projections, thereby risking the pursuit of misaligned policies. Finally, a

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focus on energy and emissions outcomes is limited when the objective is a development-centred approach. Increasingly, newer generations of models should examine concerns such as jobs, air pollution, and resource usage.

SFC's approach in engaging with the modelling ecosystem is twofold: we will work to deepen independent modelling capacity to engage in discussions about India's energy future; and we will seek to enhance the transparency and relevance of emissions-economy models for low-carbon development decisions.

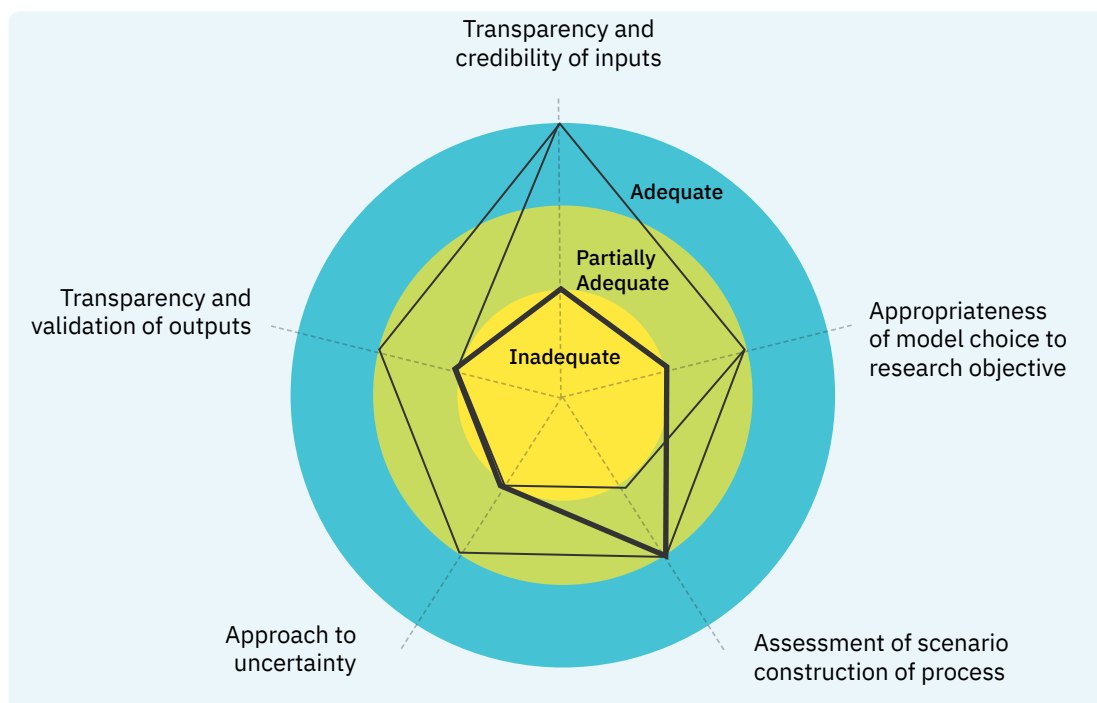
On the first, SFC will develop independent modelling capacity for low-carbon policy planning that integrates the interlinkages between development pathways, their resulting emissions, and the mitigation potentials they present, in order to offer more nuanced discussions of the implications of such modelling for policy packages. This will involve reframing the language around climate and health benefits, particularly exploring policy integrations with the more localised challenges of air pollution that affect much of the country. It will also draw upon improved consultative processes for using models in target setting, in a way that presents an opportunity to refine India's international climate commitments.



