

Renewable energy market opportunity and outlook till 2030

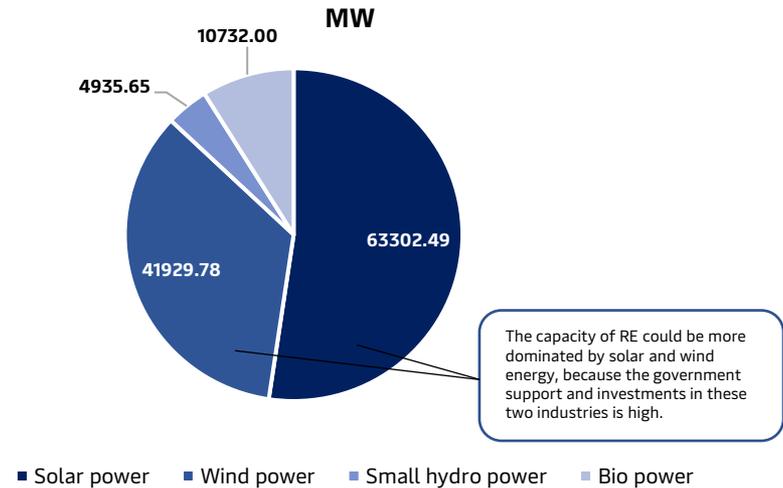


Renewable energy market in India 2022 –A know how

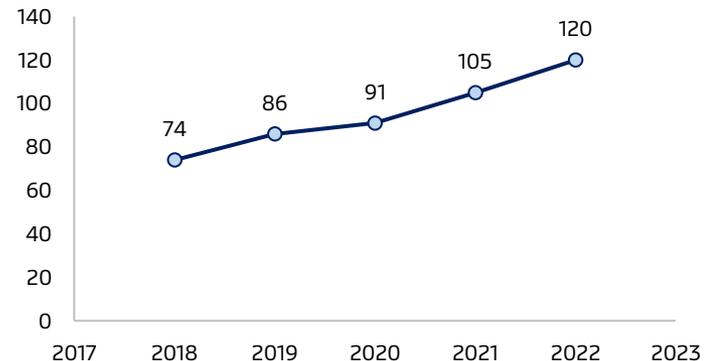
The overall renewable energy installed capacity of the world from 2016 to 2022 has reached 2006GW - 3300GW and India ranked 4th globally for the overall installed capacity of renewable energy after China, USA (325GW), and Brazil (184GW). China is the table topper with a capacity of 1063 GW in 2021, and a 33% YOY growth scenario has taken the RE capacity of China to 1414 GW in 2022. India's overall RE installed capacity is 168 GW (121 + 47 hydro) as of December 2022. India has surpassed Germany, Japan, and Canada in terms of installed RE capacity, with a gap of 11 GW, 21 GW, and 43 GW respectively. This energy gap may continue to increase as more investments are made in India in comparison to these three countries. China is the only country in Asia ahead of India in RE-installed capacity, with a huge energy gap of more than 1000 GW. So India has to come up with high capacity addition targets and massive investments to surpass China in RE capacity addition.

The Indian RE capacity has grown from 74 GW in 2018 to 120 GW in 2022, at a CAGR of 10% YOY. This growth rate of RE is primarily driven by the two main sources: solar and wind, which cumulatively capture almost 87% of the total RE install capacity as of CY 2022. Solar energy has contributed 52% of the total share of RE capacity, and wind energy has contributed 35%. The top players that are involved in RE generation are Tata Power, Adani Green Energy, Waaree Renewable, Renew Power, and Suzlon. These players have a market capitalization of 66,367 cr, 3,431,25 cr, 170 cr, 1,023 cr, and 11,273 cr, respectively. The top five states in India, which have the maximum RE installed capacity and received the highest investment by the RE players, are Rajasthan, Gujarat, Maharashtra, Karnataka, and Tamil Nadu. These states have an installed RE capacity of 20GW, 18GW, 11GW, 16GW, and 18GW respectively. The addition of RE capacity will continue as these states' governments set targets. The governments of Rajasthan and Gujarat have set targets of 30 and 38 GW of installed renewable energy capacity, respectively, by 2025, and the governments of Karnataka, Tamil Nadu, and Gujarat have also set a milestone to achieve 61, 12, and 20 GW of RE installed capacity, respectively, by 2030.

