India’s Race to 175 GW

Twenty seven states need a step up for India to meet its December 2022 renewables target

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About

This mini-report analyses the state-wise installed renewable energy (RE) capacity data from the Ministry of New and Renewable Energy (MNRE) in relation to state-specific RE targets. This data is published only for the latest month, but for the purpose of this research, internet archive machines were used to dig out and piece together month-by-month RE installation data to track progress. It analyses the latest data to March 2022, in the context of the 175 GW RE target set for December 2022. The data is also available to download separately.

The purpose of this report is to provide a database with hard-to-find data on state-wise RE progress, pulled from internet archive machines. Alongside this database, the report provides top-line messages that can be inferred from the data. This data could be used to track progress in different states and/or act as a starting point for other relevant research. This analysis does not provide a policy analysis of various barriers to RE uptake in Indian states or suggest solutions to those barriers.

Highlights

110 GW

Renewables capacity installed, as of Mar-22

4

States and union territories surpassed their respective RE targets for the end of 2022

27

States and union territories achieved <50% of their respective RE targets for the end of 2022

65 GW

Shortfall on the December 2022 target of 175 GW RE, as of Mar-22

5

Key states account for two-thirds of the shortfall on 175 GW target, as of Mar-22

2

States accounted for 73% of new RE capacity additions in the preceding 6 months

Executive Summary

Race to 175 GW

01 27 Indian states and union territories are yet to achieve even half of their respective 2022 RE targets, while four have reached their targets.

Multiple Indian states with high power demand are currently below 50% of their targets, such as Maharashtra (48%), Uttar Pradesh (32%), Madhya Pradesh (46%), Andhra Pradesh (50%), Punjab (35%) and Haryana (28%). Telangana, Karnataka, Rajasthan and Andaman & Nicobar have surpassed their targets while Gujarat (97%) and Tamil Nadu (75%) are inching closer.

02 Five key Indian states account for two-thirds of the shortfall on the 175 GW target, as of March 2022.

They are Maharashtra (11 GW), Uttar Pradesh (10 GW), Andhra Pradesh (9 GW), Madhya Pradesh (7 GW) and Tamil Nadu (5 GW).

03 Four of these five states have installed less than 0.5 GW of new renewables in the last six months.

Maharashtra installed 187 MW, Uttar Pradesh 235 MW, Andhra Pradesh 36 MW and Madhya Pradesh 88 MW.

04 Rajasthan and Gujarat accounted for 73% of India's new RE capacity in the last six months.

Rajasthan built about 4.8 GW RE capacity, Gujarat 1.8 GW and all the other states combined 2.5 GW between October 2021 and March 2022.

India's renewables journey is gaining momentum. Although India may fall short of its 2022 RE target of 175 GW without including large hydro, it is more than possible for India to deliver on its 2030 targets of 450 GW RE or 500 GW non-fossil capacity. But that would need all the states to be fully engaged and aligned with the national targets.

Aditya Lolla
Senior Electricity Policy Analyst, Ember

Progress towards India's RE targets

Momentum is building, but there's a way to go for 175 GW

India's coal phasedown commitment at COP26 makes delivering its renewable energy (RE) targets critical.

India's electricity demand is expected to see an average annual growth rate of 4-5% till 2030. Unless India builds enough RE capacity to meet this new demand, the country's coal generation will continue to increase. Our previous analysis suggests that if India delivers on the targets of 450 GW RE it set in the Optimal Generation Capacity Mix (OGCM) report, it can keep its coal generation from rising from the current levels. To achieve this, India cannot afford to slip on its more immediate target of 175 GW RE (excluding large hydro) by 2022, announced in its National Electricity Plan 13 (NEP13). This target is split between 100 GW of solar, 60 GW of wind, 10 GW of biopower and 5 GW of small hydro power.

India's journey to 175 GW is gaining momentum, but there is still some way to go to achieve this target. Indian states have their own RE targets for 2022 which add up 175 GW, but the progress on these state-level targets has been highly uneven. Lack of progress in certain key states shows a disconnect between central targets and state priorities and may end up holding India back in its race to 175 GW.

