



Source: NRDC ©

Discussion document

India & Renewable energy

Rise of renewable energy in India and a supply side perspective

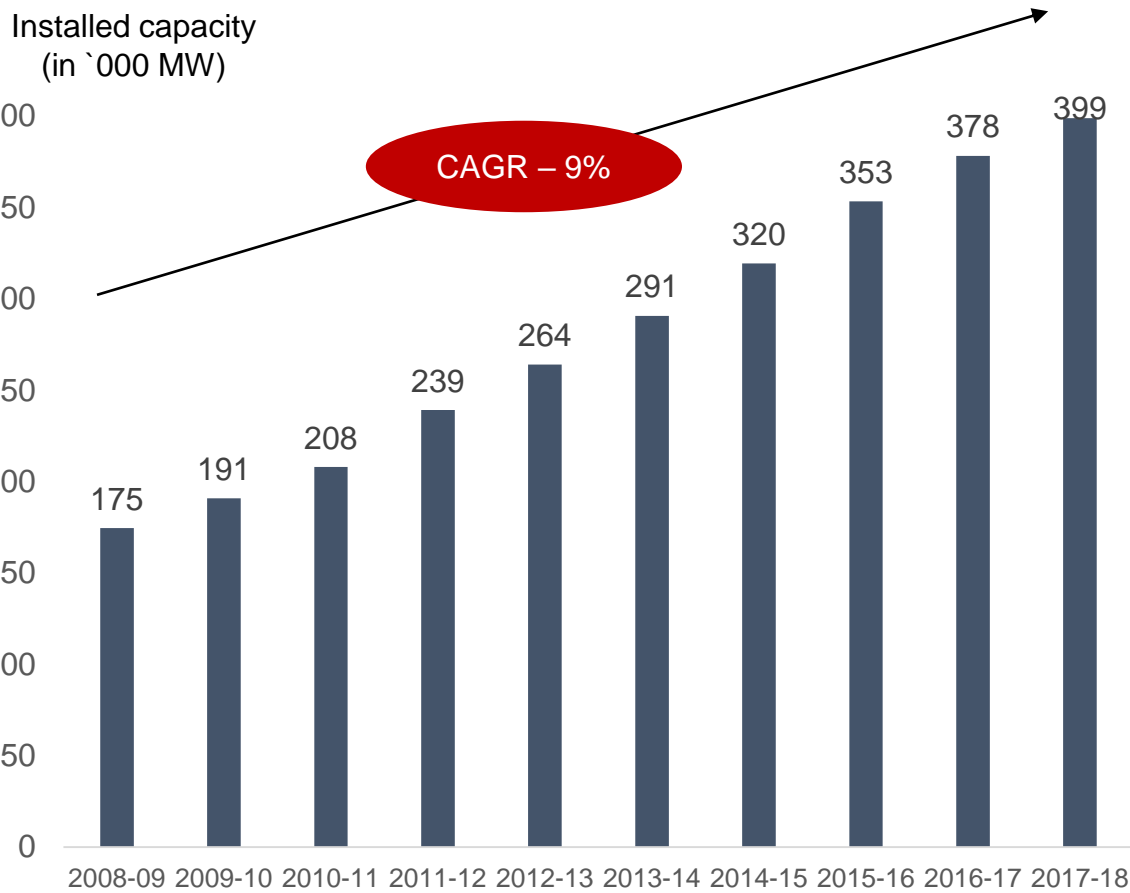
Delhi, India
February 2019

This report is solely for the use of client personnel. No part of it may be circulated, quoted, or reproduced for distribution outside the client organization without prior written approval from the author. It is not a complete record of the discussion.

