

## About Green Energy Portfolio

This is a basket of stocks, which will get benefit from the energy transition refers to the global energy sector's shift from fossil-based systems of energy production and consumption — including oil, natural gas, and coal — to renewable energy sources like wind and solar, as well as other sources like biofuels.



## Why should you invest in this Green Energy Portfolio smallcase?

- 1. Things like** solar panel installations, electric vehicle sales are at record highs.
- 2. Renewable electricity** is increasingly cheaper than any new power capacity based on fossil fuels, according to a report by the International Renewable Energy Agency (IRENA). Renewable energy has become competitive – and one often-overlooked reason is the reduced cost of financing.
- 3. Highest spending** – According to Goldman Sachs, spending for renewable power projects will become the largest area of energy spending in 2021.

According to the report, renewable power will reach 25% of total energy supply capex in 2021, beating out hydrocarbons for the first time ever.

**Exhibit 1: A new era for green infrastructure is coming, with renewables overtaking upstream oil & gas investment by 2021E...**  
Energy supply capex (US\$bn), and clean energy as a % of total (%)



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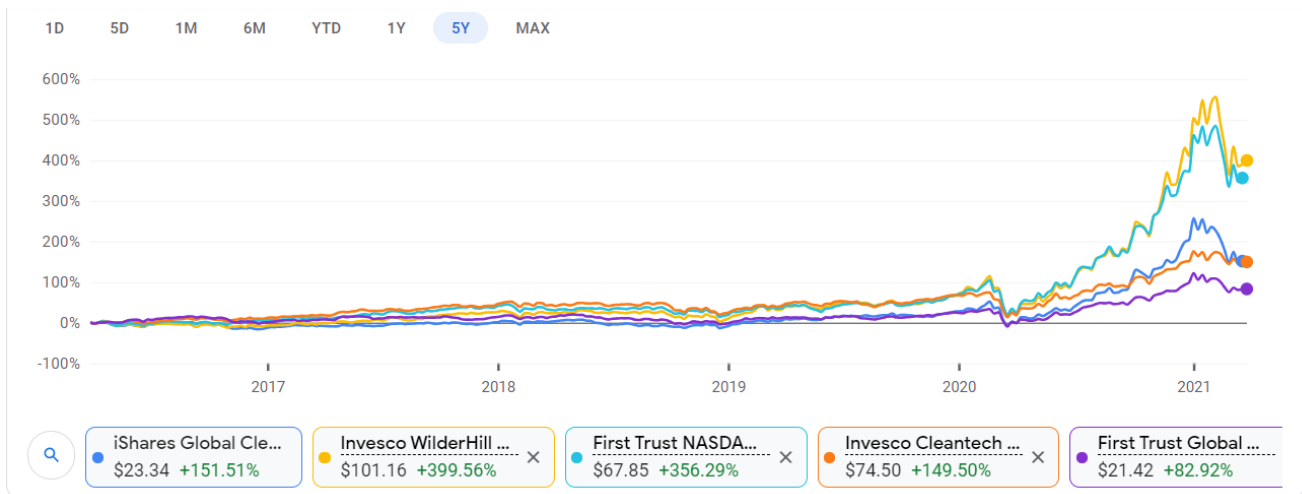
**4. Climate Change is Priority** - With Joe Biden’s presidential election victory, climate change is set to be a one of the top priority for the incoming administration. President has laid out an ambitious roadmap for decarbonizing the US economy, which includes a carbon-free power sector by 2035 and net-zero carbon emissions for the country by 2050.

More than a **hundred countries** have joined an alliance aiming for net-zero emissions by 2050.

**5. ESG factors in Investing** – Due to ESG factors in Investing, the energy transition will continue to increase in importance.

**6. Rising Share** - The Bloomberg report shows that solar and wind will increase their combined share of global generation capacity to 16% from 3% by 2030. According to a new report by Bloomberg New Energy Finance, by 2030, renewable energy sources will account for over 60% of the 5,579 gigawatts of new generation capacity and 65% of the \$7.7 trillion in power investment.

## Let have a look at the performance of Clean energy ETF's



In the last year, post covid, we have witnessed a very strong trend in the Clean energy ETF's worldwide.

### What is green energy?

**Green energy** is any energy type that is generated from natural resources, such as sunlight, wind or water. The key with these energy resources are that they don't harm the environment through factors such as releasing greenhouse gases into the atmosphere.



