

PROJECT PROFILE
ON
LT POWER CAPACITORS

MONTH & YEAR
AUGUST 2011

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This publication is supported by

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STIFTUNG **FÜR DIE FREIHEIT**

L.T. POWER CAPCITORS

INTRODUCTION

Power capacitor is basically an electrical device used for improving power factor of the electrical power system when the load is inductive. Most of the industries use induction motors, which results Low power factor in the neighbouring distribution line. This causes big KVAR loss and wastage of energy. Therefore, Improvement of power factor is considered to be one of the important measures of energy conservation. Use of power capacitors improves the power factor of the line to which they are connected and thereby improving power factor for neighbouring industry also. In certain applications, capacitors are used to store energy also, but with limited use.

MARKET

Almost all the Electricity authorities have now made compulsory to install L.T. Power Capacitors in the case of all industrial loads. This implies for every induction motor, LT power capacitor is a must. Due to massive rural electrification and use of electric pumps in irrigation and industrial purposes the motor load is increasing day by day. Hence, demand for power capacitors is increasing. At present, there are a number of units manufacturing LT power capacitors. However, as the

demand for this item is ever increasing, there is scope for more units to come up.

The Indian power sector has grown from a low 1300 MW at the time of independence to more than 138,000 MW. In terms of growth, the generation rate is slightly more than 8 per cent. In spite of this growth, the country as a whole suffers from black outs and brown outs with large parts of the population (more than 500 million) without access to power. The country faced a peak load deficit of 13.9 per cent and a supply deficit of 9.9 per cent in 2006-07.

The Indian economy has grown at an average rate of 8.4 per cent per annum in the Tenth Five year plan. This has catapulted the country into the world's big league, and on the basis of purchasing power parity, today it is ranked as the fourth largest economy, behind the U.S., China and Japan. From various projections, in absolute terms, India will be one of the top three economies in the world in the next 25 years.

While the economy has grown and India is today spoken of in the same breath as China, the power sectors in the two countries present quite divergent pictures. In 1950, the installed capacities of China and India were at the same level. Thereafter, while India could achieve an installed capacity of 138 Giga Watts (GW) at the end of 2006, China had an installed capacity of 620 GW.

During 2006 alone, China added more than 100GW of new capacity. Compared to this, during each of the last three five year plans on an average, India could add only 20 GW. Further, per capita consumption of electricity in China stands at 1440 KWH, whereas in India it is only 630 KWH. Also, considering the fact that large parts of the Indian population do not have access to electricity, it becomes clear that the power sector has to put in lot of effort.

The Eleventh Plan envisages a capacity addition of around 80000 MW for which ordering has been completed. BHEL has got 55 per cent share of the orders. Integrated energy policy envisages coal to remain the dominant fuel source till 2031-32. To bring the per capita consumption to world average level, four-fold growth is required of which the share of nuclear power will go up significantly. McKinsey estimates demand to soar from around 148 GW at present to 315-335 GW by 2017.

To achieve these targets, the development of mega projects becomes a necessity. With a view to encouraging large size projects, the Central Government enunciated the mega power policy in 1995, which provided tax incentives to projects above a certain size that cater-participation of private players, the Government formulated the Ultra Mega Power Project (UMPP) policy in 2005, which envisaged the setting up of projects of

4000 MW capacity each. The developers for these projects were to be selected through a tariff based competitive bidding process. Three projects have been awarded under this policy and these are expected to be completed in 5-6 years.

India has an installed capacity (including captive) of less than 150,000 MW and has one of the lowest per capital consumption in the world (around 600 units a year as compared with a global average of over 2600 units and China's at 1100 units). Added to this is the harsh reality that only 55 per cent of the households across the country have access to electricity and more than 1.25 lakh villages are still to be electrified!

The abovementioned discussion points to the necessity of creation of additional capacity of power and the installation of more sub stations and transmission towers. There is tremendous scope and backlog to be fulfilled urgently in this sector.