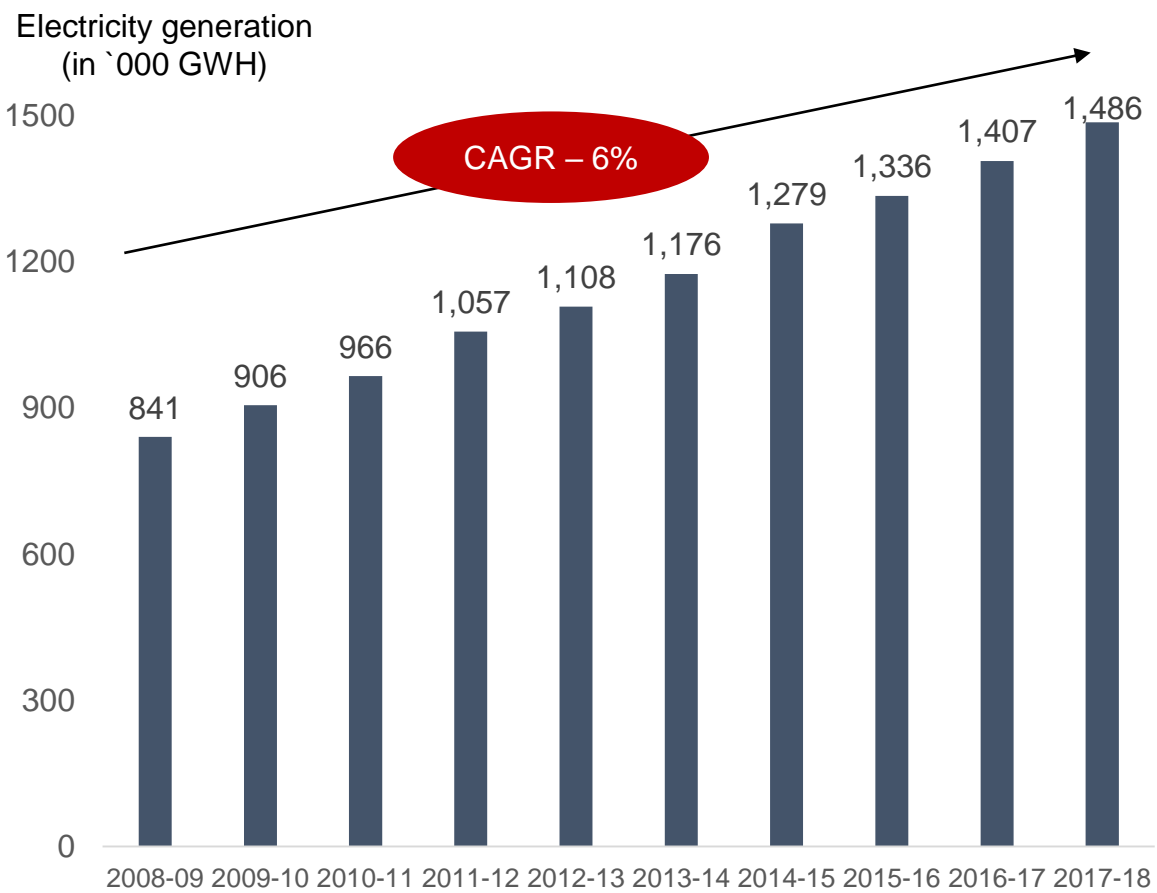
RAPUTT

India has witnessed a steady growth in electricity production capacity and electricity production ...