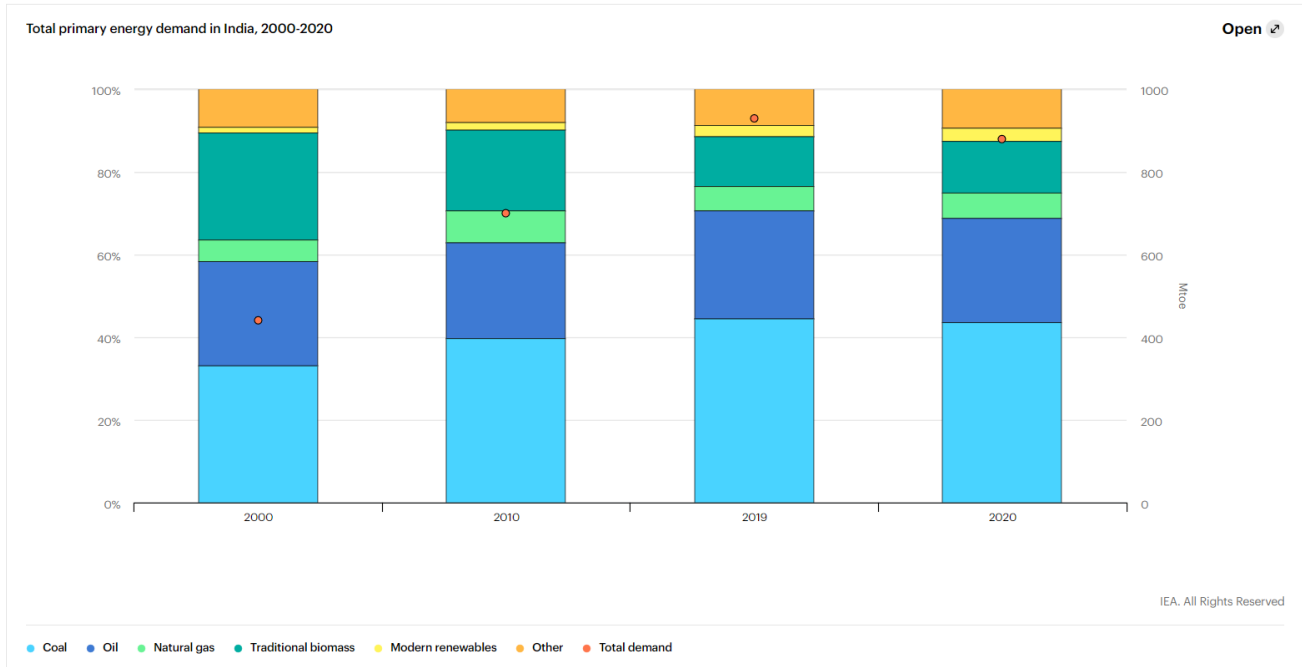
Any resource which not produce pollution like fossil fuels, is deemed green energy. Green energy sources are usually naturally replenished, as opposed to fossil fuel sources like coal, which can take millions of years to develop. Green sources also often avoid mining or drilling operations that can be damaging to eco-systems.

## Major types of green energy –

- **Solar Power** - Solar power is usable energy generated from the sun in the form of electric or thermal energy. Solar energy is captured in a variety of ways, the most common of which is with photovoltaic solar panels that convert the sun's rays into usable electricity.
- **Wind Power** - Wind power or wind energy is the use of wind to provide mechanical power through wind turbines to turn electric generators for electrical power. Wind power is a popular sustainable, renewable source of power.
- **Hydropower** - Hydropower or water power is power derived from the energy of falling or fast-running water, which may be harnessed for useful purposes.
- **Biofuels** - Biofuel, any fuel that is derived from biomass—that is, plant or algae material or animal waste. Since such feedstock material can be replenished readily, biofuel is considered to be a source of renewable energy, unlike fossil fuels such as petroleum, coal, and natural gas.
- **Biomass** - Biomass power plants use wood waste, sawdust and combustible organic agricultural waste to create energy. While the burning of these materials releases greenhouse gas these emissions are still far lower than those from petroleum-based fuels.
- **Geothermal energy** - Geothermal energy is heat within the earth. Geothermal energy is a renewable energy source because heat is continuously produced inside the earth. People use geothermal heat for bathing, to heat buildings, and to generate electricity.

