

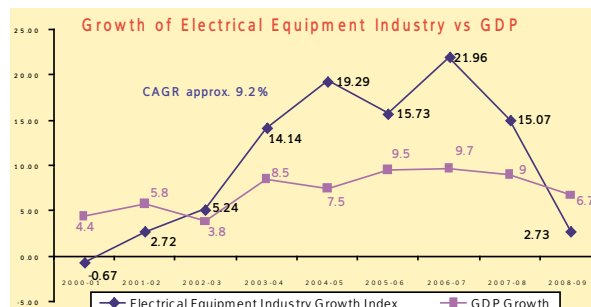


Availability of electricity is directly linked to the GDP growth of developing economies; A growth ratio of 1:1 is generally accepted, hence Power sector is the prime infrastructure sector, which drives all other sectors.

Similarly, the growth of the Indian electrical industry and its investment attractiveness is very much dependant on the policies of the Government. To improve and sustain the GDP growth, reduce the electricity demand supply gap etc. timely capacity additions to electricity generation, transmission and distribution are the key.

The government announcements of relatively massive additions to Generation, Transmission & Distribution sector investments under the 11th & 12th plan period had thus enthused the industry. Further continuation of T & D reforms in the form of R-APDRP and programs like 'ELECTRICITY for ALL by 2012' under RGGVY created more optimism.

The Industry and the investors responded enthusiastically. The electrical industry peaked in 2006-07 returning a record growth of 22 %. The Industry CAGR too was an astonishing 9.2% for almost 5 years. Electrical equipment manufacturers across the board expanded capacity doubling or even tripling it over last five years.



However, the global meltdown starting September 2008 reduced the overall demand and hit exports badly. Fortunately, India has escaped relatively unscathed, thanks to some fast responses by the GOI and the domestic industry in the form of prudent fiscal policy, 3 quick stimulus packages and overall cost cutting, process improvements respectively.

The Indian economy is now showing signs of revival and so is the electrical industry and its various segments including the critical and raw material intensive transformer industry. The health of the Indian transformer industry is directly related to the health of power sector since the major customers for transformers are primarily the central/State Government Utilities, power plants through EPC/IPP route etc. The transformer industry which had more than doubled its capacity over the last five years anticipating huge domestic and overseas demand is

today suffering from overcapacity. The facts are that the approximate installed transformer manufacturing capacity is to 280 GVA and the approximate capacity utilisation is at 70%. The demand projections for 11th and 12th Plans as per IEEMA - PWC study is 8-10%. Government should thus ensure that the power sector should grow at not less than 12% per annum (to make up for past slippages).

Industry dynamics

The Indian Transformer industry which is a mature industry and more than five decades old, manufactures all types of transformers and can very well meet the country's demand for transformers up to 800 KV now going up to 1200KV. The industry enjoys a good reputation in terms of quality, price and delivery in the domestic as well as overseas markets even in advanced countries.

The Indian transformer industry can generally be divided into distribution transformers, power transformers, generating transformer and other types of special transformers for welding, traction, furnace etc. Some of the transformer manufacturers in India have successfully developed the technology and cost effectiveness in their design and manufacture processes resulting in reduction in lead times.

Power Transformers

Power transformer is installed at all points starting from the generation site upto the last substation, before distribution activities commence. This transformer is used to step up or step down power to match the voltage requirements. They are oil filled transformers with its range spanning from 33KV - 765KV and above 10MVA capacity. Power transformers would account for about 60-62% of the total transformer industry in MVA terms.

The total production of power transformers increased from 95,000 MVA in 2008 to 120,000 in 2009. This also includes exports to the tune of 18000MVA. The currently OBP has crossed more than 200,000 MVA spreading to end 2010.

Distribution Transformers

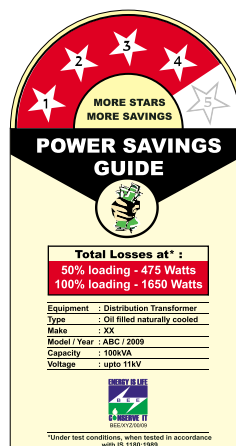
The basic purpose of a distribution transformer is to provide end users with low voltage power. A distribution transformer could either be oil filled or dry type by nature, with voltage ranging from 1.1 - 33KV. Distribution transformers would account for the remaining 38-40% of the total transformer industry in MVA terms.



