

# Trends and Growth Rates of Major Renewable Energy Sources: A Decadal Analysis

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Energy lies at the heart of the global economy and acts as a vital driver of both economic and social progress. The journey of nations from basic survival to modern development has been largely fueled by access to various forms of energy. Without reliable energy services, meaningful economic advancement is nearly impossible. The availability and type of energy resources in a country often shape its development level and the overall quality of life enjoyed by its people (Karpagam, 2015 and 2019).

Energy supports almost every aspect of daily life. From cooking, heating, and lighting to powering essential services such as healthcare, education, food production and preservation, transportation, industrial output, and mining. Energy is a key enabler of human activity and well-being (Karpagam, 2015 and 2019).

A common classification is to differentiate energy forms into exhaustible (depletable) and non-depletable (renewable) energy resource. Exhaustible

resources are those that diminish with use. They offer only a limited supply over time. In contrast, renewable resources can replenish naturally. For example, wind is inherently renewable, while biomass is considered renewable only when its rate of regrowth keeps pace with its rate of use (Bhattacharya, 2017 and Karpagam, 2015 and 2019).

## Renewable Energy

Major renewable energy sectors are solar and wind. Solar energy is the energy derived from the sun's radiation, which can be

converted into electricity or heat for various uses (U.S. Department of Energy, 2023). Wind energy is the process of converting the kinetic energy of moving air into mechanical power or electricity using wind turbines (U.S. Department of Energy, 2023).

## Renewable Energy Status in India

Solar power has emerged as the important source, increasing its share significantly from 28.57 per cent in 2014–15 to 82.97 per cent in 2024–25. In contrast, wind power, which held the largest share in 2014–15



at 56.38 per cent, has declined sharply to 14.45 per cent in 2024–25. Other renewable sources such as small hydro power, biomass cogeneration (bagasse and non-bagasse), and waste-to-energy contribute only marginally in 2024–25, with most showing a decline in

share compared to 2014–15 (MNRE, 2025). This shift underscores India’s strategic focus on solar energy, driven by falling costs, favorable policies, and abundant solar resources, reflecting a clear national priority toward a solar-powered future.

Figure 1, Shares of Renewable Energy in India (2014-15 and 2024-25)

