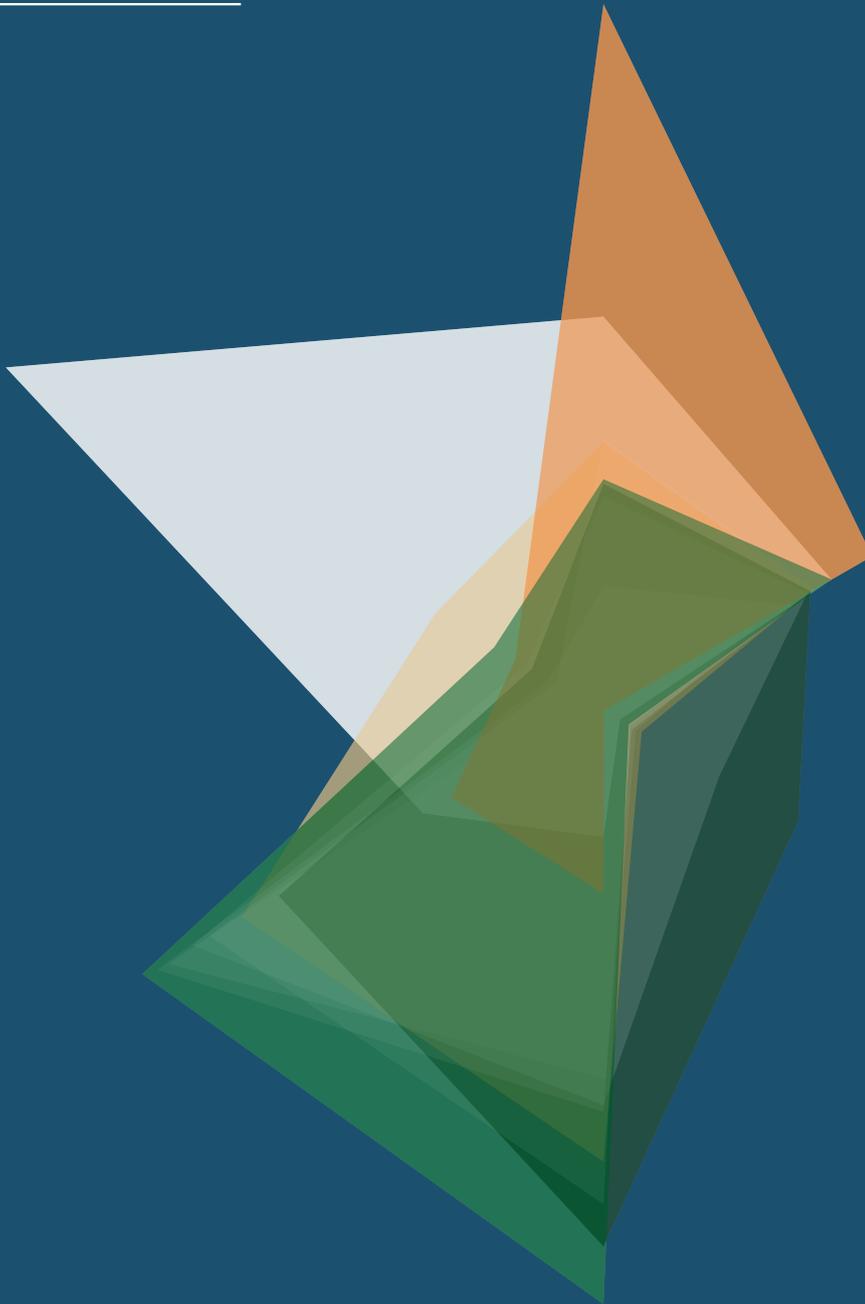


THE °CLIMATE GROUP

DRIVING CLIMATE ACTION: STATE LEADERSHIP IN INDIA

Report | May 2019



ACKNOWLEDGEMENTS

The authors of this report thank the officials from the Ministry of Environment, Forest and Climate Change, Government of India. We are grateful to the Indian state governments of Gujarat, Tamil Nadu, Punjab, Assam, Karnataka, Andhra Pradesh, Telangana, Chhattisgarh, West Bengal, Madhya Pradesh, Maharashtra and others, who have engaged with us during our programmatic efforts.

We would like to thank our Advisory Group members: Dr. Arvind Anil Boaz, Chinmaya Acharya and Siddharth Chatpalliwar (Shakti Sustainable Energy Foundation), Dr. Navroz Dubash and Ankit Bharadwaj (Centre for Policy Research), Dr. Ajay Mathur and Karan Mangotra (The Energy and Resources Institute) and Dr. Vaibhav Chaturvedi (Council on Energy, Environment and Water) for their valuable insight.

Our peer reviewers Srinivas Krishnaswamy (Vasudha Foundation) and Ulka Kelkar (World Resources Institute India) have offered important insights to inform the development of the Climate Action Compass covered in the report.

We thank our knowledge partner KPMG India, for their expertise in developing the findings of this report.

We sincerely appreciate the valuable contributions by the following Climate Group colleagues: Tim Ash Vie, Subaskar Sitsabeshan, Jean-Charles Seghers, Atul Mudaliar, Shilpi Samantray, Varunesh Singh and Ajitraj Singh.

The authors would like to thank the John D. and Catherine T. MacArthur Foundation for their generous support.

TEAM

The Climate Group: Nehmat Kaur, Jarnail Singh

Editorial Team: Nazneen Nawaz, Emma Fisher, Nithya Devaraj, Shashwat Raj

Design: Oliver Whittall

Contact: info@theclimategroup.org

Website: www.theclimategroup.org

CONTENTS

- 4** Foreword
- 7** Introduction: State-Level Leadership is Key to Achieving Climate and Development Goals
- 8** Climate Action in India: Multi-level Governance is an Opportunity
- 10** High Performing States: Evaluating India's Climate Action Leaders
- 19** Climate Action Compass: Additional Capability to Evaluate Performance
- 26** Recommendations: Making States Frontiers for Stronger Climate Action
- 27** Appendix
- 28** Glossary
- 30** References
- 32** Data sources

FORWARD



JARNAIL SINGH
India Director,
The Climate Group

As India goes through the historic national elections, it stands committed to tackling climate change. The election manifestos of major political parties stand testimony to the fact that climate action is now recognized as an issue of national interest. A sense of urgency underpins India's plans to increase ambition to mitigate climate change and ramp-up climate resilience simultaneously. The Indian government's confidence stems from the progress that the country has made over the past decade by committing itself to a climate-smart, resilient and prosperous economic future.

Since 2010, India has kick-started several national programs to boost cleaner economic development. These have focused on renewable energy, energy efficiency and clean transport among others. The national government has been the lighthouse of bold climate action while states have played an important role in achieving, and even surpassing, the ambitious goals set out by the national government.

Through two pieces of analysis, this report seeks to substantiate the role of Indian states in driving climate action and economic growth. It also offers recommendations on how they can be more strategic in evaluating and accelerating their action.

The report highlights that in India, like in other parts of the world, state governments have developed regional climate strategies that offer important learnings for scalability and success. States are custodians of regional policy and

executors of development programs, with a strong bearing on greenhouse gas (GHG) emissions. Already, in India, there is growing momentum on state-level climate policies in areas such as clean energy, energy efficiency, clean transport, and sustainable land-use, among others. This momentum, first and foremost, needs to be recognized. Furthermore, capacity building on access to finance, policy innovation and climate governance would serve to bolster states' ambition to meet their potential.

The report finds that climate action performance in Indian states is varied across the country. Yet Indian states have strong institutional structures and the potential to convert national commitments and ambition to local action.

The report also offers interesting insights into the linkage between economic development and ambitious climate action. For instance, the top 10 performing states on climate action are also the ones that have highest per capita income, suggesting economic growth and climate action go hand-in-hand. The report also finds a low degree of correlation between states that have high per capita income and those that have the highest emissions intensity of income. However, this report does not establish causality, and longer-term studies would be needed to ascertain that.

Towards the end, the report offers practical recommendations for building greater capacity at the state level to unlock finance, enable technology transfer and greater access to locally-adaptable policy actions.

Through the Under2 Coalition, The Climate Group aims to support states and regions to accelerate climate action. We firmly believe that states and

regions have the power, influence and ambition to unlock barriers to climate and energy solutions; together they can demonstrate the economic case for investing in clean energy and give national governments the confidence to maintain their commitment to the Paris Agreement - fueling their ambition to go further and faster.

KEY FINDINGS

- **The top 10 performing states on climate action are: Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Punjab, Tamil Nadu and Uttarakhand.**
- **Economic gain and climate action can go hand-in-hand. The top 10 performing climate action states align almost identically with the 10 highest per capita income states.**
- **There is a low degree of correlation between states that have high per capita income and high per capita emissions intensity.**
- **The top performing states on climate action have higher contributions to the national GDP, lower emissions intensity, better energy efficiency, higher utilization of renewable energy potential and a higher percentage growth in forest cover.**



Photo Credit: Jarnail Singh

INTRODUCTION: STATE-LEVEL LEADERSHIP IS KEY TO ACHIEVING CLIMATE AND DEVELOPMENT GOALS

Climate change is posing serious threats to communities worldwide. Rising sea levels, extreme weather, associated infrastructure destruction and impact on economic productivity are commonplace.¹ A positive flipside is that climate action is supporting economic development.

Adopting cleaner, low-carbon technologies like renewable energy or electric transport is driving important market shifts, creating new jobs, providing communities with cleaner air, higher rates of productivity and lower social costs. According to a 2018 report by New Climate Economy, focusing on climate-smart growth and delivering on bold action over the next 2-3 years could deliver benefits worth \$26 trillion from now to 2030, create 65 million new low-carbon jobs, and help avoid over 700,000 premature deaths from air pollution.² In India as well, renewable energy is presenting the opportunity to create hundreds of thousands of new jobs, while offering cheaper electricity and increased energy access to India's communities.³

Recognizing these opportunities, most leading economies have come together and pledged to limit global warming to below 2° Celsius by 2100

under the Paris Agreement on climate.⁴ Countries have committed to voluntary targets, known as Nationally Determined Contributions (NDCs), and are developing the required policies, governance frameworks, and roadmaps to achieve them. This creates an exciting opportunity for state governments to play a significant role in achieving the targets highlighted in the NDCs.

Another important consideration is the speed and scale at which a low-carbon transformation in the economy is required. According to the recent report by the Intergovernmental Panel on Climate Change (IPCC), limiting temperature rises to below 1.5° Celsius of warming by 2100 is crucial if countries want to significantly lower the risks and economic costs of climate change.⁵ This is only possible with major and immediate transformation in the way economies use and produce energy. All levels of government therefore need to strengthen action, without delay. As custodians of regional policy, state governments are critical in supporting both national and municipal governments in achieving climate goals.

