CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.

SECTION A. General description of the small-scale project activity

A.1. Title of the small-scale project activity:

Grid-connected electricity generation from renewable sources at Kadavukallu, Putluru Mandal, Dist. Anantpur , AndhraPradesh by M/s Wescare India Ltd. using wind Power
Version 2 dated 3rd November 2006

A.2. Description of the small-scale project activity:

The project activity initiated by the proponent i.e. Wescare (India) Limited includes development, design, engineering, procurement, finance, construction, operation and maintenance of wind energy based electric generating stations and supply electricity to the "regional electricity grid". The project activity involves generation, operation and maintenance of grid connected electricity generation facility at Kadavukallu in Andhra Pradesh with a total generation capacity of 13.5 MW.

The main objective of this project is to generate power from non-polluting mechanism thereby displacing the electricity from the grid that is mostly produced by carbon intensive fossil fuels. Ultimately the project activity aims at harnessing the renewable natural resources in the region, and country and thereby displacing non renewable natural resources thereby ultimately leading to sustainable, economic and environmental development.

The electricity generated from this wind farm is supplied to local substation through local transmission lines duly metered at developer's end. The project activity comprises supply, erection, commissioning & operation of 54 numbers wind electric generators each capacity 250KW out of which 50 numbers are of DasLagerway make and 4 numbers are of Pioneer Wincon make. The annual output of the wind farm in the year 2004-05 is 22.68 million units. The generated electricity is being supplied to state electricity board of Andhra Pradesh.

The power generated in the wind farm is wheeled through APTRanSCO (Andhra Pradesh Transmission Company) to the grid from where all consumers viz., India Cements Limited; Asian paints Limited; Dr.Reddy Labs; Super Spinning Mills etc., draw power. The total power consumed is billed to the client and credit is given for the number of units consumed from the wind farm.

Wescare identifies the consumer and enters into an agreement with them for supply of power. The same is intimated to APSEB. As regards additional generation, the same is banked with APSEB. As and when a consumer is identified, credit is given from the banked units.

The details of owners of the project are presented below:

Owner	*Total capacity of wind mills*	*No. of Wind turbines*	*Capacity of each turbine*	*Power generated (MU*)*	*Date of commissioning*
Wescare	2 MW	8	250 kW	18.08	31.3.2000
RCI	11.50MW	46	250 kW	99.87	18.3.2000

* From April 2000 to Spetember 2005.

RCI is a fully owned subsidiary of Wescare (India) Limited and Wescare is the owner of the CDM project activity.

The project activity meets several sustainable development objectives including:

- Contribution towards achieving the objective of the policy on wind power generation of Government of India and Government of Andhra Pradesh, which is to promote generation of energy through non-conventional sources to supplement the ever-increasing demand of the state.
- Contribution towards meeting the electricity supply deficit in Andhra Pradesh.
- Reduction in GHG (Green House Gases) emission (CH_4 and CO_2) through development of renewable technology and that of other air pollutants occurring from fossil fuel extraction, processing, transportation and burning.
- Rural and Infrastructure development in the areas around the Project.
- Reducing the average emission intensity (SOx, NOx, PM etc,) average effluent intensity and average solid waste intensity in the system.
- Conserving natural resource including land, forest, water and the ecosystem.
- Reduction in the consumption of fossil fuels in the grid for generating additional electricity equivalent to that generated by the wind mills.
- Help in economic and social development of remote village in Andhra Pradesh by making investment in that area.
- Encouragement to other entrepreneurs irrespective of sector to adopt this technology and invest in wind energy.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India	**Wescare (India) Limited, Chennai**	No (Host party)

Many other entities from Annex I countries may join as project participants. The list of such participants will be provided before the project is submitted for registration.

A.4. Technical description of the small-scale project activity:

The project activity initiated by the proponent i.e. Wescare (India) Limited includes development, design, engineering, procurement, finance, construction, operation and maintenance of wind energy based electric generating stations (Wind Mills) and supply electricity to the "regional electricity grid". The project activity involves generation, operation and maintenance of grid connected electricity generation facility at Kadavukallu in Andhra Pradesh with a total generation capacity of 13.5 MW.

The wind mills were supplied by Das Lagerwey Windturbines Limited (DLWL) (a joint venture between Devices and Systems of India and Lagerwey BV of Holland)

This project omprises of 50 Nos DLWL Wind mills with model LW 30/250, which means 30 M rotor diameter and 250 KW capacity. The Wind mills have 2 nos. blades with rotor diameter of 30 meters, having swept area of 707 sq m. the rated wind speed was 15 m/s with cut in and cut off speed ranging from 5 m/s to 25 m/s. The rotor system is connected through an integrated 3 stage (1 planetary and 2

helical) gear-box to the generator of rated output 250 kW. These machines are then connected to a 440/33000 V, 3 phase transformers to the 33KV feeders supplying power to the near by substations.

The project has 4 nos. Pioneer Wincon Make Windmills with model no. 250/29 which are three-blade, stall regulated wind electric generators (WEGs) of 250 kW capacity. The WEGs have 3 rotor blades of diameter 29 meters, having swept area of 684 sq m. The rated wind speed was 15 m/s with cut in and cut off speed ranging from 5 m/s to 25 m/s. The rotor system is connected through an integrated 3 stage (1 planetary and 2 helical) gear-box to the generator of rated output 250 kW.

All these Wind mills are connected to a 440 / 33000 V, 3 phase transformers to the 33KV feeders supplying power to the near by substations. The 33 KV feeders are connected to the Komatikuntla Substation, which is ~ 2 km from the wind farm. In these substations the feeders are connected to 33/132 KV transformer which supplies power to the nearest state grid substation at Tadipatri.

Of the total 54 wind mills, 50 are of DLWL make (Das Lagerwey Windturbines Limited) and 4 of PWL make (Pioneer Wincon Limited).

A.4.1. Location of the small-scale project activity:

Furnished below

A.4.1.1. Host Party(ies):

Government of India (GOI)

A.4.1.2. Region/State/Province etc.:

Southern region, Andhra Pradesh

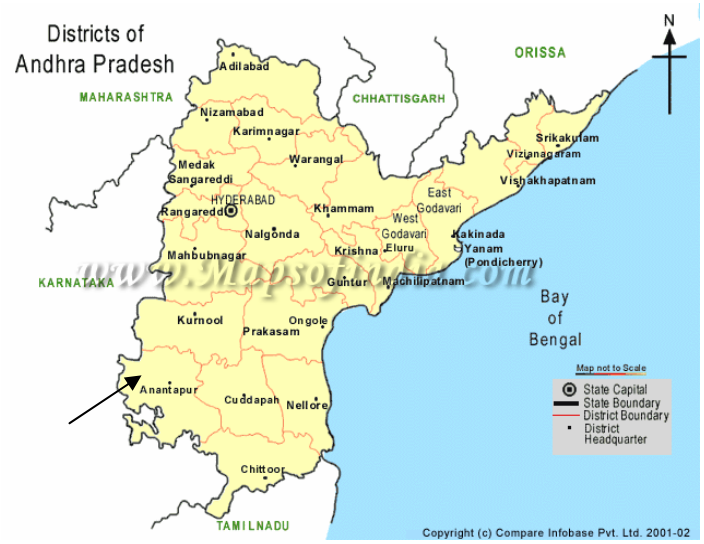
A.4.1.3. City/Town/Community etc:

Kadavukallu Village, Putluru Mandal , Anantpur District

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

The project activity is located in the village Kadavukallu, Putluru Mandal, Anantpur district in the state of Andhra Pradesh India. The Latitude is 14 deg.(North) & Longitude 78 deg.(East) The nearest railway station is Tadipatri..The relevant physical map is furnished below.

Physical map of Location



MAP OF ANANTPUR DISTRICT

A.4.2. Type and category (ies) and technology of the small-scale project activity:

The project comes under Type I – Renewable Energy Project and Category I.D.- Renewable Electricity generation for a grid as per Appendix B of the simplified modalities and procedures for small-scale CDM project activities and Guidelines for completing CDM-SSC-PDD and F-CDM-SSC-subm.

The project activity involves generation, operation and maintenance of grid connected electricity generation facility at Kadavukallu in Andhra Pradesh with a total generation capacity of 13.5 MW.

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

Andhra Pradesh (AP) has an energy demand of 6500MW. Its State Electricity Board's own generation capacity is not adequate to supply the demand in APSEB area. Any additional power requirements are met by either purchasing power or setting up of new electricity generating units. AP is a part of the southern regional grid of the country which is connected to four other states namely Tamil Nadu, Kerala, Karnataka and Pondicherry. As is true for the rest of India, for the regional southern grid too, the electricity sector relies overwhelmingly on thermal-based power generation (coal and gas), and has under-developed renewable energy sources such as wind (constitutes less than 1% of the regional grid power at present). As a result, the region's power grid is a major source of anthropogenic GHGs. In the recent past, the capacity additions in the region have primarily been through the addition of thermal power plants (more than half of which is coal and rest is a combination of gas and diesel).

This CDM project, will displace equivalent unit of electricity generated by thermal and other power plants connected to the grid**.** The CDM project activity, wind based project, represents a small capacity addition and hence will have a marginal effect on the operating generating units connected to the selected grid as well as on the capacity addition to the grid. It is demonstrated in Section B.3 that in the absence of the proposed CDM project activity, the electricity authority would have permitted new thermal/or other GHG intensive power generation options or /and continued with the existing ones, which would result in the emission of a greater amount of greenhouse gases (GHG) emissions for generating same quantum of power from the proposed project activity.

The project itself is a zero emission power project as it is based on wind, a renewable natural resource. However, there had been some fugitive emission (in the form of carbon dioxide emissions due to movement of vehicles) during the construction phase of the project, but such emission has been considered negligible when compared with the total savings earned by the project through out its lifetime and based on the scale of construction activities involved.

In absence of the project activity, in view of the substantial energy deficit situation in the state of Andhra Pradesh, the capacity/generation addition would have been the new or existing fossil fuel based generation stations connected to it.

On account of the project activity the power generated by the wind power projects shall result in avoidance of such "Business As Usual scenario" (GHG emission in the grid, which would have otherwise occurred, to generate the same power in the absence of the project).

The generation of power with wind power is not a requirement as per the Indian regulatory requirement. Though there are several promotional policies for renewable energy generation in India and specifically in the state of Andhra Pradesh, the share of wind energy in the generation capacity in the state of Andhra Pradesh and investment into Wind Turbines is insignificant component of the investments into power sector.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

The estimated activity is expected to generate an average of 16.75 GWh of electricity during each year of the crediting period. As mentioned in section A.4.3 above, the southern grid has been selected for calculating baseline emissions. The emission rate of the selected baseline grid where the project activity will occur would displace fossil fuel based electricity generation to the extent of the electricity generated by this wind project. The total emitted emission reduction achieved during the 10 year crediting period aggregating to 167550 tons of CO_2.

Estimated emission reduction:

Years	Annual Estimation of emission reduction in tonnes of CO2 e
April 2000 to March 2001	10539
April 2001 to March 2002	20170
April 2002 to March 2003	14611
April 2003 to March 2004	11943
April 2004 to March 2005	18381
April 2005 to March 2006	18381
April 2006 to March 2007	18381
April 2007 to March 2008	18381
April 2008 to March 2009	18381
April 2009 to March 2010	18381
Total Estimated Reduction (tonnes of CO2 e)	**167550**
Total number of crediting years	10
Annual average over crediting period of estimated reductions (tonnes of CO2 e)	16755

A.4.4. Public funding of the small-scale project activity:

There is no Official Development Agency funding to be used for the project activity. The funding for the wind farm project has been in the following manner:

Lease Finance from:	Number of WEGs	Amount (INR Crore)
Global Trust bank Limited (now taken over by Oriental Bank of Commerce)	20	24.60
Sundram Finance Limited	12	13.20

Centurion Bank Limited	16	19.2
India Cements Capital Finance Ltd	4	4.80
Lakshmi General Finance Co Ltd	2	2.20
TOTAL	**54**	**64.00**

The Lease finance availed from various companies/banks includes an amount varying from 30% - 40% of the cost of the Wind Electric Generators being financed, placed as a deposit with the financing institution which amounts to promoters contribution .

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

As mentioned under Appendix C of the Simplified Modalities and Procedures for Small-Scale CDM project Activities, the following results into debundling of large CDM project:

"A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure; and
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point"

For the proposed project activity the project participants have not have gone for additional registration for any similar project within the previous 2 years whose project boundary is within 1 km of the project boundary of the proposed activity. Thus it is confirmed that the small scale project activity is not a debundled component of a larger project activity.

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

Project has applied approved methodology available for small-scale CDM project at UNFCCC website under Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

Methodology type I.D: Title – "Renewable electricity generation for a grid"
Version 09 dated 28 July 2006

B.2 Project category applicable to the small-scale project activity:

Applicability Criteria	Project Conditions
Renewable energy generation units, such as photo voltaic hydro, tidal/wave, wind, geothermal and biomass, that supply electricity to an electricity distribution system that is or would have been supplied by at least one fossil fuel or non-renewable biomass fired generating unit	The project is a wind mill project hence applicable for this category
If the unit added has both renewable and non-renewable components, the eligibility limit of 15 MW for a small scale CDM project activity applies only to the renewable component. If the unit added co-fires (non-) renewable biomass and fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW	There is neither non-renewable component added, nor co-firing is required for the proposed project activity. The renewable project capacity is 13.5 MW, which is lower than the limit of 15 MW.
Biomass combined heat and power systems that supply electricity to a grid are included in this category. To qualify under this category, the sum of all forms of energy output shall not exceed 45 MW $_{thermal}$.	Not applicable

The above comparison confirms that the chosen methodology is applicable for this project activity.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

In the absence of the project activity, the GHG emissions to generate and supply the same amount of power would be:
baseline expressed in Tons of CO2 x Quantum of power generated and supplied to the grid by the project activity; and
whereas, in the case the project activity operates, the GHG emissions to generate the same amount of power will be ZERO.