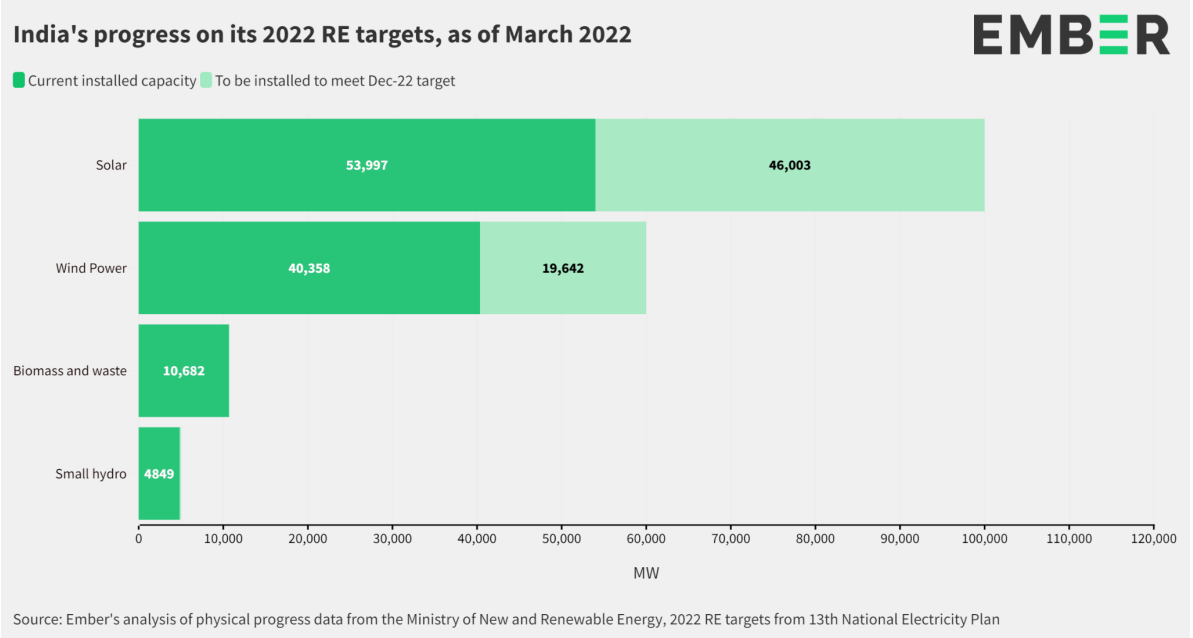
This report analyses the latest state-wise installed RE capacity data to March 2022, available from the MNRE's physical progress webpage.

National progress to 175 GW

As of March 2022, the country's installed RE capacity reached 110 GW (excluding large hydro), which is 63% of the 175 GW target.

India is at half its solar power target and two-thirds its wind power target for 2022.

With 54 GW of solar capacity and 40 GW of wind capacity on the grid, India still has some way to go to meet its 2022 solar and wind capacity targets. The country is close to achieving its small hydro target of 5 GW, needing only 0.2 GW to meet the target. India has already met its biopower targets having already installed 11 GW biopower capacity.



