

**PROJECT PROFILE**  
**ON**  
**PORTABLE DIESEL GENERATORS**

**MONTH & YEAR**  
**AUGUST 2011**

**PREPARED BY**  
**TANSTIA – FNF SERVICE CENTRE**  
**B – 22, INDUSTRIAL ESTATE,**  
**GUINDY, CHENNAI – 600 032**

**This publication is supported by**

Friedrich Naumann  
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# **PORTABLE DIESEL GENERATORS**

## **INTRODUCTION**

Diesel Generator set is used to generate electricity for meeting the electricity requirement of small establishments such as commercial buildings, Hotels, Railway Stations, Telephone Exchange, Shops etc. when there is a power supply failure from the State Electricity Board or other power supply undertakings.

The Diesel Generator sets proposed in this project profile are of lower capacity only i.e. below 7.5 kVA. The prime mover of the Generator set will be a diesel engine and the prime mover will be coupled to an alternator (single phase for small units). There will be a control panel to control the on/off operation/change over from mains supply to Generator set supply etc. A generator set of higher rating has to be started with battery starters. Diesel Generator sets of smaller rating can be started by cranking.

## **MARKET**

Since power failure is very common in India, this equipment has got good demand. Diesel Generator set of 5 kVA rating is having very good market as it suits to most of the commercial establishments.

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A recent market research by Frost & Sullivan research service titled *Indian Diesel Generator Set Market* provides a comprehensive overview of the current market environment for diesel generator sets in India as well as highlights and explains the impact of market developments on future growth. The study offers insights on industry challenges, market drivers, and market restraints and determines their impact on the future market demand for diesel gensets. In this research, Frost & Sullivan's expert analysts thoroughly examine the following market segments: 15 – 75 kVA, 75.1 – 375 kVA, 375.1 – 750 kVA, and 750.1 – 2,000 kVA.

## **Market Overview**

### **Opportunities Unfold as the Indian Diesel Generator Market Bounces Back to a High Growth Trajectory**

The Indian diesel generator set market is a well organized and highly competitive space. The market can be broadly divided into three segments namely the small diesel generators (15 –

75 kVA), medium diesel generators (75.1 – 375 kVA), and large diesel generators (375.1 – 2000 kVA). Chronic power shortages and prolific growth in industries, infrastructure, telecommunication, information technology (IT), and IT enabled services triggered market growth. The total genset market is now estimated to grow steadily at a compound annual growth rate (CAGR) of about 10.1 percent in revenue terms between FY2010 and FY2015. High growth in the industrial sector and peak power deficit at about 15 percent is expected to boost diesel generator set sales in India. “With the successful auction of 3G spectrum in May 2010, major telecom firms such as Bharti, Reliance, and Aircel have made huge investment in acquiring frequencies across major urban regions such as Mumbai and Delhi,” notes the analyst of this research service. “New telecom towers are expected to be added to accommodate the needs of 3G service deployment, creating a fresh wave of demand for diesel generator sets in the range of 15 – 30 kVA.” The telecom sector was the key growth driver for the small diesel generator set market in the recent past. The 15 – 75 kVA diesel generator set market witnessed a slight slowdown in the last years on account of saturation in certain telecom circles which necessitated several tower infrastructure firms to place their tower addition plans on hold. However, with the advent of 3G services in 2010, the small diesel generator market is expected revive and project high growth rates.

Although market prospects look upbeat, there are some challenges clouding the landscape. Import of low cost diesel generators and price competition from the unorganized diesel generator suppliers are some of the key restraints that are expected to curtail growth. Low-cost imports from China have impacted the pricing trends of domestic manufacturers, causing erosion of profit margins, especially in the 15 – 75 kVA range. The threat is likely to continue as several new entrants in this market are expected to import diesel generators. With the hike in the global price of crude oil, diesel prices are expected to rise significantly, thereby causing huge losses to end users and necessitate shutdown of diesel based generation. This will negatively impact the demand for new diesel generators in the future.

