

Renewable Energy Sector In India



Foreward

India has the 5th largest Renewable Energy Generation capacity in the world.

The Government is aiming to achieve 227GW of renewable energy capacity by year 2022. It is taking several steps to overcome challenges through policy interventions and consultations with the states. The Government has been taking several steps to overcome barriers in large scale adoption of renewable energy. The measures include easier availability of land, low-cost finance, increase in domestic manufacturing capacity, programs for skill development, and initiatives to strengthen power grid infrastructure. With the increased support of the Government and growing demand for clean energy, the sector has become attractive from investor's perspective.

This report attempts to capture an overview of renewable energy sector, Government initiatives, leading market players and use of power storage systems in large power projects.

We are sure you will find the report insightful and we hope you enjoy reading it as much as we have enjoyed putting it together for you.

Happy Reading!

Best Regards,
UJA Market Entry & Business Consulting Team



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India - World's 5th Largest Economy

5,000 year old
ancient civilization.

325 languages
spoken – 1,652 dialects.

22
official languages.

28 states,
8 union territories.

3.28 million
sq. kilometers - Area.

Stable Government
with a single party
majority, putting
emphasis on foreign
policy as a key tool for
economic development.

7,516 kilometers
- Coastline.

World's largest
democracy with
1.3 billion people.

World's second largest
pool of scientists.

World's 5th largest
economy with GDP
of USD 2.94 trillion.

World's third largest
standing army.

World's seventh
largest in area.

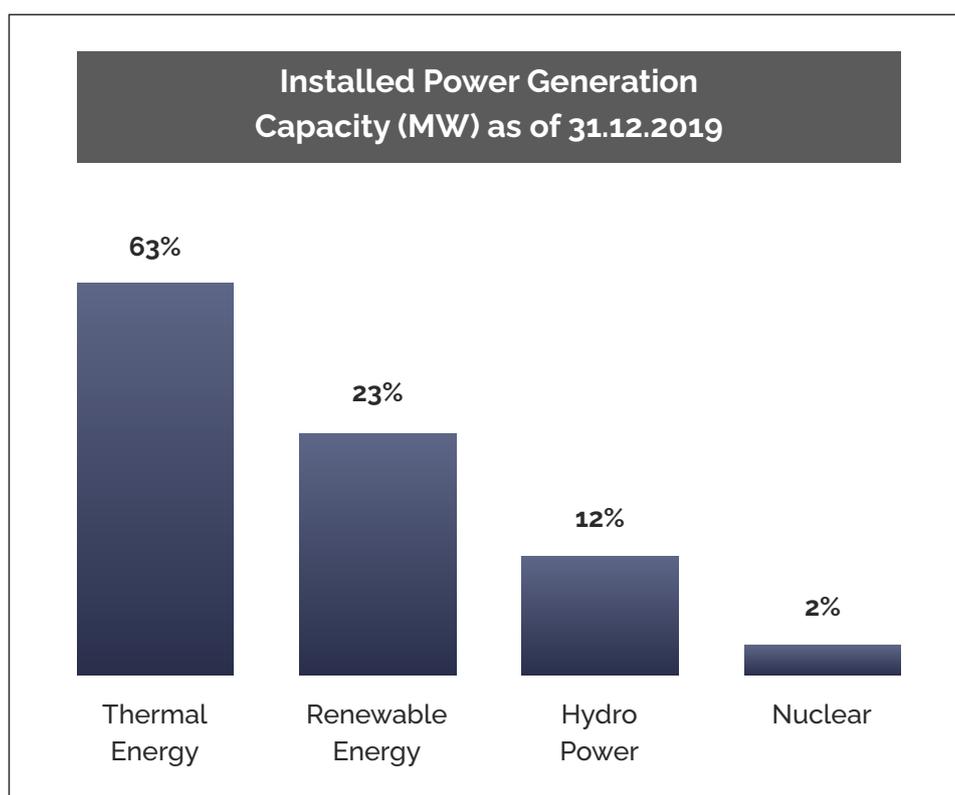
World's second
largest population.

World's largest
English speaking nation.



Total Power Generation Capacity

As of December 2019, the installed power generation capacity was 369 GW.



- Out of total power generation capacity, thermal energy accounted for 63%, which comes to around 232 GW.
- Hydro power sector accounted for 12% of total installed power generation capacity in India (~ 45 GW).
- Nuclear power accounted for 2% of the power generation capacity (~ 7 GW).
- Close to 23% of total power generation capacity was contributed by renewable energy (~85 GW).
- Several countries across the world including India have been increasingly providing impetus to increase the share of renewable energy in overall power generation capacities.

Renewable Energy Sector in India

In Climate Change Conference 2015, India submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC, outlining its post-2020 climate actions. In 2015, the Government of India set a goal of installing 175 gigawatts (GW) of renewable power capacity by 2022.

India Has



5th largest renewable energy generation capacity in the world.