Secondly, SFC will build on the prior work of its team members<sup>5</sup> to promote greater transparency in modelling, illustrating the strengths and limitations of various models and their deployment (Figure 2), and identifying how these models should be appropriately used. Working across various modelling studies that attempt to inform India’s policymakers, we will also illustrate where models converge and diverge across their structures and input assumptions, the resulting outcomes, and associated policy recommendations, highlighting the role of development choices that are implicitly embedded within model design. Based on this comparative approach, SFC will promote

representation of greater future variability in modelling studies, by incorporating more dynamism in models’ construct and use, such as through more flexible scenario design and greater uncertainty analysis.

One of the key outcomes of SFC’s work on emissions-economy models, through their more nuanced and tailored use, is to facilitate greater integration between these high-level studies and their strategic implementation, in a way that focuses on concrete nearer term actions that lay the groundwork for longer term decarbonisation and economic competitiveness.



**Figure 2:** Improving model structures. Source: TCFP<sup>6</sup> “The Climate Futures Project” (<https://climatefuture-project.in/>)

<sup>5</sup> TCFP, “The Climate Futures Project – Bridging Climate Policy and Models,” 2022, <https://climatefuturesproject.in/>.

<sup>6</sup> TCFP.

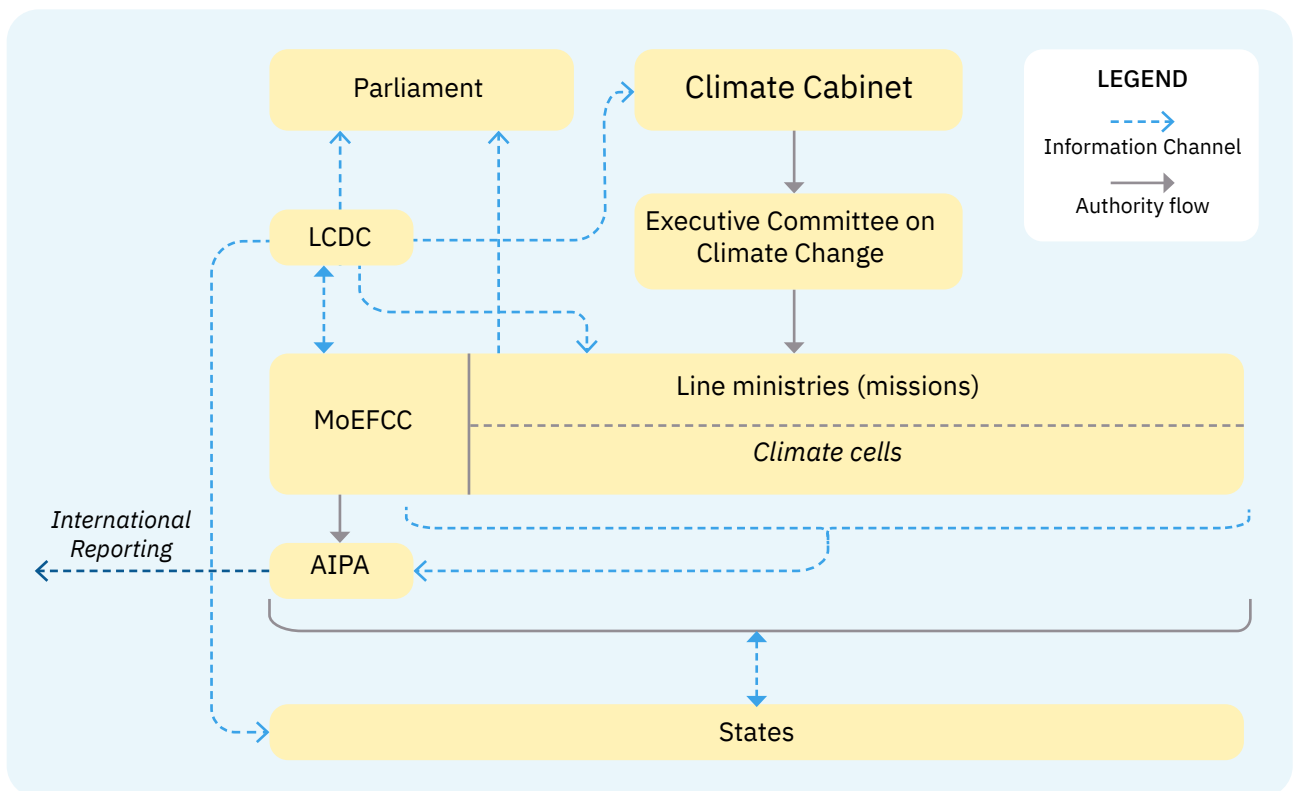




# Mainstreaming Climate Institutions

*Strategic implementation of low-carbon development pathways and climate resilience requires a denser landscape of climate institutions with the capacity to provide strategy setting, enhanced coordination, and the ability to mediate between contending interests. What kind of institutional reforms does this require at the national level and sub-national levels?*

SFC aims to build on its team members' long-standing work on climate institutions<sup>7</sup>. Indian climate institutions have proliferated over the past fifteen years since the formation of the National Action Plan on Climate Change. This has led to a somewhat ad hoc opportunistic approach<sup>8</sup> that has delivered some notable successes, such as



**Figure 3:** A possible climate governance architecture for India.  
Source: Adapted from Dubash et al. (2021)<sup>9</sup>

<sup>7</sup> Dubash, Navroz & Ghosh, Shibani. (2019). National Climate Policies and Institutions. 10.1093/oso/9780199498734.003.0019.