“The emission norms in India are being continuously updated to match those in the European Union,” says the analyst. “As the new norms are likely to be established in 2013, and major suppliers of the diesel generator sets in India will have to upgrade the design of the engines to conform to the new emission standards.” This will entail substantial investments and several technology transfer agreements with global engine suppliers. Going forward, the degree of competition in 15-75 kVA and 75.1-375 kVA is expected to increase significantly with several new participants, both domestic and international suppliers, venturing into these market segments. For participants in this space, product positioning and service

strategies that offer additional value added services will help enhance business prospects.

## **Market Sectors**

Expert Frost & Sullivan analysts thoroughly examine the following market sectors in this research:

### **By Output Range:**

- 15-75 kVA
- 75.1-375 kVA
- 375.1-750 kVA
- 750.1-2,000 kVA.

### **By End Use Vertical:**

- Telecom
- Large- and small-scale industries
- Hospitality
- Real estate
- Commercial and residential
- Hospitals and healthcare
- Retail and restaurants
- Others

India's thrust on achieving higher economic growth rate has intensified construction activities all across the country. This has also created huge demand for power supply. According to some market research, there is a demand-supply gap of about 17% in power generation. This has thrown open huge market opportunities for the power backup providing companies. The power backup market in India is growing at an annual rate of 15-20%, varying within the three different segments – generators, UPS and inverters. Major players like Kirloskar Oil Engines Ltd (KOEL), Mahindra-Powerol, Cummins India, Greaves Cotton, Ashok Leyland, Eicher, Caterpillar, MTU and few other imported brands are seeing huge market potential to grow in India.

Dinesh Vyawahare, Senior General Manager, Marketing, KOEL, said: "India's power market is growing faster than most other countries. With an installed generation capacity of 147 GW, generation of more than 600 billion kWh, and a transmission and distribution network of more than 6.3 million circuit kms, India is now the fifth largest power market in the world. The per capita electricity consumption in the country is around 665 units which is envisaged to increase to 1,000 units by 2011-12." He said good opportunity continues to exist in power sector in India due to growing gap between demand and supply. The demand for power is typically driven by sectors such as Telecom, Commercial construction, IT,

ITES, Retail, etc. KOEL is into manufacturing air cooled and liquid engines/ diesel Gensets with power output covering from 5kVA to 625kVA and 1800kVA to 6300 kVA. “Kirloskar engines are known for lower operating cost, higher reliability and longer life. We manufacture engines that are not only emission complaint and eco-friendly, but are also manufactured in an environment friendly way. KOEL engines and diesel generator sets are certified for the stringent noise and exhaust emission norms made mandatory by Central Pollution Control Board,” Vyawahare added. He said the domestic Genset market (inclusive of Telecom sector) is about two lakh per annum in the range from 10kVA to 2000kVA. “KOEL is a major player in India with about 27% market share. We foresee our market share to grow up to 35% in next couple of years,” he added.

Diversifying into the power generation sector, Mahindra & Mahindra, another player to have its strong presence, had launched its Mahindra Powerol brand in the India market in 2001. The company realised huge potential in the segment and decided to start manufacturing and supplying complete DG sets under the new brand. This has helped them to grow their business to Rs1010 crore in 2009 from its earlier revenue of Rs51 crore in 2005. The company manufactures engines which can power Diesel generating sets ranging from 5kVA to 320kVA.

“In Telecom segment we have 42% market share whereas we hold 21% market share in retail segment. In volume term, we had sold 52,000 DG sets in financial year 2008-09. Besides Telecom, DG sets are also powering customers from a diverse cross-section of industries such as banks, building & construction, public sector units, hospitals, hotels, homes and manufacturing units,” the company said.

Mahindra had also launched B100 bio diesel generator sets for the Indian market. The company said Mahindra Powerol engines and diesel generator sets are certified for the stringent noise and exhaust emission norms made mandatory by the Central Pollution Control Board, India.

According to industry estimates, the DG set market in India (15-2000 kVA range) was estimated at Rs60, 253 million with 147,040 units in financial year 2006-07. That is now projected to grow to Rs12,2230 million with sales of 205,450 units.