Additionality Check:

Additionality of the project activity is analysed in the following section as per barriers outlined in attachment A of Appendix B.

Wescare India Ltd. had gained awareness regarding the clean development mechanism in 1999-2000 through various seminars and conferences and published literature. The Wescare management had taken a decision to go ahead with the project, after duly considering CDM benefits under the Kyoto Protocol. There is documentary evidence to such decision that could be verified by the validator.

Alternatives to the project activity include the following:

Same amount of power would be generated through a higher GHG intensive fuel like coal for power generation by the other grid connected power plants, in keeping with the existing/ prevalent trend and prevailing practice in the southern region and especially in the State of Andhra Pradesh.

Generation of electricity using wind as a renewable source of energy for power generation, without CDM revenue

From the legislations point of view the project highlights include:
Electricity generation from wind farm is not a legal requirement or a mandatory choice.

There are, state and sectoral policies, primarily framed to encourage wind based power project to attract more private investment as there are many anticipated risks under the project and requires good amount of investment to be involved.

The Indian Electricity Act of 2003 does not restrict or empower any authority to restrict the fuel choice for power generation. In addition, it may be noted that the draft National Electricity Policy (revised in August 2004) asserts ‘coal would necessarily continue to remain the major fuel’.

The applicable environmental regulations do not restrict the use of wind energy for power generation. There is no legal requirement on the choice of a particular technology for power generation.

Thus it is clear that none of the alternatives that the project proponent had, in order to meets it’s power requirements are restricted by the environment regulations, nor do they oppose any legal requirement enforced. Thus the project activity is not the only baseline line scenario existing for the project proponent

The project activity faces the following barriers that would have prevented its implementation, but do not prevent implementation of the identified alternative to the project.

Technological Barriers:

With a view to sustain their desire of power generation using renewable resource in order to mitigate the emission while meeting their power requirement, the project proponent had to upgrade the skill set of their existing man power for the maintenance and operation of these wind farms.

The project proponent was well educated of the fact that, occurrence of a fire accident, at the level of the windmills, can result in complete destruction of the control circuit.

The fire may be caused due to occurrence of thunderstorm cum lightening strokes, which is a frequent phenomenon during the rainy season in this region.

Also it is known fact that the lightning arrestors fail during thunderstorm cum lightening due to the fact that sometimes the response time of the arrestor cannot match the speed (time and amplitude) at which lightning strikes. Additionally, accumulation of water particulate on lightning arrestor provides a parallel path in case of lightning through its surface, which may result in the bursting of the arrestor beside breakdown of insulation. Therefore, very purpose of the lightning arrestor is defeated.

In the event of fire, the destruction of the control circuit can lead to stoppage of communication between the control system and the nacelle controller. This will lead to freewheeling / runaway of the turbine and it will be dangerous to stop the turbine which will be rotating at speeds exceeding the speed for which it is designed. This in turn will lead to fatigue and eventually the tower may collapse. Such an event may result in complete loss of investment.

The proponent still decided to go ahead with the investment considering the CDM benefits. This risk which caused concern to the proponent prompted them to take certain additional precautions such as going in for the installation of smoke detectors in the control panel of each WEG as a risk mitigation measure. The smoke detector senses the smoke before the onset of fire and sends communication to the control system to stop the turbine. This will minimize the risk though the risk cannot be eliminated.

Investment Barriers:

The optimum generation of power depends upon the **average available wind** in a year. The occasion of this average wind being available is uncertain. The slightest change in the wind direction, which may lower the availability of the average wind can change the power output pattern. There is no mechanism, which can guarantee the required average wind direction, as well as speed that is required for a consistent availability of average wind. Also the extent to which the topology of the region affects the speed of the wind makes any kind of investments in wind farm very vulnerable.

The risks associated with the uncertainty caused by the natural forces on power generation can be minimised only by going for larger wind farms. Larger wind farms would mean subjecting oneself further to increased PPA risks.

There is uncertainty of state Govt policies on power purchase, wheeling charges and also delay in realization of revenue.

There was no dedicated substation for wind farms in the region. The windfarm had to be connected to the existing substation through a rural feeder located 14 kms from the site. Frequent grid failures are common in rural feeders increasing the risk of generation and component failures.

Financial Returns:

The financial returns from wind energy are low. Even if one was to factor in the special prices announced by AP Transco for wind energy the returns are low. The IRR calculated for this project was low at 4.9% (pre tax) at a conservative generation of 16 lac units per MW. CDM revenue helped to improve the IRR to 7.1% (pre tax) and was the deciding factor. Wind power projects provide lower IRR as these projects entail high project cost and low PLF. The IRR calculations is enclosed as Annex. 5.

State government have different policies for renewable power producers. The fact is that the wind farm developers are dependent on Government policy for tariff and transmission which **are subject to risk of change of policy**. The perceived risk turned real when in Andhra Pradesh the wind mill owners faced a difficult situation due to change in state government policy. Many wind-farms were put up since year 2000 based on third party sale and power wheeling through electricity grid, which is owned by the government. The wheeling charge was 2% of the total power wheeled. In April 2002, the government abruptly increased the wheeling charges to 28.4% which has changed the economics of these projects entirely. The mills put up before 2002 have got a stay order against this notice but the risk remains.

Barriers due to prevailing practice:

If we look at the grid penetration of wind power projects in the southern states, it is evident that Tamil Nadu is by far the leader having achieved about 23% penetration (Data Source: Government of Tamilnadu, Energy Department Policy Note 2006-07). However, penetration level of wind farms in Andhra Pradesh is less than 1% as of 31.3.05, clearly indicating that it is not a common practice.

As of 2006, only 5.73% of the identified technical potential has been set up as against 135% in neighbouring Tamilnadu. This is inspite of the fact that AP has the highest gross potential of 9063 MW which is almost 20% of the gross potential for India (46492 MW). Statistics reveal that growth in Wind Power installations in AP has been way below other states like Tamilnadu, Maharashtra. The additional installations in AP have been about 10 MW in the 4 year period 2000 – 2004 as compared to 328 MW in Maharashtra and 590 MW in Tamilnadu during the same period. (Source: Green Energy – Vol 2, No.4, July-Aug 2006).

From all the above it can be concluded that it is the existence of various barriers that has resulted in AP lagging way below other states in India

The choice of the location of the windmills is driven by the meteorological condition. Evacuation of power from the windmill site to the nearest grid substation also was a major problem for setting up this project. Installation of system for transmitting power from the wind mill site to grid substation required a significant investment which was not viable for this type of small scale project.

The Project Start date was 3rd January 2000 when the Board of Directors of the Project Proponent duly approved the investment after considering the benefits under CDM. The commissioning of the Wind Mills by connecting to the Grid was completed on 31st March 2000.

The proposed activity thus satisfies the additionality conditions and qualifies as a CDM project.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

The project boundary encompasses the physical, geographical site of the windmills at Tadipatri.

B.5. Details of the baseline and its development:

The baseline for this project is the net electricity supplied to the customer by the windmills multiplied by the emission coefficient of the Southern region Electricity grid. The emission coefficient is calculated in a transparent and conservative manner as:

The weighted average emissions (in kg CO_2equ/kWh) of the current generation mix. This includes all the power plants, connected to the state grid, irrespective of ownership (state or private) or the fuel type (thermal, hydro or nuclear).
The net electricity is calculated as:
Generation – Auxiliary consumption

Choice of grid:
The southern grid has been selected for the following reasons:
Project boundary is a notional boundary within which the baseline emissions would be estimated based on the impact of the CDM project. Emissions from all the sources of GHG emissions that are significant need to be taken in account while estimating the baseline. In case of a baseline for renewable energy projects generating power and feeding it to the grid, the system boundary could be:

a. the state boundary in which the project is being implemented
b. the regional boundary having common grid to which the project is supplying the power or
c. the combination of regional grids (national boundary).

In case of India, power is a concurrent subject between the state and the central governments. The perspective planning, monitoring of implementation of power projects is the responsibility of Ministry of Power, Government of India. At the state level the state utilities or state electricity boards (SEBs) are responsible for supply, transmission, and distribution of power. Many of the state utilities are engaged in power generation also. In addition to this there are different central / public sector organizations involved in generation like National Thermal Power Corporation (NTPC), National Hydro Power Corporation (NHPC), etc. in transmission e.g. Power Grid Corporation of India Ltd. (PGCIL) and in financing e.g. Power Finance Corporation Ltd. (PFC). There are five regional grids: Northern, Western, Southern, Eastern and North-Eastern.

The management of generation and supply of power within the regional grid is undertaken by the load dispatch centers (LDC). Different states within the regional grids meet the demand from their own generation facilities plus generation by power plants owned by the central sector i.e. NTPC and NHPC etc. Specific quota is allocated to different states from the central sector power plants. Depending on the demand and generation there are exports and imports of power within different states in the regional grid. Thus there is trading of power between states in the grid. Similarly there are imports and export of power between regional grids.

A grid boundary is defined either by any physical restriction in power flow or any administrative authority controlling the imports and exports across the boundary. The project activity is in the state of Andhra Pradesh which is a part of the southern grid of India. There is no physical restriction of Andhra Pradesh grid to be connected to the Southern grid of India. Since the CDM project would be supplying power to the regional grid it is also preferred to take the regional grid as project boundary than the state boundary. It also minimizes the effect of inter state power transactions, which are dynamic and vary widely.

Hence, all the calculation for baseline has been done based on the southern regional grid and in the calculation, wherever estimations/approximations has to be made due to unavailability of data in public domain, conservative approach has been taken.

The most recent available data has been used for the baseline calculation.. The detailed data for baseline calculation has been furnished under Annx. 3. The Calculation formula are presented in Section E

Southern Grid Power Generation

Source	MoU	OM (2002-03)	OM (2003-04)	OM (2004-05)
Year-wise OM	tCO2/ MWh	0.952	0.979	0.989
OM	tCO2/ MWh	0.973		
BM	tCO2/ MWh	0.647		
Emission Factor-CM	tCO2/ MWh	**0.810**		

Date of completing the final draft of this baseline section *(DD/MM/YYYY)*: 20/10/2005
Name of person/entity determining the baseline: PricewaterhouseCoopers (P) Limited has assisted the project proponent in determining the application of baseline methodology for the identified CDM project.

Organization:	PricewaterhouseCoopers (P) Ltd.
Street/ P. O. Box:	252 Veer Savarkar Marg, Shivaji Park,
Building:	3rd Floor, B Wing,
City:	Dadar West, Mumbai
State/Region:	Maharastra
Postcode/ZIP:	400 028
Country:	India
Telephone:	91 22 5669 1200 (Board)
FAX:	91 22 5654 7804/5
E-Mail:	ram.babu@in.pwc.com
URL:	www.pwc.com
Represented by:	
Title:	Dr.
Salutation:	Associate Director
Last Name:	Babu
Middle Name:	Ram
First Name:	P
Department:	Sustainable Business Solutions
Mobile:	98 201 35929
Direct FAX:	
Direct tel:	91 22 5669 1302
Personal E-Mail:	ram.babu@in.pwc.com

SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

C.1.1. Starting date of the small-scale project activity:

3rd January 2000

C.1.2. Expected operational lifetime of the small-scale project activity:

20 years

C.2. Choice of crediting period and related information:

Fixed 10 years

C.2.1. Renewable crediting period:

Not applicable

C.2.1.1. Starting date of the first crediting period:

Not applicable

C.2.1.2. Length of the first crediting period:

Not applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

1st April 2000

C.2.2.2. Length:

10 years

SECTION D. Application of a monitoring methodology and plan:

D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

Project has applied approved methodologies available for small-scale CDM project at UNFCCC website under Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

Methodogy type I.D : Title – "Renewable electricity generation for a grid"

Reference: Latest amended version 07 (28th November 2005) of Appendix B to the simplified M&P for small-scale CDM project activities.

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

Monitoring methodology is in accordance with the baseline methodology followed for this project activity Applicability of the baseline methodology is described in section B.1.

D.3 Data to be monitored:

Electricity generation from wind turbines is metered and recorded on a continuous basis. The total power (EG_y) supplied to the grid is the summation of the power generated from all the 54 nos of wind turbines less the internal line losses and auxiliary consumption.

ID number	*Data variable*	*Data unit*	*Measured (m), calculated (c), estimated (e),*	*Recording frequency*	*Proportion of data to be monitored*	*How long the data to be kept?*	*How will the data be archived? (electronic/ paper)*	*Comment*
1. EG_{GEN} (LCS)	Quantitative Total Electricity Generated (metered in individual wind mills)	MWh/yr	m	Continuously	100%	Crediting period +2 years after	Electronic	Metered at wind farm site. The meter is monitored and maintained by Project Proponent. The daily reading is recorded for each turbine and the Site-in-Charge is responsible for this activity.
2. . EG_{GEN} (HTSC)	Quantitative Total Electricity Generated (metered in APTransco HTSC Meter)	MWh/yr	M	Continuously	100%	Crediting period +2 years after	Electronic	Metered at wind farm site. The meter is monitored and maintained by APTransco and recorded monthly.
3. EG loss (Import)	Quantitative Total Electricity Imported	MWh/yr	m	Continuously	100%	Crediting period +2 years after	Electronic	Metered at wind farm site. The meter is monitored and maintained by APTransco and recorded monthly.
4. EGy	Quantitative Net Electricity supplied to State grid	MWh/yr	C	Continuously	100%	Crediting period +2 years after	Electronic	Calculated as the difference between parameters 2 and 3

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

ID Number	Data monitored	Uncertainty level of data (High/ Medium/ Low)	Are QA/QC procedures planned for these data?	Outline explanation why QA/QC procedures are or are not being planned
1,2,3,4	Electricity generation & supply	Low	Yes	The Monitoring plan is enclosed vide Annexure 4.These data will be used for the calculation of project electricity generation.