<sup>8</sup> Aditya Valiathan Pillai and Navroz K. Dubash, "The Limits of Opportunism: The Uneven Emergence of Climate Institutions in India," *Environmental Politics* 30, no. sup1 (October 20, 2021): 93–117, <https://doi.org/10.1080/09644016.2021.1933800>.

<sup>9</sup> Dubash, N., Pillai, A. V., Bhatia, P. (2021). Building a Climate-Ready Indian State: Institutions for Governance and Low-Carbon Development. CPR Policy Brief: New Delhi.

the National Solar Mission. At the same time, the institutional structure has yet to fully cohere into a framework that can address key governance challenges, notably strategic capacity, coordination ability, and institutions to build consensus<sup>10</sup>. Indian climate governance will be more effective if it is well tailored to the particular nature of Indian federalism<sup>11</sup>.

For instance, SFC team members are working to develop ideas for discussion around a suitable climate governance architecture tailored to Indian needs. An important element is a high-level strategy-setting body, ‘The Climate Cabinet,’ composed of the Prime Minister, select Ministers, and rotating Chief Ministers. The work of this Climate Cabinet could usefully be informed by an independent knowledge body, The Low Carbon Development Commission (LCDC), which could compile information, undertake analysis, solicit stakeholder views, and provide input into alternative policies and pathways (Figure 3). A revamped Executive Committee will be required for implementation coordination across government.

Complementary mechanisms at the state level would also be required to ensure effective cooperative federalism on climate change. SFC plans to flesh out ideas such as these for public and government consideration.

Among the work SFC undertakes on climate governance, we also consider informing growing debate about whether and what form of legal changes maybe needed to address climate change. A starting point is to explore the climate governance functions<sup>12</sup> that require legal backing. This then raises the question of whether a distinct climate law is necessary or whether ‘dispersed upgrades’ across existing laws will suffice. Past work has examined and synthesised global trends on climate law, which suggests that an enabling rather than regulatory approach to law may be appropriate for countries such as India<sup>13</sup>. Globally, the work on climate governance and law is at a nascent stage, and, based on the track record of its members, SFC aims to be at the forefront of informing consideration of whether and how these ideas can be tailored to an Indian context.

<sup>10</sup> Navroz K. Dubash et al., “National Climate Institutions Complement Targets and Policies,” *Science* 374, no. 6568 (November 5, 2021): 690–93, <https://doi.org/10.1126/science.abm1157>.