The DT segment has shown a negative growth of about 16% over last fiscal based on IEEMA statistics. However, in reality this segment may have grown, with the major share being offered by non-IEEMA members and unorganized players. The estimated share of IEEMA members is about 35-40% in the DT segment and reducing. The unhealthy competition, the L1 bidding system and lax qualifying norms have driven out the organized sector from this business.

Energy Efficient Distribution Transformers and BEE

Bureau of Energy Efficiency, Ministry of power, is actively working to ensure that quality products are procured by the EBs and has accordingly stipulated mandatory star rating for DTs. A large number of DT manufacturers have already applied to BEE for the same. IEEMA collaborated with BEE in evolution of the Energy efficiency norms over the last more than two years. It is understood that shortly DT procurement for R-APDRP would be set at a minimum of 3 star rating.



Amorphous Core Transformers

The Amorphous core transformers are finding an increasing market in India. Amorphous core is primarily used in Distribution Transformer segment. The number of State Electricity Boards and utilities opting Transformers and Amorphous Core Distribution Transformers are slowly increasing. The APDRP-2 and the RGGVY programmes are also driving the demand for these items. Energy Efficiency is playing

its part in this. With many discoms actively striving to reduce AT&C losses, demand for energy efficient transformers is increasing.

Amorphous core also finds use in power transformers however in small numbers. The current consumption of amorphous metal in India is reportedly about 30,000 to 35,000 Tons. This suffices for about 10000MVA of amorphous core transformers majorly consisting of transformers from 15 KVA to 200KVA, three phase and single phase DTs.

Due to change in legislation concerning efficiency norms in US, China and EU, the demand for amorphous metal is likely to increase in the near future leading to price rise and shortages. Amorphous steel is produced by Allied Signal a subsidiary of Hitachi steel. Currently Hitachi has monopoly over this metal and the worldwide production is reportedly at 80,000 Tons, expected to increase shortly to 110,000 tons.

Bureau of Energy Efficiency (BEE) and EBs stipulating increased use of amorphous core transformers should take note of this serious issue.

Dry Type Transformers

A dry type transformer is used where there is space constraint and higher chances of fire or for other specialized applications. Dry Type Transformers are mostly used by industrial and corporate clients at software parks, hotels, hospitals, high rise buildings, Malls and theaters etc. These transformers are categorized as distribution transformers due to their nature of operation.

Dry type transformers are generally more expensive than oil filled transformers, however the demand is on the increase. Some sources even have speculated that Dry type transformers may one day replace oil filled transformers. Estimated production of this type is in the range of 4000 MVA.

REC range of transformers

The RGGVY programme has created a huge demand for REC range of wirewound and other transformers in 5-25KVA range. This particular segment is largely supplied by the unorganized sector, quality and reliability reportedly are major issue, calling for standardisation.

Reportedly, about 272 GVA / 4.4 Lacs Nos. DTs are required under 11th plan programme of REC.

Indigenous R & D Initiative and 1200KV Transformer

With the huge power generation programmes planned by the government in the 11th & 12th Plan period addressing issues of evacuation, right of way and reducing T & D losses has become critical. Upgrading to 1200 KV system is a possible solution.

PGCIL has planned establishment of 1200kV UHVAC Test Station at Bina (WR) as a collaborative effort with manufacturers for indigenous development of 1200KV equipment in India and provide an edge over overseas suppliers. The station is being developed with an objective for optimization of design of transmission line and substation equipment, optimization of ROW and cost, ease in O&M etc.

This offers the Indian industry a great opportunity to prove the Indian capabilities in design, development and manufacture of 1200 KV equipment. PGCIL has approached the Indian Industry to commission the test station by December 2009. 24 organizations (Majority of them IEEMA members) have entered into MOU with PGCIL for design, development, supply and commissioning of the required equipment.

The test station envisages:

- Construction of 2 nos. 1200kV Bays and 2 nos. 400kV bays along with 2 nos. 1200/400/33kV 333MVA Transformers.
- Construction of two nos. 1200kV Test Lines of one km length (one single circuit and one double circuit) Setting up of Test facilities

Currently 3 transformer manufacturers (all IEEMA members) are in the process of developing 1200KV single phase transformer.

