
UP GLOBAL
INVESTORS SUMMIT
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New India's Growth Engine
UTTAR PRADESH
RENEWABLE ENERGY
SECTOR

GLOBAL SCENARIO

- New cleaner sources of energy generation are needed to meet the globally accepted climate targets. More stringent regulatory requirements for a low-carbon future are compelling companies to make significant changes to their business models.
- Renewable energy technologies have earned a firm place in the investment landscape as a main strategy for many investors looking to diversify and become part of the green value chain.
- Total global renewable power capacity addition increased to 17% in 2021 to reach more than 314 gigawatts (GW) of added capacity.
- In 2021, renewables generated 28.3% of global electricity, with solar and wind power providing more than 10%.
- Modern bioenergy provided 5.3% of total global final energy demand in 2020, accounting for around 47% of all renewable energy in final energy consumption.[1]

Global renewable energy capacity (in GW)		
Category	**2020**	**2021**
Renewable energy capacity (not including hydropower)	1,672	1,945
Hydropower capacity	1,168	1,195
Solar PV capacity	767	942
Wind power capacity	745	845
Bio-power capacity	133	143

Source: UN report: GSR2022_Full_Report.pdf (ren21.net)

GLOBAL GROWTH DRIVERS

- Countries are focusing on reducing local air pollution (and carbon emissions) from the burning of fossil fuels in road transport, buildings and industry. In the face of rising energy costs, agendas also have been exploring how to use renewables to keep costs manageable.
- Rising power demand in some countries.
- In line with global trends, most city-level renewable transport targets focus on electric vehicles with around 100 cities having such targets in place.
- The global momentum towards emission reduction targets in cities further accelerated in 2021, with more than 1,100 city governments having announced targets for net zero emissions.

[1] GSR 2022 Report

INDIA SCENARIO

India's commitment in Cop26 Summit in Glasgow include increase in India's renewable energy generation capacity to 500 GW, and meet 50% of India's energy needs through renewable means by the year 2030. Also reduction of total projected carbon emissions by one billion tonnes from now to 2030. Reduction of the carbon intensity of the economy by 45 per cent by 2030, over 2005 levels. Achieving the target of net zero emissions by 2070.

- As of July 2022, India's installed renewable energy capacity (including hydro) stood at 161.28 GW, representing 39.91% of the overall installed power capacity.[2]
- From April 2016 the Installed renewable power generation capacity has gained pace especially over the past few years, posting a CAGR (Cumulative Annual Growth Rate) of 15.92% between FY16-22.
- Globally, India stands 4th in RE power capacity, 4th in Wind power, and 5th in Solar Power capacity.
- India has one of the highest rates of growth for renewable energy in the world.[3]
- The total budgetary allocation for FY 2022-23 towards the Ministry of New and Renewable Energy is INR 6900.68 cr.[4] The government allocated Rs. 19,500 crore for PLI scheme to boost manufacturing of high-efficiency solar modules.
- As of 2021, share of India's Hydropower capacity in the global capacity was 4%, and share of solar PV is 7%. India is the second largest market in Asia for new solar PV capacity, and third globally.
- India is among the main countries with existing mini-grids: Afghanistan (4,980), Myanmar (3,988), India (2,800), Nepal (1,519) and China (1,184).[5]
- 45 solar parks of aggregate capacity 37 GW have been approved across India.[6]

Installed renewable energy capacity in India (in GW)		
FY20	**FY21**	**FY22**
87.02	94.43	116.89

Source: IBEF Presentation

Renewable Capacity Breakup in India (GW) – as of April 2022		
Category	**Installed capacity**	**Potential**
Wind power	41.66 GW	102 GW
Solar power	60.813 GW	750 GW
Bio power	9.433 GW	25 GW
Small hydro power	4.899 GW	20 GW

Source: IBEF Presentation

India's investment in Renewable Power and Fuels (USD billion)			
2018	**2019**	**2020**	**2021 -2022**
10.6	9.6	6.6	14.3

[2]Renewable Energy - IBEF
[3]MNRE Annual Report 2020
[4]Make in India
[5]GSR 2022 Report
[6]Renewable Energy in India – Invest India

