PROJECT PROFILE

ON

COMPACT FLUORESCENT LAMP

MONTH & YEAR
AUGUST 2011

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This publication is supported by

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COMPACT FLUORESCENT LAMP

(CFL LAMP)

INTRODUCTION

A compact fluorescent lamp (CFL), also known as a compact fluorescent light or energy saving light (or less commonly as a compact fluorescent tube), is a type of fluorescent lamp. Many CFLs are designed to replace an incandescent lamp and can fit into most existing light fixtures formerly used for incandescents.

Compact Fluorescent light bulbs, also known as CFLs, are an eco-friendly alternative to standard incandescent light bulbs. CFLs can be screwed into the same sockets as other light bulbs and provide very comparable lighting. CFLs are easily recognizable due to their distinct twisting shape. These “green” light bulbs have a host of benefits that can help improve the planet, our home and finances. One of the greatest benefits of compact fluorescent light bulbs is their energy efficiency. A CFL uses 50 to 80 percent less energy than other light bulbs. While many consumers are dissuaded by the higher initial cost of a CFL these light bulbs must be replaced less often than incandescent bulbs. Compact fluorescent lights can have a dramatically extended lifespan, lasting as much as 10 times

longer than their incandescent counterparts. While standard incandescent bulb will last for a year, a CFL can last anywhere from 8 to 10 years. Furthermore, a 75-watt incandescent bulb can be replaced by a 20-watt CFL bulb. One can receive the same amount of light while paying for far less energy. Replacing just one incandescent bulb with a CFL can prevent as much as 450 lb. of carbon dioxide from entering the atmosphere. Compact fluorescent light bulbs can be used in almost any light fixture that accepts an incandescent bulb. CFLs can be used in everything from table lamps to ceiling fixtures. Specially designed CFLs are also available for more unique types of lighting. A three-way CFL can be used in lighting fixtures with a three-way setting. Though CFLs were initially unsuitable for dimmer switches, dimmable CFLs are now available as well. While compact fluorescent lighting is ideal for many situations, it must be used in the right way to reap the full benefits.

PRODUCT USES AND SPECIFICATIONS

The average rated life of a CFL is between 8 and 15 times that of incandescent. CFLs typically have a rated life-span of between 6,000 and 15,000 hours, whereas incandescent lamps are usually manufactured to have a lifespan of 750 hours or 1,000 hours. For a given light output, CFLs use 20 to 33 percent of the power of equivalent incandescent lamps.

Electrical power equivalents for differing lamps		
Electrical power consumption Watts (W)		**Minimum light output lumens (lm)**
Compact fluorescent	Incandescent	
9–13	40	450
13–15	60	800
18–25	75	1,100
23–30	100	1,600
30–52	150	2,600

If a building's indoor incandescent lamps are replaced by CFLs, the heat produced due to lighting will be reduced. At times when the building requires both heating and lighting, the heating system will make up the heat. If the building required both illumination and cooling, then CFLs also reduce the load on the cooling system compared to incandescent lamps resulting in two concurrent savings in electrical power. The luminous efficacy of CFL sources is typically 60 to 72 lumens per input watt of electric power, versus 8 to 17 lm/W for incandescent lamps. This gives an efficiency range of 17 to 21% of a theoretical ideal white light source giving 347 lumens per radiant watt for a tri-phosphor spectrum. While CFLs require more energy in manufacturing than incandescent lamps, this embodied energy is more than offset by the fact

that they last longer and use less energy than equivalent incandescent lamps during their lifespan. While the purchase price of an integrated CFL is typically 3 to 10 times greater than that of an equivalent incandescent lamp, the extended lifetime and lower energy use will more than compensate for the higher initial cost. CFLs are extremely cost effective in commercial buildings when used to replace incandescent lamps. Thus CFL has got an enormous market potential.

MARKET POTENTIAL

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

The total installed capacity of the unit is 200 CFL lamps per day on single shift basis. On this basis, the installed capacity per annum is estimated at 60000 CFL lamps.

PLANT AND MACHINERY

The following machines are required for manufacturing /assembling of CFL lamps.