<sup>11</sup> Aditya Valiathan Pillai and Navroz K. Dubash, “Climate Governance and Federalism in India,” in *Climate Governance and Federalism: A Forum of Federations Comparative Policy Analysis*, ed. Alan Fenna, Joana Setzer, and Sébastien Jodoin (Cambridge: Cambridge University Press, 2023), 177–97, <https://doi.org/10.1017/9781009249676.010>.

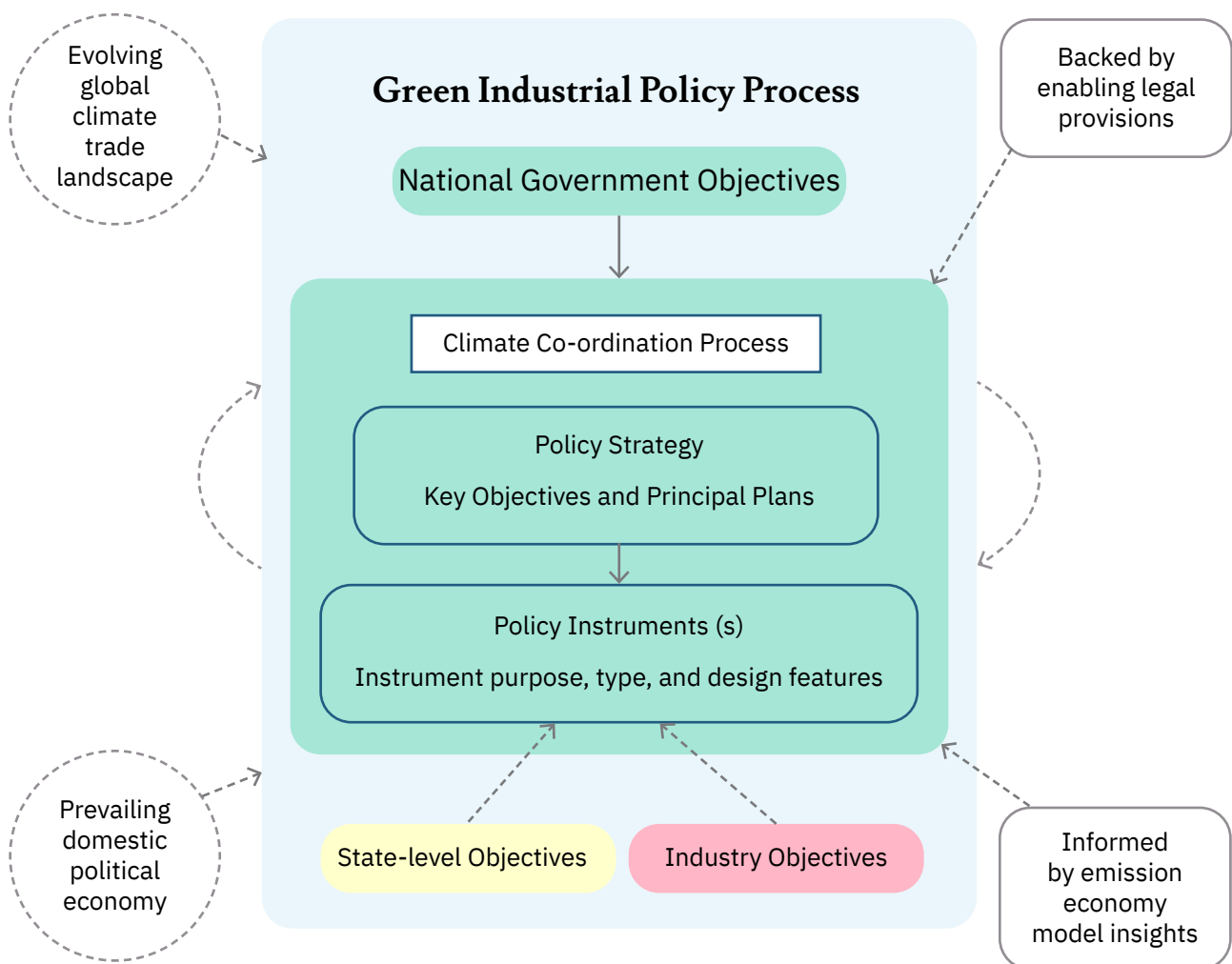
<sup>12</sup> Anirudh Sridhar et al., “Climate Governance Functions: Towards Context-Specific Climate Laws,” Grantham Research Institute on climate change and the environment, October 12, 2022, <https://www.lse.ac.uk/granthaminstitute/publication/climate-governance-functions-towards-context-specific-climate-laws/>.