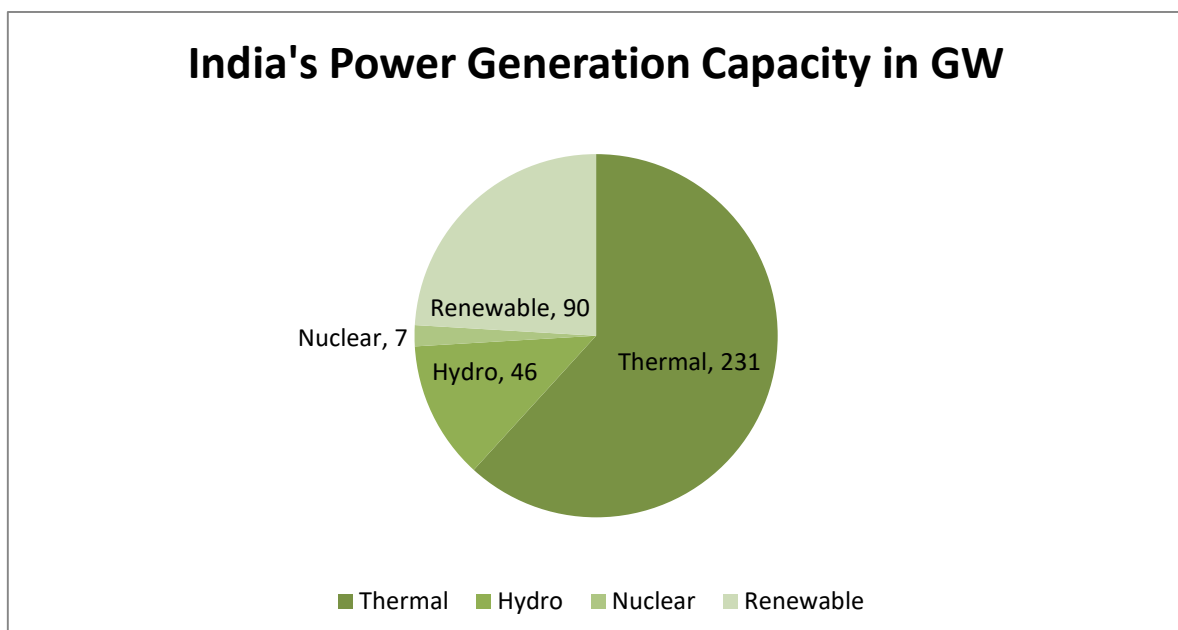
## Energy Industry in India

India is the world's third largest energy consuming country. 80% of energy demand still being met by coal, oil and solid biomass.

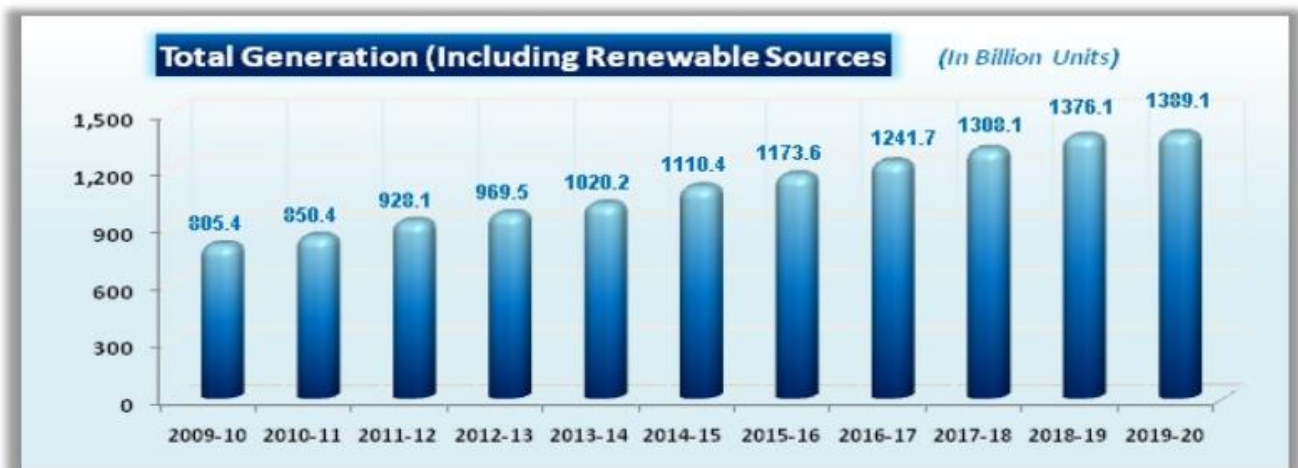


India is the world's third largest producer and consumer of electricity. India's total installed generation capacity is 374 GW, renewable form around 24% (90 GW).

