## EXECUTIVE SUMMARY

### Third largest producer and third largest consumer globally
- India is the third largest producer and third largest consumer of electricity in the world, with the installed power capacity reaching 368.68 GW as of January 2020. The country also has the fifth largest installed capacity in the world.
- India is ranked fourth in wind power, fifth in solar power and fifth in renewable power installed capacity as of 2018.

### Electrification achievements
- India is on path to achieve 100 per cent household electrification by March 31, 2019, as envisaged under the Saubhagya scheme. As of March 2019, more than 26.2 million households have been electrified under Saubhagya scheme.
- Under Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY), 100 per cent villages across the country stands electrified as on April 2018.

### Robust growth in renewables
- As of January 31, 2020, India has an installed renewable energy capacity of 86.32 GW.
- By 2020, India will cross 100 GW renewable energy capacity mark.
- Wind energy is estimated to contribute 60 GW, followed by solar power at 100 GW by 2022 and 15GW from biomass and hydropower. The target for renewable energy has been increased to 175 GW by 2022.
- The government plans to double the share of installed electricity generation capacity of renewable energy to 40 per cent till 2030.

### Favourable policy environment
- 100 per cent FDI is allowed under the automatic route in the power segment and renewable energy.

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*Note: GW – Gigawatt,  
Source: Make in India website, Ministry of New and Renewable Energy, IEA, CEA (Central Electricity Authority, Assorted articles*
ADVANTAGE INDIA
Expansion in industrial activity to boost demand for electricity.

Growing population along with increasing electrification and per-capita usage to provide further impetus.

Power consumption is estimated to reach 1,894.7 TWh in 2022.

India ranked sixth in list of countries to make most investments in clean energy with US$ 90 billion.

India’s power sector is forecasted to attract investments worth Rs 9-9.5 trillion (US$ 128.24-135.37 billion) between FY19-23.

Total FDI inflows in the power sector reached US$ 14.58 billion during April 2000 to September 2019.

As per Economic Survey 2018-19, additional investments in renewable plants up to year 2022 would be about US$ 80 billion and an investment of around US$ 250 billion for the period 2023-2030.

As of June 2019, government launches US$ 5 billion of transmission-line tenders in phases, to reach 175 GW target till 2022.

The Government of India is expected to offer nearly 20 power transmission projects worth Rs 16,000 crore (US$ 2.22 billion) for bidding in 2019.

100 per cent FDI allowed in the power sector has boosted FDI inflows in this sector.

On April 28, 2018, all un-electrified inhabited census villages have been electrified, supported by schemes like Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme (IPDS).

Note: FDI - Foreign Direct Investment, TWh - Terawatt-Hour, Crisil Research
Source: CEA, DIPP (Department of Industrial Policy and Promotion)
MARKET OVERVIEW
EVOLUTION OF THE INDIAN POWER SECTOR

- Electricity (Supply) Act 1948.
- Establishment of semi-autonomous State Electricity Boards (SEBs).
- Private sector participation in generation.
- Fast-track clearing mechanism of private investment proposals.
- Electricity Regulatory Commissions Act (1998) for establishing Central and State Electricity Regulatory Commissions and rationalisation of tariffs.

Before 1956
- Introductory Stage

1956–1991
- Nationalisation Stage
- Generation and distribution of power under state ownership.
- Power losses, subsidies, infrastructure bottlenecks and resource constraints.

1991–2003
- Liberalisation Era
- Amendments made in Electricity Act so as to create competition.
- Implementation of Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme for rural and urban areas respectively.
- Implementation of Ujwal DISCOM Assurance Yojana (UDAY) which would enable electrification to all villages and tracking it using the Grameen Vidyutikaran App.
- Amendment in National Tariff Policy (2016) has been made, wherein government is focusing more on sustainable utilisation of renewable energy resources.
- In May 2018, India ranked 4th in the Asia Pacific region out of 25 nations on an index that measures their overall power.
- India’s rank jumped to 22 in 2019 from 137 in 2014 on World Bank’s Ease of Doing Business - "Getting Electricity" ranking.