CRGO - Need for manufacture in India

CRGO has gained strategic importance in view of its limited supply and the huge demand for transformers due to enhanced power programmes. The CRGO availability had been a major problem for the industry in 2005-06. IEEMA had initiated various actions to address this problem.

The industry feels that, there is an urgent need for setting up indigenous CRGO capacity to meet the huge demand for transformation capacity of 8,50,000 MVA (which include power transformers, generator transformer, ICT up to 66 kV level & distribution transformer) during the 11th Plan.

The requirement of CRGO is estimated to be around 2.4 lakhs MT per annum. IEEMA is closely working for exploring various options regarding manufacture of CRGO in India.

TRAFOTECH-2010 - Eight International Conference on Transformers

The Transformer Division of IEEMA has planned the 8th International Conference on Transformers on Monday 18th & Tuesday 19th January 2010 at Mumbai. TRAFOTECH, held once in four years is a prestigious international conference and has gained wide recognition for the state-of-the-art information and insight it provides over the years. It is an international platform for networking, technology exchange and experience sharing.



The Theme for TRAFOTECH 2010 is "Enhanced availability through standardization".

Weakness/Threats/Challenges

- **Volatile Metal Prices:** The key input and the real cost driver in the transformer industry is the raw material i.e. metal like CRGO/Amorphous steel, copper, aluminium and Steel. A large chunk of the cost incurred by the companies is in terms of the cost of metals. Over the last few years the metal prices saw a vertical move. It impacted the margins of manufacturers to a great extent.
- However, the recent trend in the metals market is showing contrary signals. Steel and aluminium prices in the recent months are subdued and they are expected to remain soft in the near-term. This may help improve the margins of the transformer manufacturers however their top lines are impacted.
- The recent notification mandating BIS certification for CRGO/CRNGO steel has created additional problems for Indian transformer industry. The Notification has been deferred till Feb - 2010 due to outcry from the transformer industry, which is seeking deletion of the same from the mandatory list.
- **Inadequacy of Testing Facility at CPRI for Transformers:** Considering the aggressive transmission & distribution plan and need of manufacturers to certify the equipments as per latest IEC standards, CPRI needs full scale up-gradation. Present test plant availability at CPRI testing labs, both Bhopal & Bangalore, cater to Short circuit test on transformers up to 90 MVA 220 kV. Even testing for this range is inadequate and suffers from delays. Transformers beyond this rating have to necessarily be sent abroad.

The transmission voltage level is already 765KV & is likely to reach 1200KV in the near future, further up-gradation will be required to cover switchgear up to 1200KV & transformers up to 1200KV,1000MVA 1phase.

Raw Materials/ Components

- HI-B material, a premium grade of CRGO, is used for increasing efficiency of transformers; accordingly HIB is demanded for new transformers by users. However, due to the existing grid conditions, SEBs are constrained to specify transformers of lower flux density of about 1.65-1.55 Tesla, which defeats the very purpose of using HIB grade material and normal grades of CRGO will provide an economical solution besides easy availability.

Imports

- Although, domestic players could face some threat from imports in future, especially from China (There are some big players in China, who could venture into India to take advantage of high demand. At present these Chinese players are catering to their internal demand, which if exhausted over the next 2-3 years could make their way here).
- With huge demand expected to come over the next five years and fair operating margins being a characteristic of the industry, there are chances that the foreign players may enter the Indian market in an aggressive way, which is visible in 765 KV market.
- We believe that foreign competition will not be major problem for the domestic players who are already pre-qualified.

Users

- Most of the players cater to demand arising out of SEBs, which forms about 70-75% of their revenues. The balance comes from the industrial demand and exports.
- Orders from SEBs are all tender based and the lowest bidder (L1 bidder) bags it. Many SEBs have price preference clause in place, for companies present in their region.
- Procurement based on L1 rationale is not healthy for the industry as even fly by night Manufacturers /operators win bids and give a bad name to the industry.
- IEEMA is exploring with the standards and labeling programme along with BEE to help the users make informed decisions.