Source: Business Standard

## **TAMILNADU SCENARIO**

In general Tamilnadu is facing a great power demand every year and the heat is felt very badly in Tamilnadu. This year the summer is early when compared to the last year. In this criterion the government has to take some initiative to look after the power demand in Tamilnadu. In general Tamilnadu is already facing an acute power shortage and the statistics show that there were over 11,000 MW power shortages in

Tamilnadu. This shortage is 1000 MW more than the previous year demand. As the summer goes on and the temperature increases there will also be more demand for the power in Tamilnadu.

Presently we are facing a serious demand and shortage because recently the Tuticorin Thermal Plant was shut down for the purpose of maintenance. There is a strike ongoing in the Orissa so that we are not even getting this 400 MW which we usually get from Thalsar near Orissa. But the officials are stating that once when these issues are cleared then there will not be any problem for power for Tamilnadu. Official states that "this year we are facing the power shortage because of the reason that the summer started earlier. We are also gearing up the process to face the shortage and find a solution for the same."

But practically the power generation in the Tamilnadu state stands to be only 8000 MW but the serious demand of the power is 10000 MW and this year the power demand is reaching 11000 MW and this is indeed a great challenge for the DMK government. The next step that the government takes to solve this issue is the unannounced power cuts in Tamilnadu. The power cuts are already started in Coimbatore. There are many textile mills and nearly 45,000 industrial units facing this problem because of the seven hours power

cut. For the last 4 days the situation is too worse as the factories and the mills are grinding halt for nearly three hours. And after that in the evening there is a power cut for nearly four hours and that too in the peak hours. The power cut in Coimbatore is also spoiling the normal life in Coimbatore.

The temple city is the next place that is facing a serious power cuts. Power Cuts in Madurai is unannounced and there are also many complaints raised because of that. Due to the increase in the temperature and also the water scarcity problem is a great issue now which adds more to the problem. There is also a talk going on by the officials who are planning to purchase nearly 1000 MW of power from the private generators and the traders. Senior EB official said "From the May month we will go for wind energy but we should not actually rely on it".

Source: Business line

### **INSTALLED CAPACITY**

<b>Product</b>	<b>Capacity per annum 300 days per annum</b>
Diesel Generator Sets	24

## PLANT AND MACHINERY

Sl No	Item Name	Qty	Rate	Rs.
1	Pendent operated Electric Hoist 5Ts capacity with supporting frame	1	250000	250000
2	Wielding Transformer 2KVA	1	60000	60000
3	Gas Cutting Equipment	1	44000	44000
4	Flexible Shaft Grinder	1	64000	64000
5	Bench Drilling Machine	1	80000	80000
6	Set of tools such as spanners screw drivers crimping tools etc	1	16000	16000
7	Resistance load bank for loading alternator (10kw capacity	1	64000	64000
8	Testing panel for testing the Performance of the Diesel Generator set (Fitted with ammeters, voltmeter, watt meter, Indication lamp etc.)	1	176000	176000
	<b>Total</b>			<b>754000</b>
	Tools/Jigs/ fixture			46000
				800000

## MANUFACTURING PROCESS

The proposed unit is doing the assembly of diesel generator sets with necessary control panel as per the requirement of the

customer. The load requirement of the customer is studied in consultation with the customer. Any special requirements such as minimum start up period, fluctuations of load etc. are noted. A suitable alternator to meet the load requirement is procured from an alternator manufacturer.

A diesel engine suitable for the alternator is also selected and procured from the diesel engine manufacturer. The diesel engine and alternator are coupled and fixed on a frame. A control panel for starting the engine using battery bank, isolating the mains while the alternator is running, disconnecting the alternator when the mains supply is available etc. is designed and assembled as stipulated by the customer. The assembly is tested for fuel efficiency, load capacity of the alternator, operational sequences etc.

The Diesel Generator set is then despatched to the premises of the customer in dismantled condition or in assembled condition depending upon the size of the Diesel Generator set.