Trends in Installed Generating Capacity of Electricity (2008-09 till 2017-18) ¹

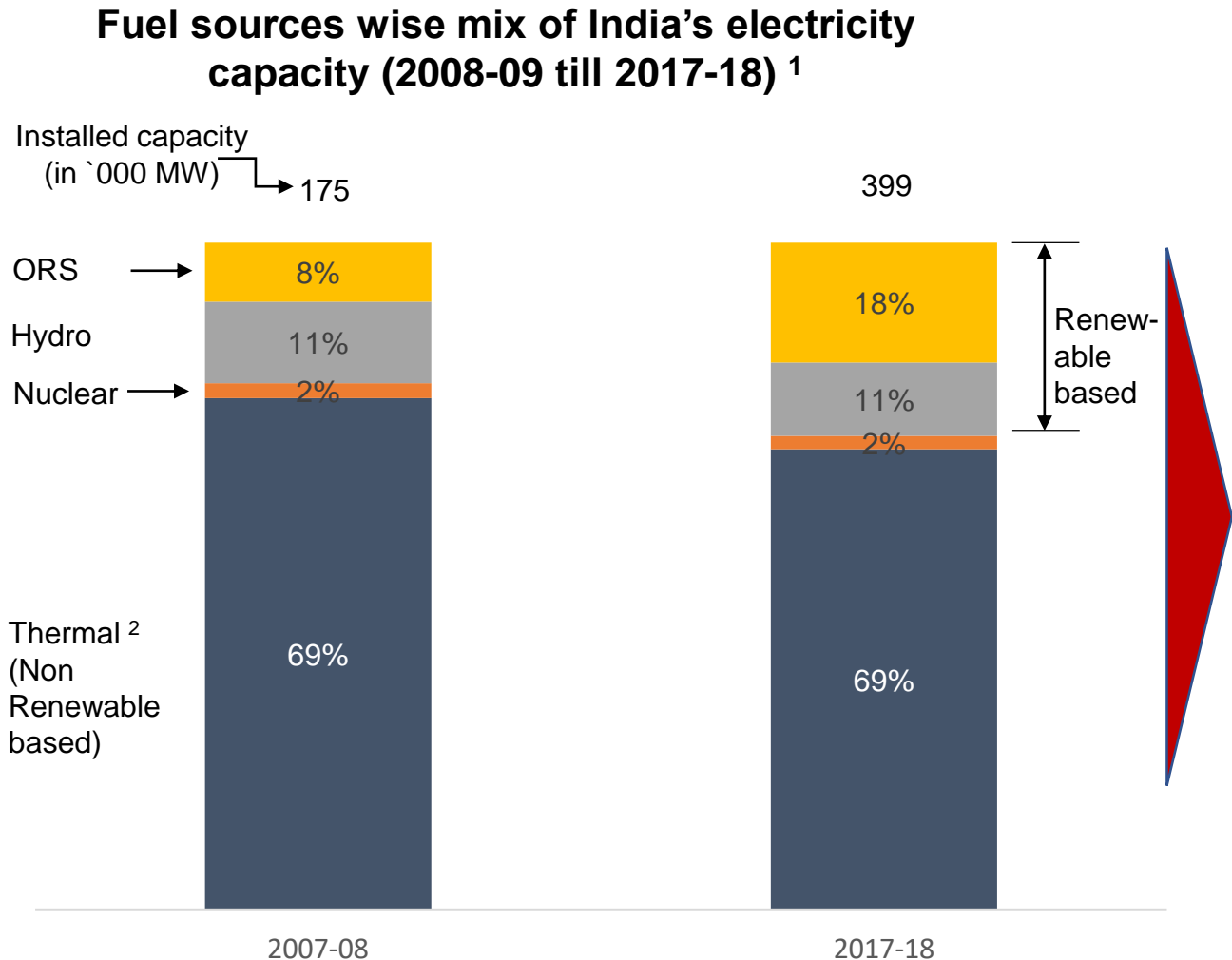


Trends in Gross Generation of Electricity (2008-09 till 2017-18) ¹



Note: MW stands for Mega Watt, GWH stands for Giga Watt Hour; ¹ includes utilities and non utilities
Source: Energy Statistics (2019) by MOSP&I; Raputt team Analysis

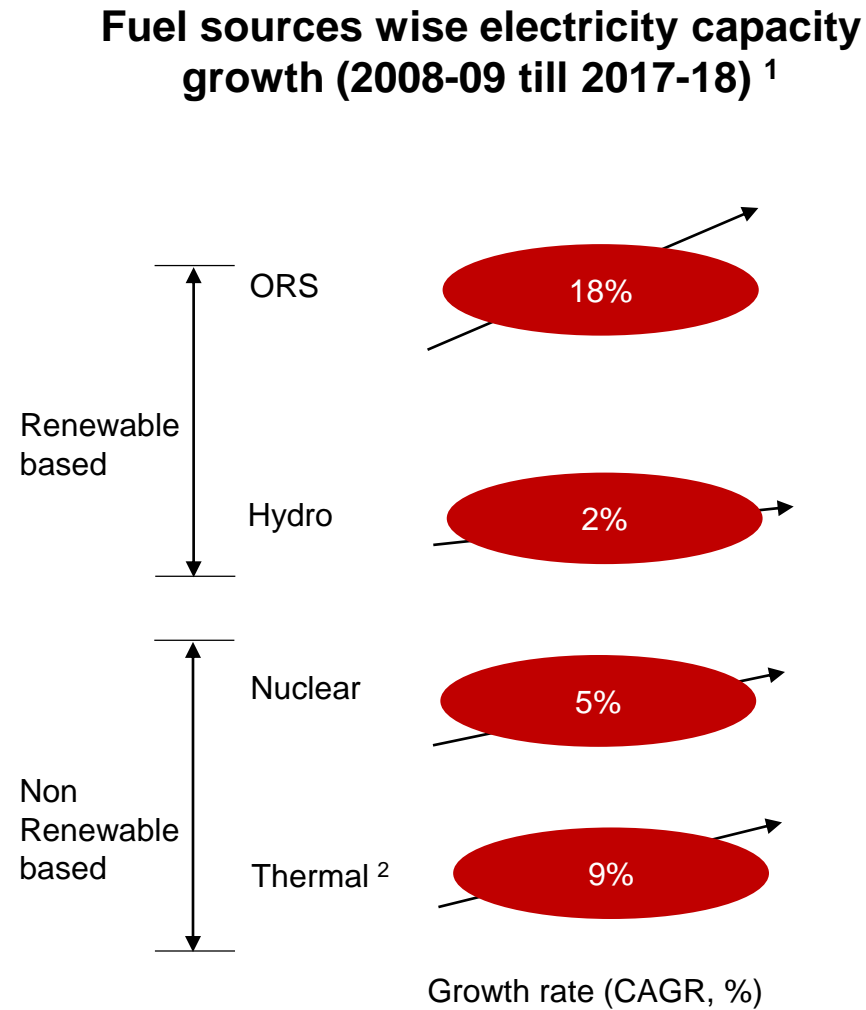
Large share of India's electricity capacity is non renewable based; among renewable sources, ORS (e.g. Wind, Solar etc.) has seen >2X growth ...