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

The Project Proponents Wescare (India) limited are a leading wind energy infrastructure development and management company. They also have an MoU for operation and maintenance with their subsidiary RCI Power Limited for operation and maintenance of Wind Turbines of RCI Power.

Wescare has a well-trained, dedicated staff at the site to take care of the on-site operation and maintenance activities that include preventive maintenance, break down maintenance and predictive maintenance. Wescare focuses more on developing the local community in operations and maintenance employment. The performance of the WEGs in terms of power generation is being monitored daily to improve the efficiency of the WEGs and increase the power generation. **There is no expected unintended emission from this Project activity.**

Each Wind Turbine has a local control system (LCS) which records the generation from that Turbine. A number of such Wind Turbines are connected to the common metering point, known as HTSC (High Tension Service Connection), which has a digital meter certified and owned by APTRANSCO. This HTSC meter will record the total generation from all these Wind Turbines, which includes auxiliary consumption. The sum total of the LCS readings of the individual Wind Turbines will not be equal to the HTSC meter readings due to internal line loss in the range of 5 to 7%. Daily readings are recorded from LCS and HTSC by the Site in Charge. The monitoring plan is enclosed vide Annx.4.

The HTSC meter is officially inspected, and the reading is recorded and certified by the APTRANSCO Officials, each month on a prescribed date. Monthly Power generation readings so taken with representatives of APTransco and Wescare (India) Limited is being made available to the Company and formally communicated to them. Thereafter, Wescare makes the billing in line with the units consumed on the basis of generation statement or the generation is banked. Wescare and RCI together monitor the project activity that ensures CO2 emission reductions. The project performance is monitored by Non-Conventional Energy Development of Andhra Pradesh Limited (NEDCAP) by monthly physical inspection. The report is sent by them to Ministry of Non-conventional Energy Sources (MNES) of Government of India so that they can use the data for articulating their non-conventional energy policies.

D.6. Name of person/entity determining the monitoring methodology:

PricewaterhouseCoopers (P) Limited has assisted the project proponent in determining the application of monitoring methodology for the identified CDM project.

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

Detailed below

E.1.1 Selected formulae as provided in appendix B:

Not applicable

E.1.2 Description of formulae when not provided in appendix B:

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

There is no CO_2 emission from this wind mill project.

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities

Since the energy generating equipment is not transferred from another activity no leakage is envisaged, as per the applied methodology.

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

The sum of E.1.2.1 and E.1.2.2 is zero.

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

The formulae used for **baseline calculations** are given as:

$$BE_y = EG_y \text{ X } EF_y \quad (1)$$

$$EGy = EG_{GEN} - EG_{loss} \quad (2)$$

Where:

BE_y Baseline emission (t CO_2/year)

EG_y Electricity supplied to grid (MWh/year)

EG_{GEN} Electricity generated by the windmills (MWh/year) (HTSC)

EG_{loss} Auxilliary consumption and transmission loss (MWh/year)

EF_y Baseline CO_2 emission factor for the electricity displaced due to the project activity during the year y (tCO_2/MWh)

The baseline emission factor (EF_y) was calculated as the average of the "approximate operating margin"(EF_{OMy}) and the "build margin" (EF_{BMy}), as per step 7a and also as weighted average emissions (in kg CO_2equ/MWh) of the current generation mix as per step 7b of approved methodology type I.D and the lower one was taken for calculated the CER to remain more conservative.

As per 7 a:

$$EF_y = w_{OM} \text{ X } EF_{OM,y} + w_{BM} \text{ X } EF_{BM,y}$$

Where:
Approximate operating margin: is the weighted average emissions (in kg CO_2equ/kWh) of all generating sources serving the system (southern regional grid in this case), excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation; and

$$EF_{OM,y} = \frac{\sum_{i,j} F_{i,j,y}.COEF_{i,j}}{\sum_{j} GEN_{j,y}}$$

Where:
$F_{i,j}$ Is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources j in the year(s) y.
j Refers to the power sources delivering electricity to the grid, not including low-operating cost and must-run power plants.
$COEF_{i,j,y}$ Is the CO_2 emission coefficient of fuel i (tCO_2/ mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources j and the percent oxidation of the fuel in year(s) y.
$GEN_{j,y}$ Is the electricity (MWh) delivered to the grid by source j.

And

Build margin: is the weighted average emissions (in kg CO_2equ/kWh) of recent capacity additions to the system, which capacity additions are defined as the greater (in MWh) of most recent 20% of existing plants or the 5 most recent plants.

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,j.y}.COEF_{i,m}}{\sum_{m} GEN_{m.y}}$$

Where:

$F_{i,m}$ Is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources m in the year(s) y.
m Refers to the power sources delivering electricity to the grid, not including low-operating cost and must-run power plants, and including imports from the grid
$COEF_{i,m,y}$ Is the CO_2 emission coefficient of fuel i (tCO_2/ mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources m and the percent oxidation of the fuel in year(s) y.
$GEN_{,m,y}$ Is the electricity (MWh) delivered to the grid by source m.

The CO_2 emission coefficient COEFi is obtained as

$COEF_i = NCV_i$ X $EFCO_{2,i}$ X $OXID_i$
where:
NCV_i is the net calorific value (energy content) per mass or volume unit of a fuel i,
$OXID_i$ is the oxidation factor of the fuel
$EFCO_{2,i}$ is the CO_2 emission factor per unit of energy of the fuel i.
As per 7 b:

The weighted average emissions (in kg CO_2equ/kWh) of the current generation mix.

$$EF_{,y} = \frac{\sum_{i,j} F_{i,j,y}.COEF_{i,j}}{\sum_{j} GEN_{j,y}}$$

Where:

$F_{i,j}$	Is the amount of fuel i (in a mass or volume unit) consumed by relevant power sources j in the year(s) y.
j	Refers to the power sources delivering electricity to the grid, including low-operating cost and must-run power plants.
$COEF_{i,j,y}$	Is the CO_2 emission coefficient of fuel i (tCO_2/ mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources j and the percent oxidation of the fuel in year(s) y.
$GEN_{j,y}$	Is the electricity (MWh) delivered to the grid by source j.

It was found after calculations that the baseline emission factor (EF_y) was more conservative when based on the weighted average emissions (as per Step 7b), as hence this value has been used for baseline calculations.

All these calculations including those for the southern regional grid have been provided in Annex 3.

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

Refer to the table in Section E.2

E.2 Table providing values obtained when applying formulae above:

S.No	Period	Net Generation (MWh)	Average carbon emission factor (tCO_2/MWh)	Baseline emission (tCO_2/year)	CER (tCO_2/year
1	April 00- March 01	13006.46	0.810	10539.10	10539
2	April 01- March 02	24891.55	0.810	20169.55	20170
3	April 02- March 03	18031.98	0.810	14611.26	14611
4	April 03- March 04	14738.87	0.810	11942.87	11943
5	April 04- March 05	22684.55	0.810	18381.22	18381
6	April 05- March 06	22684.55	0.810	18381.22	18381
7	April 06- March 07	22684.55	0.810	18381.22	18381
8	April 07- March 08	22684.55	0.810	18381.22	18381
9	April 08- March 09	22684.55	0.810	18381.22	18381
10	April 09- March 10	22684.55	0.810	18381.22	18381
			Total		**167550**

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

The host Party, i.e. Ministry of Environment and Forest, Government of India, does not require Environmental Impact Assessment EIA of wind mill projects. The management of the project proponents have proactively taken up an EIA study to understand the impact on the environment and react upon it. The executive summary of the EIA study is furnished below. The study showed no significant environmental impacts due to the project activity.

The project proponent also ensured that all necessary safety and environmental requirements of relevant Indian legislation was met for the facilities implemented.

Wescare (India) Limited is internationally known for its contribution towards green power. It has received the Prestigious Green Power Purple Heart Award at the 2001 Green Purple Leadership Award ceremony held on 30th July 2001 at Portland, USA from the US Department of Energy (Centre for Resource Solutions , US Environmental Protection Agency).

Executive Summary of EIA Study: IMPACT OF THE PROPOSED PROJECT

GENERAL:

An Environment Impact Assessment identifies, predicts, and intercepts the various aspects of Environmental Conditions as per the legislative norms, policies, programs and operational procedures for commissioning any new project. Pre-operational and post-operational conditions of the environment are studied. Hence sufficient attention has given on these aspects.

The study of Environmental Impact Assessment (EIA) covers existing baseline environmental conditions and the resulting environmental conditions after the commencement of the unit. For this purpose normally the study area is 10 km radius from the proposed unit. The study area covers rural, agriculture, urban and residential area. During survey air, water and soil samples were collected and analysed. Besides these, noise level, wind speed, wind direction, temperature, atmosphere pressure, relative humidity and rainfall were also recorded. The impacts may be favourable or adverse based on the manufacturing unit. To take survey and analysis of various parameters pollution control boards' standards were followed.

The proposed project site is located in a rocky area and the management has sufficient awareness about prevention and control of pollution occurring to its surrounding area. The study of the various parameters showed that the levels of these parameters would not widely affect the existing baseline environmental conditions. In present case, the limits of the various parameters of air, water and soil were within the prescribed limits of Pollution Control Board.

In the present case, there is no gaseous emission from windmill operation. As this is a rocky area, there is no source of water either bore or surface land even at a depth of upto 400 feet. However there is no water required for any process and water is only required for drinking / domestic purpose, for which water is procured from commercial sources. Hence water pollution does not arise.

Noise levels will slightly increase due to this operation but within the limits prescribed by PCB. Though, solid waste disposal and gaseous emissions are normally given priority to study environmental impact assessment of the any proposed project, the source of these two categories is nil in the wind mill operations.

AMBIENT AIR QUALITY:

The existing atmospheric air quality in the proposed project site and its surroundings are reasonably emission free and the values of the pollutants TSPM, RSPM, NOX, SO_2 are within the limits prescribed by the pollution control board. The site is located at a height of 525 feet from ground level on a rocky area where the wind energy is high and pollution is negligible due to windmill operation.

IMPACT ON WATER QUALITY:

As the proposed unit is a rocky area there is no natural water source and the requirement of water for windmill operation is nil. For domestic purpose commercial water source is used, hence there is no trade effluent. The sewage generated from the domestic usage will be let into the septic tank and cleared by authorized bodies periodically.

IMPACT ON LAND:

As no wastewater will be generated from the operation because of non-usage of water for operations, the soil quality in the core zone will remain as such.

The quantity of solid wastes like cotton, cloth used for lubrication in the gearbox used for windmill operations, will be minimum and stored in a specified area. The waste is disposed as per pollution board norms. There is no other metal wastages arise from wind mill operations.

The metal wastes arise from worn-out of bearings, bolt and nuts, and other activities during the period of installation, will be less and collected in a drum and sold out.

IMPACT ON NOISE:

The proposed wind mill operation will not produces any abnormal noise pollution due to non usage of noise producing machineries and other equipments. The noise arises from transport of vehicles only and that is intermittent in nature and does not have any adverse effect on the surrounding environment. Any how, the wind mill operators will be provided ear-muffs for special cases like maintenance work and other installation work.

IMPACT ON SOCIO-ECONOMIC STATUS:

Due to the proposed windmill operation, there will be direct employment opportunity to the persons of surrounding places and indirect employment opportunities by way of transportation and other services. This will help to improve the living standards of local community and additional facilities like communication, road facilities, drainage system etc. will be created.

The windmill operation could fulfil electrical needs of surrounding villages. As there is no wastewater generation, there will be no land or soil contamination in these areas.

IMPACT ON FLORA AND FAUNA:

There is no reserve forest area found in the proposed core zone and buffer zone. It is also found that the various parameters of soil qualities are within the limits of pollution control board norms. Hence the existing status of flora and fauna in the surrounding villages will not be affected due to this windmill operations.

IMPACT ON SAFETY AND HEALTH:

Well established and systematic safety measurements practices will be provided for safety and healthy working conditions. Proper guidelines will be given to employees for careful handling and storage of material within the project site.

Protective equipment for body, legs, arms, face and head will be provided for ensuring safety if necessary. Accident reviews and monitoring will be done regularly. No occupational health problem is expected. However periodic monitoring and check-up will be held regularly.

The final conclusion drawn in the report is as under:

The proposed windmill operations will not produce any hazardous gaseous emission or solid waste or waste water. There will not be any significant variation in the levels of pollutants in the existing environment after the commencement of the unit.

SECTION G.: Stakeholders' comments:

G.1. Brief description of how comments by local stakeholders have been invited and compiled:

A meeting was organized by the project proponent at the project site to get the comments and suggestions of the local stakeholders on their project activity. A public notice was given 15 days prior to the meeting and the meeting was conducted on 10th of November 2005.

Following people participated:

1. Mr. S. Pandian President	Wescare (India) Limited
2. Mr. Sureshkumar Site-in-charge	Wescare (India) Limited
3. Employees	Wescare (India) Limited
4. Mr. M. KodandaRama Murthy District Manager Ananthapur District	Non Conventional Energy Development Corporation of Andhra Pradesh Limited (NEDCAP ltd)
5. Mr. K. Pratap Reddy Field Officer, Wind Division	NEDCAP Ltd.
6. Mr. P. Veeraiah Asst. Field Officer	NEDCAP Ltd.
7. Mr. V. V. Krishna Reddy Assistant Engineer - Wind Division Tadipatri	Andhra Pradesh Central Power Distribution Company Limited
8. Mr. K. S. Hari Kumar Manager – Loans	Oriental Bank of Commerce

The venue of the meeting was:
RCI Power Limited Wind Farm Site
Kadavakallu Village, Putluru Mandal,
Anantapur District, Andhra Pradesh.

The proceedings of the meeting were as follows:

Mr. C. Suresh Kumar, site-in charge, invited the guests and thanked the company for having given the opportunity to host the Local Stakeholder Meeting on the CDM Initiative of the Company.