### **RAW MATERIALS**

<b>Sl No</b>	<b>ITEM DESCRIPTION</b>	<b>QTY</b>	<b>Rs</b>
	Diesel Engine 7.5 HP	24	384000
	Alternator 5 kVA single phase, 230 V, 50 Hz	24	288000
	Relays and Contractors	24	144000

PVC insulated cable for Control Panel wiring	24		31200
M.S. channels, LS bolts, nuts and M.S. Plates	24		96000
Sheet metal enclosure for Control Panel	24		48000
Other misc. LS items such as crimping lugs, hardware etc	24		24000
<b>Total</b>			<b>1015200</b>

The main components for generator are Diesel engines, Alternators, Relays, PVC insulated coils, MS channels, Sheet metals, other miscellaneous items such as crimping lugs, hardware. The Diesel engines can be sourced from VCEV and Alternators from Trident Power craft Pvt ltd, Bangalore, Cummins Generator Technologies India Ltd, Pune. For smaller generators the diesel engines can be sourced from Mitsubishi and Stamford. The control panels can be sourced from Sun Industrial automotive solutions, Chennai. The gear boxes can be procured from Ghatge Patil.

## **LAND AND BUILDINGS**

Built up area	2000 sq.ft
Rent payable ( Per Month)	Rs.20000
Advance	Rs.200000

## UTILITIES

### Power & Fuel

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

## MANPOWER

Category	Qty	Amount
Electrical Fitters	1	7000
Helper	1	5000
Production Supervisor	1	8000
Marketing Executive	1	7000
Assistants	1	6000
Total		33000
Add 20% Testing Perquisites		6600
Total		39600
Say		Rs.4.75 lakhs

## SCHEDULE OF IMPLEMENTATION

After making arrangements for funds, the project can be implemented in 6 months period.

## **COST OF PRODUCTION AND PROFITABILTY**

### **Assumptions**

Installed capacity	24 Nos – mostly 7.5 KVA generators
Capacity utilisation	Year-1 -60% Year -2 -70% Year-3 onwards- 80%
Selling price per piece	Rs.1.35 lakhs
Raw materials	As per the details given above
Packing materials	As per details given above
Power	Rs.1.32 lakhs per annum
Wages and salaries	Rs.4.75 lakhs per annum
Repairs and Maintenance	Rs.0.60 lakh per annum
Depreciation	Written down value method -15 % on machinery
Selling general and administrative expenses	Rs. 40000 per month with annual increase.
Interest on Term loan	14% per annum
Interest on working capital	14% per annum
Income tax	34% on taxable income

### **MACHINERY SUPPLIERS**

1. M/s. Automation Props Test Equipment (Elec.) Pvt. Limited  
Dr. Annie Besant Road,  
Worli, Mumbai - 400 018.

(For Test Panel)

2 M/s. Mecco Instrument Pvt. Ltd. 301, Bharat Industrial Estate, T.J. Road, Sewree, Mumbai- 400 015

(For Measuring Instruments)

3. Local dealers

(For Tool kits)

## **RAW MATERIAL SUPPLIERS**

1. Mitsubishi Heavy Industries India Private Ltd

4th Floor, Prestige Takt,

23, Kasturba Road Cross,

Bangalore - 560001 (India)

( for Diesel Engines)

2.Cummins Generator Technologies India Ltd

(Stamford India )

Godrej Eternia –C, B wing,5<sup>th</sup> Floor

Wakdewadi, Mumbai - Pune Road,

Shivaji Nagar, (Next to Shopper's Stop)

Pune - 411005

3.Stamford India Power

No.41/2/5/2, Kondhwa Budruk,

Pune. ( for Diesel Engines)

4. M/s. Jyothi Limited

Alternative Division,

P.O. Chemical Industries, Vadodara

(For alternators)

5. M/s. Crompton Greaves Ltd. Marketing Office: 1,  
Dr. V.B. Gandhi Nagar, Fort,  
Mumbai - 400 023.

(For alternators)