Solar

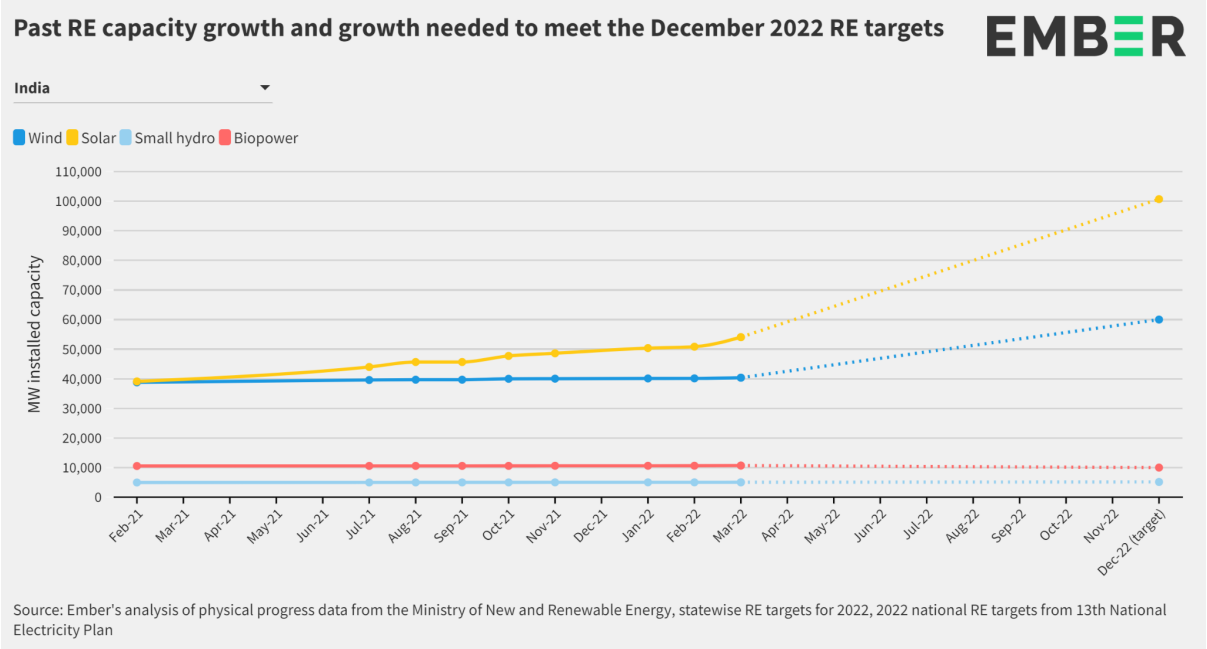
India's solar installed capacity grew by 18% in the last 6 months, from 46 GW in September 2021 to 54 GW in March 2022. Even if this high growth rate continues for the next nine months, capacity will still fall significantly short of the 100 GW target in December. Lack of progress in rooftop solar deployments is holding India back from meeting its solar power target. A recent report estimates a 25 GW shortfall in the 40 GW rooftop solar target by December 2022, compared to 1.8 GW shortfall in the utility-scale solar target of 60 GW.

India saw a record 3 GW growth in solar capacity in March 2022. However, this was ahead of the new import tariff (basic customs duties, or BCD) which has come into effect from April 2022. The growth in solar capacity may slow down in the coming months as the cost of key capital equipment is set to rise with BCD.

Wind

India's wind capacity additions in the last six months totalled less than 1 GW. Wind grew by just 2%, from 39.6 GW in September 2021 to 40.4 GW in March 2022. This is much lower

than the growth rate needed to meet the December 2022 wind target of 60 GW. Only 0.2 GW new wind power capacity was commissioned in March 2022.



Source: Ember's analysis of physical progress data from the Ministry of New and Renewable Energy, statewise RE targets for 2022, 2022 national RE targets from 13th National Electricity Plan