## India's power generation capacity

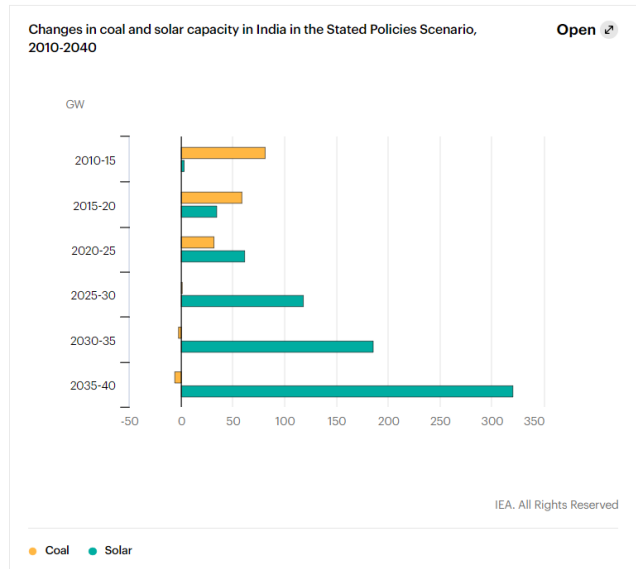
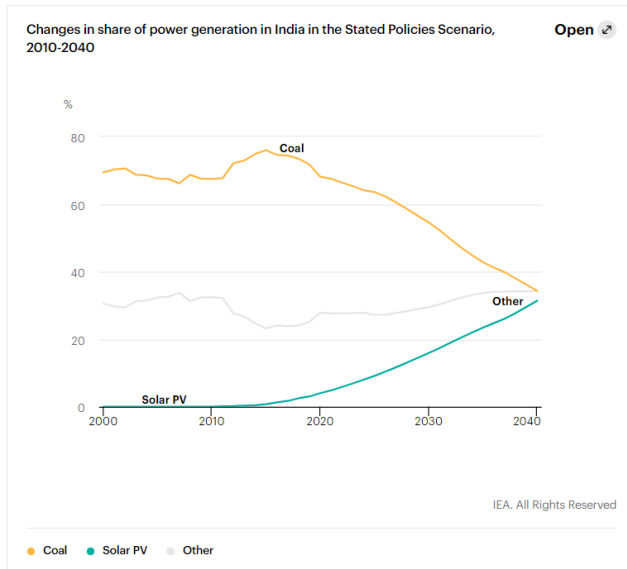


India's electricity demand is set to increase much more rapidly than its overall energy demand. On the supply side, output from renewables in some Indian states is set to exceed demand on a regular basis (typically around the middle of the day) before 2030. On the demand side, the key contributor to variability comes from rapid growth in ownership of air-conditioning units. Energy efficiency measures targeting both cooling appliances and buildings avoid around a quarter of the potential growth in consumption in the STEPS, but electricity demand for cooling still increases six-fold by 2040, creating a major early evening peak in electricity use.



**Renewable Power Generation** – Renewable form around 24% (90 GW) of total power generation capacity in India of which 40% is Solar.

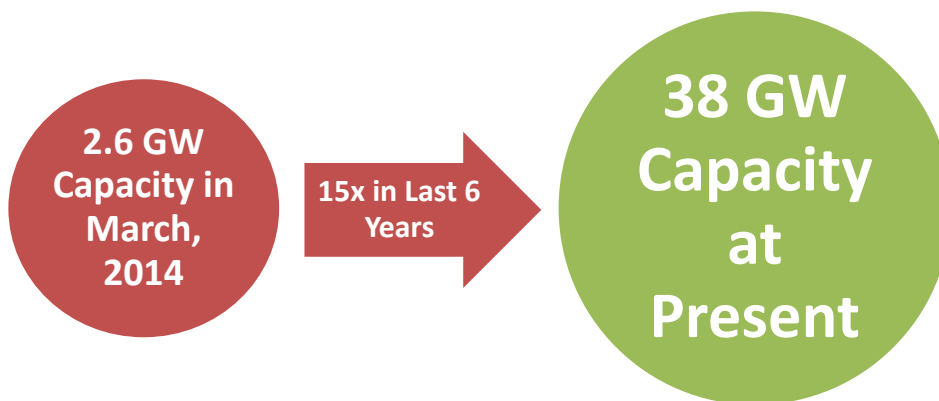
**Solar power is set for explosive growth in India**, matching coal's share in the Indian power generation mix within two decades in the STEPS – or even sooner in the Sustainable Development Scenario. As things stand, solar accounts for less than 4% of India's electricity generation, and coal close to 70%. – **Source IEA**