2003 onwards
- Growth Era

Source: MNRE, Corporate Catalyst India, IFLR
INDIA AMONG TOP FOUR POWER GENERATING NATIONS

- With a generation of 1,561 TWh, India is the third largest producer and the third largest consumer of electricity in the world.

- Although power generation has grown more than 100-fold since independence, growth in demand has been even higher due to accelerating economic activity.

- India to become the world’s first country to use LEDs for all lighting needs by 2019, thereby saving Rs 40,000 crore (US$ 6.23 billion) on an annual basis.

- India’s energy firms have made significant progress in the global energy sector, according to the latest S&P Global Platts Top 250 Global Energy Rankings, with 10 out of 14 Indian energy companies making it to the list and RIL and IOC ranking third and seventh, respectively.

**Note:** TWh - Terawatt Hours

**Source:** BP Statistical Review World Energy 2019
POWER GENERATION HAS GROWN RAPIDLY OVER THE YEARS

- With electricity production of 1,249.20 BU in India in FY19, the country witnessed growth of around 55.72 per cent over the previous fiscal year. Electricity production reached 1,050.78 BU in FY20 (up to January 2020).
- Over FY10–FY19, electricity production in India grew at a CAGR of 5.50 per cent.
- All un-electrified inhabited census villages have been electrified on April 28, 2018 ahead of the deadline May 1, 2018.

Notes: BU – Billion Unit, @ CAGR till FY19, *- till January 2020
Source: BP Statistical Review, Ministry of Power
SOURCES OF POWER WITH SHARES IN TOTAL INSTALLED CAPACITY … (1/2)

Thermal

- Coal
- Gas & Lignite
- Diesel

62.4%

India has large reserves of coal. By the end of January 2020, total installed coal thermal power capacity in India stood at 197.96 GW. By 2022, it is expected to witness total installed capacity addition of 47.86 GW.

India’s gas thermal power capacity measures about 24.95 GW as of January 2020. By 2022, it is expected to witness total installed capacity addition of 0.41 GW. Lignite thermal power capacity measures about 6.26 GW as of November 2019.

India’s diesel thermal power capacity measures about 0.50 GW as of November 2019.

Renewable

23.4%

Wind energy is the largest renewable energy source in India; projects like the Jawaharlal Nehru National Solar Mission (aims to generate 20,000 MW of solar power by 2022) are creating a positive environment among investors keen to exploit India’s potential. There are plans to set up four solar power plants of 1GW each. As of January 2020, India has 86.32 GW of renewable energy capacity. The target is to achieve installed capacity of 175 GW by FY22.

Hydro

12.3%

With a large swathe of rivers and water bodies, India has enormous potential for hydropower. As of January 2020, India has 45.39 GW of hydro power generating capacity. By 2022, it is expected to witness total installed capacity addition of 6.82 GW.

Nuclear

1.8%

As of January 2020, India has 6.78 GW of installed nuclear capacity; with one of the world’s largest reserves of thorium, India has a huge potential in nuclear energy. By 2022, it is expected to witness total installed capacity addition of 3.30 GW.

Notes: GW - Gigawatt
Source: Ministry of Coal, NHPC, CEA, BP Statistical Review 2015, Corporate Catalyst India, Indian Power Sector, Ministry of Power
In FY20 (as of January 2020), total thermal installed capacity in the country stood at 230.18 GW, while renewable, hydro and nuclear energy installed capacity totalled to 86.32 GW, 45.39 GW and 6.78 GW, respectively.

By 2022, India has set a target to achieve total production 175 GW from renewable resources out of which 100 GW will be produced from solar power.

As a part of the green corridor project, the power lines would transmit 20 giga watts of power capacity from 34 solar parks across 21 states.

In August 2018, KfW a German based financial institution signed a US$ 228.15 million loan agreement with India’s Rural Electrification Corporation Limited (REC) to provide low interest loans to renewable energy project developers.