State-by-state progress to 175GW

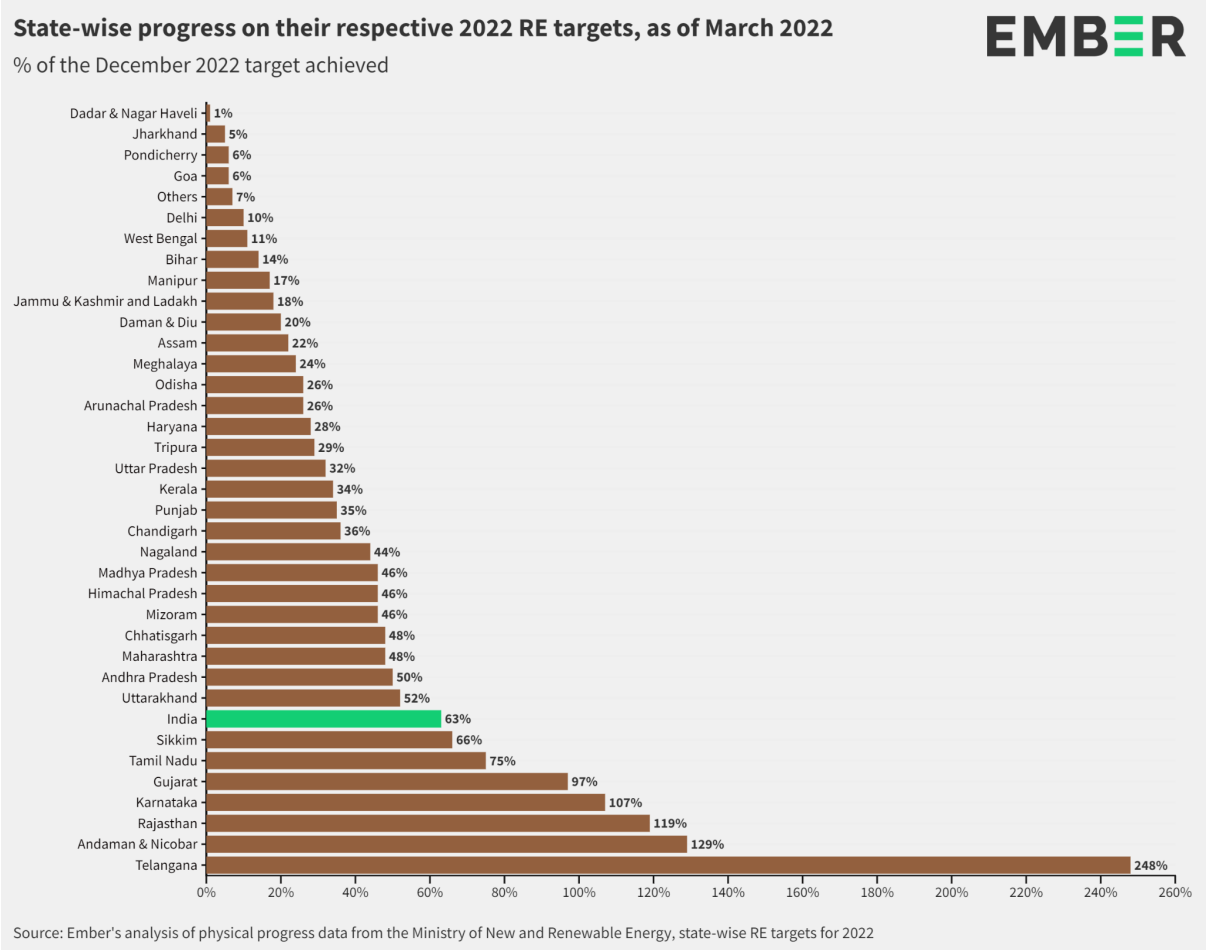
27 Indian states and union territories are yet to achieve even half of their respective 2022 RE targets while four have already hit 100% of their targets.