- New investment in renewables increased 70% to USD 11.3 billion in 2021, with notable jumps in solar PV (up 68% to USD 7.5 billion) and wind power (up 92% to USD 3.4 billion).
- India ranked among the world's top 10 countries for additions in 2021, rising one step to place ninth. Nearly 1.5 GW was installed, representing a 30% increase over 2020 additions, for a total approaching 40.1 GW (all onshore)
- Foreign Direct Investment inflow in the Indian Non-conventional energy sector stood at US$11.62 billion between April 2000-March 2022

SECTOR POLICIES

- Rooftop Solar Programme Phase-II targets 4000 MW rooftop solar capacity addition in residential sector.
- Ministry of Power's policy on "Biomass Utilization for Power Generation through Co-firing in Coal based Power Plants" issued in October 2021 mandated all thermal power plants in the country to use 5 to 10% biomass along with coal for power production.
- Central Public Sector Undertaking Scheme Phase II aims to set up a 12 GW grid-connected Solar photovoltaic Power projects. The support offered by the central government is VGF of up to INR 70 lakhs/ MW.
- Central Finance Assistance under the Biogas based Power Generation and Thermal Application Programme varies from INR 25,000 per kW to INR 40,000 per kW for power generation as per the generation capacity slab and INR 12,500 per kW to INR 20,000 per kWe for thermal applications respectively.
- Under the 'Programme on Energy from Urban, Industrial and Agricultural Waste/Residues' Scheme, Central Financial Assistance is provided for: Biogas generation, BioCNG generation, Power generation based on Biogas, and Biomass Gasifier.
- PLI Scheme in High-Efficiency Solar PV Modules Sector was approved with a financial outlay of INR 4500 cr over a five-year period for Enhancing India's Manufacturing Capabilities and Enhancing Exports. Expected outcomes/ benefits from the scheme are - Additional 10,000 MW capacity of integrated solar PV manufacturing plants; Direct investment of around 17,200 cr in setting up solar PV manufacturing projects; Direct employment of about 30,000 and Indirect employment of about 1,20,000 persons; Import substitution of around 17,500 cr every year; Demand of 17,500 cr over 5 years for 'Balance of Materials'.
- FDI up to 100% is permitted in the renewable energy sector under the Automatic route and no prior Government approval is required.[7]
- Wind-solar hybrid policy: Aims to achieve a hybrid wind-solar capacity of 10 GW by 2022. Hybridisation of the two technologies will help in minimizing variability, and optimal utilization of infrastructure including land and transmission systems.
- Repowering policy promotes optimum utilization of wind energy resources by creating a facilitative framework for repowering. Providing interest rate rebate of 0.25% over and above the existing interest rate rebate offered to new wind energy projects.
- In October 2021, India and the UK agreed on a joint plan for smart power and renewable energy projects. In June 2021, India launched the Mission Innovation CleanTech Exchange, a global initiative that will create a whole network of incubators across member countries to accelerate clean energy innovation.
- Development of Solar parks and ultra mega solar power projects.[8]
- Suryamitra Training: Ministry launched Suryamitra Skill Development Programme in the year 2015 to train 50,000 Suryamitras by the year 2020 and trained 47,166 Suryamitras by March 2020.[9]

[7] Make in India
[8] IBEF
[9] MNRE Annual Report 2020

MAJOR ONGOING SCHEMES

- Pradhan Mantri Kisan Urja Suraksha Evam Utthan Mahabhiyan scheme is one of the largest initiatives in the world to provide clean energy to more than 3.5 million farmers by solarising their agriculture pumps. It aims to install grid connected ground mounted solar power plants to support installation of additional solar capacity of 30.80 GW.
- Roof Top Solar Programme Phase-II was launched in February 2019 with a target of achieving cumulative capacity of 40,000 MW by the end of 2022. Central Financial Assistance of Rs 14588/- per KW up to 3 kW and of Rs 7294 per KW for capacity above 3 KW to 10 KW is provided in Residential sector . So far over 7.5 GW capacity of RTS capacity has been estimated to have been installed in the country and over 2.6 GW capacity is under installation in the residential segment.
- Solar Parks programme was introduced to facilitate solar project developers to set up projects in a plug-and-play model. The scheme has a target capacity of 40 GW and all states and Union Territories are eligible for getting benefit under the scheme.

