ELECTRICAL MACHINERY

For updated information, please visit www.ibef.org
**EXECUTIVE SUMMARY … (1/2)**

**Installed capacity set to increase**

- By 2022, installed power capacity in India is expected to reach 350 GW from 305.6 GW.

**Demand for generation equipment on the rise**

- By 2022, India’s generation equipment industry is expected to increase to USD27.5 billion from USD5.9 billion in 2015.

**Increasing power demand to drive T&D equipment market**

- By 2022, the T&D equipment market in India is expected to expand to USD75 billion from USD15.1 billion in 2015.

**Notes:**
- T&D - Transmission & Distribution
- MW - Megawatt

**Source:** Central Electrical Authority, Electrical Monitor, Government of India, Ministry of Heavy Industries, TechSci Research

For updated information, please visit [www.ibef.org](http://www.ibef.org)
Power backup equipment to witness a 5-fold rise by 2022

Demand for generators is expected to increase to USD6.7 billion by 2022 from USD1.2 billion in FY15

Domestic coal requirement

Domestic demand for coal is expected to increase to 747 million tonnes by FY22 from 552 million tonnes in FY17

Source: Government of India, Ministry of Heavy Industries, CEA, TechSci Research
Note: MT - Million Tonnes

For updated information, please visit www.ibef.org
GROWING DEMAND

- Power demand is estimated to reach 350,000 MW by 2022
- Government programmes, aimed at providing electricity to over 100,000 rural areas & 22.6 million households below poverty line, would also boost demand for power
- Per capita consumption crossed 1000 units in 2014-15 as compared to 957 in 2013-14

ATTRACTIVE OPPORTUNITIES

- Planned power capacity addition of around 188,500 MW by 2022 would provide significant opportunities. Replacement or brownfield expansion could provide significant opportunities as well
- In FY17, peak demand for electricity was recorded at about 153 GW
- Additional deduction of 15 per cent of the cost of new plant & machinery, exceeding USD 3.85 million that is acquired & installed during any previous year ending on 31.3.2017.

HIGHER INVESTMENTS

- The sector has witnessed increasing entry of global players through the JV route
- Existing players are planning huge capacity expansion over the next few years
- Cumulative FDI of USD6.56 billion (around 1.98 per cent of total FDI inflows) was made into the sector between April 2000 to March 2017

ADVANTAGE INDIA

- Electrical machinery sector is de-licensed; 100 per cent FDI is permitted
- Significant number of SEZs have been approved for the sector
- Implementation of National Electricity Policy (NEP)
- Increase in allocations towards Modified Special Incentive Package Scheme (M-SIPS) & Electronic Development Fund (EDF)

Source: Government of India, Ministry of Heavy Industries, Ujwal Bharat, DIPP, TechSci Research
Notes: FDI - Foreign Direct Investment, FY - Indian Financial Year (April - March), USD - US dollar, EPCG - Export Promotion Capital Goods Scheme, EHTP - Electronic Hardware Technology Park, SEZ - Special Economic Zone, CAGR - Compound Annual Growth Rate, E - Estimated
ELECTRICAL MACHINERY

ELECTRICAL MACHINERY HAS THREE MAJOR SEGMENTS

- Generation machinery
  - Boilers
  - Turbines
  - Generators
- Transmission machinery
  - Transformers
- Distribution machinery
  - Switch gears
  - Control gears
**The T&D equipment industry was worth USD15.1 billion in FY15**

**The market expanded at a CAGR of 8.3 per cent over FY07–15**

**As of January 2017, industrial production output has gone up by 2.7 per cent, year-on-year on account of increasing investments & better performance of capital goods segment.**

**Cables (35.8 per cent), Switchgear (15.9 per cent Boilers) (14.6 per cent & Transformer) (11.3 per cent account for a large chunk of the revenue)**

**In 2017-18\(^{(1)}\) 1,799 ckm of transmission lines have been commissioned, accounting for 7.8 per cent of the annual target of commissioning 23,086 ckm of transmission lines.**

**Increase in the transformation capacity is estimated at 7,045 MVA in 2017-18\(^{(1)}\), constituting 13.1 per cent of the target of 53,978 set for 2017-18**

---

**India’s T&D equipment industry (USD billion)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY07</td>
<td>8.60</td>
</tr>
<tr>
<td>FY08</td>
<td>11.40</td>
</tr>
<tr>
<td>FY09</td>
<td>10.20</td>
</tr>
<tr>
<td>FY10</td>
<td>11.00</td>
</tr>
<tr>
<td>FY11</td>
<td>13.20</td>
</tr>
<tr>
<td>FY12</td>
<td>13.40</td>
</tr>
<tr>
<td>FY13</td>
<td>12.70</td>
</tr>
<tr>
<td>FY15</td>
<td>15.10</td>
</tr>
</tbody>
</table>

**Share of major electrical equipment (FY15)**

- Cables: 4.4%
- Switchgear: 7.0%
- Boilers: 10.9%
- Transformer: 11.3%
- Transmission Lines: 14.6%
- Transmission: 35.8%

**Source:** Government of India, TechSci Research

Note: CAGR - Compound Annual Growth Rate
ckm - circuit kilometres, MVA – Mega Volt Amp \(^{(1)}\) – Data as of April 2017

For updated information, please visit [www.ibef.org](http://www.ibef.org)
The Generation Equipment market is expected to expand at a CAGR of 24.6 per cent over FY15–22.