S.No	Particulars	Nos	Rs
1	Tesla machine (1st stage checking)	2	20000
2	Grinding Tool for Wire Cleaning.	2	15000
3	PCB soldering station	2	22000
4	Cap Notching machine	2	8000
5	Eyelid soldering	2	24000
6	Pad Printing machine	1	15000
7	Sleeve cutting machine	2	12000
			116000
	Testing equipments		
1	Digital Multimeter	2	6000
2	Megger 1000V DC	2	12000

3	Testing Panel with Ammeter,Voltmeter & Multimeter	1	15000
4	Jigs & fixtures for fixing of P.C.B.	1	2000
5	Manual series testing jig for C.F.L	1	4000
			39000
			155000

PROCESS FLOW CHART FOR CFL

STORE

Lamp Testing

V

Ballast Testing

V

Failed

V

Sleeve insertion to lamp filaments

V

Wrapping of Filament wires to the Ballast

V

Supply wire Assembly with Cap

V

Fitting of Lamp to plastic shell

V

Top Eyelet soldering

V

Flux Residues cleaning

V

Testing II

Burn-in Test

V

Rating Plate Printing

V

Batch Code Printing

V

Product Cleaning

V

Sticker

Final Packing

END

Dispatch to BSR

RAW MATERIALS

For Nos 60000

Require	Qty-Nos	Rate/Piec	Value

	d		e	
	for 60000			Rs
Capsule glass tube	60000	60000	12.00	720000.00
PBT Plastic body	60000	60000	4.00	240000.00
B-22 cap	60000	60000	1.00	60000.00
PCB	60000	60000	12.00	720000.00
Assembly charges	60000	60000	3.00	180000.00
TOTAL				1920000.00
Packing materials		60000.00	1.50	0.90

LOCATION LAND AND BUILDING

Built up area-Sq.ft	1000
Rent p.m.-Rs per .10 per sq.ft	10000
Advance-10 months. Rs	100000

UTILITIES

Power & Fuel

Three phase-	KW	10.00
Power charges p.a	Rs.lakhs	1.32
For process-Litres per day		0
For human consumption-litres/day		200

MANPOWER

		Monthly wages	Total
Works Manager	1	10000	10000
Technical Supervisor	1	9000	9000
Skilled workers	3	7000	21000
Semi skilled	4	4000	16000
Unskilled	3	5000	15000
Accounts Assistant	1	6000	6000
Store keeper	1	6000	6000
Security	2	5000	10000
Sales	1	7000	7000

representative		
sub total		100000
Add benefits	20%	20000
Total per month		120000
TOTAL PER ANNUM-Rs. lakhs		14.40

SCHEDULE OF IMPLEMENTATION

After the funding arrangements are made and the premises are kept ready the project implementation will take about 3 months period.

COST OF PRODUCTION AND PROFITABILTY

Assumptions

Installed capacity	60000 nos CFL lamps
Capacity utilisation	Year-1 -60% Year -2 -70% Year-3 onwards- 80%
Selling price per MT	Rs.98.00 per piece.
Raw materials	As per the details given above
Packing materials	As per details given above
Power & Fuel	Rs.1.32 lakhs per annum at 100%
Wages and salaries	Rs. 14.40 lakhs with increase 5% every year.
Repairs and	Rs.1.20 lakh per annum

Maintenance	
Depreciation	Written down value method -15 % on machinery
Selling general and administrative expenses	Rs.30000 per month
Interest on Term loan	14% per annum
Interest on working capital	14 % per annum
Income tax	34 % on profits

ADRESSES OF RAW MATERIAL AND PLANT AND MACHINERY SUPPLIERS:

1. Apzem India Engineering, No. 7, New Street, Arjun Nagar, Chennai, Tamil Nadu, India - 600 062
2. Universal Tools & Engineers , 2 Mohammed Hussain St, K.P Complex, Mount Road, Chennai, 600002
3. Lab Electronics, No. 5, Old No. 27/7, 2nd Floor, 10th Avenue, Chennai, - 600083
4. MRK Engineers Pvt. Ltd, W430, 1ST FLOOR, 5TH STREET, SECTOR C, ANNANAGAR WESTERN EXTN.,
Chennai – 600101.
5. Electricals Electronics Enterprises, .172, Thambu Chetty, Parrys, Chennai, - 600 001.
6. G. B. International, No. 16, SIDCO Industrial Estate, N. P. Ambattur, Chennai, - 600 098

7 .M/s Phillips India Ltd., 68, Najafgarh Road, New Delhi.