Exhibit 1: RE Installed capacity in India as of Dec 2022 in MW



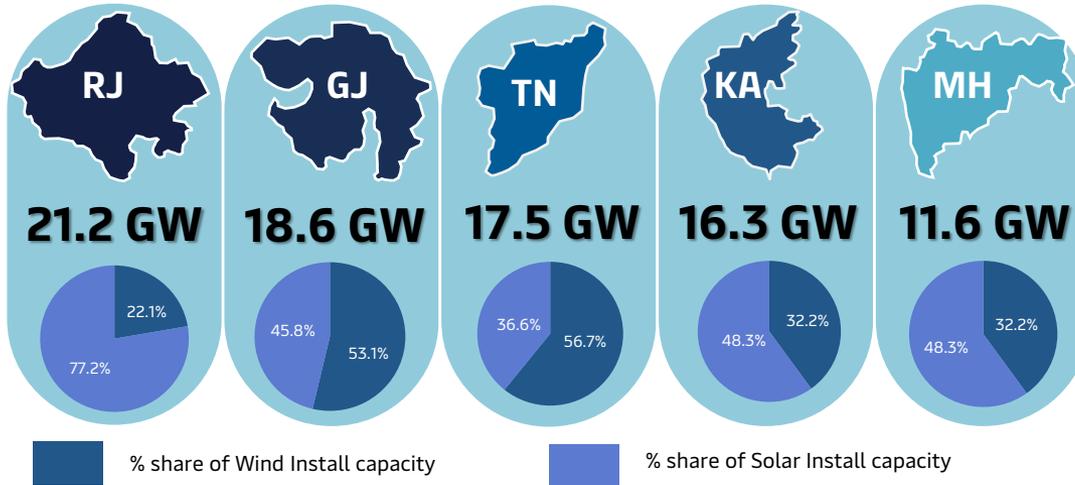
Calendar year wise RE installed capacity in GW



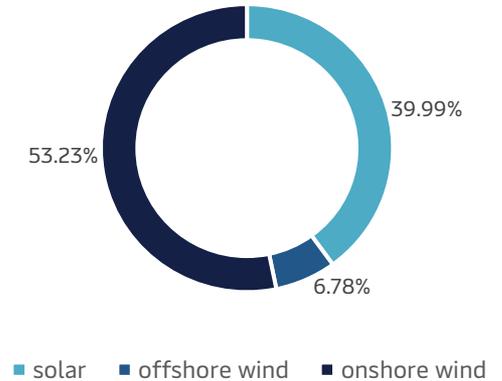
Source: CEA, Eninrac research

Exhibit 2:- Renewable energy landscape in India

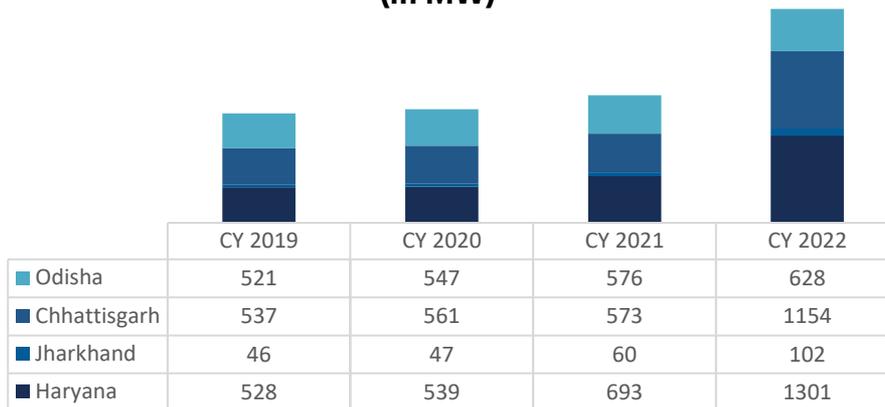
Top 5 states and their RE installed capacity as of Dec-2022 (in GW)



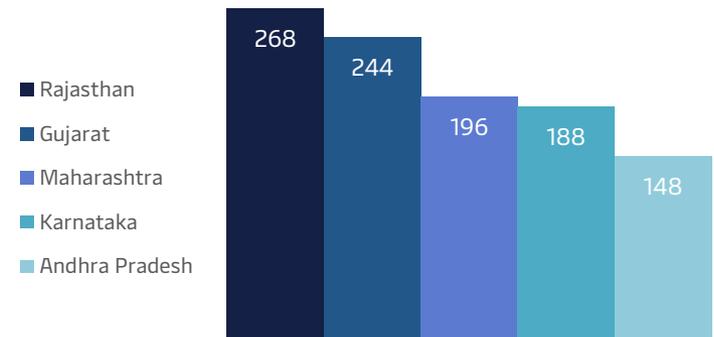
Renewable energy potential breakup as of FY 2022



Top states for maximum capacity addition in RE in previous years (in MW)



Top state and their unused RE capacity (in GW)



*including solar and onshore wind only

Why is the Indian RE sector gaining attention from domestic and cross-border players?