The Department of Heavy Industries has planned Vision 2020 for the electrical equipment industry for making the country the choice for the production of electrical equipment and reach an output of US$ 100 bn by balancing exports and imports.


Note: CAGR - Compound Annual Growth Rate
E: Estimated
Boilers is the major segment, accounting for 66.71 per cent of the total industry in FY15, Turbines accounted for 17.32 per cent, whereas Generators made up the remaining 15.97 per cent.

As of November 12, 2016, Bharat Heavy Electricals Ltd (BHEL) awarded a contract worth USD41.24 million to General Electric Company (GE), for supplying 2 units of 800MW supercritical boilers for Telangana Super Thermal Power Project, Phase-I.

In addition, Reliance Infrastructure Ltd won an EPC order worth USD561.41 million from NLC India Ltd for setting up 2 units of 250MW lignite-based thermal power projects in Rajasthan. The project includes contract for supplying boiler, turbines, generators & balance of plant. The project is slated for completion by 2020.

These projects are anticipated to increase the demand of BTG segment over next few years.

In May 2017, Indian Electrical and Electronics Manufacturers’ Association (IEEMA) signed a Memorandum of Understanding with British Electro Technical & Allied Manufacturers’ Association (BEAMA) to promote the interests of electrical equipment industry in each other’s country.

Source: Draft Indian Electrical Equipment Industry Mission Plan (2012-2022),
TechSci Research
Note: As per the latest data available
EPC – Engineering, Procurement and Construction
BTG – Boilers, Turbines, Generators
As per the latest data available during FY15–22, the size of transformers industry is expected to expand at a CAGR of 30.7 per cent to USD11.1 billion.

Domestic transformer industry has the capability to manufacture the whole range of power & distribution transformers, including transformers used for HVDC transmission up to 500 KV.

Production of transformers (million KVA)

<table>
<thead>
<tr>
<th>Year</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>221</td>
<td>202</td>
<td>209</td>
<td>186</td>
</tr>
</tbody>
</table>

Transformers market size (USD billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17E</th>
<th>FY22F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.7</td>
<td>1.9</td>
<td>5.9</td>
<td>11.1</td>
</tr>
</tbody>
</table>

CAGR: 30.7%


Notes: HVDC is High Voltage Direct Current, KVA - Kilo Volt Ampere, E: Estimated
During FY15–22, the size of switch & control gears industry is expected to expand at a CAGR of 19.2 per cent to USD8.2 billion.

The switch gear industry in India manufactures the entire voltage range from 240 KV to 800 KV.

In May 2016, transmission of 1200 KV was started through National Test station at Bina (Madhya Pradesh).

Significant advances have been made in control gears due to major developments in the field of technology.

Domestic electronic component manufacturers to invest USD 148.74 million in 2017 in the Electronics Manufacturing Cluster in Bhiwadi, Rajasthan.

**Market size of switch & control gears (USD billion)**

<table>
<thead>
<tr>
<th></th>
<th>FY15</th>
<th>FY17E</th>
<th>FY22E</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAGR: 19.2%</td>
<td>2.4</td>
<td>4.4</td>
<td>8.2</td>
</tr>
</tbody>
</table>

*Source: Department of Heavy Industry Annual Report, TechSci Research*

*Note: E-Estimates*
Exports of electrical machinery rose to USD 4.6 billion in FY15 from USD 3.7 billion in FY16 with a CAGR of 2.02 per cent between 2009-15.

Electrical equipment industry’s production for FY15 is estimated at USD 19.55 billion.

Boilers, parts, electrical wires & cables were the primary drivers of the increase in exports.

Indian manufacturers with capacity & advanced technology in industry export a wide array of equipment, including transformers & cables.

Exports of electrical machinery (USD billion)

<table>
<thead>
<tr>
<th></th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
<th>FY17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>4.7</td>
<td>3.9</td>
<td>4.1</td>
<td>4.7</td>
<td>4.9</td>
<td>4.8</td>
<td>5.3</td>
<td>3.7</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Source: Engineering Exports Promotion Council (EEPC) India

Exports of electrical power equipment & parts worth USD2.5 billion in FY14 accounted for the largest share of electrical machinery exports.

Exports of electric wires & cables worth USD659.4 million accounted for 17.0 per cent of electrical machinery exports.