UTTAR PRADESH SCENARIO

- Uttar Pradesh has a solar Potential of 22.38 GW.
- The State has total tied up capacity of 39191 MW, out of which 30003 MW is currently operational and balance is likely to be commissioned in next 3-4 years.
- In the Commissioned operational thermal capacity 30003 MW. Of this, 5616 MW is from State utilities, 16329 MW (private utilities) and 8059 MW (central utilities).
- Thermal power contributed 20130 MW to the state's total installed operational power generation capacity, followed by 3,783 MW (hydropower), 549 MW (Gas power) and 5541 MW (renewable power).
- As of September 2022, solar installations in Uttar Pradesh stood at 2,379 MW.
- As UP is the largest producer of sugarcane and second largest producer of rice in India, the by-product bagasse and rice musk form abundant raw material base for power production in the state.

Approved Solar Parks in UP as in December 2020		
Solar Parks	**Capacity (MW)**	**Land identified at**
Solar Park in UP	440	Orai & kalpi Tehsils of Jalaun, Meja tehsil of Allahabad, Chaanbe tehsil of Mirzapur and Akbarpur tehsil in Kanpur Dehat districts
Jalaun Solar Park	1200	Tehsil Orai, district Jalaun of Uttar Pradesh
Lalitpur Solar Park	600	Lalitpur district, Uttar Pradesh
Jhansi Solar Park	600	Jhansi district, Uttar Pradesh
Chitrakoot Solar Park	800	Chitrakoot district ,Uttar Pradesh

Source: MNRE Annual Report 2020_Changes File_18.03.201.indd

Grid connected rooftop solar plants installed in UP as in September 2022	
DISCOM/Electricity Department	**Capacity installed as on 30.9.2022 (in MW)**
Madhyanchal Vidyut Vitran Nigam	258.78
Puravanchal Vidyut Vitran Nigam	
Paschimanchal Vidyut Vitran Nigam	
Dakshinanachal Vidyut Vitran Nigam	
Kanpur Electricity Supply Co. Ltd.	
Noida Power Co. Ltd	
Torrent Power	

Source: MNRE site physical Achievement

Capacity of off grid solar applications installed in UP as on 30.9.2022					
Category	Solar Home Light (Nos)	Solar lamp (Nos)	Solar Street Light (Nos)	Solar Pump (Nos)	Solar Power Plant (kW)
Capacity	235909	2346365	31,9355	36494	10638.31
Capacity installed (KW)	0	16282	12700	92357	0

Source: UPNEDA

Small Hydro Power projects in UP (as on 31.12.2021)							
Total potential		Projects installed					
Nos.	Total capacity (MW)	Upto 2019-20		2020-21		Total	
		Nos.	Capacity (MW)	Nos.	Capacity (MW)	Nos.	Capacity (MW)
251	460.75	9	25.10	1	24	9	49.10

Source: MNRE Annual Report 2020_Changes File_18.03.201.indd

Potential and cumulative achievements of biogas plants in UP (under NNBOMP up to 31.01.2021)	
Estimated Potential (Nos. of Biogas Plant units)	Cumulative achievement up to 2020-21 (31/03/2021) (Nos. of Biogas Plant units)
1938000	441131