CLIMATE ACTION IN INDIA: MULTI-LEVEL GOVERNANCE IS AN OPPORTUNITY

INDIA'S CLIMATE GOVERNANCE AND THE ROLE OF STATES

India's climate governance framework has been evolving and is interlinked among three main institutional setups - domestic initiatives, global participation in the Paris Agreement and India's delivery on the Sustainable Development Goals (SDGs) under the United Nations (UN) Agenda 2030.⁶

Domestic policy and initiatives

For a number of years, India has had individual legislations such as the Wildlife Protection Act, 1972, the Water (Prevention and Control of Pollution) Act, 1974, the Forest (Conservation) Act, 1980, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, and the Energy Conservation Act, 2001. All have been dependant on a number of governmental departments and specialized regulatory institutions, including central and state-level pollution control boards, the central and state-level environmental ministries, and specialized central and state-level regulators.⁷

In 2006, India released its National Environmental Policy which served as an aggregation of India's domestic initiatives relating to discrete environmental topics such as pollution, water, energy, transport, waste management, agriculture, mining, forests, environmental clearance and finances.⁸

In 2008, India released its National Action Plan on Climate Change (NAPCC) to highlight the need for rapid economic growth while addressing the global risk of climate change.⁹ Eight dedicated national missions formed the core of the NAPCC, including: solar, energy efficiency, sustainable habitats, water, Himalayan ecosystems, afforestation, sustainable agriculture, and strategic knowledge for climate change.¹⁰

In 2009, the Government of India asked all Indian

states and union territories (UTs) to prepare State Action Plans on Climate Change (SAPCCs), making it one of the largest efforts of state-level climate planning globally.¹¹

The implementation of environmental and climate policy relied on the individual Indian states, which have distinctive political and economic configurations. Most states continue to be largely dependent on the centre for grants and budgetary allocations to implement their SAPCCs.

2015 Paris Agreement

In 2015, when countries came together for the Paris Agreement, they committed to ambitious climate action in the form of NDCs.¹² India put forward eight NDCs and pledged to increase the share of non-fossil fuel electricity to 40% of total installed electrical capacity, reduce carbon intensity of its economy by 33-35% (compared to 2005 levels), and install additional carbon sinks through increased forest cover.¹³

While the role of states in achieving the NDCs has not been made explicit in any implementation framework, states themselves find that the NDCs offer a helpful benchmark with which to evaluate their own climate leadership.¹⁴

UN Agenda 2030

The UN 2030 Agenda, launched in 2015, envisages "a world of universal respect for human rights and dignity, the rule of law, justice, equality and non-discrimination".¹⁵ As a signatory, India is committed to achieving the 17 SDGs outlined in the declaration.

According to a report commissioned by the Government of India, the role of state governments is central to the implementation of India's programs to achieve the SDGs.¹⁶

India's National Institute for Transforming India (NITI) Aayog has led the approach to implement the SDGs, with a view to establish a cohesive policy framework for the country.¹⁷

CLIMATE ACTION MOMENTUM IN INDIAN STATES

Supporting India's climate ambition, Indian states are spearheading key initiatives to take climate action to the next level. Several Indian states are

leading on renewable energy initiatives, enhancing energy efficiency, promoting climate change adaptation measures and committing to long-term emissions reductions, over and above their state action plans on climate change. They are aligned to both India's national economic as well as GHG emissions intensity reduction targets. Indian states can therefore act as frontiers for climate action. They have the right scale, and with the right skill, can deliver on successful regional policy that can uplift India's climate leadership.

STATE CLIMATE LEADERSHIP IN INDIA¹⁸



32 STATE ACTION PLANS ON CLIMATE CHANGE



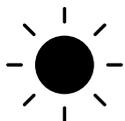
28 LED-VILLAGE CAMPAIGNS



21 DEMAND SIDE MANAGEMENT STATE-LEVEL PROGRAMS



19 STATE-LEVEL WIND POLICIES AND REGULATORY PROVISIONS



15 STATE-LEVEL SOLAR POLICIES



10 STATE-LEVEL ENERGY CONSERVATION BUILDING CODE (ECBC) NOTIFICATIONS



9 STATE-LEVEL AFFORESTATION PROGRAMS UNDER GREEN INDIA



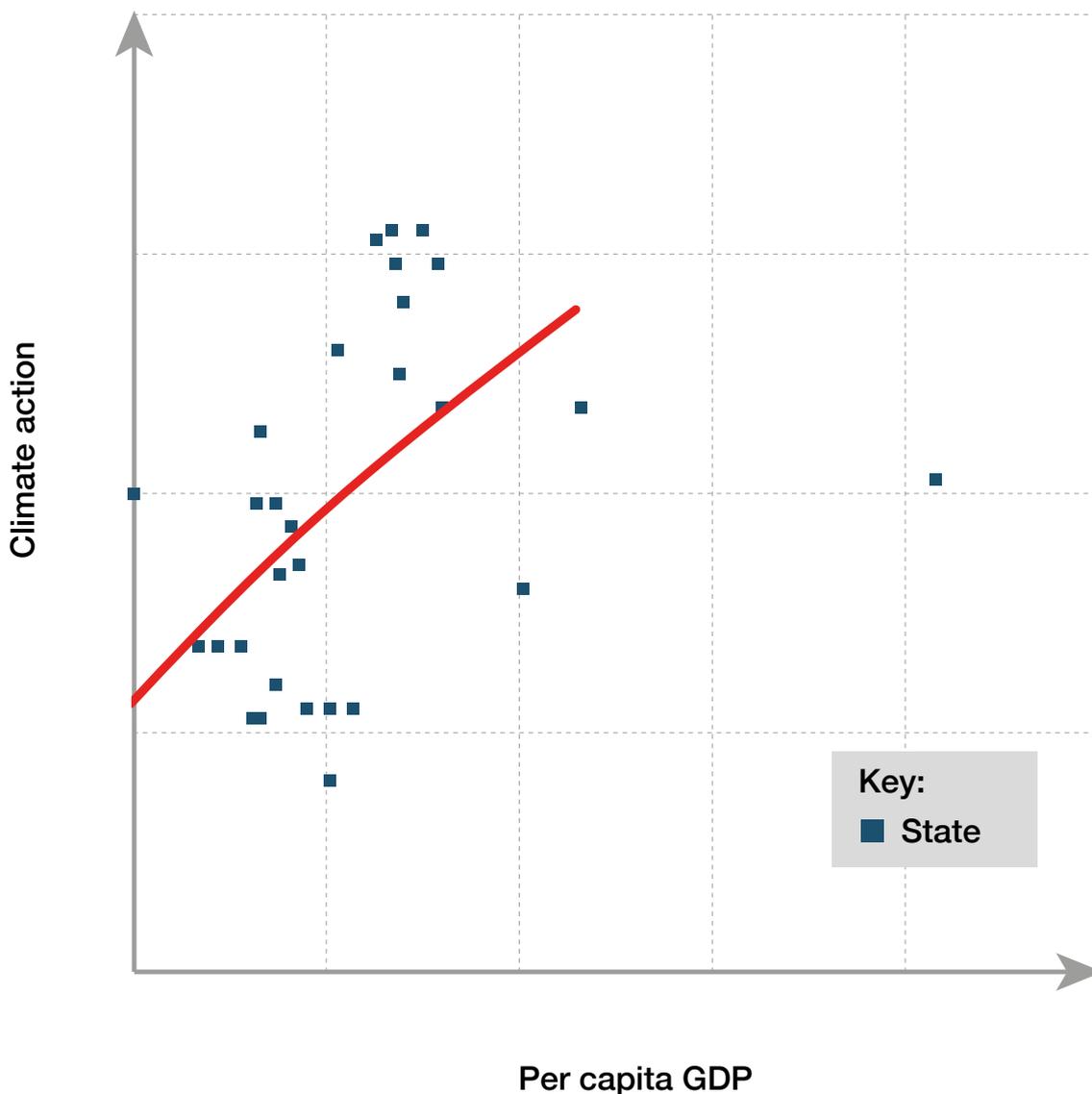
7 ELECTRIC VEHICLES POLICIES

HIGH PERFORMING STATES: EVALUATING INDIA'S CLIMATE ACTION LEADERS

This section includes the results of a landscape analysis conducted by KPMG for The Climate Group. State-level data was analyzed (methodology in Appendix) to identify leaders across key economic and climate criteria. Performance across those criteria was then combined to identify the top 10 high performing

states. Further analysis found that economic performance is highly correlated with climate action in Indian states. Overall, these states have a higher contribution to national GDP, lower emissions intensity, better energy efficiency and utilization of renewable energy potential and a higher percentage growth in forest cover.