Note: ORS stands for Other Renewable Sources such as Wind, Solar, Bio-gas, urban and industrial waste to energy;

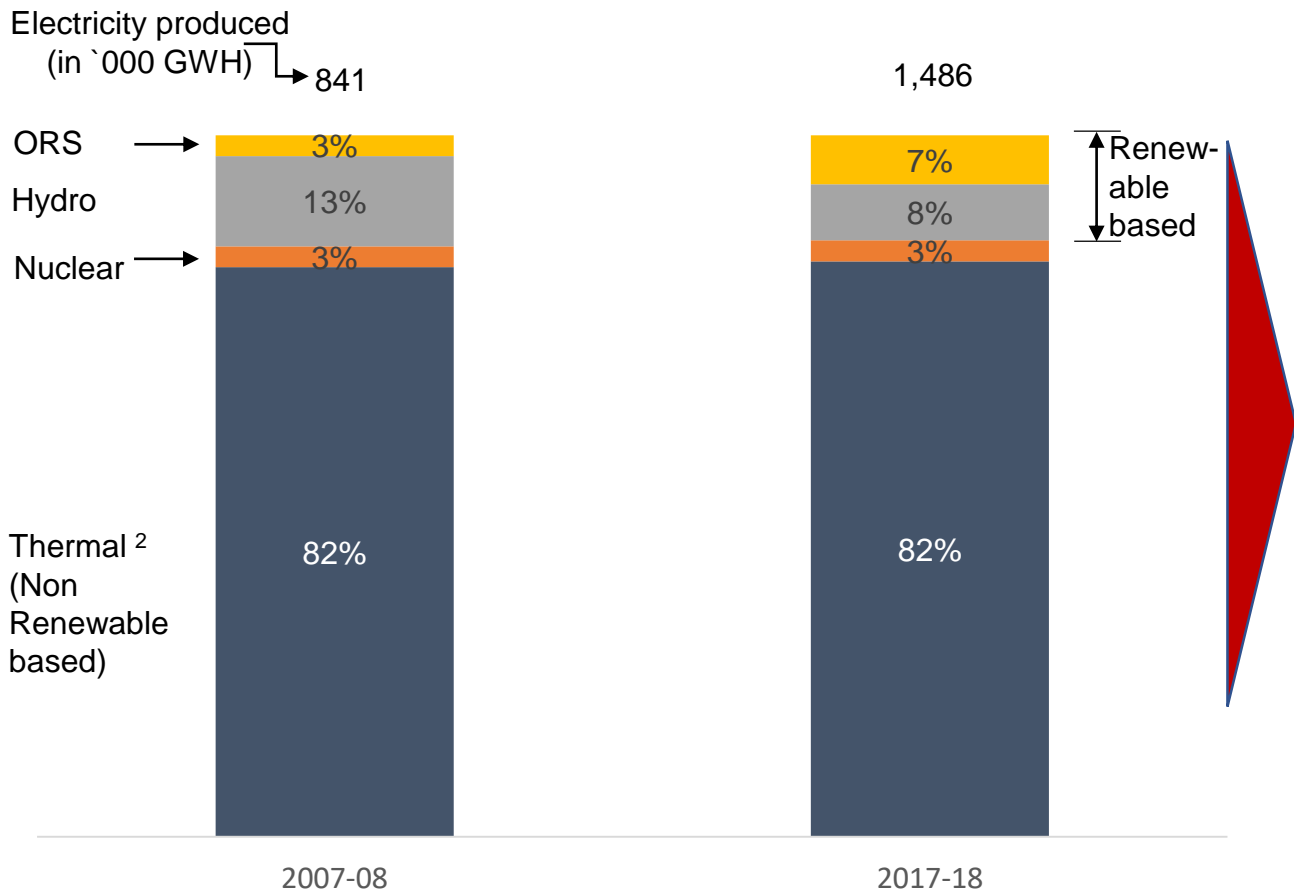
¹ includes utilities and non utilities; ² includes coal, diesel and gas-based fuel sources