He requested Mr. S. Pandian, President, to Chair the Meeting and conduct the proceedings. Mr. S. Pandian invited Mr. A. Kodandarama Murthy, District Manager, NEDCAP Ltd and all other government officials present to take their seats on the podium. He invited all the employees and other local people in the meeting. Then with the permission of the officials presents, Mr. S. Pandian gave a brief explanation of the Kyoto Protocol, its objective and the phenomena of Global warming and the resulting depletion of the ozone layer, the role of UNFCCC and the CDM process, all in the local language so that it could be understood by one and all.

After the Preamble, Mr. S. Pandian made a power point presentation on the Company's CDM initiative and explained the concept slidewise.
After the presentation, he requested all present to voice their views and concerns.

The representatives from NEDCAP, Oriental Bank of Commerce and other people present in the meeting expressed their views which are detailed in the minutes of the meeting furnished below.

The meeting concluded with Mr. S. Pandian thanking all those present at the meeting for their time and patient hearing.

G.2. Summary of the comments received:

The comments received from the local stakeholders were very positive and there were no issues or concerns raised. The Minutes of the stakeholder meeting is reproduced below.

MOM of the stakeholder meeting

Minutes of the Local Stakeholders Meeting on Clean Development Mechanism Initiative of Wescare (India) Limited

Date : 10/11/2005

Venue : RCI Power Limited Wind Farm Site
Kadavakallu Village, Putluru Mandal,
Anantapur District, Andhra Pradesh.

PARTICIPANTS

1. Mr. S. Pandian President	Wescare (India) Limited
2. Mr. Sureshkumar Site-in-charge	Wescare (India) Limited
3. Employees	Wescare (India) Limited
4. Mr. M. Kodanda Rama Murthy District Manager Ananthpur District	Non Conventional Energy Development Corporation of Andhra Pradesh Limited (NEDCAP Ltd)
5. Mr. K. Pratap Reddy Field Officer, Wind Division	NEDCAP Ltd.
6. Mr. P. Veeraiah Asst. Field Officer	NEDCAP Ltd.
7. Mr. V. V. Krishna Reddy Assistant Engineer - Wind Division Tadipatri	Andhra Pradesh Central Power Distribuion Company Limited
8. Mr. K. S. Hari Kumar Manager – Loans	Oriental Bank of Commerce

PROCEEDINGS

Mr. C. Suresh Kumar, site-in charge, invited the guests and thanked the company for having given the opportunity to host the Local Stakeholder Meeting on the CDM Initiative of the Company.

He requested Mr. S. Pandian, President, to Chair the Meeting and conduct the proceedings. Mr. S. Pandian invited Mr. A. Kodandarama Murthy, District Manager, NEDCAP Ltd and all other government officials present to take their seats on the podium. He invited all the employees and other local people in the meeting. Then with the permission of the officials presents, Mr. S. Pandian gave a brief explanation of the Kyoto Protocol, its objective and the phenomena of Global warming and the resulting depletion of the ozone layer, the role of UNFCCC and the CDM process, all in the local language so that it could be understood by one and all.

After the Preamble, Mr. S. Pandian made a power point presentation on the Company's CDM initiative and explained the concept slidewise.

After the presentation, he requested all present to voice their views and concerns.

Mr. Kothandarama Murthy, NEDCAP, expressed his happiness at the responsible and effective manner in which company was operating the wind farm. He did not have any concerns on the CDM initiative and suggested that the company must further expand its capacity and also take steps to improve generation. Mr. S. Pandian responded that the company would take all measures to achieve better utilization and increase the capacity and thereby generate more employment for the people from the nearby villages as it had done earlier.

Mr. Harikumar of Oriental Bank of Commerce first thanked RCI and Wescare for the opportunity to visit the site and conveyed his best wishes to the Company in its CDM endeavor. He did not have any concerns on the CDM initiative of the company.

Mr. S. Pandian enquired and requested the employees and other local people present to voice their concerns. The people / employees did not have any concerns / issued in respect of the CDM activity.

The meeting concluded with Mr. S. Pandian thanking all those present at the meeting for their time and patient hearing.

Minutes of the Meeting approved by

10th November 2005 S. Pandian

G.3. Report on how due account was taken of any comments received:

The project proponent thanked the participants for their encouragement and co-operation.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY
Project proponent 1:

Organization:	Wescare (India) Limited
Street/P.O.Box:	16, Cenotaph Road, Teynampet
Building:	Wescare Towers
City:	Chennai
State/Region:	Tamilnadu
Postcode/ZIP:	600 018
Country:	INDIA
Telephone:	91-44-39188479/39188480
FAX:	91- 44- 24322352
E-Mail:	pandian.s@wescaregroup.net
URL:	
Represented by: Mr.S.Pandian	
Title:	President
Salutation:	Mr.
Last Name:	Swami Pillai
Middle Name:	-
First Name:	Pandian
Department:	Operations
Mobile:	98848-02784
Direct FAX:	91-44-24322352
Direct tel:	91-44-39188484
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No ODA is flowing to the project. No Public Funding as part of Project financing from Parties included in Annx. 1 of the convention is involved in the Project activity.

Annexure 3

Baseline Calculations and CER Calculations

References:

1	http://www.cercind.org/2612/operational.pdf	Auxiliary Consumption in Hydro Power Generation
2	Performance Review of Thermal Power Stations 2004-05 (CEA) Section 11; http://www.cea.nic.in/god/opm/Thermal_Performance_Review/index_Thermal_Performance_Review.html	Auxiliary Consumption in Thermal ver Generation
3	http://www.cercind.org/pet22002407.html	Heat Rate in Gas Power Generation
4	http://www.cea.nic.in/god/opm/Thermal_Performance_Review/index_Thermal_Performance_Review.html	Heat Rate of Thermal Power Stations
5	http://mnes.nic.in/baselinepdfs/annexure2c.pdf	Heat Rate of Diesel Power Stations
6	http://mnes.nic.in/annualreport/2004_2005_English/index.html	Wind Energy Generation in States
7	CEA Annual Report for 2002-03, 2003-04, 2004-05	Power Generation in States

Generation Mix of Power in Southern Grid

Type	2002-03	2003-04	2004-05
Thermal	93350.1	96664.0	97964.3
Diesel	4457.0	3225.0	2370.1
Gas	15138.0	16183.0	12276.6
Total (Thermal + Gas)	**112945.1**	**116072.0**	**112611.1**
Wind*	1577.3	2055.7	1270.7
Hydro	18167.8	17317.0	25280.4
Nuclear	4390.0	4700.0	4406.7
Low cost/Must run	**24135.1**	**24072.7**	**30957.8**
Total	**137080.1**	**140144.7**	**143568.8**
% of Low cost/must run	**18%**	**17%**	**22%**

Unit Million Units
Source www.cea.nic.in

OPERATING MARGIN

Southern Grid Power Generation (2004-05)

EXIM - SR - 2004/05

Source	MoU	Thermal	Diesel	Gas	
Gross Generation	MU	97964.3	2370.1	12276.6	
Net Generation	MU	90018.2	2299.0	11966.5	104283.8
Heat Rate	kcal/kWh	2490.0	2062.0	2000.0	
Fuel CV	kcal/kg	3820.0	10186.0	10750.0	
Fuel Consumption	Tonnes per annum	63856336.8	479796.6	2284018.6	
Total Emissions	tCO2/ annum	96187754.9	1210310.9	5761551.0	103159616.8
Emission Factor-OM	tCO2/ MWh	**0.989**			

Import from	MU
ER	3441.2
WR	162.8
NR	0
NER	0
Total	**3604.0**

Southern Grid Power Generation [2003-04]

EXIM - SR - 2003/04

Source	MoU	Thermal	Diesel	Gas	
Gross Generation	MU	96664.0	3225.0	16183.0	
Net Generation	MU	87938.6	3128.3	15770.3	106837.2
Heat Rate	kcal/kWh	2490.0	2062.0	2000.0	
Fuel CV	kcal/kg	3820.0	10186.0	10750.0	
Fuel Consumption	Tonnes per annum	63008733.0	652852.0	3010790.7	
Total Emissions	tCO2/ annum	94910996.6	2042559.6	7594869.9	104548426.2
Emission Factor-OM	tCO2/ MWh	**0.979**			

Import from	MU
ER	4437.4
WR	299.1
NR	13.1
NER	0
Total	**4749.6**

Southern Grid Power Generation [2002-03]

EXIM - SR - 2002/03

Source	MoU	Thermal	Diesel	Gas	
Gross Generation	MU	93350.1	4457.0	15138.0	
Net Generation	MU	85119.8	4323.3	14753.2	104196.2
Heat Rate	kcal/kWh	2425.0	2062.0	2000.0	
Fuel CV	kcal/kg	3820.0	10186.0	10750.0	
Fuel Consumption	Tonnes per annum	59260189.1	902251.5	2816372.1	
Total Emissions	tCO2/ annum	89264508.9	2822849.1	7104439.3	99191797.2
Emission Factor-OM	tCO2/ MWh	**0.952**			

Import from	MU
ER	
WR	
NR	
NER	
Total	**0**

BUILD MARGIN

Southern Grid Power Generation [2004-05]

Source	MoU	Thermal	Diesel	Gas	Hydro	Nuclear	Wind	
Gross Generation	MU	14743.1	1796.1	6941.9	2751.8	2926.3	1270.7	
Net Generation	MU	13720.3	1742.2	6765.2	2738.0	2575.1	1270.7	28811.5
Heat Rate	kcal/kWh	2490.0	2062.0	2000.0	0.0	0.0		
Fuel CV	kcal/kg	3820.0	10186.0	10750.0	0.0	0.0		
Fuel Consumption	Tonnes per annum	9610006.9	363591.0	1291508.5				
Total Emissions	tCO2/ annum	14475697.1	917176.4	3257894.7				18650768.3
Emission Factor-BM	tCO2/ MWh	**0.647**						

Southern Grid Power Generation

Source	MoU	OM (2002-03)	OM (2003-04)	OM (2004-05)
Year-wise OM	tCO2/ MWh	0.952	0.979	0.989
OM	tCO2/ MWh	0.973		
BM	tCO2/ MWh	0.647		
Emission Factor-CM	tCO2/ MWh	**0.810**		

BUILD MARGIN PIVOT

Type	Data	Total
Diesel	Sum of Gross Gen (MU)	1796.1
	Sum of Net Gen (MU)	1742.2
Gas	Sum of Gross Gen (MU)	6941.9
	Sum of Net Gen (MU)	6765.2
Hydro	Sum of Gross Gen (MU)	2751.8
	Sum of Net Gen (MU)	2738.0
Nuclear	Sum of Gross Gen (MU)	2926.3
	Sum of Net Gen (MU)	2575.1
Thermal	Sum of Gross Gen (MU)	14743.1
	Sum of Net Gen (MU)	13720.3
Total Sum of Gross Gen (MU)		29159.0
Total Sum of Net Gen (MU)		27540.8

BUILD MARGIN

SN	Type	Ownership	State	Station	Capacity (MW)	Gross Gen (MU)	Aux Con (MU)	Net Gen (MU)	Commissioning	Date of commissioning
61	Hydro	State	AP	Mini Hydro	30.0	6.3	0.0	6.3	01.12.2005	1-Dec-05
158	Hydro	Mysore PC	Karnataka	Narayanpur	6.6	42.5	0.2	42.2	01.12.2005	1-Dec-05
164	Hydro		Kerala	Other Hydro	5	0.0	0.0	0.0	01.12.2005	1-Dec-05
167	Hydro		Kerala	Malampuzha	2.5	0.0	0.0	0.0	01.12.2005	1-Dec-05
141	Hydro	KPCL	Karnataka	Almattidam 6	55	26.3	0.1	26.2	10.08.2005	10-Aug-05
140	Hydro	KPCL	Karnataka	Almattidam 5	55	26.3	0.1	26.2	06.07.2005	6-Jul-05
139	Hydro	KPCL	Karnataka	Almattidam 4	55	26.3	0.1	26.2	26.03.2005	26-Mar-05
138	Hydro	KPCL	Karnataka	Almattidam 3	55	26.3	0.1	26.2	13.01.2005	13-Jan-05
137	Hydro	KPCL	Karnataka	Almattidam 2	55	26.3	0.1	26.2	04.11.2004	4-Nov-04
182	Hydro		Kerala	Malankara	10.5	3.0	0.0	2.9	30.05.2004	30-May-04
76	Gas	State	Tamilnadu	Kuttalam	36	230.7	5.8	224.9	30.03.2004	30-Mar-04
136	Hydro	KPCL	Karnataka	Almattidam 1	15	7.2	0.0	7.1	26.03.2004	26-Mar-04
185	Hydro		Kerala	Chembukadavu	6.5	6.2	0.0	6.2	30.12.2003	30-Dec-03
186	Hydro		Kerala	Urumi	6.2	0.9	0.0	0.9	30.12.2003	30-Dec-03
75	Gas	State	Tamilnadu	Kuttalam	64	410.2	10.3	399.9	30.11.2003	30-Nov-03
217	Thermal	NLC	Tamilnadu	NLC TS I extension	420	3237.7	268.1	2969.6	15.09.2003	15-Sep-03
51	Hydro	State	AP	Srisailam Left 6	150.0	235.3	1.2	234.1	04.09.2003	4-Sep-03
157	Hydro	Bhoruka P	Karnataka	Shahpur	1.4	0.0	0.0	0.0	01.08.2003	1-Aug-03
50	Hydro	State	AP	Srisailam Left 5	150.0	235.3	1.2	234.1	28.03.2003	28-Mar-03
74	Gas	State	Tamilnadu	Valuthur	94	557.5	13.9	543.6	13.03.2003	13-Mar-03
200	Thermal	IPP	Tamilnadu	Neyvelli Zero	250	1335.8	118.0	1217.9	16.12.2002	16-Dec-02
118	Thermal	State	Karnataka	Raichur TPS	210	1531.1	135.0	1396.1	10.12.2002	10-Dec-02
49	Hydro	State	AP	Srisailam Left 4	150.0	235.3	1.2	234.1	29.11.2002	29-Nov-02
198	Thermal	NTPC	AP	Simhadri	500	4061.1	229.4	3831.6	15.08.2002	15-Aug-02
48	Hydro	State	AP	Srisailam Left 3	150.0	235.3	1.2	234.1	19.04.2002	19-Apr-02
28	Gas	IPP	AP	LANCO- Kondapalli	355	2246.3	56.2	2190.2	01.03.2002	1-Mar-02
30	Diesel	IPP	AP	LVS power	36.8	0.0	0.0	0.0	15.01.2002	15-Jan-02
199	Thermal	NTPC	AP	Simhadri	500	4061.1	229.4	3831.6	15.01.2002	15-Jan-02

