

How States can drive the next era of Climate Management in India: Perspectives in mainstreaming climate actions from Gujarat

At the September 2019 UN climate action summit, India vowed to upscale its climate action by focusing on a low carbon pathway through renewables and other forms of clean energy, adopting sustainable mobility, preserving water, and lastly, securing finances for this transition. Implementing and upscaling these actions form an influential agenda under India's Nationally Determined Contributions (NDCs) to the Paris Agreement. The emphasis on national determination and its success strongly hinges on the ambition of the states and the seriousness it harbours for driving climate actions. The initial step is to streamline such activities at sub-national levels to achieve climate change goals. Indian states, like countries, are too at different starting points with dissimilarities in their economic and developmental interests. Climate priorities took center stage for a few states, while many others have not been too aspirational due to misplaced prerogatives and differing capabilities. Thus, a pertinent question that arises is, could cross-pollination of ideas and innovations push states for concrete climate actions? This paper discusses a few prominent initiatives from the progressive state of Gujarat that could facilitate the exchange of climate measures in other states.

Keywords: Climate action, Mitigation, State, Policy, India, Gujarat

1. STATES DIFFER IN THEIR CLIMATE ACTIONS

Few Indian states have been a leader in implementing radical and ambitious climate change actions and plans. While some states are lagging on this front, the aim is to compel these states to push for more robust measures. For instance, Gujarat is a pioneer in leading climate actions among states in India. It set up the country's first Climate Change Department in 2009ⁱ. Recently, the state piloted India's first Emissions Trading Scheme (ETS) in select few industrial areas of Suratⁱⁱ. In

2017, Maharashtra, too initiated the country's first-star rating program, to reduce air pollution from stationary sources by disclosing industrial particulate matter air pollution data. Within this program, around 300 industries are covered and rated on a 1-5-star scale based on their performance and data made publicly available on the website for improving monitoring, vigilance, and transparencyⁱⁱⁱ. The program also rates cities based on the particulate matter concentration reported by the monitoring stations. Besides, the Maharashtra Pollution Control Board (MPCB) proposes action plans for critically polluted

industrial clusters^{iv,v}. Odisha, too initiated the Star Rating Programme in 2018, which captures data on particulate matter emissions from major industrial plants for pollution regulation^{vi}.

In March 2018, Maharashtra enforced the state-wide plastic ban on select plastic items. It is working towards implementing the 'Buy Back Scheme,' a collection mechanism aimed at inducing consumers to discard their plastic milk pouches responsibly to retailers/collection centers for recycling purposes^{vii,viii}. Now other states could benefit from adopting similar measures. Despite its benefits, creating such ripple effects in climate actions at the State level is not occurring at the intended speed. Institutional and regulatory barriers are the most persistent impediments that inhibit the adoption of best mitigation or adaptation practices across states. For instance, the Buy-Back Scheme in Maharashtra is met with fierce opposition by dairy owners as an impractical step. States also assume that since no other state has come up with such directives, it is unjust to pass the onus to only one^{ix}. In such circumstances, states should realize that initiating such examples could make a positive impact in making successful inroads elsewhere. It could act as a pilot testbed with the potential for scaling up and fine-tuning policies for other states. Nonetheless, strengthening cooperation and sharing of experiences at the state and local levels domestically is crucial in mitigating climate problems.

2. MAINSTREAMING CLIMATE ACTIONS IN GUJARAT

At the sub-national level, Gujarat has taken the driving seat in its endeavour to address climate change. It established a separate and dedicated Climate Change Department in 2009, which created enormous impacts on Government policies, programs, and people's participation. Gujarat has demonstrated well in streamlining actions in mitigation and adaptation sectors as well. Even the fifth assessment report of the Intergovernmental Panel on Climate Change, mentions Gujarat's initiatives at the sub-national level explicitly^x.

From the mitigation aspect, the Government of Gujarat (GoG) has taken steps to reduce reliance on coal by declaring no further issue of permits for new thermal plants from September 2019 onwards. Days after this announcement, Chhattisgarh, a state rich in coal reserves, made a similar statement, although neither of them has made any permanent legislation. States like Tamil Nadu, Rajasthan, and Karnataka are also poised to follow their footsteps as per the analysis done by Climate Trends^{xi}. These examples demonstrate that best practices are likely to be emulated, provided states have the motivation and political willingness to do so.

Gujarat's progress in renewables, which provides direct mitigation benefits, is undisputed with the second-highest installed capacity for wind (7491 MW) and ranks 6th position on solar (2948 MW) among the states as of March 2020. Around 77 MW of biomass and 69 MW of mini-hydropower plants is installed^{xii}, while the total share of installed capacity stood at 31 percent for renewables and conventional at 69 percent by March 2020^{xiii}. On the generation front, the renewable share is about 12 percent, which the state plans to increase to 17 per cent by 2022 and take the overall installed renewable capacity of the state to 30,000 MW^{xiv,xv}.