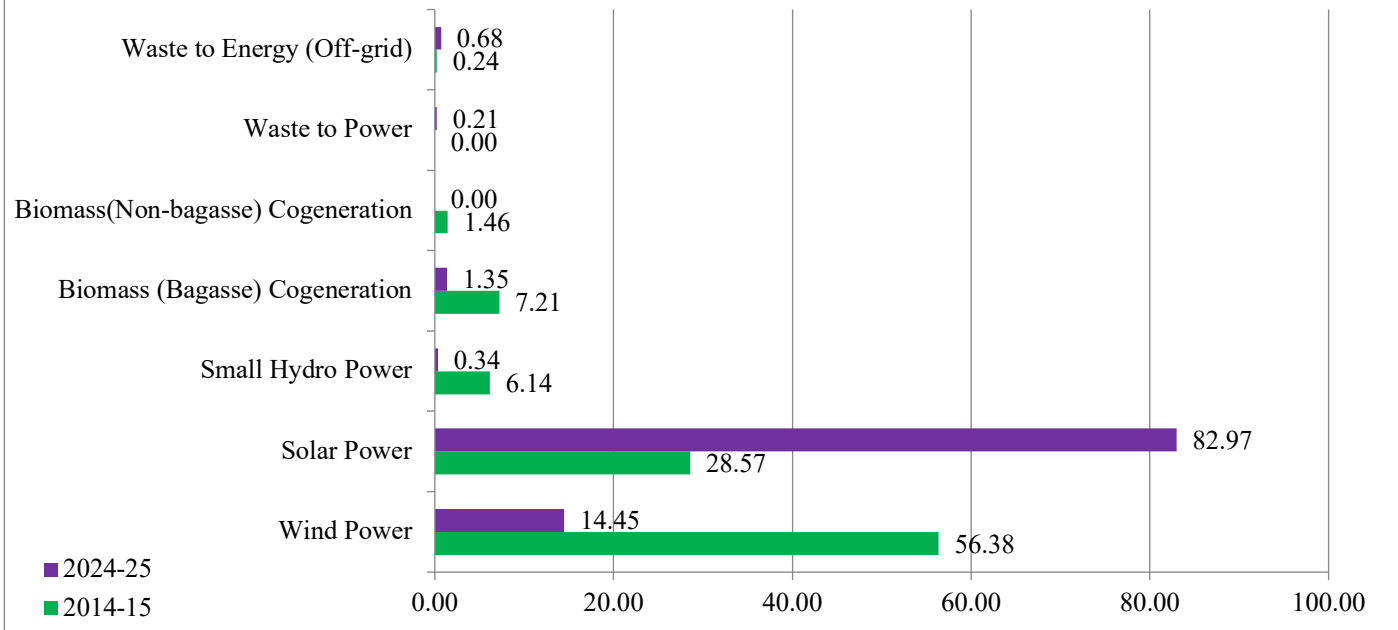
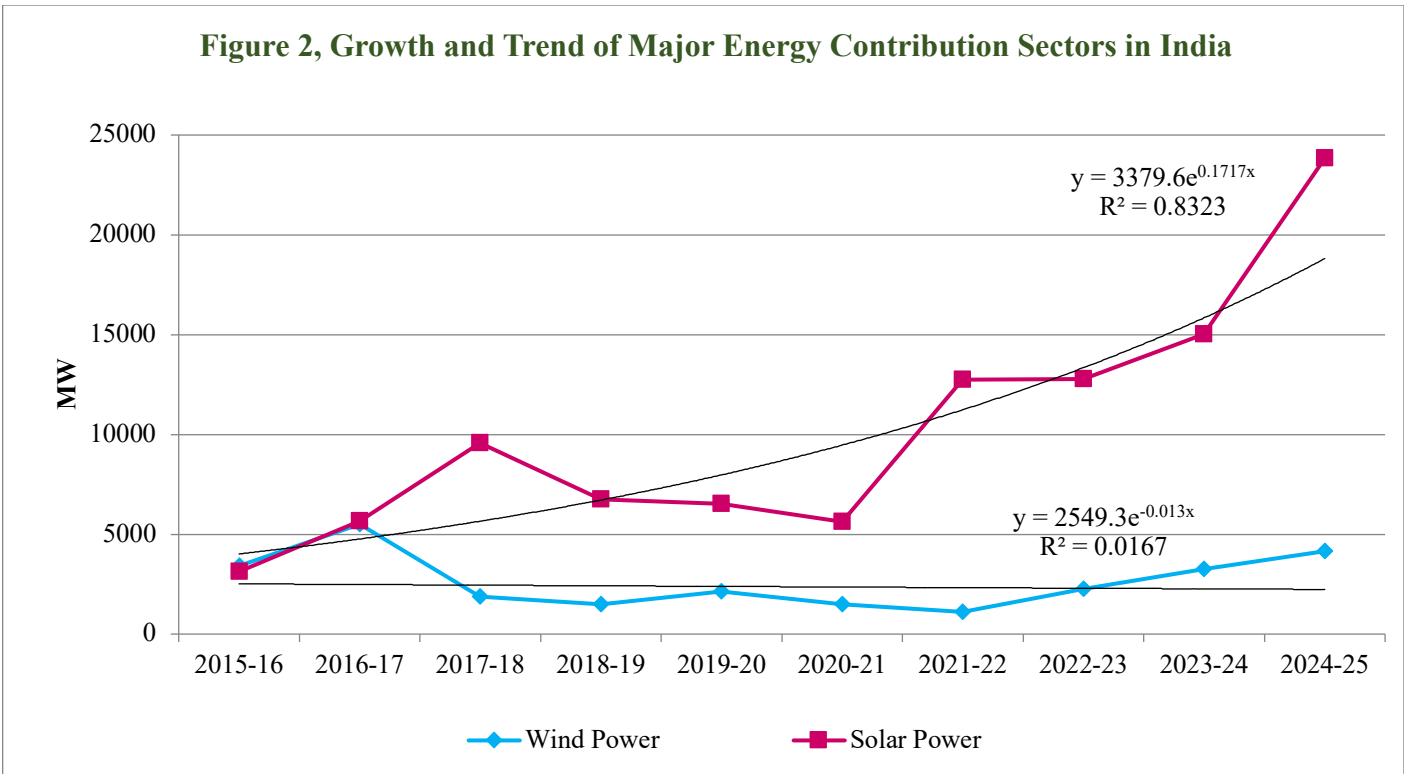


Figure 2, Growth and Trend of Major Energy Contribution Sectors in India



## Growth and Trend of Major Energy Contribution Sectors in India

Figure 2 shows the growth and trend of major energy contribution sectors in India. The installed capacity of solar energy was 3,130.36 MW in 2014–2015 and increased to 23,832.87 MW in 2024–2025, indicating a strong upward trend with a compound growth rate of 18.64 percent. In contrast, the installed capacity of wind energy was 3,423.05 MW in 2014–2015 and reached only 4,151.31 MW in 2024–2025. The trend for wind energy shows a decline, with a compound growth rate of -0.99 percent over the years. Overall, the graph highlights solar energy as the primary driver of India's renewable energy growth (MNRE, 2025).

## Conclusion

Renewable energy options, solar and wind power stand out as key contributors. In India, the renewable energy landscape has witnessed a significant shift toward solar power, which has seen remarkable growth in installed

capacity and share over the past decade. Solar energy plays a crucial role in reducing greenhouse gas (GHG) emissions and combating climate change. As a clean and renewable source, it generates electricity without releasing carbon dioxide or other harmful pollutants. India's growing reliance on solar power significantly lowers dependence on fossil fuels, which are the primary contributors to global warming. This shift supports India's climate goals under the Paris Agreement and its commitment to achieving net-zero emissions. Solar energy also improves air quality and reduces environmental degradation. Its adoption contributes to long-term energy security and resilience against climate-related risks. By replacing conventional energy sources, solar power is helping to stabilize global temperatures. Continued investment in solar technology is essential for accelerating climate action and promoting sustainable development.

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