**Notes:** GW – Gigawatt,

**Source:** Ministry of Coal, NHPC, Central Electricity Authority (CEA), Corporate Catalyst India
GENERATION CAPACITY HAS INCREASED AT A HEALTHY PACE

- Installed capacity increased steadily over the years, posting a CAGR of 8.60 per cent in FY09–19.
- Energy generation from conventional sources stood at 98.8 billion units (BU) as of November 2019. Between 2017 and 2022, conventional sources are expected to witness capacity addition of 58.38 GW. Additional 8.11 billion units (BU) of installed capacity is set to be achieved by FY19.
- Coal-based power installed capacity in India, which currently stands at 195.80* GW is expected to reach 330-441 GW by 2040. It is expected to grow at a CAGR of 6.5 per cent during FY18-23.
- In FY20 (as of January 2020), total installed capacity was 368.68 GW.

Note: GW - Gigawatt, ^ - Tentative, @ CAGR till FY19, *- Till January 2020
Source: CEA (Central Electricity Authority)
### MAJOR PLAYERS IN THE POWER SECTOR

<table>
<thead>
<tr>
<th>Company</th>
<th>Indian company</th>
</tr>
</thead>
</table>
| ![NTPC Logo](image) | **NTPC** is the largest power producer in India and is also the sixth largest thermal power producer in the world, with installed capacity was 58.15 GW in 2019, it is building additional installed capacity of 19.75 GW in India. By 2032, NTPC plans to reach 128 GW of power capacity. Coal-based power accounts for more than 84.7 per cent of the total capacity.  
- It has also diversified into hydro power, coal mining, power equipment manufacturing, oil and gas exploration, power trading and distribution. The NTPC group has reported a 5,290 MW commercial capacity addition for financial year 2019-20. |
| ![Tata Power Logo](image) | **Tata Power** is India’s largest integrated power company, with significant presence in solar, hydro, wind and geothermal energy space. The company accounts for 52 per cent of total generation capacity in the private sector. The company has an installed capacity of 10,957 MW. By 2022, the company plans to increase the generating capacity to 18 GW, distribution networks by 4 GW and energy resources by 25 million tonnes per annum. |
| ![Adani Power Logo](image) | **Adani’s first power plant at Mundra was formed to cater to the Mundra port and SEZ business in 2006. Adani ports was already the largest importer of coal, supplying over 50% of the country’s imported coal needs and at Mundra, managed the world’s largest import coal terminal.**  
- **Adani Power plans to acquire majority stake in cold-chain operator, Snowman Logistics.** |
| ![CESC Limited Logo](image) | **CESC Limited** is a vertically integrated player engaged in coal mining and generation and distribution of power. As of January 2020, it owns and operates 3 thermal power plants generating 1125 MW of power. These are Budge Budge Generating Station (750 MW), Southern Generating Station (135 MW) and Titagarh Generating Station (240 MW). |
| ![NHPC Logo](image) | **NHPC is the largest hydro power utility in India. In FY19, company achieved the highest ever generation of 24.19 BU. It is engaged in construction of two hydro-electric project with aggregate installed capacity of 2,800 MW.**  
- It had drawn an extensive plan to add about 6 GW of hydropower capacity by 2022. |

**Source:** Company websites, News articles, Industry sources  
**Note:** * - including its Joint Ventures and Subsidiaries
## MAJOR PLAYERS IN THE POWER SECTOR … (2/2)