Its solar rooftop program is a success with almost 68,000 installations, and 8,00,000 planned by the end of 2022. As shown in figure 1, the state is positioned first in terms of rooftop solar installation, with around 522 MW as of March 2020, which constitutes 21 per cent of the entire country's installation (2515 MW)^{xvi}.

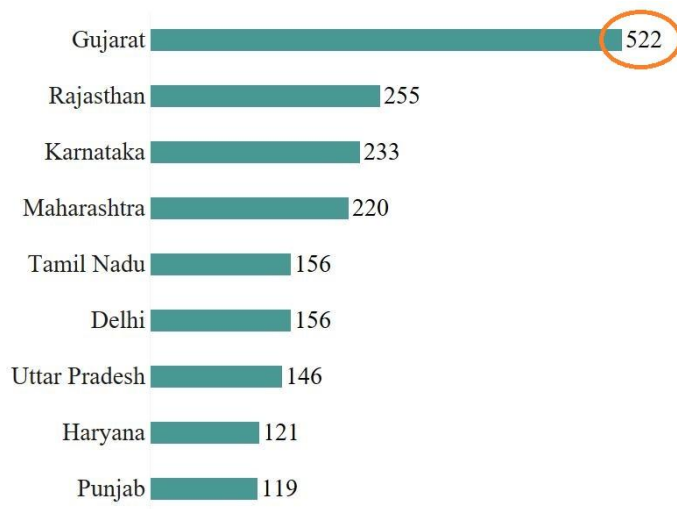


Figure 1. State-wise data of rooftop solar installed in MW (shown above 100) as on March 2020 (MNRE)

Favourable state policies (subsidies, incentives, quicker installation timelines) created an enabling environment for promoting the widespread expansion of solar rooftops that have helped attain this feat. The residential sector has the highest rooftop installation, followed by industrial and government building sectors as it mainly benefits from the Central Government subsidy of 40 per cent up to 3 kW, and 20 per cent for 4 to 10 kW of the capital cost of the solar system provided for setting up these systems (refer table 1)^{xvii}. More than 68,000 beneficiaries have benefitted from this program within the last three years, and by 2022 around 8 lakhs of them will be added through state subsidies^{xviii}.

Table 1. Status of Solar Rooftop installed in Gujarat segment-wise as of 9 March 2020 (GEDA)

Category	Commissioned Units	Capacity in Percent
Residential	68324	52.0
Industrial	1159	28.0
Commercial	1166	4.5
Others	713	3.5
Government	1487	12.0

The RPO obligation trends of major discoms in the State (GUVNL, Torrent (AHD+Surat), and Torrent (Dahej) have higher targets for non-solar than solar. Figure 2 displays a graph that shows the prescribed and fulfilled RPO targets in percent for major discoms from 2014-2015 to 2019-2020 (till the first quarter)^{xix}. Both the goals and the achieved RPO shows growth in the respective period.

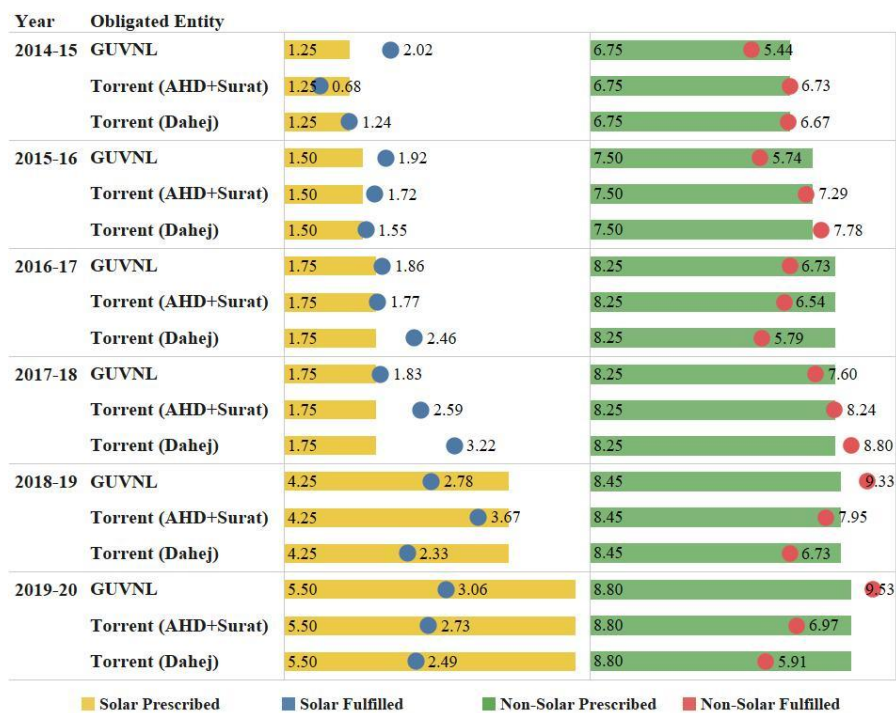


Figure 2. RPO compliance details for Gujarat DISCOMs in percent (up to first quarter 2019-2020) (GEDA 2020)