State climate action and per capita GDP

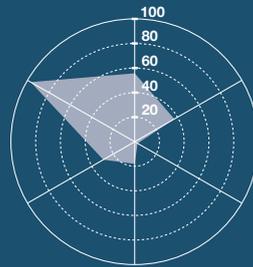


TOP 10 PERFORMING STATES*

Per capita GDP

Change in forest cover

Energy Efficiency:
Other sectors

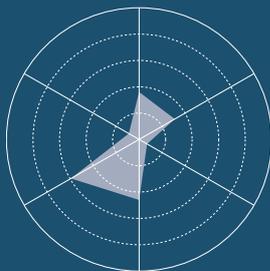


Emission intensity
of the state

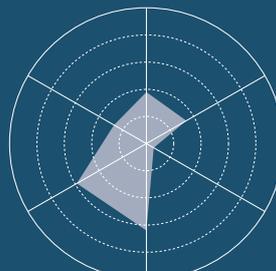
RE installed capacity
% of potential

Energy Efficiency:
Industry

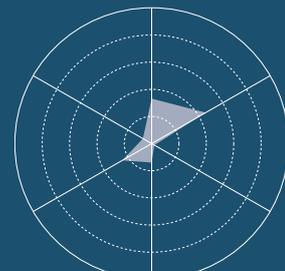
DELHI



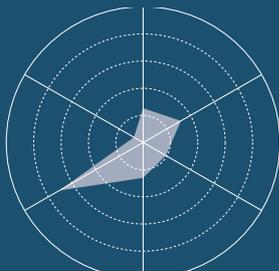
GUJARAT



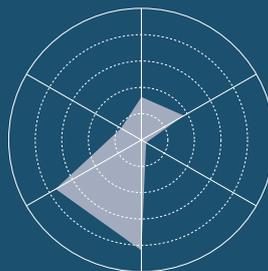
HARYANA



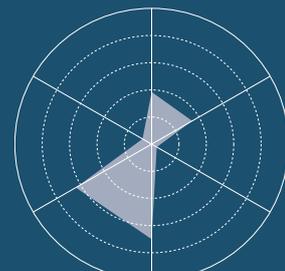
HIMACHAL PRADESH



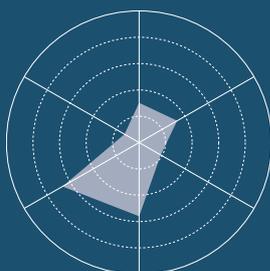
KARNATAKA



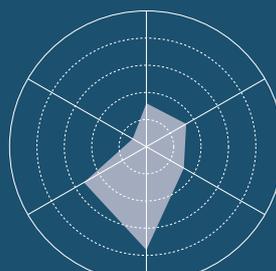
KERALA



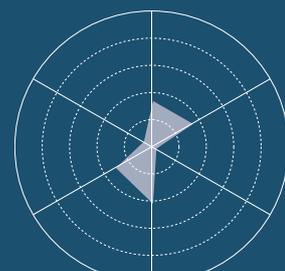
MAHARASHTRA



PUNJAB



TAMIL NADU



UTTARAKHAND

*The states are represented in alphabetical order



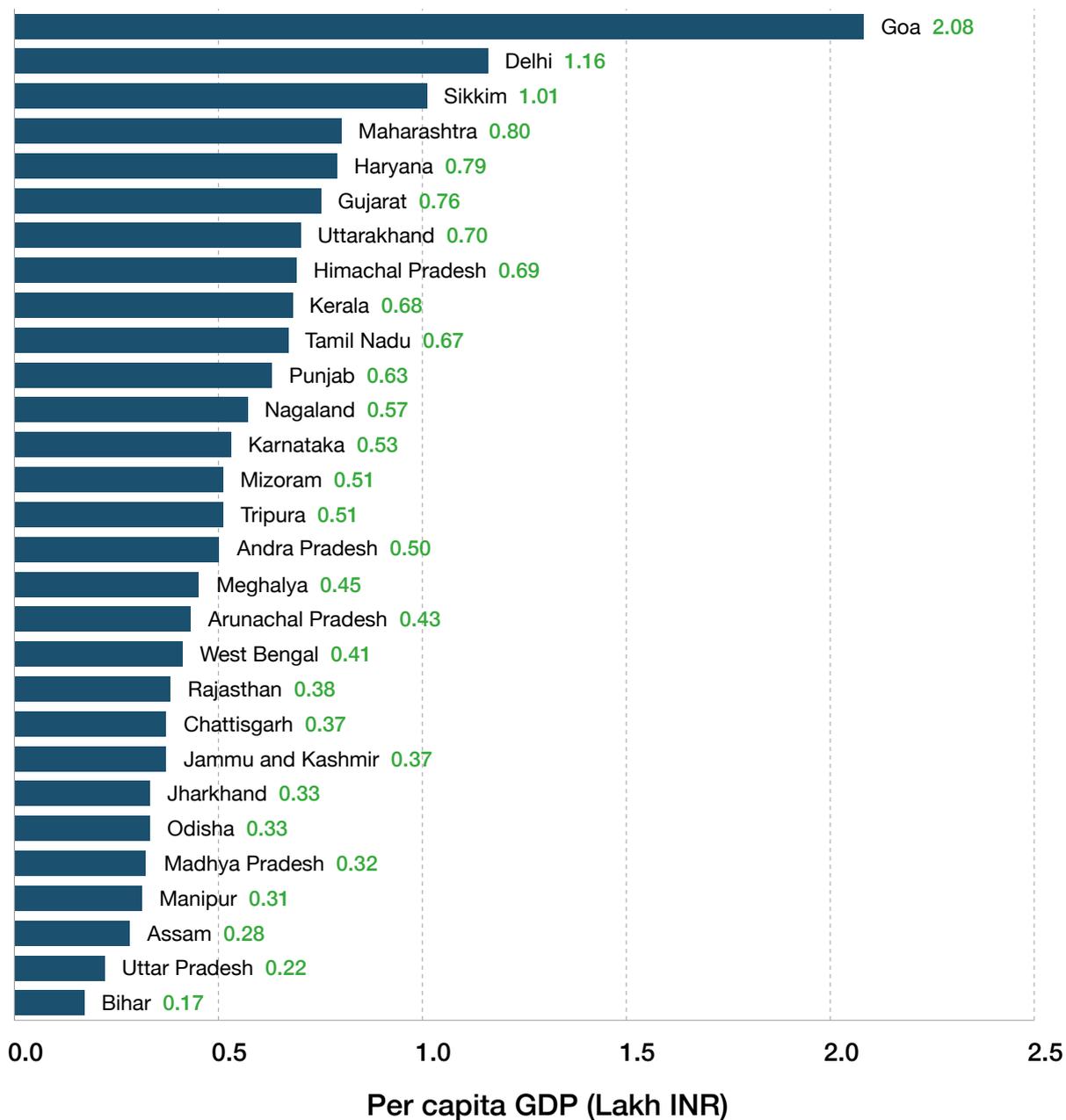
Photo Credit: Jarnail Singh

1. INCOME PER CAPITA

The analysis considers per capita income as one of the primary indicators to ascertain a state's economic performance. It is used as a standard of living indicator to measure the productivity

of the state's workforce, as it measures the total output of goods and services per member of the workforce in a given state.

Per capita income in states

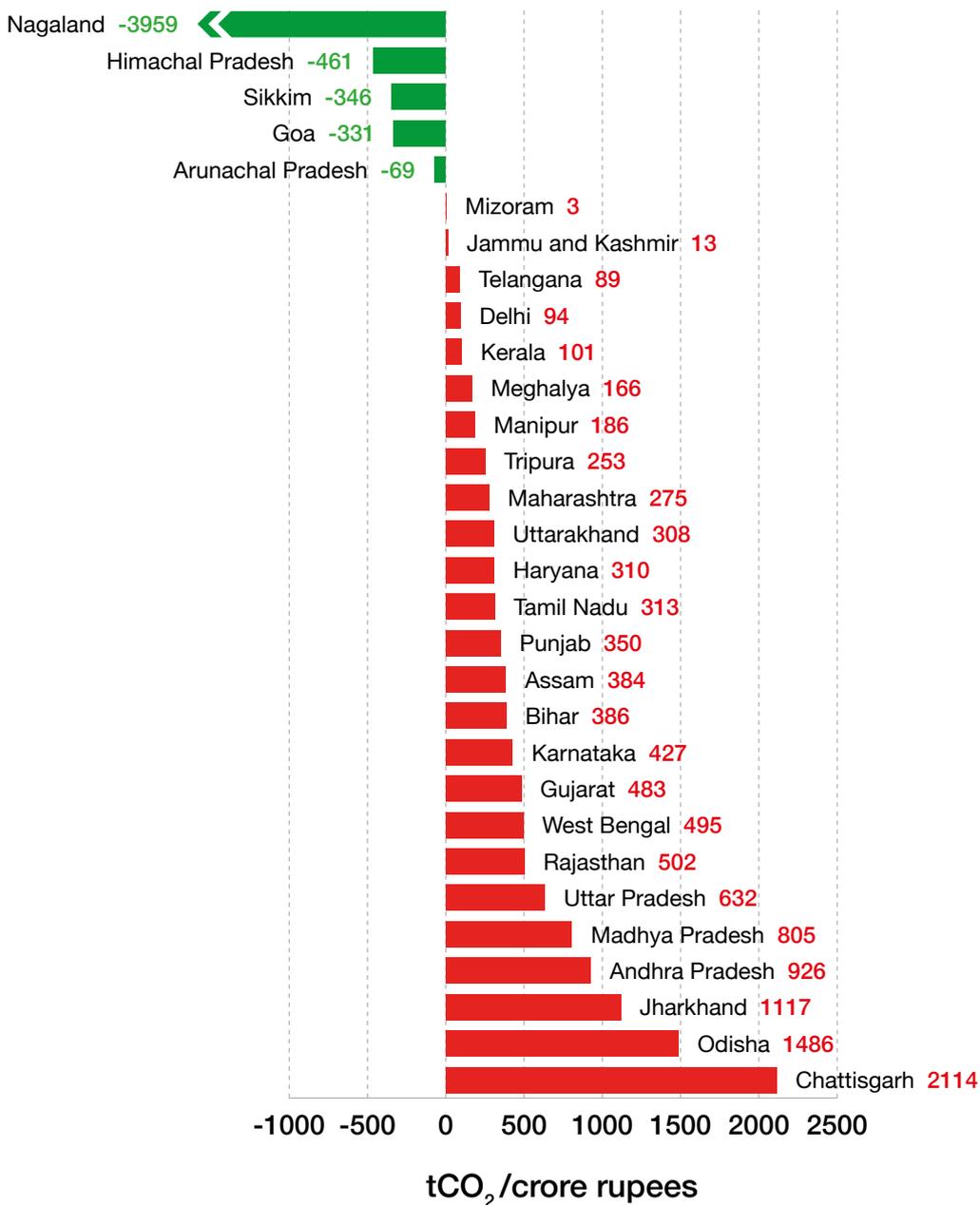


2. EMISSIONS PER CAPITA INCOME

Emissions intensity of per capita income reflects the level of GHG emissions per unit of economic activity. This metric provides an important indicator of a state's proactiveness on climate change.

The analysis considers the latest available data sets to estimate emissions intensity based on the state's GDP and GHG emissions in 2013, and maps states on the relative score of their emission intensity.¹⁹