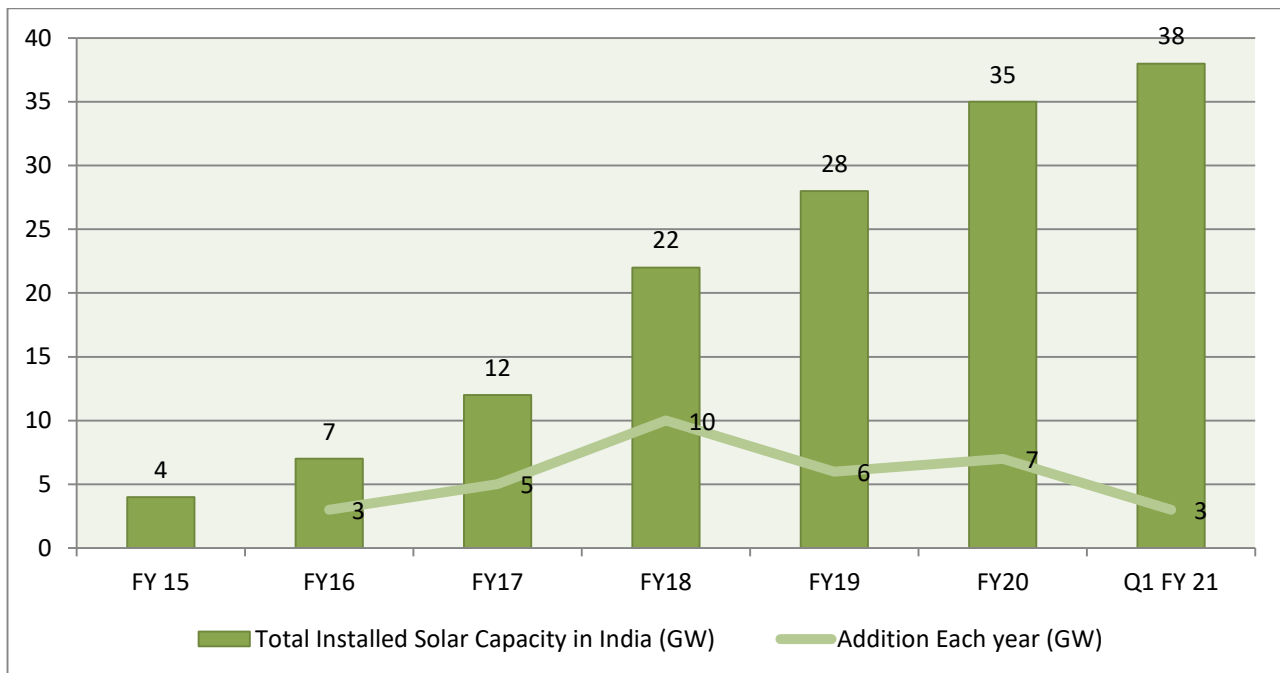
## Solar power industry in India

India's total installed capacity of solar power is 38 GW (10% of Total Capacity). India is 5<sup>th</sup> largest country in terms of total installed solar power capacity.

India's total installed capacity has increased by 15x in the last 6 years.



## Installation of Solar Power in India (From 2015 to present)



Indian Government is targeting 100 GW of installed capacity of solar power in India by 2022 and 300 GW by 2030. The government's objective is to establish India as a global leader in solar energy.

**Schemes by Government for Supporting Solar Projects** -In order to achieve the above target, Government of India have launched various schemes to encourage generation of solar power in the country like Solar Park Scheme, VGF Schemes, CPSU Scheme, Defence Scheme, Canal bank & Canal top Scheme, Bundling Scheme, Grid Connected Solar Rooftop Scheme etc.