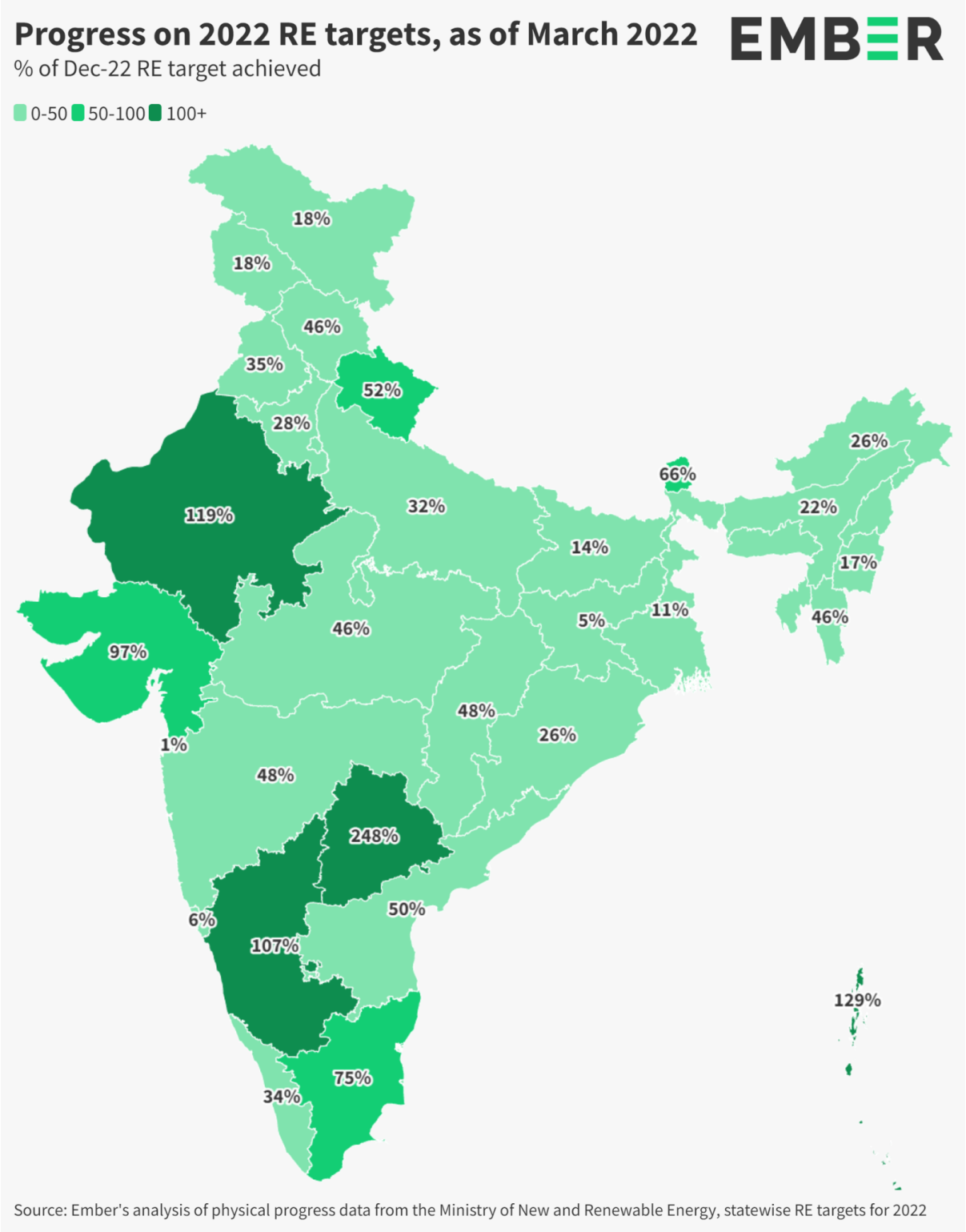
With less than 50% progress, several key high power demand Indian states like Maharashtra (48%), Uttar Pradesh (32%), Madhya Pradesh (46%), Andhra Pradesh (50%), Punjab (35%) and Haryana (28%) have a lot of catching up to do to meet their respective December 2022 targets.

This is in contrast with two other high power demand states, Gujarat (97%) and Tamil Nadu (75%), which are inching closer to their targets. Uttarakhand (52%) and Sikkim (66%) are the only other states which have achieved more than 50% of their target.

With just three quarters left until the end of 2022, 100% RE targets have been achieved in only three states, Telangana (248%), Rajasthan (119%) and Karnataka (107%), and one union territory (UT), Andaman and Nicobar (129%).