<table>
<thead>
<tr>
<th>Company</th>
<th>Indian company</th>
</tr>
</thead>
</table>
| ![PFC](image) | ▪ Power Finance Corporation Limited (PFC) is an NBFC engaged in financing and development activities within the Indian power sector.  
▪ Major products and services include project term loans, lease financing, direct discounting of bills, short-term loans and consultancy services. |
| ![Adani](image) | ▪ Adani Power is one of India’s largest private thermal power producers, with total capacity at 12.45 GW in 2019; the company aims to generate 20 GW of power by 2020.  
▪ The company is one of the world’s largest single-location thermal power plants in Mundra, Gujarat. |
| ![PGCIL](image) | ▪ Power Grid Corporation of India Limited (PGCIL) is the single largest transmission utility in India; it is responsible for planning, co-ordination, supervision and control over inter-state transmission systems.  
▪ As of January 2020, the company has 162,489 ckm transmission lines and 248 sub-stations. |
| ![Damodar](image) | ▪ Damodar Valley Corporation is engaged in power generation, distribution and transmission of electric power, irrigation and flood control. |
| ![SJVN](image) | ▪ SJVN Limited is the second largest hydro power company in India.  
▪ The company plans to diversify into wind power projects soon.  
▪ In April 2018, SJVN signed an MoU with the Ministry of Power to achieve 9,200 million units generation during 2018-19.  
▪ In FY2018-19, SJVN will have Capital Expenditure (CAPEX) target of Rs 900 crore (US$ 139.64 million) and turnover target of Rs 2,175 crore (US$ 337.47 million). |

*Note: NBFC - Non-Banking Financial Company  
Source: Company websites, News articles*
## STRATEGIES ADOPTED

### Control generation costs
- Companies are developing captive coal fields to reduce price volatility and ensure uninterrupted supply of fuel to control generation cost.
- Most of the power companies are now located near energy source. This helps minimise costs of fuel transport.

### Acquiring sources of fuel supply
- Power companies are now looking at securing adequate supplies of fuel by targeting not only domestic but also overseas resources.
- Reliance Power already has coal reserves in Indonesia.
- Essar Power have captive coal mines in Indonesia from which it extracts coal for power plants in India.
- Government has enabled the power utilities for swapping their coal supplies with the nearest sources so as to save miscellaneous costs and decongest the rail network.

### Diversifying generation technologies
- Companies are using multiple-generation technologies based on a project’s requirement.
- Companies such as NTPC and Reliance Power already have coal-fired, gas-fired and hydroelectric capacity.
- This helps them diversify, reduces dependence on a single source.

### Additional revenue streams
- Most of the companies are now looking to sell their carbon credits to generate additional revenue by employing supercritical technology.

### Digital India
- Launch of smart grid mission with 14 DISCOMS as a pilot.
- Smart metering for high – end users of electricity.

*Source: TechSci Research*
GROWTH DRIVERS
Growing demand

- Electricity generation in India stood at 1,053.61 billion units during April 2019-January 2020.
- Electricity generation recorded a growth of 4.02 per cent year-on-year in FY19.

Policy support

- Supports commissioned power plants to sell electricity in the absence of valid Power Purchase Agreement (PPA).
- Relaxed FDI Norms.

Increasing investments

- India’s power sector is forecasted to attract investments worth Rs 9-9.5 trillion (US$ 128.24-135.37 billion) between FY19-23.
- PE Investments in February 2019 were US$ 350 million.

GROWTH DRIVERS IN POWER SECTOR OF INDIA

Note: FDI - Foreign Direct Investment, MOU - Minutes of Use per month and per subscriber, M&A - Mergers and Acquisitions
Source: Central Electricity Authority of India
Multiple drivers (industrial expansion, growing per-capita incomes) are leading to growth in power demand; this is set to continue in the coming years.

India is set to become a global manufacturing hub with investments across the value chain.

India’s power demand is expected to rise to 1,905 TWh by FY22.

Industrial sector had a share of 41 per cent of the total electricity consumption in FY17-18P.

**Share of electricity consumption in industrial sector**

<table>
<thead>
<tr>
<th>Year</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY08</td>
<td>38%</td>
</tr>
<tr>
<td>FY10</td>
<td>38%</td>
</tr>
<tr>
<td>FY12</td>
<td>39%</td>
</tr>
<tr>
<td>FY14</td>
<td>44%</td>
</tr>
<tr>
<td>FY16</td>
<td>44%</td>
</tr>
<tr>
<td>FY18P</td>
<td>41%</td>
</tr>
</tbody>
</table>

**Note:** TWh - Terawatt Hours, P – Provisional

**Source:** Ministry of Statistics and Program Implementation, CEA
Future investments will benefit from strong demand fundamentals, policy support and increasing government focus on infrastructure.