Emissions intensity of GDP in the state

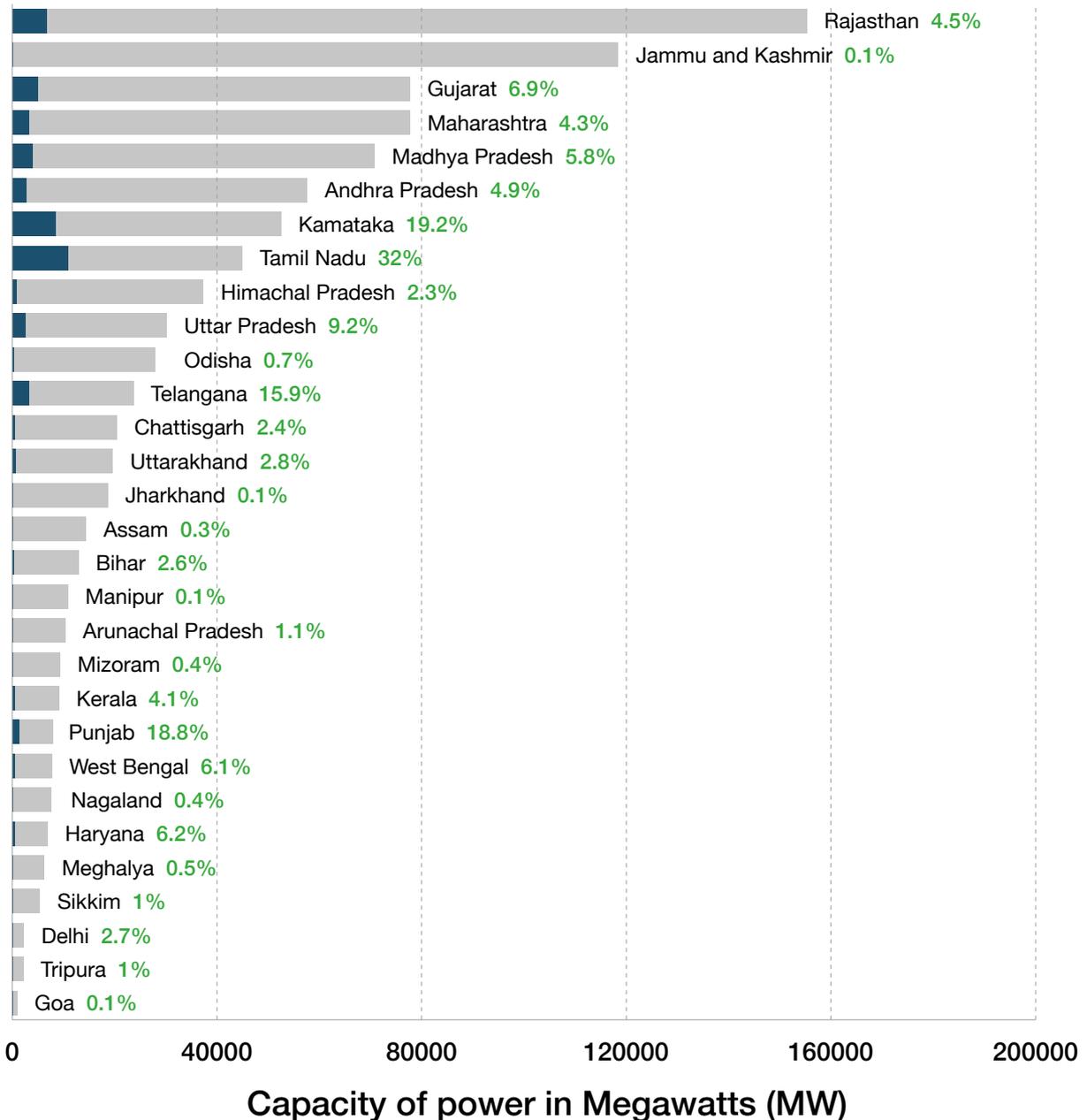


3. LEVERAGING RENEWABLE ENERGY POTENTIAL

The analysis considers the extent to which the state is utilizing and leveraging its renewable energy potential (as estimated by the Ministry of New & Renewable Energy) as a metric of performance on clean energy. Instead of simply

considering installed capacity of renewable energy, the analysis considers installed capacity relative to the renewable energy potential in the state.²⁰ The technologies considered included solar, wind, biomass and small hydro-based energy projects.

Current renewable energy capacity (■) vs potential (■)



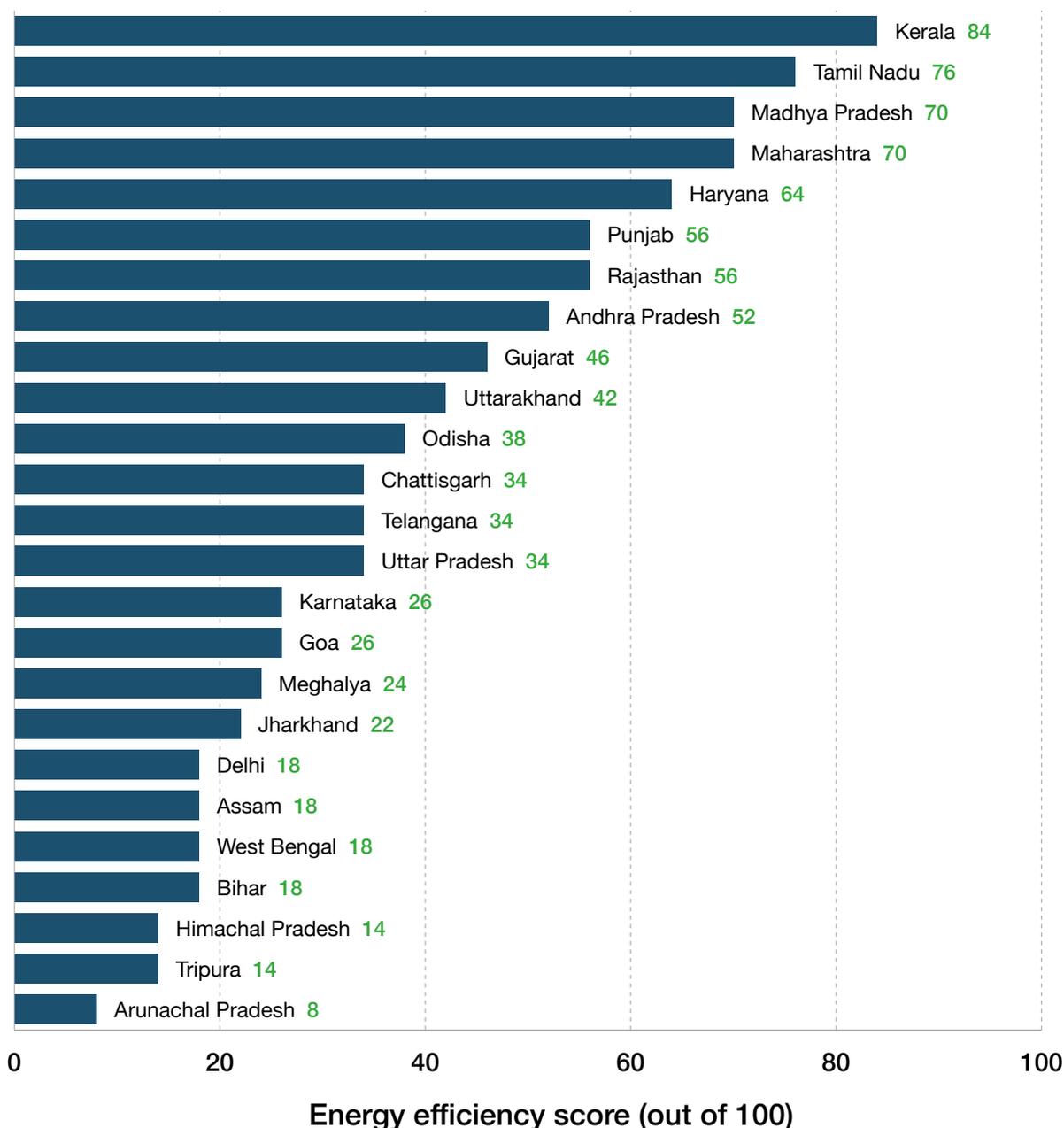
4. ENERGY EFFICIENCY OF INDUSTRIAL OUTPUT

In reviewing the highest energy consuming sectors, the analysis considered industrialization levels in each state based on their contribution to GDP as well as the level of energy efficiency in the industrial sector as identified by the State Energy Efficiency Preparedness Index developed by the Bureau of Energy Efficiency (BEE) and NITI Aayog in July 2018.²¹

An understanding of emissions intensity per unit of industrial output can help states realign policies to facilitate industrial growth, while reducing the emissions intensity of the industrial sector.

There was no available data for Mizoram, Sikkim, Nagaland, Jammu and Kashmir, and Manipur so these states are excluded.²²

Industrial energy efficiency

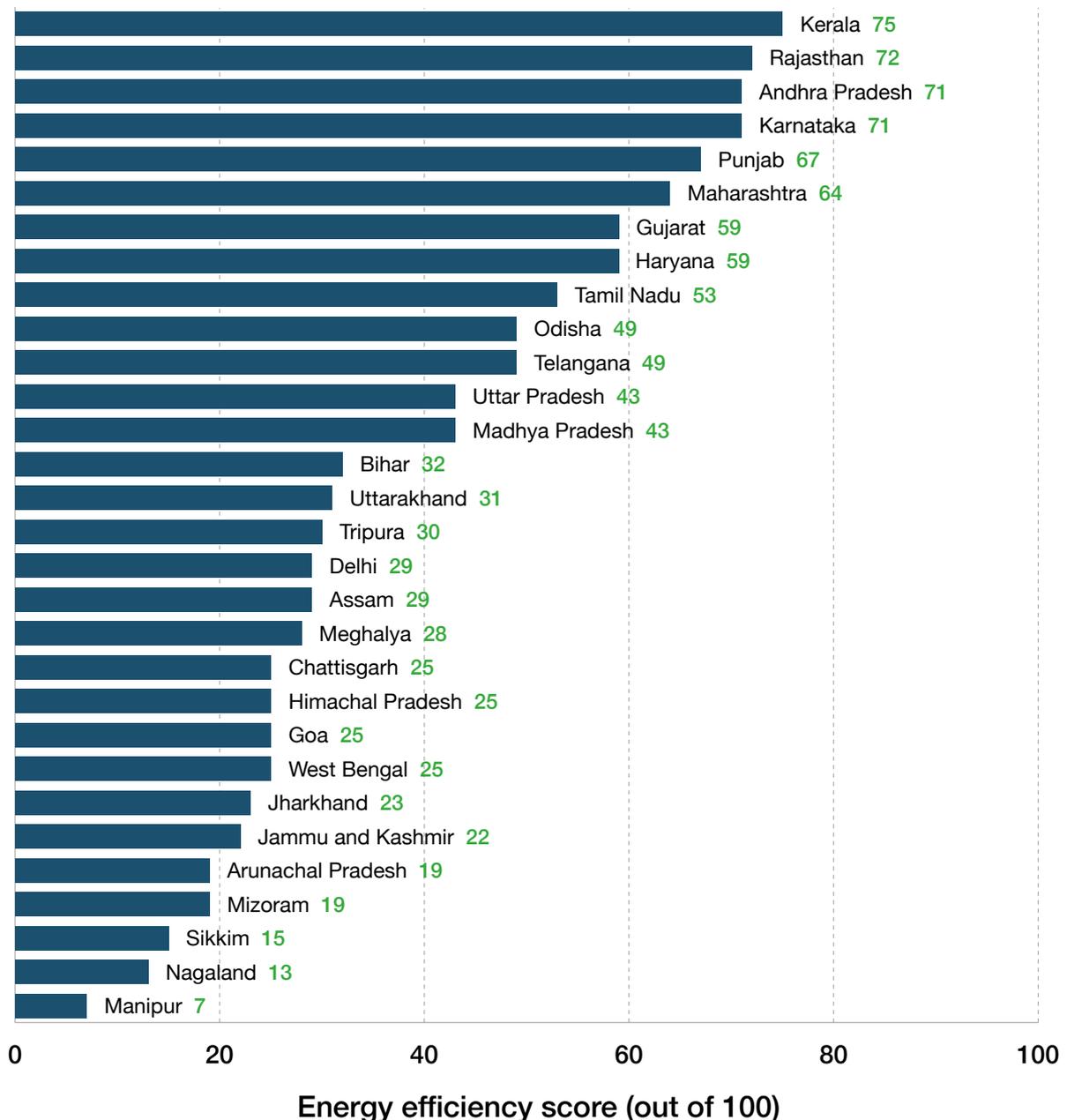


5. ENERGY EFFICIENCY IN BUILDINGS, TRANSPORT, MUNICIPAL SERVICES, AGRICULTURE AND POWER DISTRIBUTION

This analysis looks at energy efficiency in municipalities, buildings, transport, agriculture, power distribution as well as cross-sector efficiencies as highlighted by the State Energy Efficiency Index.²³ The composition of the index includes sector-wise energy consumption and

energy saving potential. It examines the states' policies, financial mechanisms, institutional capacity, adoption of energy efficiency and resultant energy savings achieved. These were cumulatively assessed to derive the energy efficiency score for each state.