Exports of boilers & parts & transmission line towers & parts were worth USD579.3 million & USD234.9 million, respectively.

**Break-up of exports of electrical machinery and related items by segment (FY15)**

- Electric Power Equipments and Parts: 63.87%
- Boilers & Parts: 14.60%
- Electric Wires and Cables: 14.88%
- Transmission Line Towers & Parts: 6.65%

*Source: Engineering Exports Promotion Council (EEPC) India, TechSci Research*
NOTABLE TRENDS IN THE ELECTRICAL MACHINERY SECTOR

Upgrading technology
- Industry players are upgrading their transmission capacities to the next higher voltage system of 765 kilovolts (KV) & are gearing up to supply transformers & related equipment of this class.

Increasing R&D expenditure
- Indian manufacturers are becoming more competitive with respect to their product designs, manufacturing & testing facilities.
- Investments in Research & Development (R&D) in the electrical machinery industry are among the largest in India’s corporate sector.

Diversifying product portfolio
- Players are entering into strategic alliances & tie-ups with technology suppliers to upgrade capabilities.
- As of April 2017, Suzuki Motor Corp plans to form a JV with Toshiba Corp and Denso Corp. to produce lithium-ion batteries for electric vehicles in India, with an initial investment of US$ 184 million.
- In May 2017, L&T has bagged a contract worth USD669.34 million from the Ministry of Defence to supply 100 artillery of 155mm/52 calibre tracked self-propelled guns for the Indian Army. The contract will have over 50 per cent indigenous content from the manufacturing facilities.

Adoption of super-critical technology
- The Government of India is encouraging the adoption of supercritical technology for thermal power plants due to its efficiency & reduced emissions.
- During the 12th Five Year Plan, 60 per cent of the total additional power is expected to be generated using supercritical technology.

Source: Department of Heavy Industries Annual Report, TechSci Research
# ELECTRICAL MACHINERY

## KEY PLAYERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Revenues (FY16)</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larsen &amp; Toubro</td>
<td>USD15.48 billion</td>
<td>Engineering &amp; Construction, Cement, Electrical &amp; Electronics</td>
</tr>
<tr>
<td>Bharat Heavy Electricals Ltd</td>
<td>USD3.95 billion</td>
<td>Power Generation, Transmission, Transportation</td>
</tr>
<tr>
<td>Siemens India Ltd(1)</td>
<td>USD1.7 billion</td>
<td>Power Generation and Distribution equipment, Transportation Systems, Communication &amp; Healthcare Products</td>
</tr>
<tr>
<td>ABB India Ltd(1)</td>
<td>USD0.6 billion</td>
<td>Transformers, Switch Gears, Control Gears</td>
</tr>
<tr>
<td>Crompton Greaves Ltd</td>
<td>USD0.81 billion</td>
<td>Power Generation &amp; Transmission Equipment</td>
</tr>
</tbody>
</table>

*Source: Company Annual Reports, TechSci Research  
Note: (1) Revenue for Half Year Ended (6 months)*
**ELECTRICAL MACHINERY**

**KEY ELECTRICAL MANUFACTURING PLANTS ACROSS INDIA**

**NORTH:** Delhi, Uttarakhand & Haryana are the main hubs for electrical manufacturing in North India.

**CENTRAL:** Madhya Pradesh hosts manufacturing units for Crompton Greaves & BHEL.

**WEST:** Maharashtra & Gujarat host manufacturing units for major players.

**SOUTH:** Tamil Nadu & Karnataka are hubs for electrical manufacturing in South India.

Source: TechSci Research

For updated information, please visit [www.ibef.org](http://www.ibef.org)
ELECTRICAL MACHINERY

PORTER FIVE FORCES ANALYSIS
## PORTER FIVE FORCES ANALYSIS

### Competitive Rivalry

- With a small number of firms in the high-end equipment market, competition is moderate in the sector.
- Large players provide complete solutions.
- Government plans to increase investment in power, rivalry is expected to increase.

### Threat of New Entrants

- Threat is low, because of the capital intensive nature of the industry.
- Presence of big players, blocks entry of new players.

### Substitute Products

- Threat from substitutes is low.
- Other substitutes such as solar & wind plants are less developed compared to electrical transformers.

### Bargaining Power of Suppliers

- Bargaining power of suppliers is low.
- Suppliers (steel, aluminium) tend to have longer term contracts with the companies.