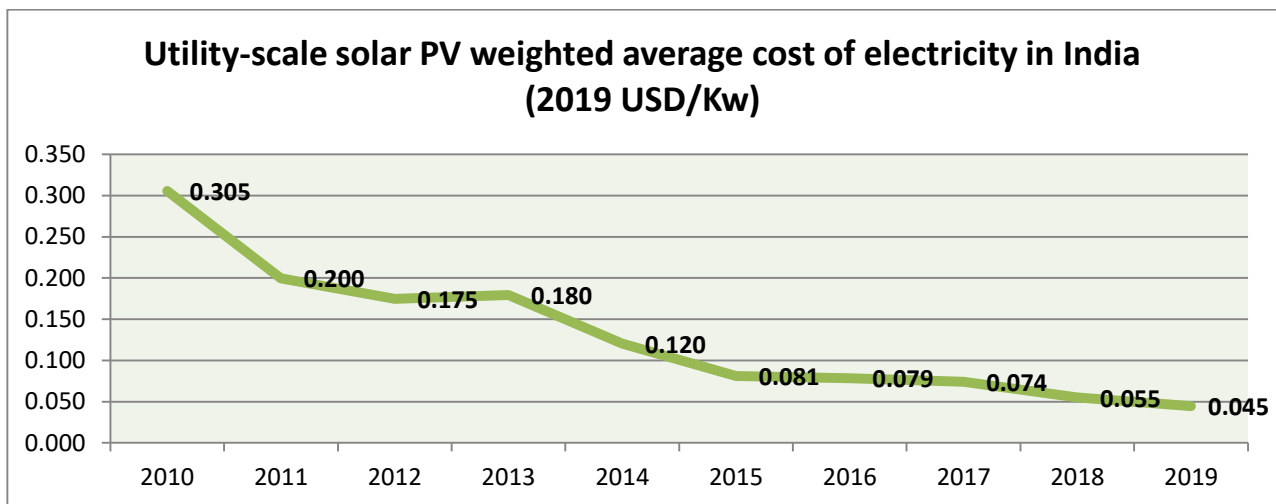
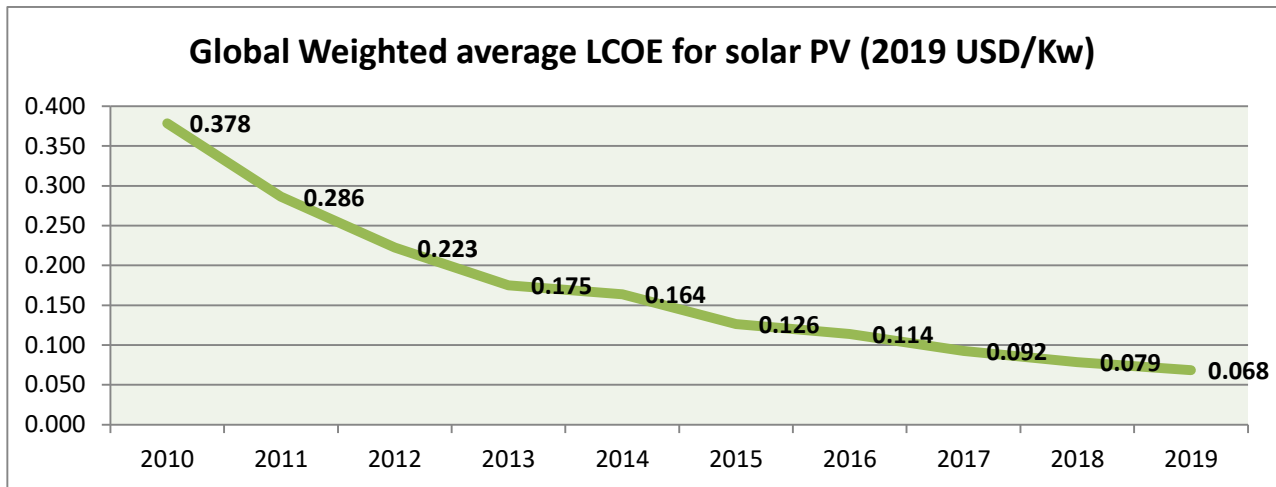
**Opportunity is very big in Solar Power** –National Institute of Solar Energy has assessed the Country's solar potential of about 748 GW assuming 3% of the waste land area to be covered by Solar PV modules.

**Government Support** -Indian government has agreed on a financing package that includes INR45 billion (US\$603 million) of investment over five years to support the domestic development of high-efficiency PV modules.