Energy efficiency score for other sectors

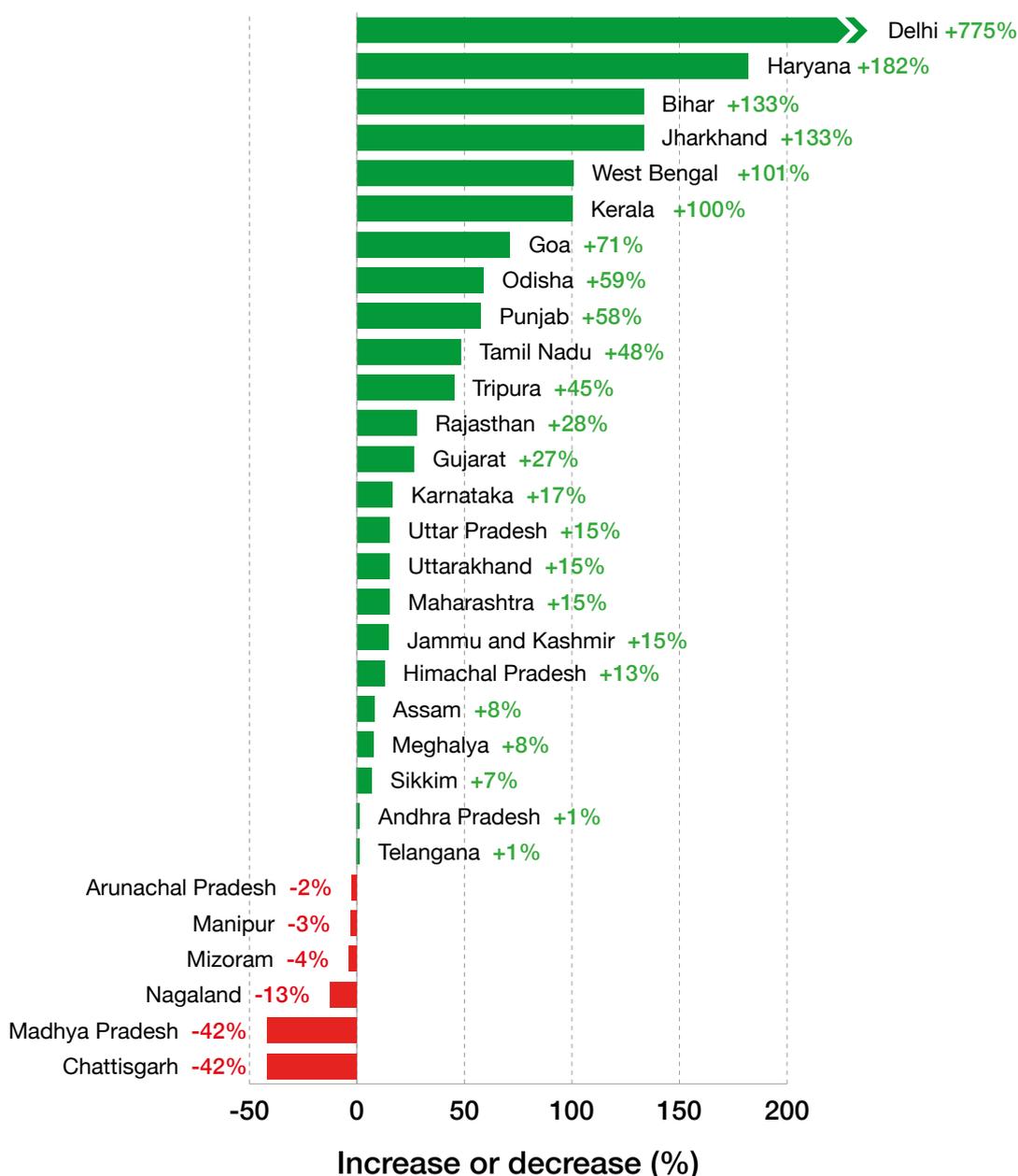


6. GROWTH IN FOREST COVER

This analysis gives a sense of carbon sequestration efforts and the impact of conservation and afforestation programs in a state. The percentage growth in forest cover has been calculated from 1991 to 2017 (period for major economic and industrial development in India).

The newly formed states (Uttarakhand, Jharkhand, Chhattisgarh and Telangana) do not have historical data. They have been scored based on their parent state performance and are given the same scores as Uttar Pradesh, Bihar, Madhya Pradesh and Andhra Pradesh respectively.

Percentage change in forest cover



CLIMATE ACTION COMPASS: ADDITIONAL CAPABILITY TO EVALUATE PERFORMANCE

India's second Biennial Update Report to the United Nations Framework Convention on Climate Change (UNFCCC), submitted in December 2018, declares that to "establish an integrated domestic monitoring, reporting and verification (MRV) system for assessment of GHG mitigation actions is a capacity building need for India. An integrated MRV system requires streamlined data management systems, technical capacity, improved analytical capabilities, and most importantly, active coordination between all stakeholders and the various nodal agencies within the government." In line with this need, The Climate Group has developed the Climate Action Compass, an excel-based framework that offers additional analytical capability to state governments in India. This framework aims to enable states to assess their domestic circumstances and priorities under their SAPCC and link them to key metrics that align with India's national ambition on climate action.

It offers a comprehensive assessment on nine key metrics of sustainable, economic and resilient growth, including: per capita income, health and education, energy productivity, waste management, emissions intensity, non-fossil energy, carbon sinks, climate adaptation efforts, finance and technology innovation.

It breaks each of these critical areas into quantitative and qualitative metrics that connect national climate goals, state action plans on climate change and the SDGs. States can input data and qualitative responses as well as local priorities into the framework to receive a directional output report that highlights key recommendations for the state to consider in strengthening action in key areas.

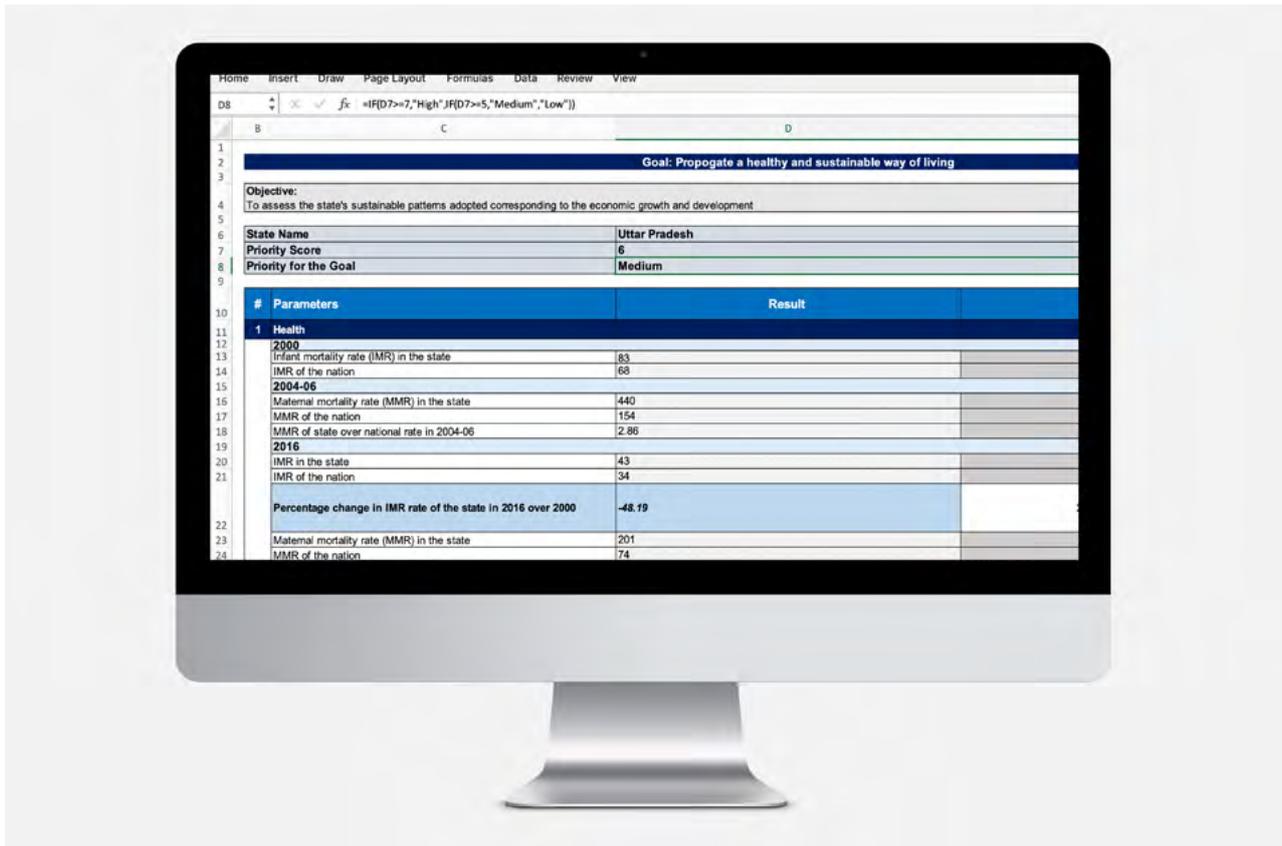
It is important to note that the framework does not provide a breakdown of NDC targets into state-level goals. It simply provides a means for

states to use relevant data to assess how existing climate action aligns to India's climate ambition from a bottom-up perspective. In fact, the framework allows states to review goals in a way that adequately reflects the state's local priorities and development goals.

Once the state inputs data into the Climate Action Compass, performance on each metric is scored. There is further flexibility for states to prioritise which metrics are most important for them, based on the state government's policy or sectoral goals at any given point in time. The tool then generates a colour-coded score (0-3) as well as percentage result, for each metric, as well as for the state's performance cumulatively.

BENEFITS OF USING THE CLIMATE ACTION COMPASS

- 1. Spot-check analysis:** The Climate Action Compass can be used to check performance on areas where the state is looking to develop policy. Further, the Compass can be used to assess performance over time. A 2019 result would be different from a 2020 result, given the changes in state-level data.
- 2. Performance compared to national goals:** The Climate Action Compass can be used by states to understand the role that they individually play in achieving national targets. This can be further highlighted by the state to showcase leadership.
- 3. Comprehensive metrics:** The Climate Action Compass offers a comprehensive set of metrics that should be considered while planning for sustainable economic development and providing clean and resilient futures to its communities.