Source: MNRE Annual Report 2020_Changes File_18.03.201.indd

GREEN ENERGY CAMPAIGNS IN UTTAR PRADESH

- UP energy saving campaign has been developed to create public awareness and to motivate schools to adopt energy efficient equipments and practices, as well as to indicate healthy energy usage behaviour. The objective of this campaign is to reduce demand of energy in Uttar Pradesh.
- Perform Achieve and Trade (PAT) scheme is a market-based compliance mechanism to accelerate improvements in energy efficiency in energy-intensive industries. The energy savings achieved by notified industries is covered into tradable instruments called Energy Saving Certificates (ESCerts).
- In Uttar Pradesh, total 11 Industries/Establishments (10 New Industries/Establishments from Cement, Paper & Pulp, Textile, Commercial Buildings (Hotels), and 01 Industry from the Petroleum Refinery sector previously notified in PAT Cycle-II) have been notified under PAT cycle-VI on the 13th April 2020.
- In Uttar Pradesh, total 36 Industries/Establishments (01 new Railway Workshop & 01 new Private DISCOM and 34 Industries/Establishments from Aluminium, Cement, Chlor Alkali, DISCOMs, Iron & Steel, Pulp & Paper, Railways, Textile, Thermal Power Plant previously notified in PAT Cycle-II & PAT Cycle-III) has been notified under PAT cycle-VII on 21st Oct 2021 and 26th Sep 2022.

STATE POLICIES

UTTAR PRADESH SOLAR ENERGY POLICY 2022

The Government of Uttar Pradesh in November 2022 adopted the Uttar Pradesh Solar Energy Policy - 2022 policy with the main focus to provide low cost and reliable power to the people of UP, and to reduce the dependence on fossil fuels and achieve renewable power.

- The Policy aims to achieve a target of 22000MW Solar Power Projects up to 2026-27.
- UP will develop Solar Power Projects for captive consumption and sale of power to third parties other than Uttar Pradesh Power Corporation Ltd, Interstate and Intrastate.
- Development of Solar Parks.
- Green Energy corridor is being set up in Bundelkhand Region of the State to facilitate evacuation of power of 4000 MW capacity solar projects which is amenable for enhancement in capacity depending on the Private investment.
- 100 % exemption on Stamp duty on the land used for setting up of solar power plant/solar park.
- 100% exemption in Electricity duty for 10 years.
- 30000 youth to be trained as Surya Mitra at UPNEDA training centres in the next 5 years.
- To encourage Utility scale solar systems with four hours battery storage systems with State Subsidy @ Rs 2.50 Cr/MW available.
- Solar Rooftop installations in residential sector will be encouraged. About 13.50 lakh houses to be covered with Solar Rooftop power plants during the Policy Period.
- Ayodhya to be pilot Model Solar City .Thereafter sixteen Nagar Nigam cities to be developed as Solar Cities.
- Solarization of Segregated Agriculture Feeders and Grid connected Private Tube wells.
- Government Buildings and Government PSU Buildings, schools, Govt colleges, Technical Institutions and Universities across the State shall be covered with Solar Rooftop Plants in phased manner.

UTTAR PRADESH STATE BIO ENERGY POLICY 2022

The Government of Uttar Pradesh in September 2022 declared the policy with the main objective of encouraging setting up Compressed Biogas Plants ,Bio Diesel production plants and Bio Coal production plants utilising Bioenergy waste.

- Main incentives available on setting up these plants in addition to incentives available from Govt of India .
- Incentive of Rs 75 lakh/tonne to the maximum of Rs 20 Crore on setting up Compressed Biogas (CBG) Production Plant.
- Incentive of Rs 75000/tonne to the maximum of RS 20 Crore on setting up of Bio-Coal Production Plant.
- Incentive of Rs 3 lakh/ to the maximum of Rs 20 Crore on setting up Bio diesel Production Plant .
- State subsidy available to the tune of 30 % of cost maximum Rs 20 lakhs on procurement of Bailer Recker and trolley equipment's. This subsidy will be available in addition to 50 % subsidy available from Central Government in Agriculture mechanisation scheme.
- Financial support available as Infrastructure subsidy on construction of maximum 5 KM of Approach road with maximum investment of Rs 50 Crore.
- Exemption on development charges levied by development authorities.
- Exemption of 100 % Stamp duty and Electricity duty.
- Government land on lease rent of Rs 1 per acre per annum available for setting up Bio Energy industry and storage of feedstocks.
- Permission under change in land use and Land ceiling Act deemed .