26	Gas	IPP	AP	BSES- Peddapuram	220	1141.3	28.5	1112.8	30.11.2001	30-Nov-01
47	Hydro	State	AP	Srisailam Left 2	150.0	235.3	1.2	234.1	12.11.2001	12-Nov-01
79	Diesel	IPP	Tamilnadu	Samayanallur DEPP	106	382.0	11.5	370.6	22.09.2001	22-Sep-01
78	Diesel	IPP	Tamilnadu	Samalpatti DEPP	105.7	357.3	10.7	346.6	15.07.2001	15-Jul-01
123	Diesel	TATA IPP	Karnataka	Belgaum	81.3	238.5	7.2	231.3	01.07.2001	1-Jul-01
152	Hydro	Bhoruka P	Karnataka	Madhavmantrii	3	22.9	0.1	22.7	01.07.2001	1-Jul-01
184	Hydro	KLPVT	Kerala	Kuthungal	21	36.2	0.2	36.0	01.07.2001	1-Jul-01
124	Gas	GMR IPP	Karnataka	Tanir Bavi	220	629.6	18.9	610.7	15.05.2001	15-May-01
143	Hydro	KPCL	Karnataka	Gerusuppa	240	437.6	2.2	435.4	01.05.2001	1-May-01
46	Hydro	State	AP	Srisailam Left 1	150.0	235.3	1.2	234.1	26.04.2001	26-Apr-01
77	Gas	IPP	Tamilnadu	Pillai Perumal Nallur GTPP	330.5	464.3	11.6	452.7	26.04.2001	26-Apr-01
161	Diesel	IPP	Kerala	Kasargode	21.84	15.7	0.5	15.3	15.03.2001	15-Mar-01
174	Hydro		Kerala	Kuttiadi	50	148.2	0.7	147.5	27.01.2001	27-Jan-01
219	Nuclear	NPC	Karnataka	Kaiga 1	220	1463.1	175.6	1287.6	16.11.2000	16-Nov-00
69	Gas	State	Tamilnadu	Kovilkalapai	108	763.3	19.1	744.2	30.09.2000	30-Sep-00
111	Hydro	State	Tamilnadu	Mukurthy Mini	0.7	0.0	0.0	0.0	18.08.2000	18-Aug-00
122	Diesel	IPP	Karnataka	Bellay	25.2	40.3	1.2	39.1	15.05.2000	15-May-00
109	Hydro	State	Tamilnadu	Parsons Valley	30	55.6	0.3	55.3	29.03.2000	29-Mar-00
110	Hydro	State	Tamilnadu	Thirumurthy Mini	1.95	0.0	0.0	0.0	20.03.2000	20-Mar-00
220	Nuclear	NPC	Karnataka	Kaiga 2	220	1463.1	175.6	1287.6	16.03.2000	16-Mar-00
60	Hydro	State	AP	Singur	15.0	1.5	0.0	1.5	31.03.2000	31-Jan-00
119	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130	258.2	21.4	236.8	15.12.1999	15-Dec-99
120	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130	258.2	21.4	236.8	15.12.1999	15-Dec-99
176	Hydro		Kerala	Kakkad	50	210.4	1.1	209.3	14.10.1999	14-Dec-99
191	Gas	NTPC	Kerala	Kayamkulam GT3	129.2	222.9	5.6	217.4	01.10.1999	1-Oct-99
133	Hydro	KPCL	Karnataka	Kodasalli 3	40	71.6	0.4	71.2	28.08.1999	28-Aug-99
156	Hydro	Bhoruka P	Karnataka	Rajankollur	2	0.0	0.0	0.0	01.08.1999	1-Aug-99
154	Hydro	Bhoruka P	Karnataka	Harangi	9	0.0	0.0	0.0	19.07.1999	19-Jul-99
187	Gas	State	Pondicherry	PPCL GTG	32.5	275.7	6.9	268.8	25.05.1999	25-May-99
151	Hydro	KPCL	Karnataka	Kadra 3	50	77.0	0.4	76.6	21.05.1999	21-May-99
132	Hydro	KPCL	Karnataka	Kodasalli 2	40	71.6	0.4	71.2	20.04.1999	20-Apr-99
108	Hydro	State	Tamilnadu	Sathanur	7.5	10.2	0.1	10.2	30.03.1999	30-Mar-99
80	Diesel	IPP	Tamilnadu	GMR Vasavi DEPP	196	762.2	22.9	739.4	01.02.1999	1-Feb-99

190	Gas	NTPC	Kerala	Kayamkulam GT2	115.2	198.8	5.0	193.8	01.02.1999	1-Feb-99
150	Hydro	KPCL	Karnataka	Kadra 2	50	77.0	0.4	76.6	23.01.1999	23-Jan-99
117	Thermal	State	Karnataka	Raichur TPS	210	1531.1	135.0	1396.1	01.01.1999	1-Jan-99
179	Hydro		Kerala	Madupetty	2	4.1	0.0	4.0	31.12.1998	31-Dec-98
160	Diesel	State	Kerala	Kozhikode	129	160.5	4.8	155.7	01.12.1998	1-Dec-98
159	Diesel	State	Kerala	Brahmpuram	107	136.4	4.1	132.3	24.11.1998	24-Nov-98
153	Hydro	Bhoruka P	Karnataka	Shahpur	6.6	25.2	0.1	25.0	01.11.1998	1-Nov-98
189	Gas	NTPC	Kerala	Kayamkulam GT1	115.2	198.8	5.0	193.8	01.11.1998	1-Nov-98
131	Hydro	KPCL	Karnataka	Kodasalli 1	40	71.6	0.4	71.2	20.06.1998	20-Jun-98
134	Hydro	KPCL	Karnataka	Bhadra	33.4	41.4	0.2	41.2	29.03.1998	29-Mar-98
18	Thermal	State	AP	Kothagudem V Stage II	250.0	2070.5	182.0	1888.5	28.02.1998	28-Feb-98
105	Hydro	State	Tamilnadu	Lowerbavani RBC	8	30.8	0.2	30.6	10.02.1998	10-Feb-98
27	Gas	IPP	AP	Jegrupadu	216	1419.6	35.5	1384.1	01.01.1998	1-Jan-98
162	Gas	IPP	Kerala	BSES	174	111.8	2.8	109.0	01.01.1998	1-Jan-98
178	Hydro		Kerala	Lower Pariyar	180	512.4	2.6	509.8	31.12.1997	31-Dec-97
25	Gas	State	AP	Vijjeswaram II - 2	60.0	425.2	10.6	414.6	23.12.1997	23-Dec-97
149	Hydro	KPCL	Karnataka	Kadra 1	50	77.0	0.4	76.6	02.06.1997	2-Jun-97
24	Gas	State	AP	Vijjeswaram II - 1	112.0	837.4	20.9	816.5	31.03.1997	31-Mar-97
17	Thermal	State	AP	Kothagudem V Stage I	250.0	2070.5	182.0	1888.5	27.03.1997	27-Mar-97
29	Gas	IPP	AP	Spectrum- Godavari	208	1373.0	34.3	1338.6	01.01.1997	1-Jan-97
165	Hydro		Kerala	Peppara	3	6.4	0.0	6.3	31.12.1996	31-Dec-96
166	Hydro		Kerala	Edamalayar	75	338.3	1.7	336.6	31.12.1996	31-Dec-96
73	Gas	State	Tamilnadu	Basin Bridge	30	10.1	0.3	0.0	31.03.1996	31-Mar-96
72	Gas	State	Tamilnadu	Basin Bridge	30	10.1	0.3	0.0	26.03.1996	26-Mar-96
71	Gas	State	Tamilnadu	Basin Bridge	30	10.1	0.3	0.0	25.02.1996	25-Feb-96
68	Thermal	State	Tamilnadu	North Chennai 3	210	1305.3	120.0	0.0	24.02.1996	24-Feb-96
70	Gas	State	Tamilnadu	Basin Bridge	30	10.1	0.3	39.5	12.02.1996	12-Feb-96
36	Hydro	State	AP	Upper Sileru 4	60.0	136.0	3.4	132.6	31.03.1995	31-Mar-95
67	Thermal	State	Tamilnadu	North Chennai 2	210	1305.3	120.0	0.0	27.03.1995	27-Mar-95
8	Thermal	State	AP	Rayalaseema - 2	210.0	1676.8	157.3	1519.5	25.02.1995	25-Feb-95
6	Thermal	State	AP	Vijayawada - 6	210.0	1641.5	157.3	1484.2	24.02.1995	24-Feb-95
181	Hydro		Kerala	Kallada	15	76.9	0.4	76.5	31.12.1994	31-Dec-94
66	Thermal	State	Tamilnadu	North Chennai 1	210	1305.3	120.0	3556.1	25.10.1994	25-Oct-94

62	Wind	IPP	AP	Wind	2.0				10.10.1994	10-Oct-94
115	Thermal	State	Karnataka	Raichur TPS	210	1531.1	135.0	1396.1	01.09.1994	1-Sep-94
121	Diesel	VVNL	Karnataka	Yelehanka Diesel	128	271.1	8.1	263.0	01.04.1994	1-Apr-94
5	Thermal	State	AP	Vijayawada - 5	210.0	1641.5	157.3	1484.2	31.03.1994	31-Mar-94
7	Thermal	State	AP	Rayalaseema - 1	210.0	1676.8	157.3	1519.5	31.03.1994	31-Mar-94
35	Hydro	State	AP	Upper Sileru 3	60.0	136.0	3.4	132.6	31.03.1994	31-Mar-94
59	Hydro	State	AP	Penna Ahobilam	20.0	0.0	0.0	0.0	23.01.1994	23-Jan-94
145	Hydro	KPCL	Karnataka	Mallapur	9	0.0	0.0	0.0	01.01.1994	1-Jan-94
146	Hydro	KPCL	Karnataka	Manidam DPH	9	23.5	0.1	23.3	01.01.1994	1-Jan-94
213	Thermal	NLC	Tamilnadu	NLC TS II	210	1321.1	109.4	1211.7	01.06.1993	1-Jun-93
214	Thermal	NLC	Tamilnadu	NLC TS II	210	1321.1	109.4	1211.7	01.06.1993	1-Jun-93
215	Thermal	NLC	Tamilnadu	NLC TS II	210	1321.1	109.4	1211.7	01.06.1993	1-Jun-93
216	Thermal	NLC	Tamilnadu	NLC TS II	210	1321.1	109.4	1211.7	01.06.1993	1-Jun-93
195	Thermal	NTPC	AP	Ramagundam STPS 4	500	4088.1	269.4	3818.7	01.06.1988	1-Jun-93
130	Hydro	KPCL	Karnataka	Ghatprabha	32	96.6	0.5	96.1	01.01.1993	1-Jan-93
148	Hydro	KPCL	Karnataka	Sirwar	1	0.0	0.0	0.0	01.01.1993	1-Jan-93
106	Hydro	State	Tamilnadu	Punachi Mini	2	0.0	0.0	0.0	16.12.1992	16-Dec-92
155	Hydro	Bhoruka P	Karnataka	Shivpura	18	72.3	0.4	72.0	01.11.1992	1-Nov-92
107	Hydro	State	Tamilnadu	Maravakandy Mini	0.75	0.0	0.0	0.0	14.10.1992	14-Oct-92
56	Hydro	State	AP	NS Left Canal	60.0	5.1	0.0	5.1	27.09.1992	27-Sep-92
23	Gas	State	AP	Vijjeswaram I - 3	34.0	264.0	6.6	257.4	17.03.1992	17-Mar-92
188	Diesel		Lakshdeep	Mix	10	6.0	0.2	5.8	01.01.1992	1-Jan-92
22	Gas	State	AP	Vijjeswaram I - 2	33.0	236.1	5.9	230.2	12.03.1991	12-Mar-91
114	Thermal	State	Karnataka	Raichur TPS	210	1531.1	135.0	1396.1	01.03.1991	1-Mar-91
21	Gas	State	AP	Vijjeswaram I - 1	33.0	229.6	5.7	223.9	02.12.1990	2-Dec-90
4	Thermal	State	AP	Vijayawada - 4	210.0	1641.5	157.3	1484.2	23.08.1990	23-Aug-90
55	Hydro	State	AP	NS Right Canal 3	30.0	15.9	0.1	15.8	10.08.1990	10-Aug-90
104	Hydro	State	Tamilnadu	Lower Bhavani Small	8	30.8	0.2	30.6	31.03.1990	31-Mar-90
102	Hydro	State	Tamilnadu	Vaigai Small	6	12.3	0.1	12.2	23.02.1990	23-Feb-90
129	Hydro	KPCL	Karnataka	Varahi	230	973.3	4.9	968.4	01.01.1990	1-Jan-90
103	Hydro	State	Tamilnadu	Pykara Mini	2	5.0	0.0	5.0	07.10.1989	7-Oct-89
3	Thermal	State	AP	Vijayawada - 3	210.0	1641.5	157.3	1484.2	05.10.1989	5-Oct-89
197	Thermal	NTPC	AP	Ramagundam STPS 6	500	4088.1	269.4	3818.7	01.10.1989	1-Oct-89