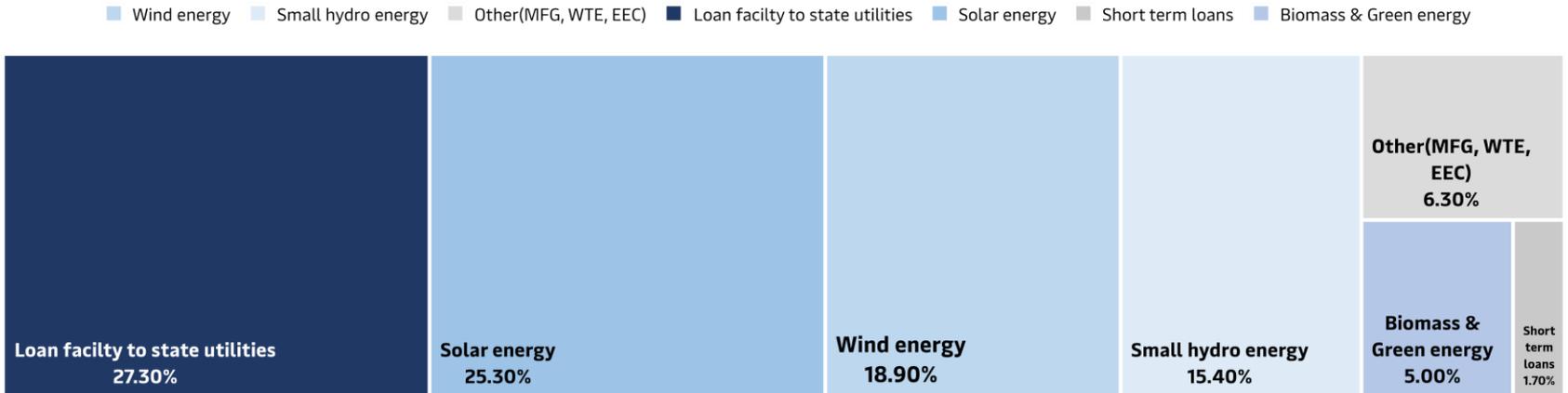
The Indian government has set a target of 500 GW of renewable energy capacity by 2030. If we assume business-as-usual in RE capacity addition until 2030, we will only have 200 GW of capacity by 2030, with a YOY growth of 10 GW. In order to meet the target, India must add at least 48 GW of RE capacity YOY. Major policies that are provided by the government to achieve the target are the PLI scheme, the RE-RTD program, the offshore policy, etc. Different state governments are also offering incentives to domestic and international private players to invest in and build RE plants in their respective states. Investment in India's renewable energy sector increased by more than 125 percent year on year to 1450 crore in the fiscal year 2022, and it is expected to exceed 12500 crores following the G20 summit. To expand the renewable energy market in India, Gujarat and Rajasthan have emerged as two of the country's top states for attracting corporate investments, inviting investments worth INR 3.98 trillion and INR 2.91 trillion, respectively, in FY 2022. While Gujarat gains from its location along the western coast and a 1600-km-long coastline, Rajasthan also shares a border with some of India's most populous states, giving it access to 40 percent of their markets, particularly in the wind & solar sectors. Different states in India, like Chhattisgarh, Jharkhand, Assam, Gujarat, and Pondicherry are promoting RE by providing easy clearances on land acquisition, generation and transmission incentives and policies, and much more. The first offshore wind project in Gujarat has been proposed by the government, in which 35 international Indian players have participated in the bidding. This step will bring foreign players' business to India. **International funding** has also been indulging in RE as SECI and the World Bank signed agreements for a ₹12,427,912,650 IBRD loan, a ₹2,317,014,392 **Clean Technology Fund** (CTF) loan, and a 1,821,040,320 CTF grant to help India increase its power generation capacity through cleaner, renewable energy sources. The agreement underscores the Government of India's commitment to achieving 500 gigawatts (GW) of renewable energy by 2030 to address the challenges of climate change. The government has also developed **GEC (Green Energy Corridor)** projects that have been longed for by the government to facilitate renewable power evacuation and reshape it for future needs. The second component of the intra-state GEC, with a target capacity of 9700 circuit km of transmission lines and 22,600 MVA capacity sub-stations, is expected to be completed by March 2023. The intra-state **GEC Phase-II** (GEC-II) scheme was approved by the CCEA in January 2022. The total target is 10750 km of intra-state transmission lines and 27500 MVA of sub-stations, with a scheduled commissioning timeline of March 2026. **GOAR (Green Energy Open Access Rules 2022)** has reduced the capacity for access to green energy from 1 MW to 100 KW, which is going to add more consumers of green energy, and the demand for green energy will automatically rise and create a market opportunity. G20 Summit 2022: At the **G20 summit in 2022**, the Indian government pledged to produce 50% of its energy from renewable sources by 2030, which means the government will be giving a great push towards renewable energy generation by introducing new eye-catching schemes, policies, and incentives for private players. The RE-RTD (Renewable Energy Research and Technology Development) program aims to increase the R&D (Research and Development) effort from FY 2022 to FY 2026 in order to promote indigenous technology development for the efficient and cost-effective deployment of new and renewable energy across the country.