- The scenario is becoming more competitive and many new players are entering the business. Many of the projects are funded either by WB or ADB.
- These tenders have an inbuilt price variation clause (PVC), which protects both the Suppliers and the Purchasers from any losses arising out of Rising/ Falling raw material prices. Companies bidding for tenders quote for the tenders as per the IEEMA basic prices/ indices, which is widely accepted by the sector.
- The IEEMA basic prices/indices has been fairly successful in capturing variation in prices of key raw materials, which has saved many a manufacturer from closure in the widely swinging prices of raw materials.
- Everybody is aware that the financial condition of most of the SEBs is not very enthrusting. Delay in lifting of ordered materials and delayed payments by some SEBs create cash flow problems for manufacturers.
- However, the government is taking active steps to reform the SEBs by unbundling the SEBs into more autonomous/independent entities to make them more efficient and self supporting. State Electricity Regulatory Commissions- SERCs and Central Electricity Regulatory commission- CERC, too are actively working towards reducing the problems and inefficiencies of the sector.

Strengths and Opportunities

Future Demand

- Majority of the demand for the transformer industry that is expected will be driven by investments by the government for enhancing the generation capacity and spreading its reach by distributing power to the remote villages.
- The transformer industry will also be helped by the Capex cycle in both the public and the private sector.
- The Government has set itself a mission "Power for all by 2012" under which it intends to increase the total generation capacity to just over 210,000MW by the end of the Eleventh Five Year Plan.
- The government is currently working on strengthening the transmission lines and creating a National Grid which proposes to interconnect the five regions, thereby enhancing the transfer capacity to about 37,150 MW
- This will be complete by 2012 through creation of "Transmission Super Highways" and consequently, demand for 765/400KV power transformers is likely to be strong.
- With thrust now being on distribution of power to the remotest villages, the demand for distribution transformers (DTs) could be mind boggling.
- Under the rural electrification program the Center aims at providing all households with electricity by year 2012. In order to reduce and monitor the T&D losses, the government, as per the directive of the CEA, laid emphasis on 100% metering and also increasing the penetration.
- As per the program it aims at setting up of electricity distribution infrastructure viz. Rural Electricity Distribution Backbone with at least 33/11KV sub station, Village Electrification Infrastructure with at least one distribution transformer in a village and stand alone grids with generation unit where grid supply is a problem.
- With the large number of DTs being targeted, energy efficient transformers has become a necessity. Bureau of Energy and CEA are actively working with ieema to help increase energy efficiency of electrical equipments including DTs through various methods.
- Energy labeling programs/efficiency rating systems are under planning to make buyer decision easy.
- Energy efficient DTs, based on the amorphous core technology are finding increasing acceptance amongst the SEBs.
- The dry type transformers too are finding increased acceptance. Dry type transformers are designed to cater to demands of Housing sector, commercial, IT/ITES and specialty requirements could be amongst the largest beneficiaries of the boom in these sectors.
- Pole mounted transformers are also in great demand due to the APDRP programme taken up by the SEBs to strengthen and upgrade the distribution system.
- Growing demand from oil, gas, cement sectors in addition to demand from the replacement market also adds to a promising future for the industry.
- The average life of a transformer is 20-30 years, which means that transformers installed during the Sixth/ Seventh plan could now be up for replacement.

Exports

- Exports which currently form a negligible portion (10% of the total transformer industry production) of Indian transformers industry is also witnessing a gradual growth. This is an untapped area, which companies plan to venture into.
- Further, many foreign manufacturers who already have their base set here are looking forward to make their Indian base as the exporting hub for transformers.
- Many Middle Eastern and African countries are also undergoing power reforms just like India; this brings opportunity for the many medium and large sized players to participate in international contracts.
- Manufacturers are also looking at the Latin American region for new business opportunities.
- The Indian multinational has arrived; in fact, one of the Indian manufacturers has recently taken over a couple of European manufacturing units and is tapping developed markets. IEEMA

members in other segments like switchgear, lighting have also taken over industries in developed countries.

- Indian manufacturers are eyeing the developed markets based on Indian quality and pricing. India could very well become the manufacturing/sourcing hub for finished electrical equipment, sub-assemblies, components and accessories.

Conclusion

The future of the Indian Transformer industry in particular and the electrical industry in general appears to be quite good, since India and the world, present a fairly optimistic demand scenario.

The Indian Transformer industry is fully geared up for the emerging business.



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