INSTALLED CAPACITY

Product	Capacity per annum 300 days per annum -Nos
LT Power Capacitors	120000

PLANT AND MACHINERY

Sl No	Item Specification	Qty	Rate	Value in Rs.
1	Vacuum Impregnation Plant	1	600000	600000
2	Foil Winding Machine	1	130000	130000
3	Air Conditioner with Accesories	2	30000	60000
4	Drilling Machine	1	15000	15000
5	Hand Drilling Machine	1	10000	10000
6	Bench Grinder	1	10000	10000
7	Welding Set 200 amps	1	16000	16000
8	Spot Welder Machine 15KVA	1	10000	10000
9	Sheet Binding Machine	1	20000	20000
10	Hand Sheering Machine	1	8000	8000
11	Baking oven	1	40000	40000
12	Vapour decreasing plant	1	20000	20000
13	Spray Painting unit with Compressor	1	30000	30000
(a)	Total			969000
(b)	Testing Equipments			
	High Voltage Tester	1	15000	15000

	(2.5 KV)			
	Insulation Tester Multi range	1	10000	10000
	D.C Over Voltage Tester	1	6000	6000
	Discharge Device Tester	1	10000	10000
	Auto transformer 0-270V, 20 Amp	1	40000	40000
	Test panel with Ammeters, Volt meters, watt meters of different range, P.F. meter, capacitance bridge etc	1	50000	50000
(b)	TOTAL			131000
	TOTAL A+B			1100000

MANUFACTURING PROCESS

Tissue paper. The aluminium foil used is of purity 99.7% or above. The aluminium foil and condenser tissue paper are wound in alternate layers using a foil-winding machine to manufacture the basic condenser unit. Numbers of such units (rolls of aluminium foil and condenser tissue paper) are stacked together. The number of rolls in a stack depends upon

the voltage and capacitance required. The stack of the aluminium foil rolls is pressed together with M.S. plate. The two sides of the stack where the ends of the individual rolls are coming are plastered using tin lead mixture of proper proportion for joining the alternate layer of aluminium foil. Connecting leads are soldered to the plastered ends of the stack. The stack assembly is housed in a can made of M.S. and the leads are connected to porcelain bushing terminals provided on the top of the can. The can is fabricated from M.S. plate separately and is decreased before using the stack assembly. After housing the stack assembly, the can is put under vacuum at a high temperature in vacuum impregnation plant. Subsequently, PXE oil (Synthetic Insulating Oil) is filled into the cans. The cans are then sealed. The capacitor is then tested as per the relevant standard.

The unit may also utilize common test facilities available at Electronics Test and Development Centres (ETDCs) and Electronic Regional Test Laboratories (ERTLs) and Regional Testing Centres (RTCs).

RAW MATERIALS

For Nos		Qty	Rate/Kgs	Value Rs lakhs
	120000			
Condenser Tissue	kgs	32400	170.00	55.08
Aluminium Foil	kgs	14400	240.00	34.56
Pxe Oil Synthetic	kgs	21600	90.00	19.44
Insulation Oil				
Ms Sheets, screws				36.00
TOTAL				145.08
Packing materials		120000	20.00	24.00

LAND AND BUILDINGS

Built up area	1000 sq.ft
Rent payable (Per Month)	Rs.10000
Advance	Rs.100000

UTILITIES

Power & Fuel

Three phase-	KW	20.00
Power charges Rs.lakhs p.a		2.64
For process-Litres per day		Nil
For human consumption- litres/day		200

MANPOWER

		Monthly wages	Total
Works Manager	1	10000	10000
Technical Supervisor	1	9000	9000
Skilled workers	8	7000	56000
Unskilled	10	5000	50000
Accounts Assistant	1	6000	6000
Store keeper	1	6000	6000
Security	2	5000	10000
Salesman	1	7000	7000
sub total			154000
Add benefits		20%	30800
Total per month			184800
TOTAL PER ANNUM-			22.18
Rs. lakhs			

COST OF PRODUCTION AND PROFITABILTY

Assumptions

Installed capacity	120000 Nos
Capacity utilisation	Year-1 -60% Year -2 -70% Year-3 onwards- 80%
Selling price Per Nos	Rs.270.00
Raw materials	As per the details given above
Packing materials	As per details given above

Power	Rs.2.64 lakhs per annum
Wages and salaries	Rs.22.18 lakhs per annum
Repairs and maintenance	Rs.1.20 lakhs
Depreciation	Written down value method -15 % on machinery
Selling general and administrative expenses	Rs.6.00 lakhs with 5% increase annually.
Interest on Term loan	14% per annum
Interest on working capital	14% per annum
Income tax	34%

MACHINERY SUPPLIERS

1. M/s. Vacuum Plant and Instruments Mfg. Co. Ltd. 48-A, Mundhawa, Pune-411036.

(Vacuum Impregnation Plant, Fc Winding Machine, vapour degreasing plant)

2. M/s. Person Engg. Corporation

Great Western Compound, 37, Maharashtra Chamber of Commerce Lane, Fort, Mumbai-400001.

(General purpose machines)

3. M/s. Manlik Engg. Works

Shed No. 9, R.K. Indl. Estate, Ajod Dairy Road, Rakhial, Ahmedabad.