<sup>13</sup> Navroz K. Dubash, “Design National Framework Climate Laws to Enable Low-Carbon Resilient Transformation,” *Science* 383, no. 6684 (February 15, 2024): eado0317, <https://doi.org/10.1126/science.ado0317>.

# Strategising Green Industrial Policies

Modelling low-carbon development pathways and mainstreaming climate institutions helps inform the government about necessary measures. Embedding development-centric climate-ready approaches, however, further requires the state to put development at the centre of the low-carbon transition and explore it as an economic opportunity, even while being aware of the substantial challenges. In this context, climate policymaking is increasingly being understood as part of a 'green' industrial policy.

- How can the centre and states engage in designing green industrial policy packages at multiple scales to gain economic advantage, while tailoring their approaches to local context?
- How can India increase its global green competitiveness, particularly in the emerging context of green industrial policy and growing industrial nationalism globally?



**Figure 4:** An illustrative green industrial policy process. Source: Author generated

Realising a low-carbon development pathway will depend upon the implementation of strategic green industrial policy (GIP) packages, as well as the national and subnational capacity to design them. GIPs should ideally combine policies encouraging RD&D in low-carbon technologies, incentives for their commercial deployment, infrastructure aligned to their scale up, and nudges encouraging their adoption, with parallel restrictions on the continued use of fossil-fuel resources. SFC seeks to contribute to state capacity - informed by our work on modelling low-carbon pathways, and backed by an appropriate institutional framework - to appropriately sequence and combine necessary policies for a low-carbon development pathway that is socio-economically beneficial to its citizens (Figure 4). In this context, we will explore national and state green industrial policy (GIP) strategies to maximise development-climate linkages, considering the evolving domestic political economy and global low-carbon trade landscape.

Maximising development-climate linkages requires strengthening investment and implementation capabilities. In the past two decades, India has successfully promoted the deployment of clean

energy technologies such as solar PV, wind, LED lighting, and, increasingly, electric vehicles. However, it has had limited success in technology innovation and manufacturing, where most of the economic value in clean energy technologies is created. While domestic solar PV module manufacturing has picked up significantly in the last few years, the manufacturing capacity of other high-technology clean energy components continues to fall short against estimated future needs and the capabilities of global competitors. Besides, India's clean energy RD&D investments are negligible and mismatched with its current and future clean energy requirements<sup>14</sup>. SFC will work to understand how India could bridge its innovation and manufacturing gap to become more globally competitive, reduce its clean energy trade imbalance, and thereby increase economic opportunities onshore.

Finally, important trade dimensions to GIP pose challenges for Indian policy formulation. Several countries, including industrialised economies, are now racing to implement GIPs to onshore the economic benefits of their domestic energy transitions. The USA's Inflation Reduction Act (IRA) - which subsidises and promotes the onshoring of

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<sup>14</sup> Fang Zhang et al., "From Fossil to Low Carbon: The Evolution of Global Public Energy Innovation," *WIREs Climate Change* 12, no. 6 (2021): e734, <https://doi.org/10.1002/wcc.734>.