### Bargaining Power of Customers

- Bargaining power is medium, following high price sensitivity.
- Buyers are limited & majorly government agencies, which lend higher negotiating power.
### ELECTRICAL MACHINERY

**STRATEGIES ADOPTED**

<table>
<thead>
<tr>
<th>New technologies</th>
<th>Capacity addition</th>
<th>Promotion of R&amp;D</th>
<th>Skill upgradation &amp; incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In May 2017, the government has planned a policy, which is aimed at turning the country’s vehicles to battery power by the year 2030. As a part of the policy, two- and three-wheelers and non-air-conditioned city buses made by automobile companies in India will be sold without batteries, which will result in significant price drop of public transport vehicles.</td>
<td>• India plans to increase investment in infrastructure (including electricity), as it lags behind other countries</td>
<td>• Government is helping companies enhance the level of research to match the best in the world</td>
<td>• Skill upgradation is necessary as firms need to have the desired talent pool</td>
</tr>
<tr>
<td>• In May 2017, ISRO developed a solar vehicle, which uses solar panels to charge the lithium-ion batteries, that in turn powers the electric motor. The in-house technology made using a battery, solar panel, super-capacitor, control electronics for battery charging, drive electronics and power transmission.</td>
<td>• With more capacity addition in power sector, demand for electrical machinery would rise, prompting the companies to increase their production capacity</td>
<td>• Government has relieved custom duties on some equipment. Companies, too, are enhancing their R&amp;D departments to take advantage of the situation</td>
<td>• The government plans to set up the Electrical Equipment Skill Development Council (EESDC) which would focus on identifying critical manufacturing skills required for the electrical machinery industry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It is enhancing export incentives by removing export barriers</td>
<td></td>
</tr>
</tbody>
</table>
GROWTH DRIVERS OF ELECTRICAL MACHINERY SECTOR

Demand-side drivers
- Capacity addition for power generation
- Rise in demand for backup equipment
- Industrialisation leading to demand for boilers & turbines
- Rising business opportunities with expanding nuclear capacity

Policy
- De-licensing of power
- Reduction in Tariff & Customs
- Hike in duty on foreign products
- Easy fuel linkages & faster regulatory clearance for power projects

Investment
- Entry of global majors through joint ventures
- Increasing FDI inflow
- Easy credit & subsidised loans to power companies
- Rapid increasing infrastructure investment & industrial production

Source: TechSci Research
During FY07-FY16, India’s energy requirement grew at a CAGR of 5.5 per cent, reaching to 1,114 billion units in FY16.

The rising demand for energy has led to increasing capacity addition for power generation.

Source: CEA, TechSci Research
Note: CEA - Central Electrical Authority
The increase in capacity during the 12th Five-Year Plan (FY12–17) up to March 2017 stood at 99,209.47 MW by the end of 12th Five-Year Plan against target of 88,537 MW.

In FY17, a target of producing 1,098 billion units of power was set by the government.

Installed capacity for power generation in India, as on March 31, 2017, was estimated to be 326,848.53 MW.

As a result of the government's initiatives to increase power generation and transmission, the electrical machinery sector is expected to witness new demand for electrical machinery of value around USD 15.28 billion by 2020.

Domestic electronic components manufacturers to invest USD 148.74 million in Electronics Manufacturing Cluster (ELCINA) located in Bhiwadi, Rajasthan.

During FY17, transmission projects worth USD 7.47 billion have been proposed for bidding.

Capacity addition for power generation in the recent Five-Year Plans (’000 MW)

Source: Ministry of Power, TechSci Research, Central Electricity Authority

Note: RE – Revised Estimates
FAVOURABLE POLICIES HAVE AIDED THE SECTOR

**De-licensing**
- The electrical machinery industry has been de-licensed; 100 per cent FDI is allowed in the sector
- This has facilitated the entry of global majors into the electrical machinery industry in India

**Tariffs & custom duties**
- Government has removed tariff protection on capital goods
- Government has lowered custom duties on a range of equipments
- Relatively lower custom duties; 5.0 per cent for power generation equipment & 7.5 per cent for T&D

**Initiatives to increase power generation**
- Planned capacity addition of 115 GW in the 12th Five-Year Plan. The government is targeting to provide 24/7 power by 2022.
- Through the Accelerated Power Development Reform Programme, the government plans to provide reliable, affordable & high-quality power to all

**FDI Policy**
- 100 per cent FDI has been allowed under the automatic route in the electrical machinery sector

**SEZ**
- The government has approved 15 SEZs for the engineering sector across the country; electrical machinery is a part of the sector. As of May 10, 2016, 13 exporting SEZs are operational
- Delhi Mumbai Industrial Corridor being developed across 7 states could boost the engineering sector

Source: Ministry of Power, TechSci Research
VISION 2022 FOR INDIAN ELECTRICAL EQUIPMENT INDUSTRY

**Vision statement**
- To make India the country of choice for the production of electrical equipment & reach an output of USD100 billion by balancing exports & imports.

**Focus on industry competitiveness**
- To focus on technology & R&D and bring it on par with global benchmark, the government has lowered customs duties on a range of equipment.

**Identify skills to support industry’s requirement**
- The government plans to set up the Electrical Equipment Skill Development Council (EESDC) which would focus on identifying critical manufacturing skills required for the electrical machinery industry.