6. M/s. J.P. Engineering Works  
A-70, G.T. Karnal Road,  
Industrial Area,  
Delhi - 110033.

(For Alternators)

7. M/s. Kirloskar Cummus Ltd. Pune

(For Diesel Engines)

8. M/s. Mono tex Agency  
165, Dr. Nanjappa Road,  
Coimbatore - 12.

(For Diesel Engines)

9. M/s. Asia Electric Company Katara Mansion,  
Dr. A.B. Road, Worli,  
Mumbai- 400 018.

(For Control Panel Assembly)

10. Local dealers for other items.

## FINANCIAL ASPECTS

### 1. COST OF PROJECT

	[Rs.lakhs]
Land & Building (Advance)	2.00
Plant & Machinery	8.00
Other Misc. assets	0.50
Pre-Operative expenses	1.00
Margin for WC	0.58
	<u>12.08</u>

### 2. MEANS OF FINANCE

Capital	6.08
Term Loan	6.00
	<u>12.08</u>

### 3. COST OF PRODUCTION & PROFITABILITY STATEMENT

	[Rs.lakhs]				
Years	1	2	3	4	5
Installed Capacity-Nos	24	24	24	24	24
Utilisation	60%	70%	80%	80%	80%
Production/Sales-Nos	14	17	19	19	19
Selling Price per piece Rs.	1.35	Lakhs			
Sales Value (Rs.lakhs)	<b>18.90</b>	<b>22.95</b>	<b>25.65</b>	<b>25.65</b>	<b>25.65</b>
Raw Materials	6.09	7.11	8.12	8.12	8.12
Packing Materials	0.00	0.00	0.00	0.00	0.00
Power	0.79	0.92	1.06	1.06	1.06
Wages & Salaries	4.75	4.99	5.24	5.50	5.78
Repairs & Maintenance	0.60	0.66	0.73	0.80	0.88
Depreciation	1.20	1.02	0.87	0.74	0.63
Cost of Production	<u>13.43</u>	<u>14.70</u>	<u>16.02</u>	<u>16.22</u>	<u>16.47</u>

Selling, Admin, & General exp	3.60	3.78	3.97	4.17	4.38
Interest on Term Loan	0.84	0.74	0.53	0.32	0.11
Interest on Working Capital	0.18	0.18	0.18	0.18	0.18
Total	18.05	19.40	20.70	20.89	21.14
Profit Before Tax	0.85	3.55	4.95	4.76	4.51
Provision for tax	0.29	1.20	1.67	1.60	1.52
Profit After Tax	<b>0.56</b>	<b>2.35</b>	<b>3.28</b>	<b>3.16</b>	<b>2.99</b>
Add:	1.20	1.02	0.87	0.74	0.63
Depreciation					
Cash Accruals	1.76	3.37	4.15	3.90	3.62
Repayment of Term loan	0.00	1.50	1.50	1.50	1.50

#### 4. WORKING CAPITAL:

	Months	Values	%	Margin Amount	Bank Finance
Consumptions					
Raw Materials	0.50	0.25	25%	0.06	0.19
Consumables	2.00	0.00	25%	0.00	0.00
Finished goods	0.50	0.56	25%	0.14	0.42
Debtors	0.50	0.79	10%	0.08	0.71
Expenses	1.00	0.30	100%	0.30	0.00
		1.90		0.58	1.32

#### 6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$$\frac{\text{Profit after Tax}}{\text{Sales}} = \frac{3.28}{25.65} \quad 13\%$$

$$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}} = \frac{5.66}{13.40} \quad 42\%$$

$$\frac{\text{Profit after Tax}}{\text{Promoters Capital}} = \frac{3.28}{6.08} \quad 54\%$$

## 7. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	5.24
Repairs & Maintenance	0.73
Depreciation	0.87
Admin. & General expenses	3.97
Interest on TL	0.53
	<hr/>
	11.34
	<hr/>

Profit Before Tax (P) 4.95

$$\text{BEL} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{11.34}{16.29} \times \frac{80}{100} \times 100$$

56% of installed capacity