INVESTMENT OPPORTUNITIES

- Setting up of Solar Power Plant for captive use or third party sale
- Setting up Solar Rooftops under RESCO mode for sale of Power .
- In development of Solar City
- Bio Ethanol manufacturing & blending units
- Green Hydrogen manufacturing units

KEY PLAYERS IN UTTAR PRADESH

M+ SOLAR by PETRONAS | adani Power | Azure | एनटीपीसी NTPC | AVAADA

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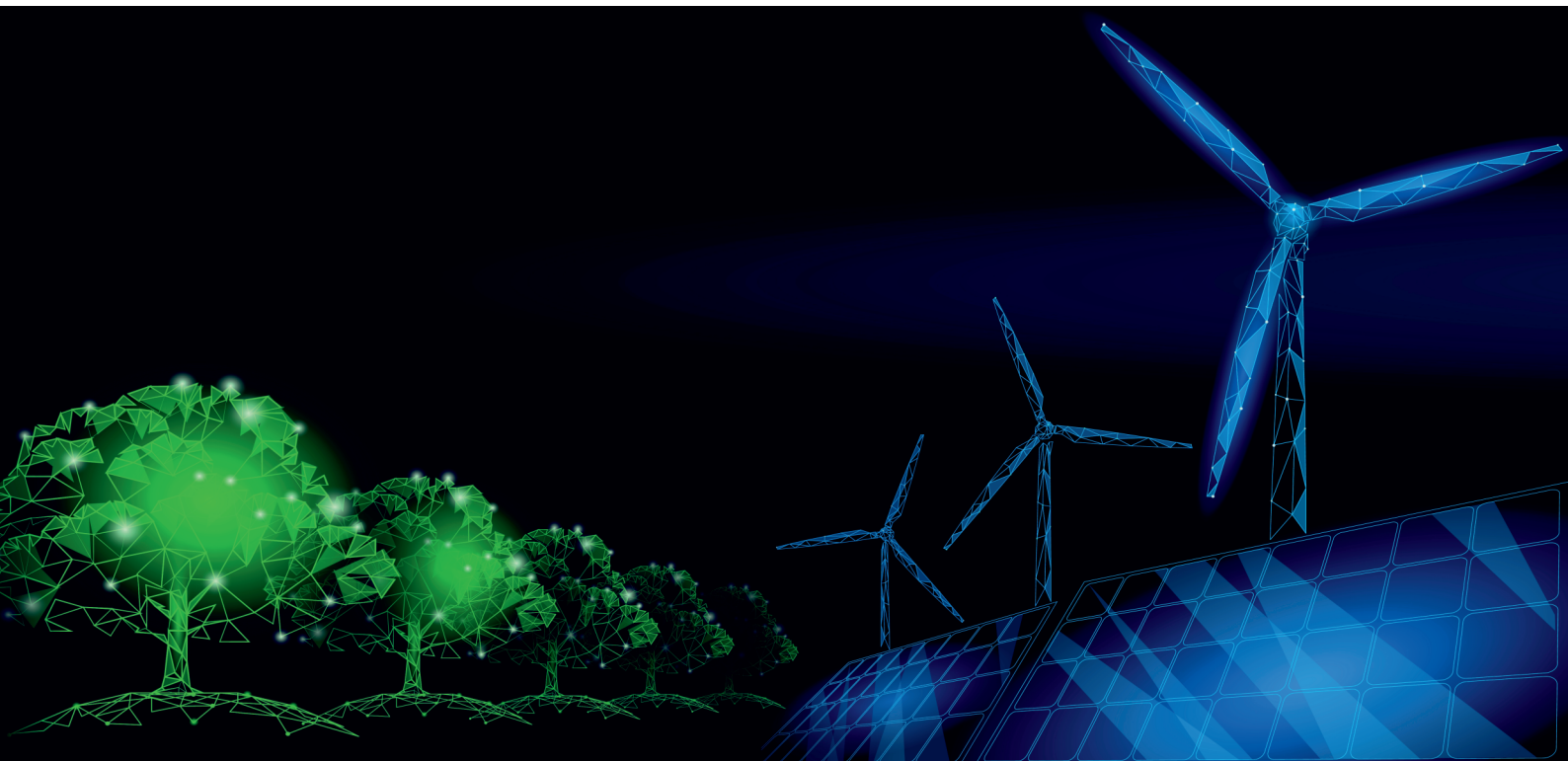

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