CLIMATE ACTION COMPASS: KEY METRICS

METRIC	GOAL	REFLECTED BY	MEASURED THROUGH
1. Social Performance	Propagate a healthy and sustainable way of living for all	Sustainable patterns adopted by the states corresponding to the economic growth and development	Health, Literacy, Life Expectancy and performance on SDG 1 (no poverty), SDG 2 (no hunger), SDG 3 (gender equality) and SDG 10 (reduced inequality)
2. Energy Efficiency	Promote energy efficiency in industry, transport, agriculture and buildings	State's contribution and ambitious actions in the current state of development and the focus on adopting a low-carbon path to achieve economic growth and development	State performance on energy efficiency preparedness index on buildings, industry, agriculture, power distribution and transport and state policies
3. Waste Management	Adopt a sustainable and cleaner path for development	State's contribution and ambitious actions in the current state of development	Change in per capita waste generated, change in per capita waste managed, policy on waste, SDG index waste processing performance

METRIC	GOAL	REFLECTED BY	MEASURED THROUGH
4. Emissions Intensity Reduction	Reduce emission intensity per unit state GDP from 2005 baseline	Scope for energy intensity reduction across the demand sectors and state-level policy preparedness to meet the target at the national level	Emission intensity reduction, state policy on reducing emissions intensity
5. Non-Fossil Fuel Energy	Adoption of non-fossil fuel-based energy resources in the state's energy mix	State's performance on the 175 GW target (100 GW solar, 60 GW wind, 10 GW biomass and 5 GW small-scale hydro) set for the year 2022	Installed capacity and generation of solar, wind, biomass, hydro (large and small), nuclear; renewables policy, finance/investment received for renewable projects, performance on SDG 7 (access to clean energy)
6. Carbon Sinks	Significant improvement in the state's carbon sink to contribute towards the national target of creating an additional carbon sink of 2.5-3 billion tons of CO2 equivalent by 2030	State's progress on creating additional carbon sinks through mobilization of state action and policy frameworks	Forest cover target achieved, state policy on forest cover and sinks, REDD+ initiatives
7. Climate Change Adaptation	Enhancing investment in development programs in critical sectors vulnerable to climate change to improve adaptive capacity	State strategies on building resilience on agriculture, water, health, coastal regions, disaster management, protection of biodiversity and Himalayan ecosystem and budget to support the implementation of these programs	Budgetary allocations and policy for adaptation of sectors and performance on SDG 2 (zero hunger to signify food security), SDG 6 (clean water and sanitation to signify public health resilience) and SDG 11 (sustainable and resilient cities)
8. Climate Finance	Mobilizing funds for mitigation and adaptation programs in the state	Financial investment required and received for implementation of low-carbon, climate resilient projects. Mobilizing investment includes the identification and assessment of flows and the development of financing and investment strategies	International funding received through the Green Climate Fund and other public mechanisms, domestic funds received from national government sources (NAFCC, NCEEF), private sector investments, lines of credit and collaborations with development financial institutions
9. Climate Change R&D Technological Advancements	Building capacities and deployment of innovative technology through collaborative R&D to enhance climate change focused adaptive and mitigative actions in the state	Leapfrogging to global best available technologies in the critical sectors identified in the states and the efforts made by the state in global collaboration on research and development	Global collaborations, international memberships and participation, budgetary allocations for R&D, capacity building programs

SPOTLIGHT STATES: A DEEPER DIVE ON GUJARAT

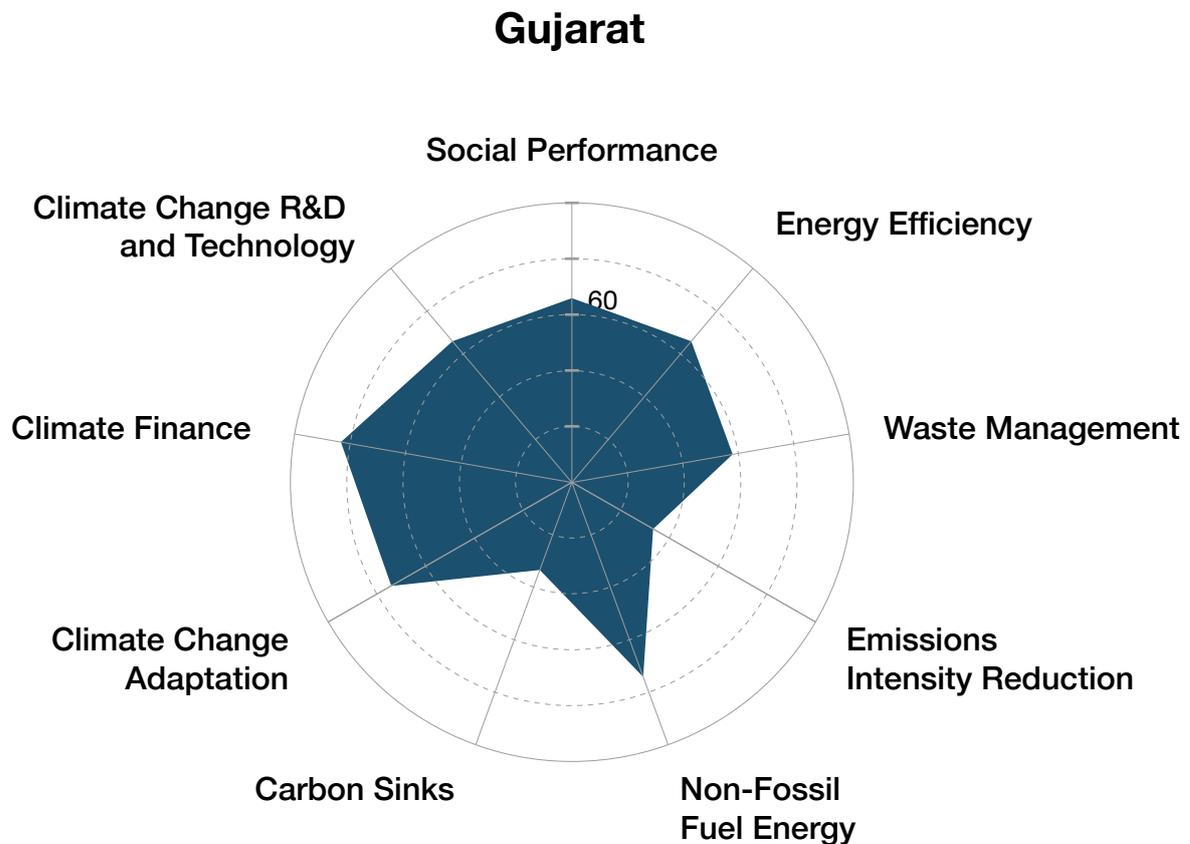
GUJARAT

Gujarat is one of the states proactively implementing climate policies. It is ranked as one of the most energy-efficient states based on rankings in the State Energy Efficiency Index on buildings, industries, agriculture and municipalities.²⁴ Financial incentives are available for hybrid and electric vehicles and Gujarat is fast emerging as the latest major automotive hub.

for the purchase of battery operated two-wheel vehicles, solar water heating systems and promoting of waste to energy projects, among others. Further, Gujarat Green Revolution Company (GGRC) - which acts as the implementing agency on behalf of the government of Gujarat - promotes micro-irrigation systems among local farmers for efficient water management.

Initiatives have been undertaken by key state nodal agencies on solar rooftop systems, subsidies

A summary of Gujarat's performance against each of the metrics, shows:



Social Performance: Gujarat saw a decline in the infant mortality rate (IMR) and the maternal mortality rate (MMR) in 2016 when compared with the figures for the year 2000. The life expectancy at birth and at age five has also increased significantly in years 2010-14 when compared with years 2006-10. Further, the state has fared well on the Index for SDG Goal 4 on quality education and SDG Goal 10 on reduced economic inequalities and has scored higher than India's national average.

Energy Efficiency: Gujarat aims to develop an internal state GHG inventory to monitor the emissions and reductions required in each of these sectors to enable it to cut emissions in line with national targets. Gujarat is yet to formalize its policy on electric vehicles but currently has around 12% of the total number of EVs in use in India.

Waste Management: Gujarat has initiatives on waste processing, using technologies such as vermi-composting, bio-mechanization, waste to energy and waste to compost. The state municipal corporation is also working towards reducing garbage collection and disposal load by installing organic waste converters in cities. Gujarat has a dedicated policy on converting waste to energy but is not performing well in comparison to the other Indian states on the waste processing as per the SDG baseline index report.²⁵

Emissions Intensity Reduction: Due to economic growth, the overall demand for energy across all the sectors is increasing at a rapid rate. Emissions from the energy sector have also seen a steady increase despite the influx of renewable energy. This is due to the dominance of fossil fuels in the energy mix.

Non-Fossil Fuel Energy: The state has financial incentives in place for the adoption of low-cost renewable energy technologies. There are defined policies in place for clean energy, such as solar, wind and hydro and there are ongoing development programmes like the residential rooftop solar plants, solar parks, canal-based solar power and the Gandhinagar Solar City Project amongst others. In addition, the state

has also achieved a significant percentage of India's 2022 renewable energy targets.

Carbon Sinks: There is a 27% increase in forest cover, creating an encouraging trend in terms of conservation and afforestation programs led by the Forests and Environment Department in the state.

Climate Change Adaptation: Gujarat is implementing projects on climate change adaptation in agriculture, water resources, health and disaster management with schemes such as bio-village, soil health card and micro-irrigation in place. Many villages have adopted 100% drip and sprinkler irrigation systems. The Gujarat State Disaster Management Authority (GSDMA) is also undertaking programs on flood rescue and mainstreaming of gender in disaster risk reduction. Furthermore, Ahmedabad became the first city in South Asia to design and implement an early heatwave warning system and preparedness plan to raise public awareness, to help prevent heat-related deaths and illnesses.

Climate Finance: Gujarat has received funding and grants from international agencies such as the Global Environment Facility and National Bank for Agriculture and Rural Development (NABARD) for projects on climate change adaptation and resilience in vulnerable districts.