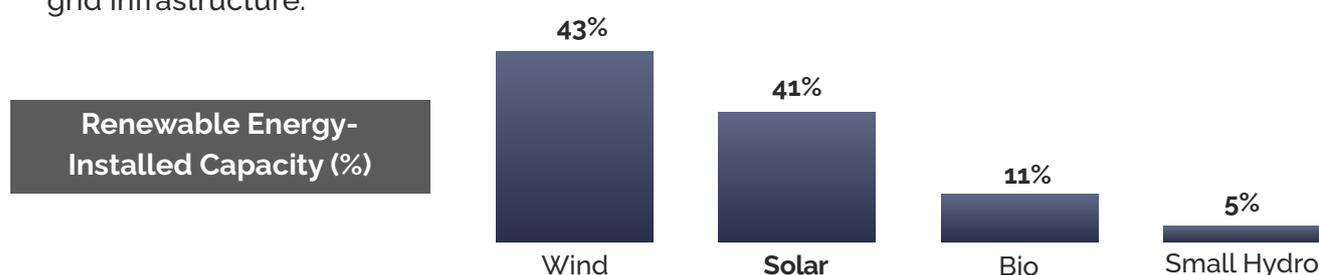


4th largest installed wind power generation capacity globally.



5th largest solar power generation capacity in the world

- As of Dec 2019, the installed capacity of renewable energy was close to 86 GW.
- During FY16 to FY20, the renewable energy capacity has increased at CAGR of 17.33% year on year.
- The Government of India is aiming to achieve 227GW of renewable energy capacity by 2022, much ahead of its target of 175 GW set in Climate Change Conference 2015.
- Amongst renewable energy sources, wind energy is the largest contributor with 43% share in total renewable energy capacity in India (~36.98 GW) as of Dec 2019.
- Solar energy is the second largest source of renewable energy in India with its share of 41% in the total renewable energy generation capacity. It comes to around 35.26 GW.
- Bio power contributed around 11% to the total renewable energy capacity in India (~9.46 GW).
- Small hydro power generation capacity was pegged at 4.3 GW (~5% of the renewable energy capacity).
- Between April 2000 and June 2020, India's non-conventional energy sector received Foreign Direct Investments (FDI) of USD 9.56 billion.
- Since the Government is aiming to achieve 227GW of renewable energy capacity, the Government is taking several steps to overcome challenges through policy interventions and consultations with the states. The Government has been taking several steps to overcome barriers in large scale adoption of renewable energy. The measures include easier availability of land, low-cost finance, increase in domestic manufacturing capacity, programs for skill development, and initiatives to strengthen power grid infrastructure.



Government Initiatives

■ Green energy corridor:

1. It is an inter-state power transmission system which is being implemented by eight renewable energy rich states in India, viz. Tamil Nadu, Rajasthan, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Himachal Pradesh and Madhya Pradesh. The project aims to strengthen the integration of renewable energy projects into grid.
2. In the Union Budget 2021-22, USD 788 million were allocated to Ministry for New and Renewable Energy and USD 41 million to the 'Green Energy Corridor' scheme.

■ Wind-Solar Hybrid policy: In 2018, Ministry of New and Renewable Energy(MNRE) adopted the National Wind-Solar Hybrid Policy to promote large grid-connected wind-solar PV hybrid projects. Several incentives are being offered to promote development of new wind -solar hybrid projects.

■ Solar parks and ultra mega solar power projects: In 2014, the Government made an announcement to set up 25 solar parks and ultra mega solar power projects (20 GW capacity). In 2017, under this scheme, the Government has proposed to enhance the capacity to 40 GW. These parks are expected to be operational by year 2022.

■ Under Union Budget 2021-22, the Government has provided an additional capital infusion of USD 137 million to Solar Energy Corporation of India (SECI) and USD 205 million to Indian Renewable Energy Development Agency.

Key Players

Key Power Producers in India

Below mentioned are the leading power producers of conventional and renewable energy in India (covering both-private and public sector).

Company	Revenues (USD Bn) 2019-20	Power Generation Capacity (MW)	Renewable (MW)
NTPC	13.76	62910	920
Adani Group	4.17	15,000	2595
Tata Power	3.97	12742	2637
JSW Energy	1.17	4559	10
Torrent Power	1.87	3879	787

Leading Wind Turbine Suppliers in India

Siemens Gamesa Renewable Energy
Suzlon
Vestas
Inox Wind
GE Renewable Energy
Envision
Senvion



Solar PV Module Suppliers in India

Risen Energy
Waaree
Znshine
Vikram Solar
Trina Solar
Renesola
JinkoSolar
LONGi Solar
Canadian Solar



Use of Power Storage Systems in Power Projects

- Irrespective of many advantages of using power storage systems in power generation projects, the adoption rate of energy storage system has been very low in India. It can be mainly attributed to high investment required and other operational difficulties.
- In India, most of the companies prefer to directly connect to the grid instead of investing in the batteries. Some of the key reasons for the same are depicted in the below chart:

98% Net Metering

With 2% of transit loss, power companies are able to bill 98 % of power generated by directly connecting the projects to the grid. Hence, the power companies usually do not prefer to invest in power storage systems unless there are some operational issues or the Government tender mentions the requirement of having power storage systems at the power plant.

Need of Inverter

Along with the power storage system/ large scale batteries, additional investment is needed to purchase and install inverters to convert power from DC-AC.

Security Issue

Power companies also need to invest in security arrangements for batteries due to rampant thefts of equipment in such large projects.

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