**Develop and strengthen support infrastructure**
- The government plans to establish electrical equipment industry clusters.
- It plans to take steps to enhance product-testing infrastructure in the country.

**Increase share in export market**
- The government plans to provide credit support to economically less-developed export markets.
- It aims to create a dedicated fund for EXIM bank to support exporters in the electrical machinery industry.

**National Electricity Policy (NEP)**
- The government aims to achieve per capita electricity consumption of 1,000 kWh through effective implementation of stringent norms, under NEP.

*Source: Ministry of Power, TechSci Research*
SPECIAL ECONOMIC ZONES (SEZs) WILL PROMOTE EXPORTS … (1/2)

<table>
<thead>
<tr>
<th>Developer</th>
<th>Location</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>M/s Essar Hazira SEZ</td>
<td>Hazira, Gujarat</td>
<td>Engineering</td>
</tr>
<tr>
<td>Gujarat Industrial Development Corporation Ltd (GIDC)</td>
<td>Gandhinagar, Gujarat</td>
<td>Electronic products</td>
</tr>
<tr>
<td>N.G. Realty Pvt Ltd</td>
<td>Ahmedabad, Gujarat</td>
<td>Engineering</td>
</tr>
<tr>
<td>E. Complex Pvt Ltd</td>
<td>Amreli, Gujarat</td>
<td>Engineering</td>
</tr>
<tr>
<td>Dishman Infrastructure Ltd</td>
<td>Ahmedabad, Gujarat</td>
<td>Engineering</td>
</tr>
<tr>
<td>Ansal Properties &amp; Infrastructure Ltd</td>
<td>Sonepat, Haryana</td>
<td>Engineering</td>
</tr>
<tr>
<td>Raheja Haryana SEZ Developers Pvt Ltd</td>
<td>Gurgaon, Haryana</td>
<td>Engineering</td>
</tr>
<tr>
<td>Ansal Kamdhenu Engineering SEZ Ltd</td>
<td>Sonepat, Haryana</td>
<td>Engineering</td>
</tr>
<tr>
<td>Karnataka Industrial Areas Development Board</td>
<td>Shimoga, Karnataka</td>
<td>Engineering</td>
</tr>
<tr>
<td>Suzlon Infrastructure Ltd</td>
<td>Mangalore, Karnataka</td>
<td>Port-based for high-tech engineering products</td>
</tr>
<tr>
<td>Maharashtra Industrial Development Corporation (MIDC)</td>
<td>Satara, Maharashtra</td>
<td>Engineering</td>
</tr>
<tr>
<td>Township Developers India Pvt Ltd</td>
<td>Pune, Maharashtra</td>
<td>Engineering</td>
</tr>
<tr>
<td>Vividha Infrastructure Pvt Ltd</td>
<td>Patiala, Punjab</td>
<td>Engineering</td>
</tr>
</tbody>
</table>

Source: SEZ India, TechSci Research
ELECTRICAL MACHINERY

SPECIAL ECONOMIC ZONES (SEZs) WILL PROMOTE EXPORTS … (2/2)

<table>
<thead>
<tr>
<th>Developer</th>
<th>Location</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Chennai Township Pvt Ltd</td>
<td>Kanchipuram, Tamil Nadu</td>
<td>Engineering</td>
</tr>
<tr>
<td>Perundurai Engineering SEZ by SIPCOT</td>
<td>Erode, Tamil Nadu</td>
<td>Engineering</td>
</tr>
<tr>
<td>Uttar Pradesh State Industrial Development Corporation (UPSIDC)</td>
<td>Kanpur, Uttar Pradesh</td>
<td>Engineering</td>
</tr>
<tr>
<td>Chandigarh Administration(1)</td>
<td>Chandigarh, Punjab</td>
<td>Electronics Hardware</td>
</tr>
<tr>
<td>Aspen Infrastructures Limited(1)</td>
<td>Karnataka, Gujarat</td>
<td>High-tech Engineering products &amp; related Services</td>
</tr>
<tr>
<td>Quest SEZ Development Private Limited(1)</td>
<td>Karnataka</td>
<td>Precision Engineering Product</td>
</tr>
<tr>
<td>Maharashtra Industrial Development Corporation(1)</td>
<td>Aurangabad, Maharashtra</td>
<td>Engineering &amp; Electronics</td>
</tr>
<tr>
<td>Mahindra Worldcity (Jaipur) Ltd.(1)</td>
<td>Jaipur, Rajasthan</td>
<td>Engineering and related industries</td>
</tr>
<tr>
<td>State Industries Promotion Corporation of Tamil Nadu(1)</td>
<td>Vellore, Tamil Nadu</td>
<td>Engineering</td>
</tr>
</tbody>
</table>

Source: SEZ India, TechSci Research
NOTE: (1) – Operational SEZ as on 18th February 2016
FOREIGN INVESTMENTS FLOWING IN; RISE IN FDI INFLOWS