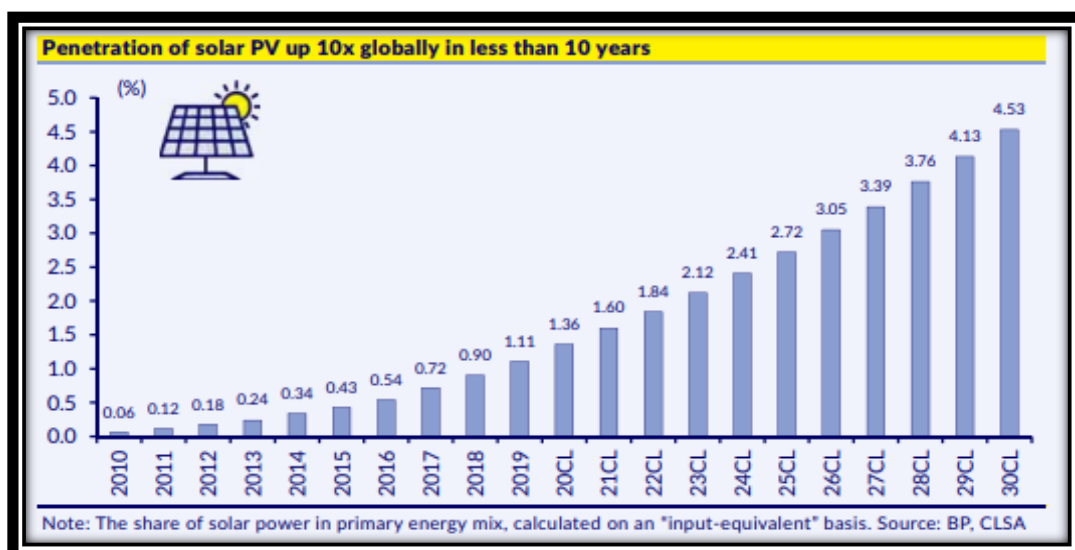
**Included in PLI (production-linked incentive) scheme** –Solar modules included in a production-linked incentive (PLI) scheme that has been green-lighted by India's cabinet in a move to help make domestic manufacturers globally competitive, create economies of scale and boost exports.



## Cost of Solar energy is decreasing



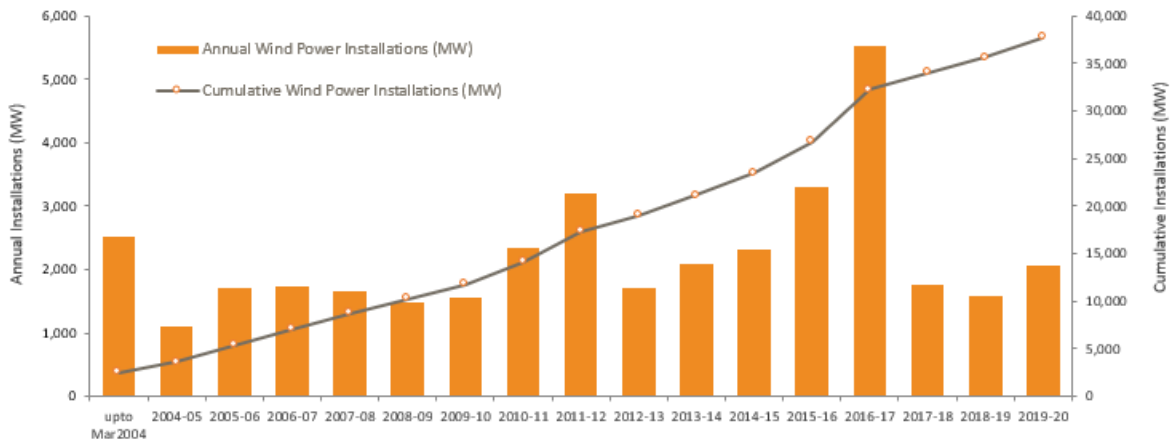
**Penetration of Solar energy is very low** – It is a long term trend, and we can expect solar energy is going to disrupt traditional energy for a very long term. The current contribution of solar energy in the total energy mix has been just 1% only.



## Wind Power

The country currently has the fourth highest wind installed capacity in the world with total installed capacity of 35.6 GW (as on 31st March 2019).