196	Thermal	NTPC	AP	Ramagundam STPS 5	500	4088.1	269.4	3818.7	01.03.1989	1-Mar-89
116	Thermal	State	Karnataka	Raichur TPS	210	1531.1	135.0	1396.1	01.01.1989	1-Jan-89
57	Hydro	State	AP	Pochampad	27.0	1.6	0.0	1.6	31.03.1988	31-Mar-88
90	Hydro	State	Tamilnadu	Lower Mettur	120	254.7	1.3	253.4	23.03.1988	23-Mar-88
183	Hydro	KLPVT	Kerala	Maniar	10	34.5	0.2	34.3	31.12.1987	31-Dec-87
101	Hydro	State	Tamilnadu	Kadamparai	400	256.8	1.3	255.5	28.03.1987	28-Mar-87
94	Hydro	State	Tamilnadu	Servalar	20	34.6	0.2	34.4	20.03.1987	20-Mar-87
45	Hydro	State	AP	Srisailam Right 7	110.0	134.4	0.7	133.8	19.03.1987	19-Mar-87
65	Thermal	State	Tamilnadu	Mettur	840	6684.0	556.1	6127.9	07.01.1987	7-Jan-87
44	Hydro	State	AP	Srisailam Right 6	110.0	134.4	0.7	133.8	31.10.1986	31-Oct-86
92	Hydro	State	Tamilnadu	Suruliyar	35	101.4	0.5	100.9	27.08.1986	27-Aug-86
43	Hydro	State	AP	Srisailam Right 5	110.0	134.4	0.7	133.8	31.03.1986	31-Mar-86
113	Thermal	State	Karnataka	Raichur TPS	210	1531.1	135.0	1396.1	01.03.1986	1-Mar-86
210	Thermal	NLC	Tamilnadu	NLC TS II	210	1321.1	109.4	1211.7	01.03.1986	1-Mar-86
211	Thermal	NLC	Tamilnadu	NLC TS II	210	1321.1	109.4	1211.7	01.03.1986	1-Mar-86
212	Thermal	NLC	Tamilnadu	NLC TS II	210	1321.1	109.4	1211.7	01.03.1986	1-Mar-86
218	Nuclear	NPC	Tamilnadu	MAPP Kalpakkam	340	1480.5	177.7	1302.8	01.01.1986	1-Jan-86
142	Hydro	KPCL	Karnataka	Kalindi Supa DPH	100	294.6	1.5	293.2	23.08.1985	23-Aug-85
112	Thermal	State	Karnataka	Raichur TPS	210	1531.1	135.0	1396.1	01.03.1985	1-Mar-85
52	Hydro	State	AP	Nagarjunasagar	815.6	501.5	2.5	499.0	01.01.1985	1-Jan-85
194	Thermal	NTPC	AP	Ramagundam STPS 3	200	1635.2	107.8	1527.5	01.12.1984	1-Dec-84
42	Hydro	State	AP	Srisailam Right 4	110.0	134.4	0.7	133.8	27.08.1984	27-Aug-84
193	Thermal	NTPC	AP	Ramagundam STPS 2	200	1635.2	107.8	1527.5	01.05.1984	1-May-84
135	Hydro	KPCL	Karnataka	Kalindi Nagjhari	810	1719.7	8.6	1711.1	01.01.1984	1-Jan-84
41	Hydro	State	AP	Srisailam Right 3	110.0	134.4	0.7	133.8	19.11.1983	19-Nov-83
37	Hydro	State	AP	Donkarayi	25.0	132.3	3.3	129.0	04.10.1983	4-Oct-83
192	Thermal	NTPC	AP	Ramagundam STPS 1	200	1635.2	107.8	1527.5	01.10.1983	1-Oct-83
54	Hydro	State	AP	NS Right Canal 2	30.0	15.9	0.1	15.8	14.09.1983	14-Sep-83
63	Thermal	State	Tamilnadu	Ennore	450	1223.0	149.9	1073.0	31.03.1983	31-Mar-83
53	Hydro	State	AP	NS Right Canal 1	30.0	15.9	0.1	15.8	24.02.1983	24-Feb-83
40	Hydro	State	AP	Srisailam Right 2	110.0	134.4	0.7	133.8	14.12.1982	14-Dec-82
39	Hydro	State	AP	Srisailam Right 1	110.0	134.4	0.7	133.8	30.08.1982	30-Aug-82
2	Thermal	State	AP	Vijayawada - 2	210.0	1641.5	157.3	1484.2	10.10.1980	10-Oct-80

144	Hydro	KPCL	Karnataka	Linganamakki	55	194.3	1.0	193.3	01.01.1980	1-Jan-80
1	Thermal	State	AP	Vijayawada -1	210.0	1641.5	157.3	1484.2	01.11.1979	1-Nov-79
64	Thermal	State	Tamilnadu	Tuticorin	1050	8180.0	643.8	7536.2	09.07.1979	9-Jul-79
16	Thermal	State	AP	Kothagudem - 8	110.0	842.8	74.1	768.7	10.01.1978	10-Jan-78
38	Hydro	State	AP	Lower Sileru	460.0	1171.3	29.3	1142.0	01.01.1978	1-Jan-78
15	Thermal	State	AP	Kothagudem - 7	110.0	842.8	74.1	768.7	10.03.1977	10-Mar-77
147	Hydro	KPCL	Karnataka	Sharavati	1035	3853.7	19.3	3834.5	01.01.1977	1-Jan-77
175	Hydro		Kerala	Iddukki	780	2003.4	10.0	1993.4	31.12.1976	31-Dec-76
177	Hydro		Kerala	Poringal Kuthu L	16	108.0	0.5	107.4	31.12.1976	31-Dec-76
14	Thermal	State	AP	Kothagudem - 6	120.0	919.4	80.8	838.6	19.12.1974	19-Dec-74
13	Thermal	State	AP	Kothagudem - 5	120.0	919.4	80.8	838.6	13.08.1974	13-Aug-74
173	Hydro		Kerala	Kuttiadi	75	222.3	1.1	221.2	31.12.1972	31-Dec-72
100	Hydro	State	Tamilnadu	Kodayar II	40	82.8	0.4	82.4	17.11.1971	17-Nov-71
19	Thermal	State	AP	Ramagundam B	62.5	496.0	44.6	451.4	17.10.1971	17-Oct-71
96	Hydro	State	Tamilnadu	Sholayar I	70	258.2	1.3	256.9	22.04.1971	22-Apr-71
99	Hydro	State	Tamilnadu	Kodayar I	60	124.2	0.6	123.6	02.01.1971	2-Jan-71
97	Hydro	State	Tamilnadu	Sholayar II	25	92.2	0.5	91.7	25.03.1970	25-Mar-70
98	Hydro	State	Tamilnadu	Aliyar	60	162.1	0.8	161.3	25.03.1970	25-Mar-70
209	Thermal	NLC	Tamilnadu	NLC TSI	100	709.6	58.8	650.9	01.01.1970	1-Jan-70
34	Hydro	State	AP	Upper Sileru 2	60.0	136.0	3.4	132.6	31.03.1968	31-Mar-68
33	Hydro	State	AP	Upper Sileru 1	60.0	136.0	3.4	132.6	14.10.1967	14-Oct-67
12	Thermal	State	AP	Kothagudem - 4	60.0	459.7	40.4	419.3	08.07.1967	8-Jul-67
11	Thermal	State	AP	Kothagudem - 3	60.0	459.7	40.4	419.3	27.05.1967	27-May-67
168	Hydro		Kerala	Sholayar	54	263.0	1.3	261.7	31.12.1966	31-Dec-66
170	Hydro		Kerala	Sabaragiri	300	1224.5	6.1	1218.4	31.12.1966	31-Dec-66
10	Thermal	State	AP	Kothagudem - 2	60.0	459.7	40.4	419.3	27.11.1966	27-Nov-66
9	Thermal	State	AP	Kothagudem - 1	60.0	459.7	40.4	419.3	04.07.1966	4-Jul-66
86	Hydro	State	Tamilnadu	Kundah IV	100	282.4	1.4	281.0	10.05.1966	10-May-66
95	Hydro	State	Tamilnadu	Sarkarpathy	30	114.7	0.6	114.1	12.01.1966	12-Jan-66
89	Hydro	State	Tamilnadu	Mettur Tunnel	200	308.6	1.5	307.0	13.08.1965	13-Aug-65
20	Thermal	State	AP	Nellore	30.0	153.9	15.5	138.4	22.04.1965	22-Apr-65
85	Hydro	State	Tamilnadu	Kundah III	180	508.4	2.5	505.8	07.04.1965	7-Apr-65
126	Hydro	VVNL	Karnataka	Munirabad	27	68.7	0.3	68.4	01.01.1965	1-Jan-65

87	Hydro	State	Tamilnadu	Kundah V	40	113.0	0.6	112.4	31.10.1964	31-Oct-64
32	Hydro	Shared	AP	Tungabhadra (AP Utilisation)	57.6	148.3	3.7	144.6	01.01.1964	1-Jan-64
172	Hydro		Kerala	Panniar	30	142.4	0.7	141.7	31.12.1963	31-Dec-63
201	Thermal	NLC	Tamilnadu	NLC TSI	50	354.8	29.4	325.4	01.05.1962	1-May-62
202	Thermal	NLC	Tamilnadu	NLC TSI	50	354.8	29.4	325.4	01.05.1962	1-May-62
203	Thermal	NLC	Tamilnadu	NLC TSI	50	354.8	29.4	325.4	01.05.1962	1-May-62
204	Thermal	NLC	Tamilnadu	NLC TSI	50	354.8	29.4	325.4	01.05.1962	1-May-62
205	Thermal	NLC	Tamilnadu	NLC TSI	50	354.8	29.4	325.4	01.05.1962	1-May-62
206	Thermal	NLC	Tamilnadu	NLC TSI	50	354.8	29.4	325.4	01.05.1962	1-May-62
207	Thermal	NLC	Tamilnadu	NLC TSI	100	709.6	58.8	650.9	01.05.1962	1-May-62
208	Thermal	NLC	Tamilnadu	NLC TSI	100	709.6	58.8	650.9	01.05.1962	1-May-62
180	Hydro		Kerala	Nariamanglam	45	232.0	1.2	230.8	31.12.1961	31-Dec-61
84	Hydro	State	Tamilnadu	Kundah II	175	494.2	2.5	491.8	31.10.1960	31-Oct-60
83	Hydro	State	Tamilnadu	Kundah I	60	169.5	0.8	168.6	26.03.1960	**26-Mar-60**
91	Hydro	State	Tamilnadu	Periyar	140	492.7	2.5	490.3	12.10.1958	12-Oct-58
171	Hydro		Kerala	Porimgalkuttu	32	181.6	0.9	180.7	31.12.1957	31-Dec-57
31	Hydro	Shared	AP	Machkund (AP Utilisation)	84.0	900.6	22.5	878.1	01.01.1956	1-Jan-56
169	Hydro		Kerala	Senagulam	48	167.0	0.8	166.1	31.12.1954	31-Dec-54
58	Hydro	State	AP	Nizamsagar	10.0	0.0	0.0	0.0	28.11.1954	28-Nov-54
82	Hydro	State	Tamilnadu	Moyar	36	90.2	0.5	89.7	10.04.1952	10-Apr-52
125	Hydro	VVNL	Karnataka	Jog	120	174.2	0.9	173.3	01.01.1952	1-Jan-52
93	Hydro	State	Tamilnadu	Papanasam	28	88.5	0.4	88.1	07.04.1944	7-Apr-44
163	Hydro		Kerala	Pallivasal	37.5	222.6	1.1	221.4	31.12.1940	31-Dec-40
127	Hydro	VVNL	Karnataka	Shimshapur	17.2	93.9	0.5	93.4	01.01.1940	1-Jan-40
88	Hydro	State	Tamilnadu	Mettur Dam	40	26.0	0.1	25.9	13.06.1937	13-Jun-37
81	Hydro	State	Tamilnadu	Pykara	70	213.4	1.1	212.4	19.10.1932	19-Oct-32
128	Hydro	VVNL	Karnataka	Shivnasamudram	42	191.6	1.0	190.6	01.01.1902	1-Jan-02

FACTORS

Parameters	2002-03			2003-04			2004-05			Source
	Coal	Natural Gas	Diesel	Coal	Gas	Diesel	Coal	Gas	Diesel	
NCV_i (kcal/kg)	3820	10750	10186	3820	10750	10186	3820	10750	10186	Coal: General Review 2003-04 (CEA) Gas: IPCC-Good Practice Guidance Diesel: General Review 2003-04 (CEA)
Heat Rate; (kcal/kWh)	2425	2000	2062	2490	2000	2062	2490	2000	2062	Coal: Performance review of Thermal Power Stations 2004-05, 2003-04; Gas: Petition 22/99 before CERC
$EF_{CO2,i}$ (tonne CO_2/TJ)	96.1	56.1	74.1	96.1	56.1	74.1	96.1	56.1	74.1	IPCC 1996 Revised Guidelines and the IPCC Good Practice Guidance
$OXID_i$	0.980	0.999	0.990	0.980	0.999	0.990	0.980	0.999	0.990	Revised 1996 IPCC Guidelines
$COEF_{i,j,y}$(tonne of CO_2/tonne of fuel)	**1.506**	**2.523**	**3.129**	**1.506**	**2.523**	**3.129**	**1.506**	**2.523**	**3.129**	Calculated as per ACM0002/ version03