* Cumulative FDI inflow in India, during April 2000 to March 2017, stood at US$ 6.56 billion

* Electrical machinery accounted for around 1.98 per cent of the total FDI inflow in India as on March 2017

**Cumulative FDI inflows since April 2000 (USD billion)**

CAGR: 21.95%

1.1 1.5 2.2 2.4 3.0 3.2 3.3 3.9 4.7 6.56

FY08 FY09 FY10 FY11 FY12 FY13 FY14 FY15 FY16 FY17

Source: Department of Industrial Policy & Promotion, TechSci Research
Note: Cumulative from April 2000 to March 2017
Companies seek inorganic growth by targeting foreign & domestic players

- In July 2015, Mitsubishi Heavy Industries, Ltd. (MHI) & Mitsubishi Nichiyu Forklift Co., Ltd. Jointly acquired UniCarriers Corporation

- Crompton Greaves acquired the smart grid automation company ZIV Group for EUR150 million

- In July 2016, Ultratech cement has acquired Jaypee cement for US$ 2.42 billion

- In August 2015, Malaysia IHH Healthcare acquired 74 per cent stake in Ravindranath GE Medical Associates for US$ 319.8 million.

### RISE IN M&A ACTIVITY

#### Major M&A deals

<table>
<thead>
<tr>
<th>Target</th>
<th>Acquirer</th>
<th>Type</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>UniCarriers Corporation</td>
<td>Mitsubishi Heavy Industries, Ltd. (MHI) and Mitsubishi Nichiyu Forklift Co., Ltd.</td>
<td>Acquisition</td>
<td>2015</td>
</tr>
<tr>
<td>Toshiba India</td>
<td>Toshiba JSW Turbine &amp; Generator</td>
<td>Acquisition</td>
<td>2014</td>
</tr>
<tr>
<td>AEG Power Solutions India</td>
<td>Toshiba Mitsubishi-Electric</td>
<td>Acquisition</td>
<td>2014</td>
</tr>
<tr>
<td>RS Infosystems Pvt Ltd</td>
<td>Advance Metering Technology</td>
<td>Acquisition</td>
<td>2013</td>
</tr>
<tr>
<td>Maruti Weld Pvt Ltd</td>
<td>Voestalpine Bohler Welding</td>
<td>Acquisition</td>
<td>2013</td>
</tr>
<tr>
<td>Henikwon Corporation</td>
<td>Larsen &amp; Toubro</td>
<td>Acquisition</td>
<td>2012</td>
</tr>
<tr>
<td>ZIV Group</td>
<td>Crompton Greaves</td>
<td>Acquisition</td>
<td>2012</td>
</tr>
<tr>
<td>Schneider Electric Infra Ltd</td>
<td>Energy Grid Automation Ltd</td>
<td>Acquisition</td>
<td>2012</td>
</tr>
<tr>
<td>Alstom T&amp;D India Ltd</td>
<td>Grid Equipments Ltd</td>
<td>Acquisition</td>
<td>2012</td>
</tr>
</tbody>
</table>

Source: Thomson Banker, Edelweiss Research, Assorted News articles, TechSci Research
## BRIGHT PROSPECTS LURE GLOBAL MAJORS

### Boiler capacities planned through JV

<table>
<thead>
<tr>
<th>Companies in JV</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L&amp;T – MHI</td>
<td>4,000</td>
</tr>
<tr>
<td>BGR – Hitachi</td>
<td>4,000</td>
</tr>
<tr>
<td>Thermax- Babcock</td>
<td>3,000</td>
</tr>
<tr>
<td>Bharat Forge - Alstom</td>
<td>2,000</td>
</tr>
</tbody>
</table>

### Turbine capacities planned through JV

<table>
<thead>
<tr>
<th>Companies in JV</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toshiba – JSW</td>
<td>5,000</td>
</tr>
<tr>
<td>GB Engineering Ansaldo</td>
<td>3,000</td>
</tr>
<tr>
<td>L&amp;T – MHI</td>
<td>4,000</td>
</tr>
<tr>
<td>BGR – Hitachi</td>
<td>4,000</td>
</tr>
</tbody>
</table>

### Global majors entering through JV

<table>
<thead>
<tr>
<th>Joint Venture</th>
<th>Indian partner</th>
<th>Foreign partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>L&amp;T - MHI</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>BGR - Hitachi</td>
<td>70/74%</td>
<td>30/26%</td>
</tr>
<tr>
<td>Thermax - Babcock</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>Bharat Forge - Alstom</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>Toshiba - JSW</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>GB Engineering - Ansaldo</td>
<td>15%</td>
<td>85%</td>
</tr>
</tbody>
</table>

Source: Edelweiss Research, TechSci Research

Notes: JV – Joint Venture, MHI – Mitsubishi Heavy Industries
Nuclear power generation