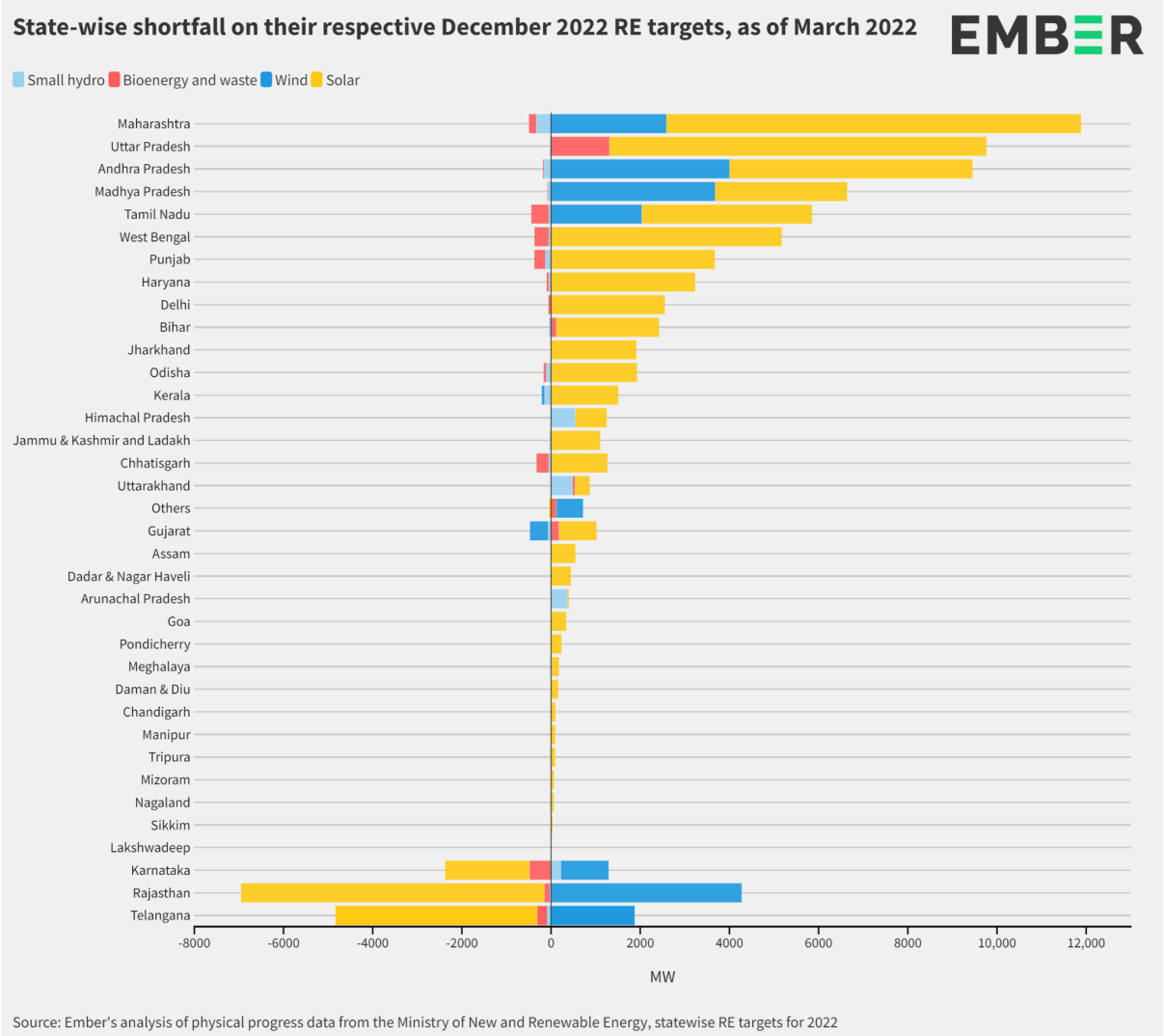
In absolute terms, much of the RE capacity as of March 2022 is concentrated in the western and southern parts of India, led by states like Tamil Nadu (16 GW), Karnataka (16 GW), Gujarat (16 GW), Rajasthan (15 GW), Maharashtra (11 GW) and Andhra Pradesh (9 GW).





Source: Ember's analysis of physical progress data from the Ministry of New and Renewable Energy, statewise RE targets for 2022

Five key Indian states account for two-thirds of the current shortfall on the 175 GW target. As of March 2022, India needs 65 GW of new RE capacity to meet its December 2022 target. About 65% of this can be achieved if five states bridge the current shortfall on their respective December 2022 targets: Maharashtra (11 GW), Uttar Pradesh (10 GW), Andhra Pradesh (9 GW), Madhya Pradesh (7 GW) and Tamil Nadu (5 GW).