Source: Energy Statistics (2019) by MOSP&I; Raputt team Analysis

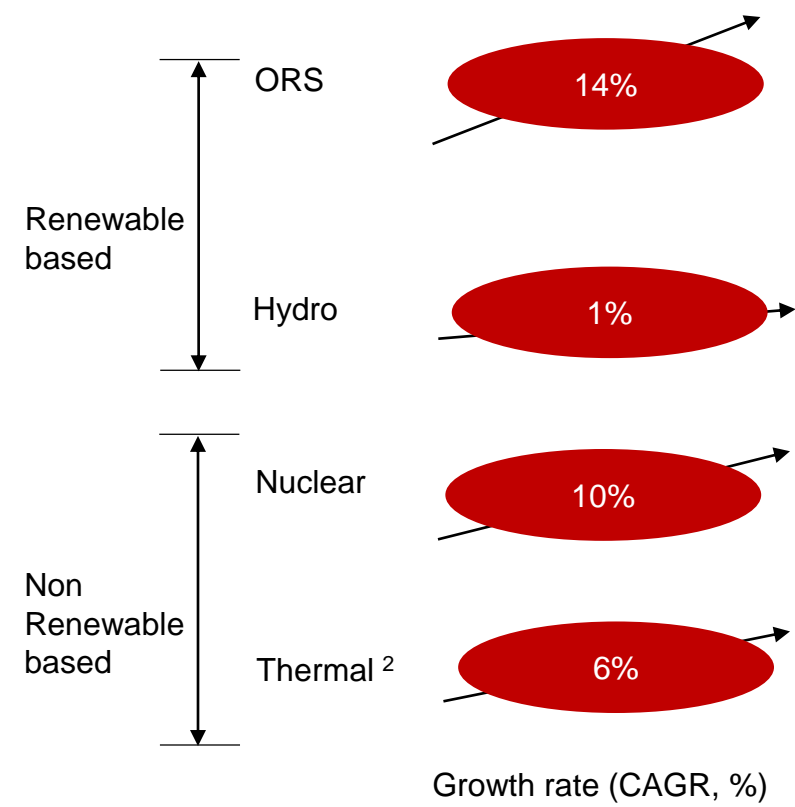


... which translates into similar trends for electricity produced

Fuel sources wise mix of electricity generated
(2008-09 till 2017-18) ¹



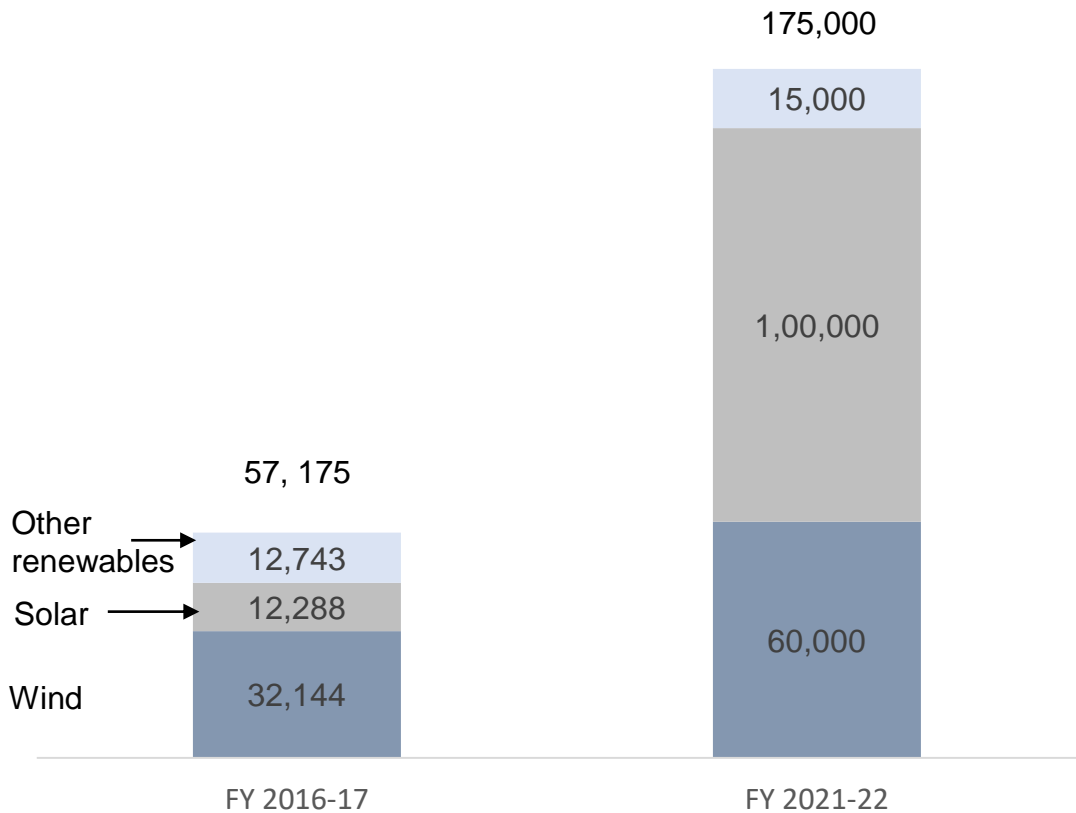
Fuel sources wise growth in electricity generated (2008-09 till 2017-18) ¹



Note: ORS stands for Other Renewable Sources such as Wind and Solar; ¹ includes utilities and non utilities; ² includes coal, diesel and gas-based fuel sources
Source: Energy Statistics (2019) by MOSP&I; Raputt team Analysis

Government push, international commitment, declining component cost and declining prices are some key drivers for renewable energy

Renewable energy capacity addition targets of Govt of India (Till FY 2021-22), in MW



Factors driving growth of Renewable energy ¹

1

Government Push

- ~ 21 per cent of the total electricity demand of the country in FY 2021-22 to met from renewable energy sources

2

International commitment

- 40 per cent of India's installed power generation capacity by 2030 has been pledged to be from non-fossil fuel sources

3

Decline in module cost ^a

- 73% decline in solar module prices between the period 2010 and 2016

4

Falling prices ^a

- Decline in module cost, increase in project sizes has led to increase in competition
- Increase in competition has led to competitive pricing

Note: ^a includes data for solar projects only, more data for other renewable sector is being collated for the next edition