- Nuclear power generation in FY16 stood at 37.456 BU and is estimated to reach 9.101 BU in FY17\(^{(1)}\)
- Capacity factor of these reactors increased to 73 per cent in FY17\(^{(1)}\) from 63 per cent in FY07
- With many bilateral nuclear agreements in place, India is expected to become a major hub for manufacturing nuclear reactors & associated components

Power capacity addition

- Market-oriented reforms, such as the target of ‘Power For All’ by 2012 & plans to add 115 GW of capacity by 2017 and 101 GW by 2022, provide high incentives for capacity addition in power generation, which would increase the demand for electrical machinery
- Foreign participation in the development & financing of generation & transmission assets, engineering services, equipment supply & technology collaboration in nuclear & clean coal technologies is expected to increase

High-voltage technology

- Power transmission in India, which is currently carried out largely in the 220 KV & 400 KV range, is expected to move up to a higher range of 765 KV & high-voltage direct current
- This presents a significant opportunity to manufacturers with capabilities in high-voltage (HV) to develop technology that can handle the need of such high voltages in the country

\(^{(1)}\) Data Upto June 2016

Source: TechSci Research
Notes: KV - Kilo Volts, MU – Million Units, BU – Billion Units,
ELECTRICAL MACHINERY

SUCCESS STORIES
BHEL – MAINSTAY OF THE ELECTRICAL MACHINERY INDUSTRY … (1/2)

Salient features

- One of the largest engineering & manufacturing companies with ‘Maharatna’ status
- One of the major Integrated Power Plant Equipment (IPPE) manufacturers in the world with operations in over 75 countries
- Profit-making since 1971–72
- Installed base of more than 124,064 MW
- 17 manufacturing units, 2 subsidiaries, 5 joint ventures & over 150 project sites
- Accounted for over 57 per cent of India's total installed generating capacity in FY14
- Net sales of the company increased over FY07–17 at a CAGR of 0.96 per cent
- Net sales of USD4.29 billion in FY17
- BHEL commissioned 3 supercritical units of 660 MW each in Uttar Pradesh at the 1980 MW coal-based Lalitpur Super Thermal Power Project (STPP) & has set a new benchmark in project commissioning
- The company won “DSIJ Award 2015” for the Most Efficient Maharatna PSU
- Won “India Pride Award 2015-16” for Excellence in Heavy Industries

Net sales (USD billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (USD billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY07</td>
<td>3.9</td>
</tr>
<tr>
<td>FY08</td>
<td>4.9</td>
</tr>
<tr>
<td>FY09</td>
<td>5.8</td>
</tr>
<tr>
<td>FY10</td>
<td>7.0</td>
</tr>
<tr>
<td>FY11</td>
<td>9.3</td>
</tr>
<tr>
<td>FY12</td>
<td>10.2</td>
</tr>
<tr>
<td>FY13</td>
<td>8.0</td>
</tr>
<tr>
<td>FY14</td>
<td>6.5</td>
</tr>
<tr>
<td>FY15</td>
<td>4.9</td>
</tr>
<tr>
<td>FY16</td>
<td>3.95</td>
</tr>
<tr>
<td>FY17</td>
<td>4.29</td>
</tr>
</tbody>
</table>

Source: Company Reports, TechSci Research
Note: Maharatna is the title given to nine Public Sector Enterprises by the Government of India having comparative advantages.
Recent Awards and Recognitions

- The company reported net profit of USD 16.82 million during the 2nd quarter of FY17
- Received “Excellence Award” by Power Grid in May 16

Notes: PLF - Plant Load Factor, ‘Navratna’ is one of the designations given to public sector enterprises based on their profitability and thereby granted certain autonomy. APPDCL: Andhra Pradesh Central Power Distribution Company Limited
L&T – ONE OF INDIA’S LEADING PLAYERS IN THE SECTOR … (1/2)

Salient features

- India’s largest E&C company with interests in projects, infrastructure development, manufacturing, IT & financial services
- Enjoys AAA rating with stable outlook from CRISIL & LAAA from ICRA
- During FY09-FY17, turnover of the company grew at a CAGR of 8.19 per cent, reaching to USD15.48 billion
- In FY17, net sales increased to USD16.36 billion from USD15.48 billion in FY16
- As of November 2016, the company’s construction arm bagged projects worth USD294.22 million across various different verticals, of which the company bagged contracts worth USD87.23 million in the power transmission & distribution segment

Net sales (USD billion)

Source: Company reports, TechSci Research

Note: E&C – Engineering & Construction
Focused on motors & consumer products

Entered into electrical engineering with manufacturing of transformers & power system products

Focused on gaining technological edge, global market reach & wide product portfolio