8. M/s Mangal Instruments, 134, Apna Bazar, Nehru Nagar, Ring Road, N.Delhi

9. M/s Aerosol (P) Ltd, B-90, Mayapuri, Ph-I, Ind. Area, N.Delhi.

10 .M/s J.D. Industries, E109 Karampura, Shivaji Marg, N.Delhi.

11. M/s R.S.G Packaging 483-A, Oberoi compound, dilshad Garden, G.T.Road, N.Delhi.

12. M/s AAKRITI Exports, 187, DSIDC Compound, Okhla Ind. Area, Ph-I, N.Delhi.

13 .M/s Assam Electricals, Tinsukhia (Assam)

14. M/s Stesalit Ltd, Ind Area Baddi, Solan (H.P.)

FINANCIAL ASPECTS

1. COST OF PROJECT

	[Rs.lakhs]
Land & Building (Advance)	1.00
Plant & Machinery	1.55
Other Misc. assets	1.00
Pre-Operative expenses	1.00
Margin for WC	0.89
	5.44

2. MEANS OF FINANCE

Capital	4.28
Term Loan	1.16
	5.44

3. COST OF PRODUCTION & PROFITABILITY STATEMENT

[Rs.lakhs]

Years	1	2	3	4	5
Installed Capacity-Nos	60000	60000	60000	60000	60000
Utilisation	60%	70%	80%	80%	80%
Production/Sales-Nos	36000	42000	48000	48000	48000
Selling Price per piece Rs.	98.00				
Sales Value (Rs.lakhs)	**35.28**	**41.16**	**47.04**	**47.04**	**47.04**
Raw Materials	11.52	13.44	15.36	15.36	15.36
Packing Materials	0.54	0.63	0.72	0.72	0.72
Power	0.79	0.92	1.06	1.06	1.06
Wages & Salaries	14.40	15.12	15.88	16.67	17.50
Repairs & Maintenance	1.20	1.32	1.45	1.60	1.76
Depreciation	0.23	0.20	0.17	0.14	0.12
Cost of Production	28.68	31.63	34.64	35.55	36.52
Selling, Admin, & General exp	3.60	3.78	3.97	4.17	4.38
Interest on Term Loan	0.16	0.14	0.10	0.06	0.02
Interest on Working Capital	0.37	0.37	0.37	0.37	0.37

Total	32.81	35.92	39.08	40.15	41.29
Profit Before Tax	2.47	5.24	7.96	6.89	5.75
Provision for tax	0.83	1.76	2.68	2.32	1.93
Profit After Tax	**1.64**	**3.48**	**5.28**	**4.57**	**3.82**
Add: Depreciation	0.23	0.20	0.17	0.14	0.12
Cash Accruals	1.87	3.68	5.45	4.71	3.94
Repayment of Term loan	0.00	0.29	0.29	0.29	0.29

4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	0.50	0.48	25%	0.12	0.36
Consumables	2.00	0.09	25%	0.02	0.07
Finished goods	0.50	1.20	25%	0.30	0.90
Debtors	0.50	1.47	10%	0.15	1.32
Expenses	1.00	0.30	100%	0.30	0.00
		3.54		0.89	2.65

5. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$$\frac{\text{Profit after Tax}}{\text{Sales}} = \frac{5.28}{47.04} \quad 11\%$$

$$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}} = \frac{8.43}{8.09} \quad 104\%$$

$$\frac{\text{Profit after Tax}}{\text{Promoters Capital}} = \frac{5.28}{4.28} \quad 123\%$$

6. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	15.88
Repairs & Maintenance	1.45
Depreciation	0.17
Admin. & General expenses	3.97
Interest on TL	0.10
	21.57

Profit Before Tax (P) 7.96

$$BEL = \frac{FC \times \frac{100}{}}{FC + P} = \frac{21.57}{29.53} \times \frac{80}{100} \times 100$$

58% of installed capacity