Source: CRISIL; Quotes from India's power minister by Economic times (February 7, 2020); Raputt team Analysis

Renewable market landscape in India is led by developers who are either niche players or part of diversified conglomerates

Leading “solar” developers by cumulative installed capacity (up to May 2019)¹

Developer name	Developer type	Installed capacity (in MW)
ACME Holding	Niche	2,300
Adani	Diversified	1,970
Greenko energy holdings	Niche	1,916
Azure Power	Niche	1,519
Tata power	Diversified	1,388
Renew Power	Niche	1,241*
NTPC	Diversified	870
Avaada Power	Niche	680
Hero future energies	Diversified	553
NLC	Diversified	440

Leading “wind” developers by cumulative installed capacity (up to May 2019) ¹

Developer name	Developer type	Installed capacity (in MW)
Renew power	Niche	2,637*
Greenko energy holdings	Niche	2,156
Sembcorp	Niche	1,365 ***
Tata power	Diversified	1,161
Mytrah Energy	Niche	1,000
CLP	Niche	994 **
Hero Future Energies	Diversified	576
Continuum Energy	Niche	552
Inox Renewables	Diversified	500 ***
Torrent power	Diversified	311

Note: * data as on March 2018. a 4.3 MW project is combined solar and wind based project, whose split was not available; ** figure excludes a 100 MW wind project in which CLP holds a 49% equity stake; ***Estimated installed capacity which assumes commissioning of projects won in tenders in 2017

Source: “Clean Energy Investment Trend 2019” by CEEW & IEA; Raputt team Analysis

Thanks