Revenue base of over USD0.81 billion in FY16

Consolidated revenue expanded at a CAGR of 3.48% during FY09–15

Crompton and SOGO partner to widen consumer appliances portfolio in FY15

Strong presence in the Indian electrical equipment market

1937–60

1960–2005

2005–16

Global leader in offshore wind transformer applications, with 42% market share

Emerged as one of the leading companies in the Indian electrical engineering market

Made 9 acquisitions after 2005, including Pauwels Group

Opened a manufacturing unit in Bengaluru

Strong brand presence in the consumer electric products market

Among the world’s top 10 transformer companies

Focus on R&D

Source: Crompton Greaves website; TechSci Research
CromptonGreaves:GainingGlobally…(2/2)

- CromptonGreavesestablisheditsinternational
  manufacturingfootprintin2005byacquiringBelgium-
  basedPauwelsGroup

- Thecompany’ssuccessfulacquisitionsincludeGanz,
  Hungary, in 2006; Microsol, Ireland, in 2007; Sonomatra,
  France; MSE, USA, in 2008; & PTS, UK, in 2011.

- Overseasmarketaccountsforabout50percentof
  revenues

Segmentalrevenue(FY16)

<table>
<thead>
<tr>
<th>Segment</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Segment</td>
<td>1.9</td>
<td>1.9</td>
<td>2.2</td>
<td>2.4</td>
<td>2.2</td>
<td>2.3</td>
<td>2.3</td>
<td>0.78</td>
</tr>
<tr>
<td>ConsumerProduct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IndustrialSystems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

Source:Companyreports,Companywebsite,TechSciResearch
Indian Electrical & Electronics Manufacturer’s Association (IEEMA)
501, Kakad Chambers, 132,
Dr Annie Besant. Road,
Worli, Mumbai 400018.
Tel: +91-22-2493 0532, +91-22-2493 0532 / 6528 / 6529
Fax: +91-22-2493 2705
mumbai@ieema.org

Engineering Export Promotion Council (EEPC)
‘Vanijya Bhawan’, 1st Floor
International Trade Facilitation Centre,
1/1, Wood Street,
Kolkata, West Bengal–700016.
Phone: 91-33-22890651, 22890652
Fax: 91-33-22890654
E-mail: eepc@eepcindia.org
**BTG**: Boilers, Turbines, Generators

**BHEL**: Bharat Heavy Electricals Limited

**CAGR**: Compounded Annual Growth Rate

**CEA**: Central Electrical Authority

**DHI**: Department of Heavy Industries

**E&C**: Engineering & Construction

**EEPC**: Engineering Export Promotion Council

**FDI**: Foreign Direct Investment

**FY**: Indian Financial Year (April to March)

**GW**: Giga Watt

**HVDC**: High Voltage Direct Current

**KV**: Kilo Volts
KVA: Kilo Volt Ampere
L&T: Larsen and Toubro
MHI: Mitsubishi Heavy Industries
PLF: Plant Load Factor
SEZ: Special Economic Zone
USD: US Dollar

Wherever applicable, numbers have been rounded off to one decimal
### Exchange rates (Fiscal Year)

<table>
<thead>
<tr>
<th>Year</th>
<th>INR equivalent of one USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004–05</td>
<td>44.81</td>
</tr>
<tr>
<td>2005–06</td>
<td>44.14</td>
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<tr>
<td>2006–07</td>
<td>45.14</td>
</tr>
<tr>
<td>2007–08</td>
<td>40.27</td>
</tr>
<tr>
<td>2008–09</td>
<td>46.14</td>
</tr>
<tr>
<td>2009–10</td>
<td>47.42</td>
</tr>
<tr>
<td>2010–11</td>
<td>45.62</td>
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<tr>
<td>2011–12</td>
<td>46.88</td>
</tr>
<tr>
<td>2012–13</td>
<td>54.31</td>
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<tr>
<td>2013–14</td>
<td>60.28</td>
</tr>
<tr>
<td>2014–15</td>
<td>61.06</td>
</tr>
<tr>
<td>2015–16</td>
<td>65.46</td>
</tr>
<tr>
<td>2016-2017E</td>
<td>66.95</td>
</tr>
</tbody>
</table>

### Exchange rates (Calendar Year)

<table>
<thead>
<tr>
<th>Year</th>
<th>INR equivalent of one USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>43.98</td>
</tr>
<tr>
<td>2006</td>
<td>45.18</td>
</tr>
<tr>
<td>2007</td>
<td>41.34</td>
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<td>2008</td>
<td>43.62</td>
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<tr>
<td>2009</td>
<td>48.42</td>
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<td>2010</td>
<td>45.72</td>
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<td>2011</td>
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<td>2012</td>
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<td>2013</td>
<td>58.44</td>
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<td>2014</td>
<td>61.03</td>
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<tr>
<td>2015</td>
<td>64.15</td>
</tr>
<tr>
<td>2016 (Expected)</td>
<td>67.22</td>
</tr>
</tbody>
</table>

Source: Reserve bank of India, Average for the year.
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