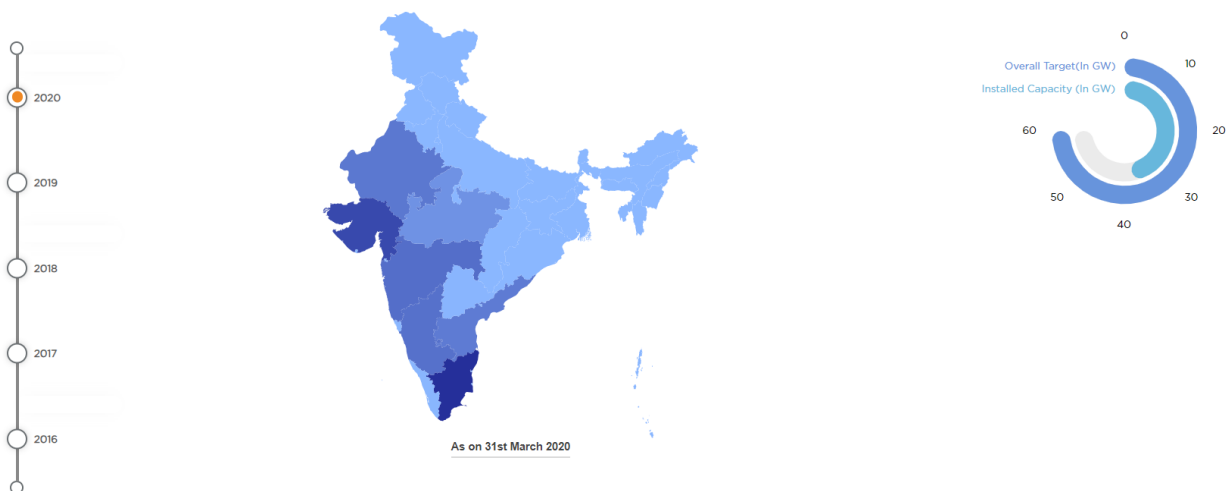
India: Wind Power Installations (MW)



Source: MNRE

Mercom India Research

## Current Status of Wind energy in India –



\*Source - <https://mnre.gov.in/wind/current-status/>

**Potential of Wind energy in India** - The recent assessment indicates a gross wind power potential of 302 GW in the country at 100 meter above ground level.

## Major Growth Drivers of Solar & Wind Industry in India

- Targets 100 GW of Installed Solar Capacity & 60 GW of Installed Wind Capacity by 2022 which is targeted to grow to 300 GW Solar Capacity by 2030

- Domestic manufacturing push by **Kusum Scheme** - 26 GW by 2022 with an incentive for farmers to install Solar Pumps/Grid Connected Projects etc.
- Focus of MNRE on Hybrid Projects (Solar & Wind)
- **Renewable Purchase Obligation (RPO)** mandates that all electricity distribution licensees should purchase or produce a minimum specified quantity of their requirements from Renewable Energy Sources.

## Biofuels

Biofuels are produced using three types of bio-based feedstock namely sugary (C molasses, B molasses, sugar syrup etc.), starchy (damaged/ surplus grains, maize etc.) and cellulosic (agri residues and biomass).

Ethanol blending rate – The higher ethanol prices – and a government proposal to bring forward the 20% blending target to 2025.

**Oil marketing companies (OMC) are set to procure 283 crore litres of ethanol from mills** for blending up to 10% with petrol in 2020-21 (December-November). This is against 167 crore, 179 crore and 150.5 crore litres in the preceding three supply years and a mere 38 crore litres in 2013-14.

**Sugar Over Production** - The Indian Sugar Mills Association has estimated diversion of 20.10 lac tons sugar for ethanol production from 'B-heavy' molasses and cane juice in the 2020-21 season. That includes 6.74 lac tons in UP, 6.55 lac tons in Maharashtra and 5.41 lac tons in Karnataka. With India's average annual sugar production of 300 lac tons outstripping domestic consumption of 255-260 lac tons, there is scope for further diversion.

**Current scenario and projection** - The government has projected the ethanol requirement for achieving 20% blending by 2025 at 900 crore litres, with sugar mills supplying 610 crore litres and grain-based distilleries the balance 390 crore litres. The average ethanol blending is expected at only 8.5% in 2020-21, with 283 crore out of the total 325 crore litres requirement being met by mills.

**Huge Demand Supply Gap** - For ethanol supply year 2019-20 oil marketing companies (OMCs) had floated a tender of 511 crore liters of ethanol in September 2019. However, in response they received supply of only 156 crore liters, leaving a huge demand supply gap. To bridge this gap, OMCs floated a second tender in January 2020 for the supply of 253 crore liters of ethanol for the period of 1st Feb – 30th Nov 2020. The huge gap in demand-supply of ethanol was further accentuated by unfavourable weather conditions.

## Risks

**Less attractive with rising interest rates** – Renewable energy is more capital intensive, the costs rise more sharply with rising interest rates.

**Slow execution of Projects** – Slower execution of projects than expectation can make an extra supply in the market, which is negative.

**Change in Government's Approach** – Change in the government's supportive approach to the renewable sector can impact growth of the industry in the country.

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