Why is the Indian RE sector gaining attention from domestic and cross-border players (cont.)?

States inviting investment: The Andhra Pradesh government has invited foreign investment for a 33 GW renewable energy pumped hydropower project, for which 29 feasible locations have been identified by the government to set up the plant on 1.45 lakh acres of land in Kadapa, Kurnool, and Anantapur districts. **Major investors** in the renewable energy sector include Mahindra Susten, Spring Energy, Athena, ACME Solar, Avada, Greenco, O2 Power Pvt. Ltd., NTPC, Solar Arise, Tata Power, Inox Wind, Kshema Power, and Infra-Structure Company. **Solar Park Scheme:** To facilitate large-scale grid-connected solar power projects, a scheme for the "development of solar parks and ultra-mega solar power projects" is under implementation, with a target capacity of 40 GW by March 2024. Solar parks provide solar power developers with a plug-and-play model by facilitating necessary infrastructure like land, power evacuation facilities, road connectivity, water facilities, etc., along with all statutory clearances. As of October 31, 2022, 56 solar parks have been sanctioned with a cumulative capacity of 39.28 GW in 14 states. **Offshore wind policy:** A strategy paper including business models for offshore wind energy has been issued. This provides a roadmap for achieving the 30 GW offshore wind energy target by 2030.