Per capita electricity consumption in the country grew at a CAGR of 4.69 per cent, during FY11-FY19, reaching 1,181 KWh in FY19.

**Note:** P : Provisional, data as per latest available figures, BU – Billion Units

**Source:** CEA
### National Policy on Biofuels - 2018
- The expected benefits of this policy are health benefits, cleaner environment, employment generation, reduced import dependency, boost to infrastructural investment in rural areas.

### Ultra Mega Power Projects (UMPPs)
- Launch of the UMPP scheme through tariff-based competitive bidding.
- Ease of land possession, provision of fuel, water and necessary clearances for enhancing investor confidence.

### R-APDRP
- Linking disbursement of central government funds (to states), with actual reduction in transmission and distribution losses. Sanctioned projects of more than US$ 5.8 billion.
- In June 2019, the state administrative council sanctioned Rs 173 crore (US$24.3 million) for Supervisory Control and Data Acquisition (SCADA) and Distribution Management System (DMS) under R-APDRP Scheme for Jammu and Srinagar cities.

### Saubhagya Scheme
- The Pradhan Mantri Sahaj Bijli Har Ghar Yojana-“Saubhagya”, launched by the Government of India with the aim of achieving universal household electrification by March 2019. By 2018, a total of 25 states have achieved 100 per cent household electrification which included 23.1 million rural and 844,670 urban households.
- Amount of 1,463.95 crore (US$ 209.45 million) was spent in 2017-18 for Saubhagya scheme, However, no additional budget allocation has been made in 2019-20 for this scheme.

### UJALA Scheme
- Over 36.10 crore LED bulbs, 71.61 lakh LED tube lights and 23.10 lakh energy efficient fans distributed across the country and saved around 47 billion kWh per year. Around Rs 18,935 crore (US$ 2.71 billion) per year in electricity bills of consumer was saved.

**Notes:** R-APDRP - Restructured Accelerated Power Development and Reform Programme , AT&T - American Telephone and Telegraph Systems  
**Source:** Ministry of Power

For updated information, please visit www.ibef.org
### POLICY SUPPORT AND INITIATIVES...(2/3)

| Energy Conservation Campaign | - Replacing nationwide street lights with LED lights.  
|                             | - Plan to save 10 per cent energy that would light up 11 crore lives.  
|                             | - Replacing 1 crore bulbs in Delhi within one year.  |
| Power to the people         | - The Union Budget 2020-21 has allocated Rs 15,875 crore (US$ 2.27 billion) to Ministry of Power and Rs 5,500 crore (US$ 786.95 million) towards the Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY).  |
| Ujwal Discoms Assurance Yojana (UDAY) | - It was launched by the Government of India to encourage operational and financial turnaround of State-owned Power Distribution Companies (DISCOMS), with an aim to reduce Aggregate Technical & Commercial (AT&C) losses to 15 per cent by FY19.  
|                             | - The Government of India has signed four Memorandum of Understanding (MoU) with the state of Nagaland and Union Territories (UTs) of Andaman & Nicobar Islands, Dadra & Nagar Haveli & Daman & Diu under the Ujwal DISCOM Assurance Yojana (UDAY) to improve operational efficiency of electricity departments in these places.  |
| Boost to manufacturing      | - To create potential for domestic manufacturers and developers, Government of India will auction 40 GW of renewable energy projects including 30 GW solar and 10 GW wind every year till 2028.  |
| Other Initiatives           | - As of September 2018, the Government of India launched a voluntary based programme to promote energy efficient chiller systems in India. It labels the energy performance by providing star ratings and will be effective up to December 31, 2020.  
|                             | - As of September 2018, a draft amendment to Electricity Act, 2003 has been introduced. It discusses separation of content & carriage, direct benefit transfer of subsidy, 24*7 Power supply is an obligation, penalisation on violation of PPA, setting up Smart Meter and Prepaid Meters along with regulations related to the same.  |

*Source: Ministry of Power, News articles*
### Direct Benefit Transfer (DBT) Scheme
- The Union and state governments have agreed to implement the Direct Benefit Transfer (DBT) scheme in the electricity sector for better targeting of subsidies.