On the adaption front, Gujarat has managed its water supply even in low rain years due to its robust infrastructure of the canal network, river linking, and water storage management. The state has significantly increased its mangrove cover from 427 sq. km in 1987 (the year in which the India State of Forest Report started surveying mangrove cover) to 1177 sq.

km in 2019^{xx}. Large scale plantations and protection measures, development, and monitoring of these habitats, capacity building, and awareness programs, etc. have facilitated this incremental growth^{xxi}.

3. INFRASTRUCTURE, CITIES AND LOCAL ACTION

Change never happens in a vacuum, but through the convergence of multiple actors – government, business, industry, and the public need to work together at local levels. GoG actively strengthened local action to address climate change by developing and enhancing green infrastructure in cities. For instance, public transport has improved in the cities of Ahmedabad, Vadodara, Surat, Rajkot. Ahmedabad became the first city to order 300 electric buses^{xxii}. The state has initiated a Policy for Reuse of treated wastewater in 2018^{xxiii}; at the same time, solid waste management, sewage treatment initiatives are more effective in urban and rural areas of Gujarat^{xxiv}. Cities like Rajkot have developed its Climate Resilient City Action Plan while Surat has formed its Resilience strategy for sustainable development. Given the pressing climate challenges we are facing, these are some of the exceptional examples compared to other cities^{xxv,xxvi}. In World cities day 2019, Surat was the only Indian city among ten global cities to win the Netexplo Smart cities award 2020 with UNESCO in the resilience category for its work on developing a mobile water quality control and wastewater recycling system^{xxvii}.

4. ROLE OF INSTITUTIONS

Gujarat has demonstrated reasonable efforts in establishing institutions that played a crucial role in delivering the vision of green development for the state. The State Nodal Agency for renewable energy, Gujarat Energy Development Agency (GEDA), undertook massive clean energy-driven initiatives that expand beyond renewables to transportation and building sectors, energy efficiency and awareness programs, etc. Mitigation efforts of the department can be delineated into several thrust areas viz. bioenergy, wind, solar, and energy conservation efficiency programs. Table 2 shows the initiatives of GEDA in various project areas.

Table 2. Green initiatives undertaken by GEDA as of 29 February 2020 (GEDA 2020)

Programs/Projects	Unit	Cumulative Achievement
Windfarms	MW	7,492
Solar power projects (ground-mounted)	MW	2,417
Solar rooftop systems	MW	469
Solar water heating systems	lpd	11,491,779
Institutional biogas plants	m ³ /day	24,035
Improved crematoria	Nos	4,371
Battery operated vehicle	Nos.	7,866

Figure 3 shows the thematic areas and scale of these green energy programs, alongside the location of projects. Besides establishing institutions for a dedicated purpose, effective communication between departments has been critical in ensuring smooth coordination in implementing policies. GoG has continuously renewed or amended its policies (industrial and renewable systems) in all of its key sectors.