Exhibit 3: Financial Highlights of Renewable Energy sector

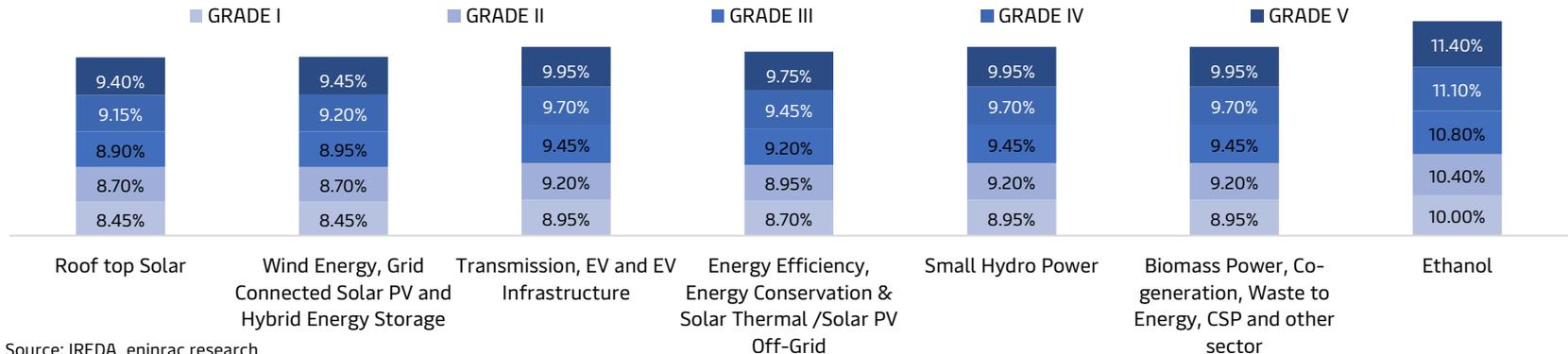
Loan Portfolio As On Oct 2022



Source: IREDA, eninrac research

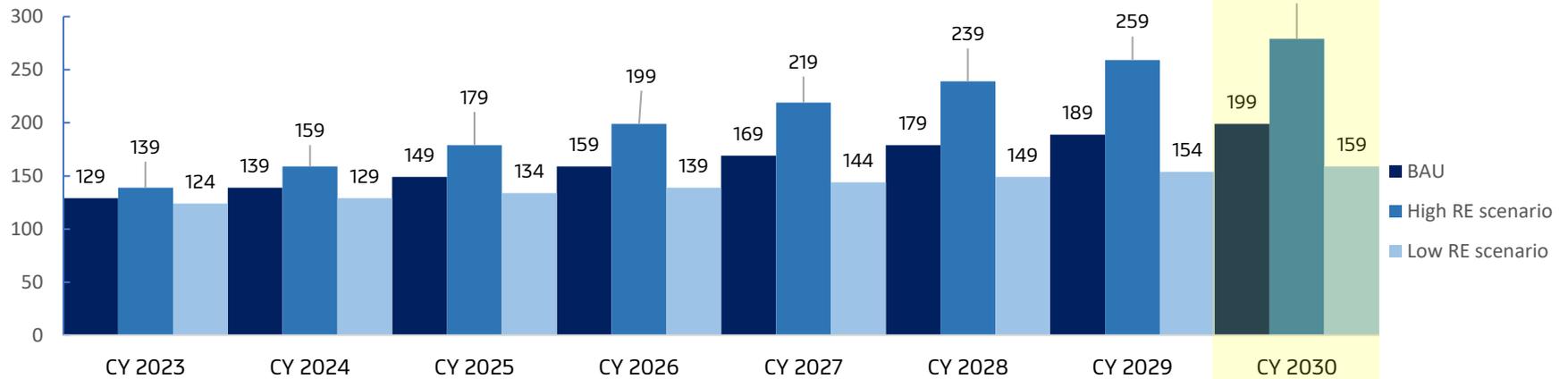
The loan facility is also supported by the Govt for the RE market players as the loan available for solar energy, wind energy, and small hydro players is 25.30%, 18.90%, and 15.40%, respectively and for state utilities is 27.30%. The loan interest has also been reduced by the Govt to support the renewable energy market as the interest on Renewable project-specific loans for CPSUs / State PSUs / JVs is between 8.20% - 8.95%. The interest on RE energy project-specific and transmission project-specific loans for state Gencos and Trancos is between 8.20% - 9.20%

Interest rate as per 17.06.2022 For private sector borrowers



Source: IREDA, eninrac research

-----500 GW-----GOI target for RE Installation till 2030----- → Eninrac Analysis



- 1) BAU scenario: YOY 10GW addition – same as over past three years
- 2) High RE scenario: YOY 20 GW capacity addition- double growth of BAU
- 3) Low RE scenario: YOY 5 GW capacity addition- half growth of BAU

Anticipated RE installed capacity outlook in India by 2030

The government of India has set a challenging goal of installing 500 GW of renewable energy capacity by 2030. If we assume that business-as-usual growth is 9.58 percent per year, then 199 GW would be installed by 2030. If we double business as usual growth, which is feasible given the government's efforts to improve RE, then 279 GW would be installed by 2030. However, due to other factors, if we only take a scenario of half the growth of additional RE capacity, then 159 GW would be feasible. The 500 GW government goal looks challenging. To meet the target of 500 GW by 2030, India must add at least 47 GW YOY (year on year). According to the Eninrac analysis, the installed capacity would be close to 199 GW.



Key signpost – What are the Key trends in the RE sector of India?

Investment in renewable energy in India reached a record of 1450 crore in FY22, an increase of 125% over FY21. Mergers and acquisitions are also having a significant impact on the growth of the RE market, with Norfund investing 900 lakhs in the ReNew Power Karnataka project for a 49% stake. The Indian multinational EPC provider has sold its 51% stake in L&T Infrastructure Development Projects to a platform backed by Edelweiss Alternatives. Actis-backed BluPine Energy acquires 404 MWp of operating solar assets in India. Sembcorp acquires Vector Green, (a Mumbai-based RE producer and OEM). NTPC and HPCL are collaborating to develop a 400 MW renewable energy power project. Bidding are also continuously becoming a trend in RE as SECI's auction for 1.2 GW of interstate transmission system connected wind power projects (Tranche-X11). Sembcorp (Green Infra Wind Energy) won the railway's energy management auction to procure 50 MW of wind power. The new upcoming hybrid wind-solar projects such as Adani green commissions 600MW hybrid project, AGEL operationalized another hybrid project of 390 MW at Jaisalmer. These steps are adding more constant power supply to the on-grid and reduce the disadvantages of the renewable energy market in India.

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**Education is not the learning of facts,
But the training of the mind to think."**

Albert Einstein

A green, irregular splat or splash shape, resembling a paint blot or a stylized starburst.

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