### Vision ‘24x7’ Power for All’
- All the states and union territories of India are on board to fulfil the Government of India’s vision of ensuring 24x7 affordable and quality power for all by March 2019, as per the Ministry of Power and New & Renewable Energy, Government of India.

### No environment clearance required for solar projects
- The Ministry of Environment, Forest and Climate Change, Government of India has clarified that solar PV (photovoltaic) power, solar thermal power projects, and solar parks will not require the environment clearance which was mandatory under the provisions of Environment Impact Assessment (EIA) notification, 2006.

### Green Energy Corridor Project
- Under the Union Budget 2019-20, the Government of India has allocated Rs 5 billion (US$ 73 million) to increase capacity of Green Energy Corridor Project along with Rs 9.20 billion (US$ 130 million) for wind and Rs 30.05 billion (US$ 440 million) for solar power projects.

### Tariff
- Feed – in Tariff, scheme used for promoting generation of electricity from renewable energy sources. It allows Power Producers to sell renewable energy generated electricity to an off-taker at a pre-determined tariff for a given period of time.
- As of August 2018, the Ministry of New and Renewable Energy set solar power tariff caps at Rs 2.50 (US$ 0.04) and Rs 2.68 (US$ 0.04) unit for developers using domestic, and imported solar cells and modules, respectively.

### Rent a roof policy
- The Union Government of India is preparing a ‘rent a roof’ policy for supporting its target of generating 40 gigawatts (GW) of power through solar rooftop projects by 2022.

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**Source:** Ministry of Power, News articles
Power is one of the key sectors attracting FDI inflows into India.

From April 2000 to December 2019, India recorded FDI of US$ 9.10 billion in non-conventional energy sector. New and renewable energy sector witnessed maximum power generation capacity addition, since 2000.

Power sector accounted for 3 per cent of total inflows till December 2019.

Cumulative FDI inflows in the power sector in April 2000–December 2019 were US$ 14.65 billion.

**Source:** DPIIT
## Important deals

<table>
<thead>
<tr>
<th>Acquirer</th>
<th>Target</th>
<th>Date</th>
<th>Value (US$ mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IndiGrid</td>
<td>Sterlite Power</td>
<td>January 2020</td>
<td>145.94</td>
</tr>
<tr>
<td>Bharti Airtel Limited</td>
<td>AMPSolar Evolution</td>
<td>October 2019</td>
<td>1.20 (26 per cent)</td>
</tr>
<tr>
<td>Adani Transmission</td>
<td>Bikaner-Khetri Transmission Limited (BKTL)</td>
<td>September 2019</td>
<td>-</td>
</tr>
<tr>
<td>SunEdison Infrastructure</td>
<td>Megamic Electronics</td>
<td>July 2019</td>
<td>10 million</td>
</tr>
<tr>
<td>Power Finance Corporation (PFC) Ltd</td>
<td>Rural Electrification Corporation (REC) Ltd</td>
<td>December 2018</td>
<td>52.63 per cent of holding</td>
</tr>
<tr>
<td>Renascent Power Ventures Pte Ltd</td>
<td>Prayagraj Power Generation Company Limited (PPGCL)</td>
<td>November 2018</td>
<td>854.94 (75.01 per cent stake)</td>
</tr>
<tr>
<td>Kohlberg Kravis Roberts &amp; Co (KKR)</td>
<td>Ramky Enviro Engineers Limited</td>
<td>August 2018</td>
<td>530</td>
</tr>
<tr>
<td>ReNew Power</td>
<td>Ostro Energy</td>
<td>April 2018</td>
<td>1,668.21</td>
</tr>
<tr>
<td>Canada Pension Plan Investment Board (CPPIB)</td>
<td>ReNEW Power Ventures Ltd</td>
<td>January 2018</td>
<td>144 (6.3 per cent stake)</td>
</tr>
<tr>
<td>ReNew Power</td>
<td>Wind power assets of KC Thapar Group</td>
<td>21 November 2017</td>
<td>155.55</td>
</tr>
<tr>
<td>Adani Transmission Limited</td>
<td>Reliance Infrastructure Limited (Mumbai)</td>
<td>October 2017</td>
<td>2,932</td>
</tr>
<tr>
<td>India Power Corp. Ltd</td>
<td>Meenakshi Energy Pvt Ltd</td>
<td>16 November 2016</td>
<td>-</td>
</tr>
<tr>
<td>Greenko Energy Holdings (GEH)</td>
<td>SunEdison</td>
<td>4 October 2016</td>
<td>392</td>
</tr>
<tr>
<td>Tata Power</td>
<td>Welspun Energy</td>
<td>14 June 2016</td>
<td>1,528</td>
</tr>
</tbody>
</table>