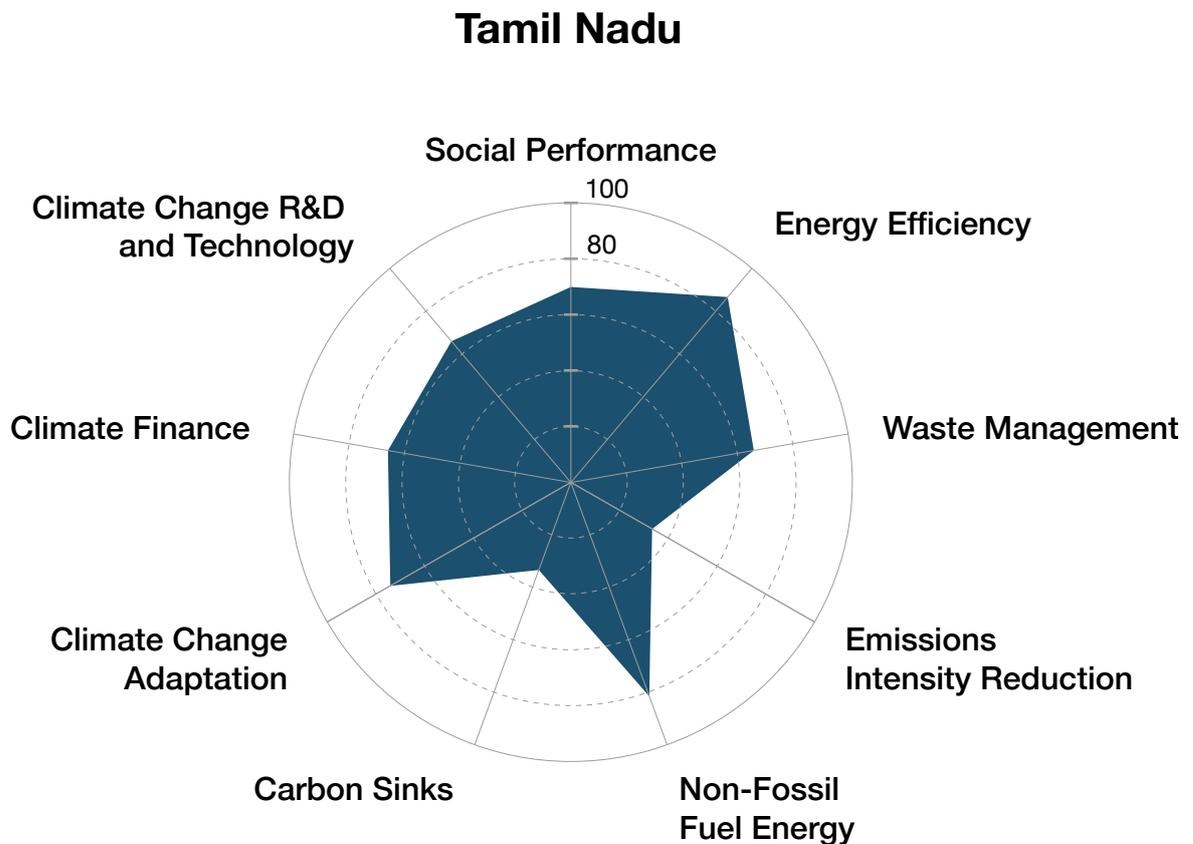
Climate Change R&D Technology: Gujarat has allocated large amounts of financing for the promotion and adoption of clean energy technologies. However, initiatives aimed at technology transfer with international players and local capacity development to increase the state's ability to manufacture these technologies is currently lacking.

For Gujarat to be aligned with national climate goals, the state needs to adopt best available technologies through global collaborations while building efforts in energy efficiency. The buildings and transport sectors offer significant potential in Gujarat if the state addresses lack of policy alignment at the national and state levels.

SPOTLIGHT STATES: A DEEPER DIVE ON TAMIL NADU

TAMIL NADU

Through the initial landscape assessment, Tamil Nadu was identified as a significant state in driving climate action. Tamil Nadu has been a leader in adopting policies and implementing schemes on climate change adaptation, mobilizing finance to reduce emissions and has increased the focus of renewable energy in the state's plans till 2023. Based on the deep dive analysis, Tamil Nadu is aligned with national targets on installing non-fossil fuel-based energy as well as deploying electric vehicles.



Social Performance: Tamil Nadu saw a decline in the infant mortality rate (IMR) and the maternal mortality rate (MMR) in 2016 when compared with the figures for the year 2000. The life expectancy at birth has also increased significantly in years 2010-14 when compared to years 2006-10. This can be attributed to having state-level health policies and schemes focused on improving the public health system and access to healthcare in the rural areas. The state has been fairing high against the parameters set out under SDG 3 aiming at Good Health and Well Being.²⁶

Energy Efficiency: The state has energy efficiency policies that are in line with the National Mission on Enhanced Energy Efficiency. However, the state's buildings sector is performing poorly on energy efficiency while the industry, agriculture and power distribution sectors are performing well on the energy efficiency index.²⁷ Tamil Nadu is yet to formalize a policy on EVs and is contributing to about 6.4% of the proportion of EVs in use nationally.²⁸ There is a significant need in the state to institutionalize the adoption of EVs to promote energy efficiency in the transport sector.

Waste Management: The state has been working extensively on waste management. It has seen a significant improvement in the percentage of per capita waste generated (baseline 1999) and the percentage of waste processed in the state (baseline 2015).²⁹ The state has a dedicated policy on waste management and has a high performing score on waste processing as per the SDG Baseline analysis.³⁰

Emissions Intensity Reduction: The state lacks an institutional policy framework and guidance to drive a significant reduction in emissions intensity. The state can kick-start emissions intensity reduction with improvements in fuel efficiency and the adoption of renewable energy widely across key sectors.

Non-Fossil Fuel Energy: Tamil Nadu's Vision 2023 has placed a high emphasis on providing access to non-conventional sources of energy.³¹ There are defined policies in place on wind-solar hybrid, solar energy, wind energy and water.

Carbon Sinks: In line with the national goal to increase carbon sinks, Tamil Nadu had a 48% increase in forest cover since 1991, an encouraging trend that can help the state achieve its carbon sink target for 2030.

Climate Change Adaptation: Tamil Nadu has identified critical areas to improve adaptive capacity towards climate change. These include climate smart agriculture, climate proofing through resource management and coastal management. This is supported by a cross-sectoral approach to policies focusing on health infrastructure, waste management and infrastructure development. These policies are focused on building climate resilience in the state with significant budgetary allocation in the 12th and 13th Five Year Plans.³²

Climate Finance: Tamil Nadu has been implementing projects around climate change adaptation and mitigation including capacity development with state budgetary allocation backed by grants from multilateral and bilateral agencies like ADB, Adaptation Fund, and Japan International Cooperation Agency (JICA). The state aims to leverage relationships with international agencies to mobilize funds.

Climate Change R&D and Technology: While the state is striving to adopt cleaner technology for economic growth and development, there is still a need for Tamil Nadu to identify methods to promote investment in local research and development capacity. The state needs to focus on collaborative initiatives to develop and innovate technologies.

RECOMMENDATIONS: MAKING STATES FRONTIERS FOR STRONGER CLIMATE ACTION

There is a tremendous opportunity in India to leverage the climate action momentum at the state-level. States need access to information on policy action across different governance levels, platforms for peer learning and engagement as well as capacity building on long-term climate strategies.

States and regions have the power, influence and ambition to unlock barriers to climate and energy solutions; together they can demonstrate the economic case for investing in clean energy and give national governments the confidence to maintain their commitment to the Paris Agreement - fuelling their ambition to go further and faster.

- **Utilise policy planning tools like The Climate Group's Climate Action Compass, state energy calculators, the Sustainable Asset Valuation tool (SAVi) and others, to help structure climate action efforts with the state's overall economic policy.**
- **Strengthen intra-state coordination; work with The Climate Group to create a peer-learning platform that can help develop a shared understanding of climate action for Indian states. This can help to identify the do's and don'ts early on and develop local capacity.**
- **In line with the above, create an India-specific state-level climate action database in partnership with The Climate Group, to record actions taking place across states as a centralized knowledge hub.**
- **Engage in international collaboration to enable real-time exchange with global peers to improve and enhance capacity in areas such as pathway planning, policy innovation and measuring performance on climate action.**

APPENDIX

STATE LANDSCAPE ANALYSIS METHODOLOGY

India's climate goals provide a set of mitigation and adaptation strategies for the following sectors: agriculture, water, health, coastal regions and islands, disaster management, protecting biodiversity and Himalayan ecosystem and rural livelihoods security. They are centred around India's NAPCC and the SAPCCs. Further, India's NDCs under the 2015 Paris Agreement lists three goals on reduction of emissions intensity, installation of non-fossil fuel-based energy and creation of additional carbon sinks.

A landscape assessment was carried out to assess the current level of action in the states with respect to the goals set out at the national level. For this purpose, a mapping exercise was conducted to identify six quantitative and two qualitative criteria that can be used to assess a state's progress on climate action with focus on goals set within the NDCs. These six criteria have been mapped as radar graphs in the section on "High Performing States: Evaluating India's Climate Action Leaders" in the main report.

The six quantitative criteria that were identified are:

1. Income per capita
2. Emissions per capita income
3. Leveraging renewable energy potential
4. Energy efficiency of industrial output
5. Energy efficiency in Buildings, Transport, Municipal Services, Agriculture and Power Distribution
6. Growth in forest cover

The two qualitative criteria are:

1. Climate governance
2. Engagement with external partners

This report is based on data collected by KPMG from most recent, publicly available data sets, listed at the end of this report. Every attempt has been made to ensure correctness of the data.

GLOSSARY

Carbon Sinks:	Any process or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere. A given pool (reservoir) can be a sink for atmospheric carbon if, during a given time interval, more carbon is flowing into it than is flowing out.
Climate Change Adaptation:	Refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts.
Climate Change Adaptation Measures:	Possible measures and actions that can be implemented to improve adaptation to climate change.
Climate Change R&D and Technology:	Scientific and technological breakthroughs instrumental to reverse climate change trends along with research and development of solutions that can be adopted to build resilience against climate change.
Climate Finance:	The contribution made towards mitigation and adaptation to climate change, and to enhance the capacity to prevent and cope with its consequences.
Demand Side Management:	Demand-side management is the modification of consumer demand for energy through various methods such as financial incentives and behavioural change through education.
Emission Intensity Reduction:	Emission intensity is the volume of emissions per unit of GDP. Reducing emission intensity means that less pollution is being created per unit of GDP.
Energy Conservation Building Code:	The Energy Conservation Building Code (ECBC), was launched by the Ministry of Power, Government of India in May 2007 to promote energy efficient construction in buildings.
Energy Efficiency:	Energy efficiency refers to a method of reducing energy consumption by using less energy to attain the same amount of useful output.
Energy Productivity:	Energy Productivity, which is defined as the ratio of output divided by energy consumption, is a useful indicator for understanding the energy efficiency of an industry or an economy.
Monitoring, Reporting and Verification (MRV) system:	Monitoring, Reporting and Verification system for assessment is a tool or system developed and adopted to account for the current GHG emissions and the reduction of the same due to the mitigation actions adopted.
NAFCC:	The National Adaptation Fund for Climate Change (NAFCC) was set up in the year 2015-16. The overall aim of NAFCC is to support concrete adaptation activities which mitigate the adverse effects of climate change.
NCEEF:	The National Clean Energy Fund (NCEF) was established in 2010 for funding research and innovative projects in clean technology.