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clean energy manufacturing, and the EU's green deal industrial policy signal a pattern of increasing deglobalisation, domestic production, and self-sufficiency. While the West is looking for a larger role for the state in their energy transitions, India is pursuing a 'market-plus' policy strategy based on India's upcoming carbon market and green credit trading mechanisms combined with incentive mechanisms like performance-linked incentives. How should India engage with this

changing context? SFC will work to understand the implications and potential policy strategies for India to pursue green industrial ambitions in a world with industrial nationalism emerging in erstwhile free markets. In this context, SFC will also study the emergence of climate trade clubs that share technology development and production between their jurisdictions and India's potential to gain access to global markets through these trade arrangements.





# Financing Low-Carbon Development Pathways

*Enabling green industrialisation and realising a feasible low-carbon development pathway will require large amounts of finance and investments into infrastructure, skills, and social resilience. Yet, current flows fall significantly short of estimated needs. What systemic changes are required to the current structures, mandates, and global and domestic architecture of climate finance to enable the financial system to better serve India's low-carbon development needs?*

The global financial architecture requires reform. Developed countries have not been able to adequately deliver on the USD 100 billion they had committed to annually provide to developing countries by 2020, and negotiations for a new collective quantified goal beyond 2025 are contentious. The objective of making finance flows consistent with low-carbon development, enshrined in Article 2.1c of the Paris Agreement, is ill-defined, with its relationship to developed countries' commitments contested. International development finance institutions, a key pillar of global climate finance flows, are attempting to align their mandates and operations to better reflect



the needs of developing countries, though the process is laborious and incremental, rather than transformative.

The domestic financial agenda, on the other hand, has evolved more rapidly. In the last two years, the Indian government has developed a green taxonomy, issued its first sovereign green bond, ensured subscriptions from public financial institutions, mandated greater corporate disclosures through the Business Responsibility and Sustainability Reporting (BRSR), and directed greater finance to green sectors through the Priority Sector Lending (PSL) scheme, among other steps. This state-directed greening of the domestic financial system is multi-pronged, yet also piecemeal, and is taking place alongside the development of market mechanisms such as emissions trading.

SFC will study these developments from an integrated perspective, focusing not on individual measures but on better understanding and informing the overarching role of the State in incentivising and/or regulating climate finance. While countries in the global North, with lesser development needs and more mature financial markets, have traditionally aimed to incentivise investments from the private sector towards greater

climate finance flows, an important question is whether that approach is appropriate in the Indian context, as against the state playing a more active role in directing finance where it's needed, in more context-appropriate ways and in fulfilment of its multiple development objectives.

This study of the desired role of the state ought to be balanced against its capabilities, particularly in the context of implementing GIPs. SFC will explore how the low-carbon development transition will likely impact public finances, particularly as tax revenues from fossil fuel use decline. Further, it will delve into alternative mechanisms to raise revenues and finance, tailored to the unique needs of various states and sectors, as well as channels to effectively mainstream its deployment.

Lastly, questions about the role of the state in financing the low-carbon transition require thinking through the responsibilities and capabilities of the central and state governments. In particular, implementing state-level policy packages will hinge upon the contours of a green fiscal federalism. To that end, SFC will further study the current model of federalism and the mandates of the 16th Finance Commission to explore how climate action and impacts may be reflected in vertical and horizontal devolution formulas.

# The Path Forward

The Climate Policy group within SFC is committed to providing deeper insights to help navigate these questions and better understand the contours of a development-centric climate-ready approach that can effectively map, mainstream, strategize, and enable India's low-carbon pathways. It will continue to do this by asking framing questions, learning from global developments and experiences, and thereby identifying key policy interventions that can create lasting positive impacts on the economy and the environment. Throughout, SFC will promote rigorous policymaking processes to enable the effective implementation of these policies toward effective outcomes.

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## **About the Authors**

Aman Srivastava and Easwaran J. Narassimhan are Fellows and Coordinators, Climate Policy, and Navroz K. Dubash is Senior Fellow at the Sustainable Futures Collaborative.

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