**Note:** FDI - Foreign Direct Investment, PE - Private Equity, Thomson One Banker

**Source:** Thomson One Banker, Industry News, VC Circle
OPPORTUNITIES
Demand for electricity is expected to increase at a CAGR of 7 per cent to 1,894.7 TWh over FY07–22.

Current production levels are not enough to meet demand; annual demand outstrips supply by about 7.5 per cent.

All India per capita consumption of electricity estimated 1,894.70 TWh by FY22.

Various reforms being undertaken by the government are positively impacting India's power sector. In wake of the surging domestic coal production, the country's power sector is becoming increasingly stable.

Non-coking coal consumption is forecasted to grow at a CAGR of 5.4 per cent to reach 1,076 MT in FY23 from 826 MT in FY18 and domestic supply is forecasted to reach 931 MT in FY23 from 664 MT in FY19, at a CAGR of 7 per cent.

Notes: TWh - Terawatt Hour
Source: International Energy Agency (IEA), CEA, Demand estimates based on IEA forecasts
India is forecasted to be a power surplus country by FY19 with peak power surplus at 2.5 per cent.

The peak power demand in the country stood at 180.80 GW as of January 2020 (P).
Wind energy is the largest source of renewable energy in India and India ranks 4 globally; it accounts for 47.44 per cent (35.14 GW)* of total installed renewable capacity (86.32 GW)*. There are plans to double wind power generation capacity to 60 GW by 2022.

The Ministry of New and Renewable Energy (MNRE) has proposed wind power capacity addition of 10 GW each to be awarded in FY19 and FY20.

As of August 2018, The Ministry of New and Renewable Energy commissioned India’s first inter state transmission system (ISTS) auction with wind power capacity of 126 MW.

Solar Power is the second largest source of renewable energy and ranks 6 globally; it accounts for 34.03 per cent (25.21 GW)* of total installed capacity in renewable energy. The government has set a target of achieving 100 GW by 2022.

The Government of India and Ministry of Power aims to achieve 175 GW and 225 GW, respectively of installed renewable energy capacity by 2022.

Government plans to establish renewable energy capacity of 500 GW by 2030.

Notes: GW – Gigawatt, Figures mentioned in the graph is as per latest data available, * - as of January 2020, SEIC – Solar Energy Corporation of India
Source: Renewables 2019 Global Status Report (REN21), CEA
STRONG UPWARD MOMENTUM IN NUCLEAR ENERGY LIKELY IN MEDIUM TO LONG TERM

- Currently, the country has net installed capacity of 6.78 GW as of November 2019, using nuclear fuels, across 20 reactors. Of the 20 reactors, 18 are Pressurised Heavy Water Reactors (PHWR) and 2 are Boiling Water Reactors (BWR).