Region-wise Design Station Heat Rate for Thermal Power Plants

Region/ Grid	2000-01	2001-02	2002-03	2003-04	2004-05
Northern	2483	2483	2491	2484	2484
Southern	**2434**	**2434**	**2425**	**2490**	**2490**
Western	2347	2347	2341	2357	2357
Eastern	2383	2383	2368	2365	2365

unit: Kcal/ Kwh

Source www.cea.nic.in

SN	Type	Ownership	State	Station	Capacity (MW)	Aux Con % (2002-03)	Gross Gen (2002-03)	Aux Con (2002-03)	Net Gen (2002-03)	Aux Con % (2003-04)	Gross Gen (2003-04)	Aux Con (2003-04)	Net Gen (2003-04)	Aux. Con % (2004-05)	Gross Gen (2004-05)	Aux Con (2004-05)	Net Gen (2004-05)	Commi-ssioning
1	Thermal	State	AP	Vijayawada - 1	210	0.0877	10283	901.8191	9381.1809	0.0936	10104	945.7344	9158.2656	0.0958	9848.8	943.51504	8905.28496	01.11.1979
2	Thermal	State	AP	Vijayawada - 2	210													10.10.1980
3	Thermal	State	AP	Vijayawada - 3	210													05.10.1989
4	Thermal	State	AP	Vijayawada - 4	210													23.08.1990
5	Thermal	State	AP	Vijayawada - 5	210													31.03.1994
6	Thermal	State	AP	Vijayawada - 6	210													24.02.1995
7	Thermal	State	AP	Rayalaseema - 1	210	0.1002	3489	349.5978	3139.4022	0.0973	3331	324.1063	3006.8937	0.0938	3353.6	314.56768	3039.03232	31.03.1994
8	Thermal	State	AP	Rayalaseema - 2	210													25.02.1995
9	Thermal	State	AP	Kothagudem - 1	60	0.0914	4644.98	424.551172	4220.428828	0.0946	4183	395.7118	3787.2882	0.0879	5363.4	471.44286	4891.95714	04.07.1966
10	Thermal	State	AP	Kothagudem - 2	60													27.11.1966
11	Thermal	State	AP	Kothagudem - 3	60													27.05.1967
12	Thermal	State	AP	Kothagudem - 4	60													08.07.1967
13	Thermal	State	AP	Kothagudem - 5	120													13.08.1974
14	Thermal	State	AP	Kothagudem - 6	120													19.12.1974
15	Thermal	State	AP	Kothagudem - 7	110													10.03.1977
16	Thermal	State	AP	Kothagudem - 8	110													10.01.1978
17	Thermal	State	AP	Kothagudem V Stage I	250	0.091	4081	371.371	3709.629	0.0946	3994	377.8324	3616.1676	0.0879	4140.9	363.98511	3776.91489	27.03.1997
18	Thermal	State	AP	Kothagudem V Stage II	250													28.02.1998
19	Thermal	State	AP	Ramagundam B	62.5	0.1451	288.22	41.820722	246.399278	0.09	471	42.39	428.61	0.09	496	44.64	451.36	17.10.1971
20	Ther	State	AP	Nellore	30	0.0703	145.92	10.2582	135.66275	0.0984	146	14.3664	131.6336	0.101	153.9	15.543	138.356	22.04.1965

	mal						1	463	37							9	1	
217	Thermal	NLC	Tamilnadu	NLC TS I extension	420	0.0838	86.87	7.279706	79.590294	0.0904	1993	180.1672	1812.8328	0.0828	3237.68	268.079904	2969.6001	15.09.2003
216	Thermal	NLC	Tamilnadu	NLC TS II	210													01.06.1993
215	Thermal	NLC	Tamilnadu	NLC TS II	210													01.06.1993
214	Thermal	NLC	Tamilnadu	NLC TS II	210													01.06.1993
213	Thermal	NLC	Tamilnadu	NLC TS II	210													01.06.1993
212	Thermal	NLC	Tamilnadu	NLC TS II	210													01.03.1986
211	Thermal	NLC	Tamilnadu	NLC TS II	210													01.03.1986
210	Thermal	NLC	Tamilnadu	NLC TS II	210	0.0838	10504.41	880.269558	9624.140442	0.0904	10003	904.2712	9098.7288	0.0828	9247.38	765.683064	8481.69694	01.03.1986
209	Thermal	NLC	Tamilnadu	NLC TSI	100													01.01.1970
208	Thermal	NLC	Tamilnadu	NLC TSI	100													01.05.1962
207	Thermal	NLC	Tamilnadu	NLC TSI	100													01.05.1962
206	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
205	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
204	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
203	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
202	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
201	Thermal	NLC	Tamilnadu	NLC TSI	50	0.0838	4378.67	366.932546	4011.737454	0.0904	4400	397.76	4002.24	0.0828	4257.78	352.544184	3905.23582	01.05.1962
200	Thermal	IPP	Tamilnadu	Neyvelli Zero	250	0.0932	1395	130.014	1264.986	0.0932	1395	130.014	1264.986	0.0883	1335.82	117.952906	1217.86709	16.12.2002
199	Thermal	NTPC	AP	Simhadri	500													15.01.2002
198	Thermal	NTPC	AP	Simhadri	500	0.09	4974	447.66	4526.34	0.09	7722	694.98	7027.02	0.0565	8122.1	458.89865	7663.20135	15.08.2002
197	Thermal	NTPC	AP	Ramagundam STPS 6	500													01.10.1989
196	Thermal	NTPC	AP	Ramagundam STPS 5	500													01.03.1989

195	Thermal	NTPC	AP	Ramagundam STPS 4	500													01.06.1988
194	Thermal	NTPC	AP	Ramagundam STPS 3	200													01.12.1984
193	Thermal	NTPC	AP	Ramagundam STPS 2	200													01.05.1984
192	Thermal	NTPC	AP	Ramagundam STPS 1	200	0.0959	16839	1614.8601	15224.1399	0.0959	16332	1566.2388	14765.761	0.0659	17169.83	1131.4918	16038.3382	01.10.1983
120	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130													15.12.1999
119	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130	0.0838	872	73.0736	798.9264	0.0904	766	69.2464	696.7536	0.0828	516.33	42.752124	473.577876	15.12.1999
118	Thermal	State	Karnataka	Raichur TPS	210													10.12.2002
117	Thermal	State	Karnataka	Raichur TPS	210													01.01.1999
116	Thermal	State	Karnataka	Raichur TPS	210													01.01.1989
115	Thermal	State	Karnataka	Raichur TPS	210													01.09.1994
114	Thermal	State	Karnataka	Raichur TPS	210													01.03.1991
113	Thermal	State	Karnataka	Raichur TPS	210													01.03.1986
112	Thermal	State	Karnataka	Raichur TPS	210	0.0844	10290	868.476	9421.524	0.0858	11400	978.12	10421.88	0.0882	10717.93	945.321426	9772.60857	01.03.1985
68	Thermal	State	Tamilnadu	North Chennai 3	210													24.02.1996
67	Thermal	State	Tamilnadu	North Chennai 2	210													27.03.1995
66	Thermal	State	Tamilnadu	North Chennai 1	210	0.092	4405	405.26	3999.74	0.0916	4347	398.1852	3948.8148	0.0919	3915.96	359.876724	3556.08328	25.10.1994
65	Thermal	State	Tamilnadu	Mettur	840	0.0786	6739	529.6854	6209.3146	0.0794	6735	534.759	6200.241	0.0832	6683.96	556.105472	6127.85453	07.01.1987
64	Thermal	State	Tamilnadu	Tuticorin	1050	0.077	8187	630.399	7556.601	0.0804	8084	649.9536	7434.0464	0.0787	8180.01	643.766787	7536.24321	09.07.1979
63	Thermal	State	Tamilnadu	Ennore	450	0.1013	1747	176.9711	1570.0289	0.0966	1258	121.5228	1136.4772	0.1226	1222.96	149.934896	1073.0251	31.03.1983
				Total Thermal-SR			**93350.071**	**8230.29905**	**85119.77195**		**96664**	**8725.3595**	**87938.641**		**97964.34**	**7946.10252**	**90018.2375**	

DIESEL

SN	Type	Ownership	State	Station	Capacity (MW)	Aux Con % (2002-03)	Gross Gen (2002-03)	Aux Con (2002-03)	Net Gen (2002-03)	Aux Con % (2003-04)	Gross Gen (2003-04)	Aux Con (2003-04)	Net Gen (2003-04)	Aux. Con % (2004-05)	Gross Gen (2004-05)	Aux Con (2004-05)	Net Gen (2004-05)	Commissioning
188	Diesel		Lakshdeep	Mix	10	0.03	0	0	0	0.03	0	0	0	0.03	6	0.18	5.82	01.01.1992
161	Diesel	IPP	Kerala	Kasargode	21.84	0.03	148	4.44	143.56	0.03	78	2.34	75.66	0.03	15.74	0.4722	15.2678	15.03.2001
160	Diesel	State	Kerala	Kozhikode	129	0.03	385	11.55	373.45	0.03	313	9.39	303.61	0.03	160.5	4.815	155.685	01.12.1998
159	Diesel	State	Kerala	Brahmpuram	107	0.03	367	11.01	355.99	0.03	266	7.98	258.02	0.03	136.4	4.092	132.308	24.11.1998
123	Diesel	TATA IPP	Karnataka	Belgaum	81.3	0.03	355	10.65	344.35	0.03	235	7.05	227.95	0.03	238.46	7.1538	231.306	01.07.2001
122	Diesel	IPP	Karnataka	Bellay	25.2	0.03	64	1.92	62.08	0.03	42	1.26	40.74	0.03	40.32	1.2096	39.1104	15.05.2000
121	Diesel	VVNL	Karnataka	Yelehanka Diesel	128	0.03	715	21.45	693.55	0.03	384	11.52	372.48	0.03	271.14	8.1342	263.006	01.04.1994
80	Diesel	IPP	Tamilnadu	GMR Vasavi DEPP	196	0.03	1209	36.27	1172.73	0.03	992	29.76	962.24	0.03	762.22	22.8666	739.353	01.02.1999
79	Diesel	IPP	Tamilnadu	Samayanallur DEPP	106	0.03	589	17.67	571.33	0.03	457	13.71	443.29	0.03	382.02	11.4606	370.559	22.09.2001
78	Diesel	IPP	Tamilnadu	Samalpatti DEPP	105.66	0.03	623	18.69	604.31	0.03	458	13.74	444.26	0.03	357.33	10.7199	346.61	15.07.2001
30	Diesel	IPP	AP	LVS power	36.8	0.03	2	0.06	1.94	0.03	0	0	0	0.03	0	0	0	15.01.2002
							4457	**133.71**	**4323.3**		**3225**	**96.75**	**3128.3**		**2370.1**	**71.104**	**2299**	

GAS

SN	Type	Ownership	State	Station	Capacity (MW)	Aux Con % (2002-03)	Gross Gen (2002-03)	Aux Con (2002-03)	Net Gen (2002-03)	Aux Con % (2003-04)	Gross Gen (2003-04)	Aux Con (2003-04)	Net Gen (2003-04)	Aux. Con % (2004-05)	Gross Gen (2004-05)	Aux Con (2004-05)	Net Gen (2004-05)	Commissioning
191	Gas	NTPC	Kerala	Kayamkulam GT3	129.2													01.10.1999
190	Gas	NTPC	Kerala	Kayamkulam GT2	115.2													01.02.1999
189	Gas	NTPC	Kerala	Kayamkulam GT1	115.2	0.025	2127	53.175	2073.825	0.025	2118	52.95	2065.05	0.025	620.5	15.5125	604.9875	01.11.1998
187	Gas	State	Pondicherry	PPCL GTG	32.5	0.025	265	6.625	258.375	0.025	277	6.925	270.075	0.025	275.69	6.89225	268.79775	25.05.1999
162	Gas	IPP	Kerala	BSES	174	0.025		0	0	0.025	991	24.775	966.225	0.025	111.83	2.79575	109.03425	01.01.1998
124	Gas	GMR IPP	Karnataka	Tanir Bavi	220	0.03	1280	38.4	1241.6	0.03	1631	48.93	1582.07	0.03	629.55	18.8865	610.6635	15.05.2001
77	Gas	IPP	TN	Pillai Perumal Nallur GTPP	330.5	0.025	2169	54.225	2114.775	0.025	1314	32.85	1281.15	0.025	464.3	11.6075	452.6925	26.04.2001
76	Gas	State	TN	Kuttalam	36													30.03.2004
75	Gas	State	TN	Kuttalam	64	0.025	0	0	0	0.025	108	2.7	105.3	0.025	640.88	16.022	624.858	30.11.2003
74	Gas	State	TN	Valuthur	94	0.025	104	2.6	101.4	0.025	671	16.775	654.225	0.025	557.5	13.9375	543.5625	13.03.2003
73	Gas	State	TN	Basin Bridge	30													31.03.1996
72	Gas	State	TN	Basin Bridge	30													26.03.1996
71	Gas	State	TN	Basin Bridge	30													25.02.1996
70	Gas	State	TN	Basin Bridge	30	0.025	276	6.9	269.1	0.025	89	2.225	86.775	0.025	40.47	1.01175	39.45825	12.02.1996
69	Gas	State	TN	Kovilkalapai	108	0.025	726	18.15	707.85	0.025	745	18.625	726.375	0.025	763.32	19.083	744.237	30.09.2000
29	Gas	IPP	AP	Spectrum- Godavari	208	0.025	1250	31.25	1218.75	0.025	1100	27.5	1072.5	0.025	1372.96	34.324	1338.636	01.01.1997
28	Gas	IPP	AP	LANCO-Kondapalli	355	0.025	2477	61.925	2415.075	0.025	2238	55.95	2182.05	0.025	2246.34	56.1585	2190.1815	01.03.2002
27	Gas	IPP	AP	Jegrupadu	216	0.025	1583	39.575	1543.425	0.025	1505	37.625	1467.375	0.025	1419.62	35.4905	1384.1295	01.01.1998
26	Gas	IPP	AP	BSES- Peddapuram	220	0.025	850	21.25	828.75	0.025	1249	31.225	1217.775	0.025	1141.34	28.5335	1112.8065	30.11.2001
25	Gas	State	AP	Vijjeswaram II - 2	60										425.2			23.12.1997
21	Gas	State	AP	Vijjeswaram I - 1	33	0.025	2031	50.775	1980.225	0.025	2147	53.675	2093.325	0.025	229.6	49.8075	1942.4925	02.12.1990
22	Gas	State	AP	Vijjeswaram I - 2	33										236.1			12.03.1991
23	Gas	State	AP	Vijjeswaram I - 3	34										264			17.03.1992
24	Gas	State	AP	Vijjeswaram II - 1	112										837.4			31.03.1997
							15138	**384.85**	**14753.2**		**16183**	**412.73**	**15770.3**		**12276.6**	**310.063**	**11966.5**	