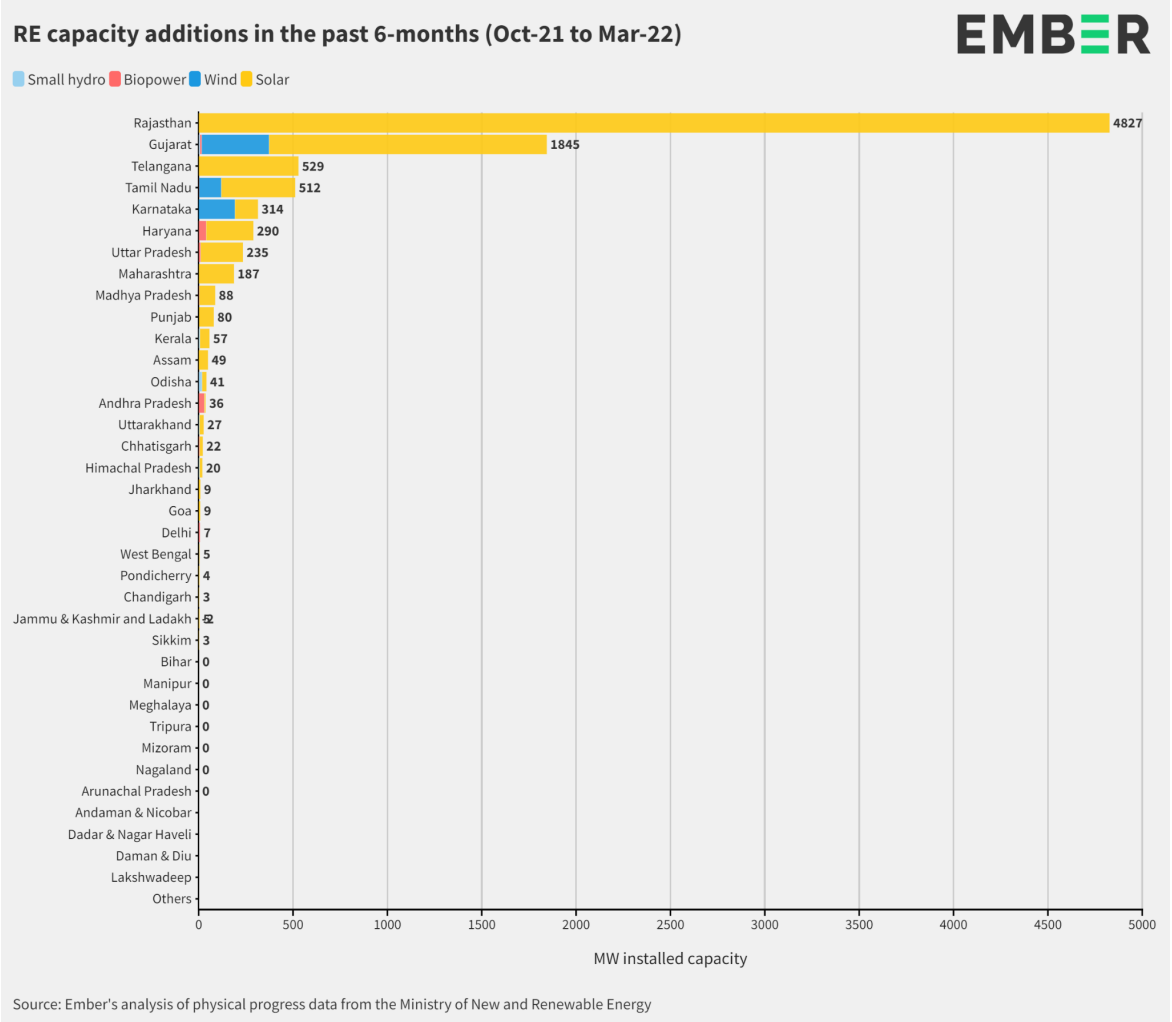


Source: Ember's analysis of physical progress data from the Ministry of New and Renewable Energy, statewise RE targets for 2022

Two states accounted for 73% of India's new RE capacity in the last six months. Rajasthan installed 4827 MW RE capacity (all solar), between October 2021 and March 2022. During the same period, Gujarat installed 1845 MW of RE capacity (1471 MW solar, 357 MW wind, 10 MW biopower and 7 MW small hydro). All the other states combined installed 2530 MW of RE in these six months.

Four of the five key states identified in the previous section installed very little capacity in the last six months: Maharashtra installed 187 MW, Uttar Pradesh 235 MW, Andhra Pradesh 36 MW and Madhya Pradesh 88 MW.

There were 13 states and UTs with near-zero (<0.5 MW) new RE capacity deployment in the last six months.