- Nuclear Power Corporation of India Limited (NPCIL) plans to construct 5 nuclear energy parks with a capacity of 10,000 MW.

- The Government of India will set up 21 new nuclear power reactors with a total installed capacity of 15,700 megawatt (MW) by 2031.

Note: GW – Gigawatt, E – Estimates
KEY INDUSTRY ASSOCIATIONS
## Industry Associations

### Council of Power Utilities
Address: A-2/158, Janakpuri, New Delhi-110058, India  
Tel: 91 11 25618472, 45652708  
Fax: 25611622  
E-mail: cvjvarma@gmail.com, cvjv1933@yahoo.com  
Web site: www.indiapower.org

### Bureau of Energy Efficiency (BEE)
Address: Ministry of Power, 4th Floor, SEWA Bhawan, R. K. Puram, New Delhi – 110066, India  
Tel: 91 11 26179699  
Fax: 91 11 26178352  
E-mail: webmanager-bee@nic.in  
Website: http://www.beeindia.in/

### Hydro Power Association (India)
Address: Flat no 6, Green Park Apartment, Shriram Society, Warje, Pune - 411058, Maharashtra, India  
Tel: 91 20 25233338  
E-mail: hypaindia@gmail.com, president@hpaindia.org, secretary@hpaindia.org  
Website: http://hpaindia.org/

### Indian Wind Energy Association (INWEA)
Address: PHD House, 3rd Floor, Opp. Asian Games Village, August Kranti Marg, New Delhi-110016, India  
Tel: 91 11 26523042  
E-mail: manish@inwea.org  
Web site: http://www.inwea.org/
USEFUL INFORMATION
GLOSSARY

- CAGR: Compound Annual Growth Rate
- FDI: Foreign Direct Investment
- FY: Indian Financial Year (April to March)
  - So FY10 implies April 2009 to March 2010
- GW: Gigawatt
- MandA: Merger and Acquisition
- MW: Megawatt
- NBFC: Non-Banking Financial Company
- PE: Private Equity
- PLF: Plant Load Factor
- Rand D: Research and Development
- R-APDRP: Restructured Accelerated Power Development and Reform Programme
- TandD: Transmission and Distribution
- TWh: Terawatt-Hour
- RGGVY: Rajiv Gandhi Grameen Vidyutikaran Yojana
- US$: US Dollar
- Wherever applicable, numbers have been rounded off to the nearest whole number
## Exchange Rates

### Exchange Rates (Fiscal Year)

<table>
<thead>
<tr>
<th>Year</th>
<th>INR Equivalent of one US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004–05</td>
<td>44.95</td>
</tr>
<tr>
<td>2005–06</td>
<td>44.28</td>
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<td>2006–07</td>
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<td>2007–08</td>
<td>40.24</td>
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<tr>
<td>2008–09</td>
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<td>2009–10</td>
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<tr>
<td>2010–11</td>
<td>45.58</td>
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<tr>
<td>2011–12</td>
<td>47.95</td>
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<tr>
<td>2012–13</td>
<td>54.45</td>
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<td>2013–14</td>
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<td>2014–15</td>
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<tr>
<td>2015–16</td>
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<td>2017–18</td>
<td>64.45</td>
</tr>
<tr>
<td>2018–19</td>
<td>69.89</td>
</tr>
</tbody>
</table>

### Exchange Rates (Calendar Year)

<table>
<thead>
<tr>
<th>Year</th>
<th>INR Equivalent of one US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
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</tr>
<tr>
<td>2006</td>
<td>45.33</td>
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<tr>
<td>2007</td>
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<tr>
<td>2008</td>
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<td>2009</td>
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<td>2018</td>
<td>68.36</td>
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<td>2019</td>
<td>69.89</td>
</tr>
</tbody>
</table>

*Source: Reserve Bank of India, Average for the year*
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