(General purpose machines)

4. M/s. Thoshnival Brothers (Bombay) Pvt. Ltd.

198, Jamshedji Tata Road, Mumbai-400020.

(Testing Equipment)

5. M/s. Rectifiers and Electronics

10/3, DLF Indl. Area, Moti Nagar,

New Delhi-110015.

(Testing Equipment)

6. M/s. Growers Pvt. Ltd.

228, Kaliandas Udyog Bhawan, Near Century Bazar,

Mumbai-400025.

(Ovens)

RAW MATERIALS SUPPLIERS

1. M/s. Aluminium Foils

21/8, M. G. Road, Bangalore-1.

(Aluminium Foils)

2. M/s. Alcaps

A-143, DDA Sheds, Okhla Phase - II,

New Delhi - 110020

(Aluminium Foils)

3. M/s. Heri Inc.

Trading and Tanishq Enterprises, C-146, FFC, Okhla Phase -

III, New Delhi - 110020

(Aluminium Foils)

4. M/s. Ter Indian Agency

Trafford House, No. 6, Press Club Road,
Mumbai-400001.

(Condenser Tissue Paper)

5. M/s. Papeteries

Balnore, Paris, Arance, Dedex-16,
France.

(PXE Oil (Synthetic Insulating C

FINANCIAL ASPECTS

1. COST OF PROJECT

	[Rs.lakhs]
Land & Building (Advance)	1.00
Plant & Machinery	11.00
Other Misc. assets	1.00
Pre-Operative expenses	2.00
Margin for WC	3.96
	<u>18.96</u>

2. MEANS OF FINANCE

Capital	10.71
Term Loan	8.25
	<u>18.96</u>

3. COST OF PRODUCTION & PROFITABILITY STATEMENT

	[Rs.lakhs]				
Years	1	2	3	4	5
Installed Capacity-Nos	120000	120000	120000	120000	120000
Utilisation	60%	70%	80%	80%	80%
Production/Sales-Nos	72000	84000	96000	96000	96000
Selling Price per piece Rs.	270.00				
Sales Value (Rs.lakhs)	194.40	226.80	259.20	259.20	259.20
Raw Materials	87.05	101.56	116.06	116.06	116.06
Packing Materials	14.40	16.80	19.20	19.20	19.20
Power	1.58	1.85	2.11	2.11	2.11
Wages & Salaries	22.18	23.28	24.44	25.66	26.94
Repairs & Maintenance	1.20	1.32	1.45	1.60	1.76
Depreciation	1.65	1.40	1.19	1.01	0.86
Cost of Production	<u>128.05</u>	<u>146.21</u>	<u>164.46</u>	<u>165.65</u>	<u>166.94</u>

Selling, Admin, & General exp	6.00	6.30	6.62	6.95	7.30
Interest on Term Loan	1.16	1.01	0.72	0.43	0.14
Interest on Working Capital	2.21	2.21	2.21	2.21	2.21
Total	137.42	155.73	174.01	175.24	176.59
Profit Before Tax	56.98	71.07	85.19	83.96	82.61
Provision for tax	19.37	24.16	28.97	28.55	28.09
Profit After Tax	37.60	46.91	56.23	55.42	54.53
Add:	1.65	1.40	1.19	1.01	0.86
Depreciation					
Cash Accruals	39.25	48.31	57.42	56.43	55.39
Repayment of Term loan	0.00	2.06	2.06	2.06	2.07

4. WORKING CAPITAL:

	Months	Values	%	Margin	Bank
	Consumptions			Amount	Finance
Raw Materials	0.50	3.63	25%	0.91	2.72
Consumables	2.00	2.40	25%	0.60	1.80
Finished goods	0.50	5.34	25%	1.34	4.00
Debtors	0.50	8.10	10%	0.81	7.29
Expenses	1.00	0.30	100%	0.30	0.00
		19.77		3.96	15.81

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$$\frac{\text{Profit after Tax}}{\text{Sales}} = \frac{56.23}{259.20} \quad 22\%$$

$$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}} = \frac{88.12}{34.77} \quad 253\%$$

$$\frac{\text{Profit after Tax}}{\text{Promoters Capital}} = \frac{56.23}{10.71} \quad 525\%$$

7. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	24.44
Repairs & Maintenance	1.45
Depreciation	1.19
Admin. & General expenses	6.62
Interest on TL	0.72
	<hr/>
	34.42
	<hr/>

Profit Before Tax (P) 85.19

$$\text{BEL} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{34.42}{119.62} \times \frac{80}{100} \times 100$$

23% of installed capacity