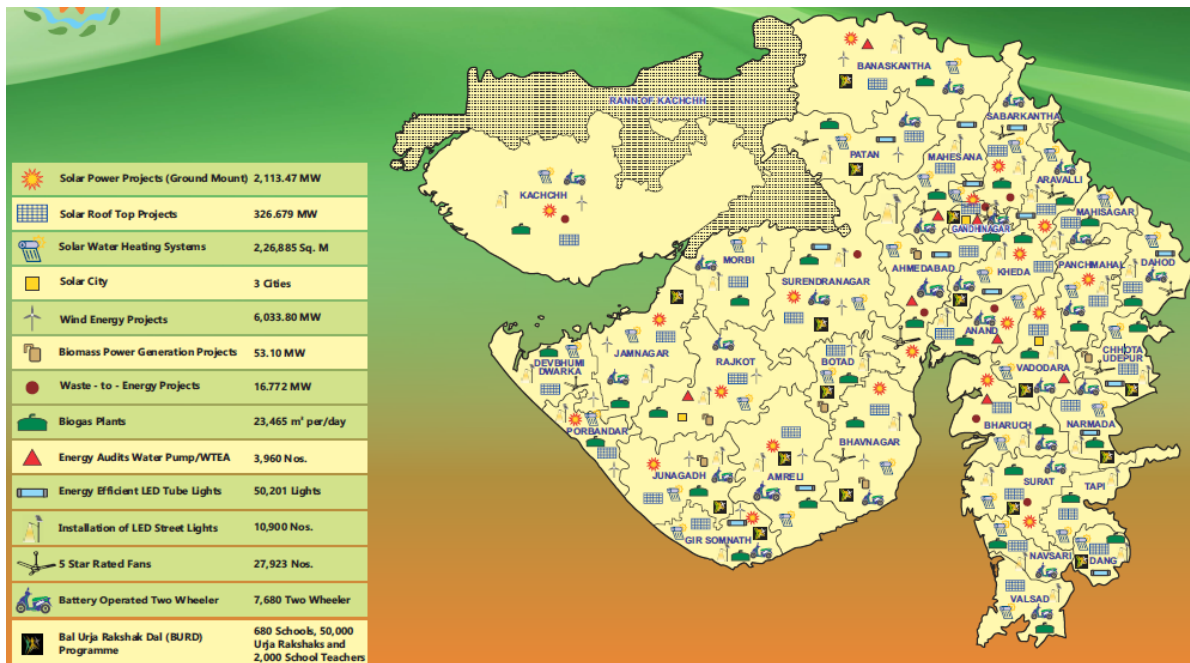


Figure 3. Map highlighting the expansion of GEDA's clean energy activities (GEDA)

5. INNOVATION IN FINANCE

With uncertainty prevailing around climate finance in the country, Gujarat initiated the Green Budget in 2016-2017. The Green Budget provides financing for flagship programs of several departments within the state, which contribute to either mitigation or adaptation actions^{xxviii}. For the financial year 2020-21, the total outlay for the green budget is a massive amount of Rs 5922 Crore^{xxix}.

Another example is the state's NAFCC project, which showcases excellent utilization of Central funds for convergence and grass-root activities in remote and rural areas of Kachchh district^{xxx}. Further, the 2019 state budget focuses on pollution-free clean energy^{xxxi} with an amount of Rs. 1,000 crores specially earmarked for extending solar rooftop systems^{xxxii,xxxiii}. Whereas the budget of 2020 focuses on robust water management^{xxxiv}.

6. DISCUSSION

As of present, there is no legislation on climate change either at the National or Sub-National level in the country. While the NAPCC and SAPCCs act as guiding documents that put climate change in the spotlight, there was still no clarity of the framework provided or a clear financial strategy during the first SAPCC exercise. However, the streamlining of climate actions with existing programs and policies within several departments were equally important. Partnerships and knowledge exchange between states need to strengthen to create a dynamic where states prompt each other to do more and emulate best practices. Indian states are at an infantile stage when it comes to building capacity for facing climate challenges. Institutional structures need to be more robust for creating a knowledge base, and coordination and accountability are necessary across line departments for developing the state^{xxxv}.

Every state needs to navigate a feasible pathway that includes synergies and trade-offs to contribute to the NDCs. States need more clarity on accessing financing options beyond the state budget. A state climate hub or a knowledge-exchange mechanism that assists them in climate actions in the context of their developmental and economic needs is required. As evident, all these involve systemic changes and streamlining of activities that should have started years ago when the SAPCCs formulated. Department of Science and Technology, Government of India, has funded State level knowledge centers under the National Mission for Strategic Knowledge on Climate Change (NMSKCC)^{xxxvi}. Gujarat's NMSKCC center is jointly working under GEER Foundation and IIT Gandhinagar^{xxxvii}.

Gujarat has time and again reaffirmed its position as an active participant in climate actions at the sub-national level. Its strategic innovation at the policy, practice, and implementation levels sets a high benchmark. For example, the successful implementation of the country's first ETS scheme will undoubtedly have a profound impact on other states, and they are likely to follow. The expansion of this scheme to curb greenhouse gas emissions will place Gujarat as a flagbearer rather than an active participant among states. Since the state announcement of no new thermal plants, the generated capacity from green energy sources will likely increase. Allocating healthy targets, for example, in the case of renewably generated electricity, is a useful approach taken by GoG to allow for continuous self-assessment of its mitigation commitments. A key takeaway for other states is the support of local initiatives, as shown by the GoG and empowering municipalities that ensure multi-pronged development outcomes.

Climate change action in our country has always been a matter of the Centre, imposed from the top. Despite this, as a state, Gujarat has had many climate governance successes reiterated throughout this article. It has shown greater responsibility by acting individually in making low carbon choices that should motivate other states too.

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