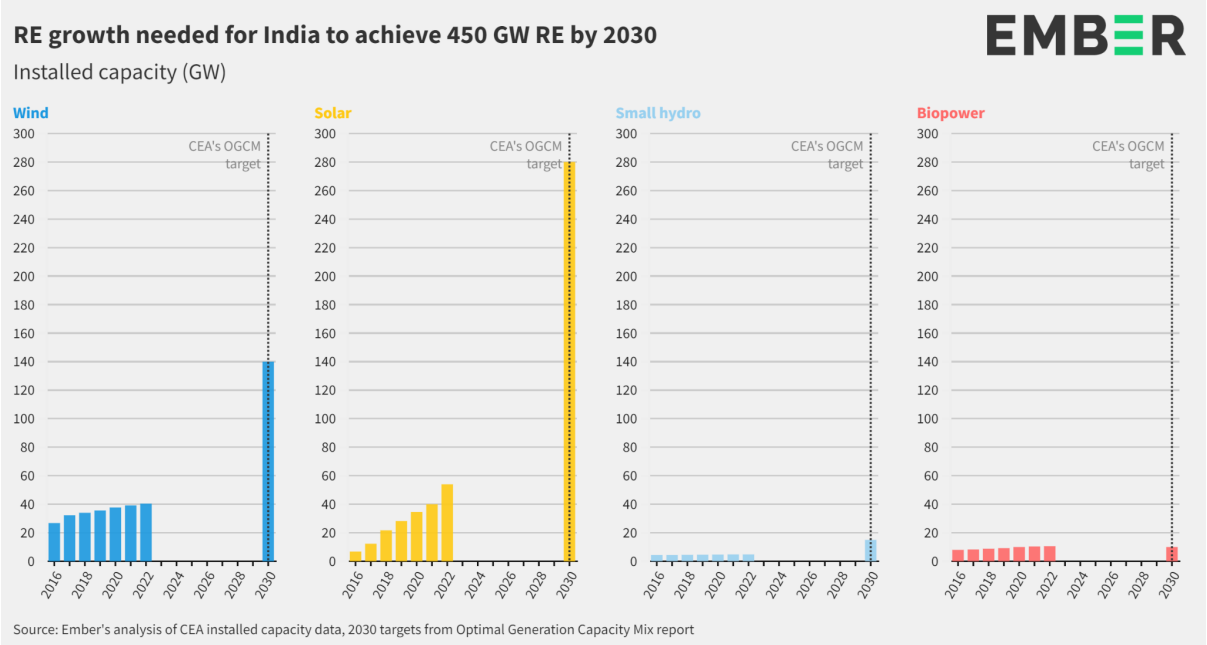
Source: Ember's analysis of physical progress data from the Ministry of New and Renewable Energy

Progress to 450GW

To achieve 450 GW RE by 2030, India needs a five-fold growth in solar, four-fold growth in wind and three-fold growth in small hydro capacity in the next eight years.

India needs to deploy 340 GW of new RE capacity to meet the 2030 target of 450 GW set in the Optimal Generation Capacity Mix report. This would mean 42.5 GW of RE addition every year on an average for the next eight years. It would require the country's solar capacity to rise to 280 GW from 54 GW and wind to rise to 140 GW from 40 GW during this period. This translates to 12.5 GW new wind and 29 GW of new solar capacity addition every year on average till the end of this decade - a far faster pace than the country's recent progress. India saw an addition of 1 GW of wind and 14 GW of solar capacity in the last 12 months (FY 2021-22).

Small hydro needs to triple from the current level of 5 GW to meet the 2030 target of 15 GW. India is ahead of the curve when it comes to biopower with its 11 GW of installed capacity, which is already more than the 2030 target of 10 GW.



Source: Ember's analysis of CEA installed capacity data, 2030 targets from Optimal Generation Capacity Mix report

Conclusion

Regional efforts should align behind national goals

There has been uneven progress across India's states in meeting their respective RE targets. A few states and UTs have surged ahead in delivering on RE targets, while most still have a long way to go.

Whilst it's likely that without large hydro, India's 175 GW target won't be met by December, it's still more than possible that India can achieve the 2030 targets of 450 GW RE and 500 GW non-fossil capacity. This will require all the states and UTs to be fully engaged and aligned with the national target.