REDD+:	Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.
Renewable Energy:	Energy that is collected from renewable resources, which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat.
Social Performance:	Relates to the performance of a state on indicators such as literacy rate, life expectancy, health indicators, poverty, access to good quality education and gender equality.
Sustainable Asset Valuation Tool (SAVi):	Demonstrates how sustainable infrastructure delivers better value and financial returns.
Sustainable Development Goals:	Sustainable Development Goals, otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities.
Union Territory:	Type of administrative division in the Republic of India. Unlike the states of India, which have their own governments, union territories are federal territories ruled directly by the union government (central government), hence the name “union territory”.
Waste Management:	Involves collecting, transporting, disposing, recycling and monitoring waste generated through human activities.

REFERENCES

- ¹ Intergovernmental Panel on Climate Change, Special Report: Global Warming of 1.5°C (2018) <https://www.ipcc.ch/sr15/>
- ² New Climate Economy, Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times (2018) https://newclimateeconomy.report/2018/wp-content/uploads/sites/6/2018/12/NCE_2018Report_Full_FINAL.pdf
- ³ Natural Resources Defense Council and Council on Energy, Environment and Water, Greening India's Workforce: Gearing up for Expansion of Solar and Wind Power in India (2017) <http://www.ceew.in/sites/default/files/CEEW-NRDC-Greening-India-Workforce-report-20Jun17.pdf>
- ⁴ United Nations Framework Convention on Climate Change, The Paris Agreement (2015) <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
- ⁵ Intergovernmental Panel on Climate Change, Special Report: Global Warming of 1.5°C (2018) <https://www.ipcc.ch/sr15/>
- ⁶ United Nations, Sustainable Development Goals, <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>
- ⁷ Government of India
- ⁸ Government of India, Ministry of Environment, Forest and Climate Change, National Environment Policy 2006, <http://www.moef.gov.in/sites/default/files/introduction-nep2006e.pdf>
- ⁹ Government of India, Ministry of Environment, Forest and Climate Change, National Action Plan on Climate Change (2008) <http://www.moef.nic.in/ccd-napcc>
- ¹⁰ Government of India, Ministry of Environment, Forest and Climate Change, National Action Plan on Climate Change (2008) <http://www.moef.nic.in/ccd-napcc>
- ¹¹ Government of India, Ministry of Environment, Forest and Climate Change, State Action Plans on Climate Change, <http://envfor.nic.in/ccd-sapcc>
- ¹² United Nations Framework Convention on Climate Change, The Paris Agreement (2015) <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
- ¹³ United Nations Framework Convention on Climate Change, The Paris Agreement (2015) <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
- ¹⁴ The Climate Group's interviews
- ¹⁵ United Nations, Sustainable Development Goals, <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>
- ¹⁶ Government of India, Voluntary National Review Report on the Implementation of Sustainable Development Goals (2017) http://niti.gov.in/writereaddata/files/India%20VNR_Final.pdf
- ¹⁷ National Institute for Transforming India, Sustainable Development Goals India Index - Baseline Report (2018) <http://niti.gov.in/content/sdg-india-index-baseline-report-2018>
- ¹⁸ Ministry of Power, Ministry of New and Renewable Energy, Ministry of Environment, Forest and Climate Change, Government of India
- ¹⁹ GHG Platform India (2005 and 2013), <http://www.ghgplatform-india.org/economy-wide-emission-estimates>; Statistics Times, <http://statisticstimes.com/economy/gdp-of-indian-states.php>
- ²⁰ Government of India, Ministry of New & Renewable Energy, www.mnre.gov
- ²¹ National Institute for Transforming India (NITI) Aayog, State Energy Efficiency Preparedness Index (2018) https://www.aeee.in/state-ee-index/wp-content/uploads/2018/08/State-EE-Preparedness-Index-FINAL_July2018.pdf
- ²² National Institute for Transforming India (NITI) Aayog, State Energy Efficiency Preparedness Index (2018) https://www.aeee.in/state-ee-index/wp-content/uploads/2018/08/State-EE-Preparedness-Index-FINAL_July2018.pdf
- ²³ Government of India, State Energy Efficiency Preparedness Index (2018) https://www.aeee.in/state-ee-index/wp-content/uploads/2018/07/State-EE-PREPAREDNESS-Index-4-pager-FINAL_30-Jul-2018.pdf
- ²⁴ Government of India, State Energy Efficiency Preparedness Index (2018) https://www.aeee.in/state-ee-index/wp-content/uploads/2018/07/State-EE-PREPAREDNESS-Index-4-pager-FINAL_30-Jul-2018.pdf

²⁵ Data for waste generated in 1999-2000 for Gujarat is not available in the public domain and therefore, percentage change in waste generated per capita GDP in 2014-15 over 1999-2000 has not been analysed

²⁶ National Institute for Transforming India, Sustainable Development Goals India Index - Baseline Report (2018) <http://niti.gov.in/content/sdg-india-index-baseline-report-2018>

²⁷ Government of India, State Energy Efficiency Preparedness Index (2018) https://www.aeee.in/state-ee-index/wp-content/uploads/2018/07/State-EE-PREPAREDNESS-Index-4-pager-FINAL_30-Jul-2018.pdf

²⁸ Government of India, Department of Heavy Industry, National Automotive Board, FAME-India (<https://www.fame-india.gov.in/>)

²⁹ Government of India, Ministry of Statistics and Programme Implementation, Statistics Related to Climate Change – India (2015), <http://www.ghgplatform-india.org/images/Publications/Status%20of%20Swacch%20Bharat%20Mission%20Implementation%20on%20India%20E2%2080%2099s%20Solid%20Waste%20Emissions.pdf>

³⁰ National Institute for Transforming India, Sustainable Development Goals India Index - Baseline Report (2018) <http://niti.gov.in/content/sdg-india-index-baseline-report-2018>

³¹ Government of Tamil Nadu, Vision Tamil Nadu 2023 http://www.spc.tn.gov.in/pdfs/TN_Vision_2023.pdf

³² Government of Tamil Nadu, ENVIS Centre, State of Environment and Related Issues http://tnenvis.nic.in/Database/Climate_1209.aspx

DATA SOURCES

ENERGY	
GHG emissions in India in 2005	GHG Platform India, http://www.ghgplatform-india.org/economy-wide-emission-estimates
GHG emissions in India in 2013	GHG Platform India, http://www.ghgplatform-india.org/economy-wide-emission-estimates
Renewable energy generation in 2006-07	MNRE Annual Report 2006-07, https://mnre.gov.in/file-manager/annual-report/2006-2007/EN/HTML/contents.htm
Renewable energy generation in 2017-18	MNRE Annual Report 2017-18, https://mnre.gov.in/file-manager/annual-report/2017-2018/EN/pdf/chapter-3.pdf
Electricity generation in 2006-07	Ministry of Power Annual Report 2006 – 07 https://powermin.nic.in/sites/default/files/uploads/ar06_07.pdf
Electricity generation in 2017-18	Ministry of Power Annual Report 2017 – 18 https://powermin.nic.in/sites/default/files/uploads/MOP_Annual_Report_Eng_2017-18.pdf
Installed grid connected solar projects in India	MNRE Annual Report 2017-18, https://mnre.gov.in/file-manager/annual-report/2017-2018/EN/pdf/chapter-4.pdf
Installed capacity of other renewable energy projects in India	MNRE Annual Report 2017-18, https://mnre.gov.in/file-manager/annual-report/2017-2018/EN/pdf/chapter-3.pdf
ENERGY EFFICIENCY	
Energy efficiency in critical sectors	State Energy Efficiency Index, Bureau of Energy Efficiency, http://www.aeee.in/state-ee-index/wp-content/uploads/2018/07/State-EE-Preparedness-Index-FINAL_July2018.pdf
FORESTRY	
State Forest Cover (2017)	India State of Forest Report, Forest Survey India, 2017, http://fsi.nic.in/isfr2017/isfr-forest-cover-2017.pdf
State Forest Carbon Stock	India State of Forest Report, Forest Survey India, 2017, http://fsi.nic.in/isfr2017/isfr-forest-cover-2017.pdf
State Forest Cover (1991)	http://fsi.nic.in/documents/sfr_1991_hindi.pdf

SOCIAL INDICATORS

GDP Per Capita	Ministry of Statistics and Programme Implementation 2015, http://statisticstimes.com/economy/gdp-of-indian-states.php
Infant Mortality Rate	NITI Aayog http://niti.gov.in/content/infant-mortality-rate-imr-1000-live-births
Maternity Mortality Rate	NITI Aayog http://niti.gov.in/content/maternal-mortality-ratio-mmr-100000-live-births
Literacy Rate	NITI Aayog http://niti.gov.in/content/literacy-rate-7years
Life Expectancy	NITI Aayog http://niti.gov.in/content/life-expectancy

SUSTAINABLE DEVELOPMENT GOALS

State's Performance on SDGs	SDG Baseline Report, NITI Aayog, http://niti.gov.in/content/sdg-india-index-baseline-report-2018
-----------------------------	--

TRANSPORT

Number of internal combustion engine vehicles in 2005	http://mospi.nic.in/statistical-year-book-india/2017/189
Number of electric vehicles	FAME India, https://fame-india.gov.in/

WASTE

Waste generation in India in 1999-2000 and 2014-15	Statistics related to Climate Change - India 2015, Government of India, Ministry of Statistics and Programme Implementation
Waste processing baseline	SDG Baseline Report, NITI Aayog, http://niti.gov.in/content/sdg-india-index-baseline-report-2018
Total waste generation (TPD) as per SBM, 2017	GHG Platform, India, http://www.ghgplatform-india.org/Images/Publications/Status%20of%20the%20Swacch%20Bharat%20Mission%20Implications%20on%20India%E2%80%99s%20Solid%20Waste%20Emissions.pdf

ABOUT THIS REPORT

State governments are important stakeholders in driving climate action. This report seeks to highlight their critical role in India's fight against climate change. It also highlights the potential for greater state leadership in meeting India's clean economic development goals.

This report has been authored and published by The Climate Group, in partnership with KPMG as knowledge partner for the states landscape analysis and development of the Climate Action Compass, presented later in the report.

ABOUT THE CLIMATE GROUP

The Climate Group's mission is to accelerate climate action to achieve a world of no more than 1.5°C of global warming and greater prosperity for all. We do this by bringing together powerful networks of businesses and governments that shift global markets and policies. We focus on the greatest global opportunities for change, take innovation and solutions to scale, and build ambition and pace.

The Climate Group is Secretariat to the Under2 Coalition, a global network of ambitious state and regional governments committed to keeping global temperature rises to well below 2°C. Established in 2015, the Under2 Coalition builds on the legacy of its forerunner, the States & Regions Alliance.



Photo Credit: Jarnail Singh



CONTACT US

The Climate Group India Office

**717 - 718, Seventh Floor
International Trade Tower, Nehru
Place New Delhi 110019 India**

+91 11 4987 4369 / 4987 4368

info@theclimategroup.org

THE °CLIMATE GROUP