HYDRO

SN	Type	Ownership	State	Station	Capacity (MW)	Aux Con % (2002-03)	Gross Gen (2002-03)	Aux Con (2002-03)	Net Gen (2002-03)	Aux Con % (2003-04)	Gross Gen (2003-04)	Aux Con (2003-04)	Net Gen (2003-04)	Aux. Con % (2004-05)	Gross Gen (2004-05)	Aux Con (2004-05)	Net Gen (2004-05)	Commissioning
186	Hydro		Kerala	Urumi	6.2	0.005	0	0	0	0.005	0	0	0	0.005	0.91	0.00455	0.90545	30.12.2003
185	Hydro		Kerala	Chembukadavu	6.5	0.005	0	0	0	0.005	0	0	0	0.005	6.19	0.03095	6.15905	30.12.2003
184	Hydro	KLPVT	Kerala	Kuthungal	21	0.005	23	0.115	22.885	0.005	19	0.095	18.905	0.005	36.18	0.1809	35.9991	01.07.2001
183	Hydro	KLPVT	Kerala	Maniar	10	0.005	23	0.115	22.885	0.005	21	0.105	20.895	0.005	34.47	0.17235	34.29765	31.12.1987
182	Hydro		Kerala	Malankara	10.5	0.005	0	0	0	0.005	0	0	0	0.005	2.95	0.01475	2.93525	30.05.2004
181	Hydro		Kerala	Kallada	15	0.005	35	0.175	34.825	0.005	36	0.18	35.82	0.005	76.93	0.38465	76.54535	31.12.1994
180	Hydro		Kerala	Nariamanglam	45	0.005	230	1.15	228.85	0.005	196	0.98	195.02	0.005	231.95	1.15975	230.7903	31.12.1961
179	Hydro		Kerala	Madupetty	2	0.005	2	0.01	1.99	0.005	8	0.04	7.96	0.005	4.07	0.02035	4.04965	31.12.1998
178	Hydro		Kerala	Lower Pariyar	180	0.005	414	2.07	411.93	0.005	363	1.815	361.185	0.005	512.39	2.56195	509.8281	31.12.1997
177	Hydro		Kerala	Poringal Kuthu L	16	0.005	78	0.39	77.61	0.005	88	0.44	87.56	0.005	107.96	0.5398	107.4202	31.12.1976
176	Hydro		Kerala	Kakkad	50	0.005	150	0.75	149.25	0.005	126	0.63	125.37	0.005	210.38	1.0519	209.3281	14.10.1999
175	Hydro		Kerala	Iddukki	780	0.005	1905	9.525	1895.475	0.005	1246	6.23	1239.77	0.005	2003.4	10.017	1993.383	31.12.1976
174	Hydro		Kerala	Kuttiadi	50													27.01.2001
173	Hydro		Kerala	Kuttiadi	75	0.005	304	1.52	302.48	0.005	259	1.295	257.705	0.005	370.54	1.8527	368.6873	31.12.1972
172	Hydro		Kerala	Panniar	30	0.005	78	0.39	77.61	0.005	76	0.38	75.62	0.005	142.43	0.71215	141.7179	31.12.1963
171	Hydro		Kerala	Porimgalkuttu	32	0.005	123	0.615	122.385	0.005	142	0.71	141.29	0.005	181.6	0.908	180.692	31.12.1957
170	Hydro		Kerala	Sabaragiri	300	0.005	804	4.02	799.98	0.005	698	3.49	694.51	0.005	1224.54	6.1227	1218.417	31.12.1966
169	Hydro		Kerala	Senagulam	48	0.005	130	0.65	129.35	0.005	128	0.64	127.36	0.005	166.96	0.8348	166.1252	31.12.1954
168	Hydro		Kerala	Sholayar	54	0.005	138	0.69	137.31	0.005	202	1.01	200.99	0.005	263	1.315	261.685	31.12.1966
167	Hydro		Kerala	Malampuzha	2.5	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	01.12.2005
166	Hydro		Kerala	Edamalayar	75	0.005	259	1.295	257.705	0.005	155	0.775	154.225	0.005	338.31	1.69155	336.6185	31.12.1996
165	Hydro		Kerala	Peppara	3	0.005	6	0.03	5.97	0.005	1	0.005	0.995	0.005	6.37	0.03185	6.33815	31.12.1996
164	Hydro		Kerala	Other Hydro	5	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	01.12.2005
163	Hydro		Kerala	Pallivasal	37.5	0.005	157	0.785	156.215	0.005	193	0.965	192.035	0.005	222.55	1.11275	221.4373	31.12.1940
158	Hydro	Mysore PC	Karnataka	Narayanpur	6.6	0.005	36	0.18	35.82	0.005	38	0.19	37.81	0.005	42.46	0.2123	42.2477	01.12.2005
157	Hydro	Bhoruka P	Karnataka	Shahpur	1.4	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	01.08.2003
156	Hydro	Bhoruka P	Karnataka	Rajankollur	2	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	01.08.1999
155	Hydro	Bhoruka P	Karnataka	Shivpura	18	0.005	67	0.335	66.665	0.005	54	0.27	53.73	0.005	72.34	0.3617	71.9783	01.11.1992

154	Hydro	Bhoruka P	Karnataka	Harangi	9	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	19.07.1999
153	Hydro	Bhoruka P	Karnataka	Shahpur	6.6	0.005	22	0.11	21.89	0.005	22	0.11	21.89	0.005	25.15	0.12575	25.02425	01.11.1998
31	Hydro	Shared	AP	Machkund (AP Utilisation)	84	0.005	579.61	2.89805	576.712	0.005	529	2.645	526.355	0.025	900.6	22.515	878.085	01.01.1956
32	Hydro	Shared	AP	Tungabhadra (AP Utilisation)	57.6	0.005	118.52	0.5926	117.9274	0.005	148	0.74	147.26	0.025	148.3	3.7075	144.5925	01.01.1964
33	Hydro	State	AP	Upper Sileru 1	60	0.005	245.59	1.22795	244.3621	0.005	401	2.005	398.995	0.005	544.1	2.7205	541.3795	14.10.1967
34	Hydro	State	AP	Upper Sileru 2	60													31.03.1968
35	Hydro	State	AP	Upper Sileru 3	60													31.03.1994
36	Hydro	State	AP	Upper Sileru 4	60													31.03.1995
37	Hydro	State	AP	Donkarayi	25	0.005	40	0.2	39.8	0.005	111	0.555	110.445	0.005	132.3	0.6615	131.6385	04.10.1983
38	Hydro	State	AP	Lower Sileru	460	0.005	613.74	3.0687	610.6713	0.005	977	4.885	972.115	0.005	1171.3	5.8565	1165.444	01.01.1978
39	Hydro	State	AP	Srisailam Right 1	110	0.005	538.65	2.69325	535.9568	0.005	309	1.545	307.455	0.005	941	4.705	936.295	30.08.1982
40	Hydro	State	AP	Srisailam Right 2	110													14.12.1982
41	Hydro	State	AP	Srisailam Right 3	110													19.11.1983
42	Hydro	State	AP	Srisailam Right 4	110													27.08.1984
43	Hydro	State	AP	Srisailam Right 5	110													31.03.1986
44	Hydro	State	AP	Srisailam Right 6	110													31.10.1986
45	Hydro	State	AP	Srisailam Right 7	110													19.03.1987
46	Hydro	State	AP	Srisailam Left 1	150	0.005	559.7	2.7985	556.9015	0.005	328	1.64	326.36	0.005	1411.6	7.058	1404.542	26.04.2001
47	Hydro	State	AP	Srisailam Left 2	150													12.11.2001
48	Hydro	State	AP	Srisailam Left 3	150													19.04.2002
49	Hydro	State	AP	Srisailam Left 4	150													29.11.2002
50	Hydro	State	AP	Srisailam Left 5	150													28.03.2003
51	Hydro	State	AP	Srisailam Left 6	150													04.09.2003
52	Hydro	State	AP	Nagarjunasagar	815.6	0.005	869.01	4.34505	864.665	0.005	369	1.845	367.155	0.005	501.5	2.5075	498.9925	01.01.1985
53	Hydro	State	AP	NS Right Canal 1	30	0.005	0	0	0	0.005	0	0	0	0.005	47.7	0.2385	47.4615	24.02.1983
54	Hydro	State	AP	NS Right Canal 2	30													14.09.1983
55	Hydro	State	AP	NS Right Canal 3	30													10.08.1990
56	Hydro	State	AP	NS Left Canal	60	0.005	0	0	0	0.005	0	0	0	0.005	5.1	0.0255	5.0745	27.09.1992
57	Hydro	State	AP	Pochampad	27	0.005	82.99	0.41495	82.57505	0.005	64	0.32	63.68	0.005	1.6	0.008	1.592	31.03.1988
58	Hydro	State	AP	Nizamsagar	10	0.005	0	0	0	0.005	6	0.03	5.97	0.005	0	0	0	28.11.1954
59	Hydro	State	AP	Penna Ahobilam	20	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	23.01.1994
60	Hydro	State	AP	Singur	15	0.005	6.25	0.03125	6.21875	0.005	6	0.03	5.97	0.005	1.47	0.00735	1.46265	31.03.2000

61	Hydro	State	AP	Mini Hydro	30	0.005	11.7	0.0585	11.6415	0.005	8	0.04	7.96	0.005	6.3	0.0315	6.2685	01.12.2005
152	Hydro	Bhoruka P	Karnataka	Madhavmantrii	3	0.005	0	0	0	0.005	13	0.065	12.935	0.005	22.86	0.1143	22.7457	01.07.2001
151	Hydro	KPCL	Karnataka	Kadra 3	50													21.05.1999
150	Hydro	KPCL	Karnataka	Kadra 2	50													23.01.1999
149	Hydro	KPCL	Karnataka	Kadra 1	50	0.005	238	1.19	236.81	0.005	223	1.115	221.885	0.005	230.98	1.1549	229.8251	2.061997
148	Hydro	KPCL	Karnataka	Sirwar	1	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	01.01.1993
147	Hydro	KPCL	Karnataka	Sharavati	1035	0.005	2950	14.75	2935.25	0.005	3316	16.58	3299.42	0.005	3853.74	19.2687	3834.471	01.01.1977
146	Hydro	KPCL	Karnataka	Manidam DPH	9	0.005	18	0.09	17.91	0.005	11	0.055	10.945	0.005	23.46	0.1173	23.3427	01.01.1994
145	Hydro	KPCL	Karnataka	Mallapur	9	0.005	1	0.005	0.995	0.005	0	0	0	0.005	0	0	0	01.01.1994
144	Hydro	KPCL	Karnataka	Linganamakki	55	0.005	111	0.555	110.445	0.005	721	3.605	717.395	0.005	194.32	0.9716	193.3484	01.01.1980
143	Hydro	KPCL	Karnataka	Gerusuppa	240	0.005		0	0	0.005	358	1.79	356.21	0.005	437.59	2.18795	435.4021	01.05.2001
142	Hydro	KPCL	Karnataka	Kalindi Supa DPH	100	0.005	257	1.285	255.715	0.005	241	1.205	239.795	0.005	294.64	1.4732	293.1668	23.08.1985
141	Hydro	KPCL	Karnataka	Almattidam 6	55													10.08.2005
140	Hydro	KPCL	Karnataka	Almattidam 5	55													06.07.2005
139	Hydro	KPCL	Karnataka	Almattidam 4	55													26.03.2005
138	Hydro	KPCL	Karnataka	Almattidam 3	55													13.01.2005
137	Hydro	KPCL	Karnataka	Almattidam 2	55													04.11.2004
136	Hydro	KPCL	Karnataka	Almattidam 1	15	0.005	0	0	0	0.005	0	0	0	0.005	138.68	0.6934	137.9866	26.03.2004
135	Hydro	KPCL	Karnataka	Kalindi Nagjhari	810	0.005	1812	9.06	1802.94	0.005	1718	8.59	1709.41	0.005	1719.69	8.59845	1711.092	01.01.1984
134	Hydro	KPCL	Karnataka	Bhadra	33.4	0.005	18	0.09	17.91	0.005	11	0.055	10.945	0.005	41.4	0.207	41.193	29.03.1998
81	Hydro	State	Tamilnadu	Pykara	70	0.005	254	1.27	252.73	0.005	141	0.705	140.295	0.005	213.44	1.0672	212.3728	19.10.1932
82	Hydro	State	Tamilnadu	Moyar	36	0.005	105	0.525	104.475	0.005	53	0.265	52.735	0.005	90.17	0.45085	89.71915	10.04.1952
83	Hydro	State	Tamilnadu	Kundah I	60	0.005	764	3.82	760.18	0.005	429	2.145	426.855	0.005	1567.44	7.8372	1559.603	26.03.1960
84	Hydro	State	Tamilnadu	Kundah II	175													31.10.1960
85	Hydro	State	Tamilnadu	Kundah III	180													07.04.1965
86	Hydro	State	Tamilnadu	Kundah IV	100													10.05.1966
87	Hydro	State	Tamilnadu	Kundah V	40													31.10.1964
88	Hydro	State	Tamilnadu	Mettur Dam	40	0.005	41	0.205	40.795	0.005	15	0.075	14.925	0.005	26.03	0.13015	25.89985	13.06.1937
89	Hydro	State	Tamilnadu	Mettur Tunnel	200	0.005	89	0.445	88.555	0.005	70	0.35	69.65	0.005	308.55	1.54275	307.0073	13.08.1965
90	Hydro	State	Tamilnadu	Lower Mettur	120	0.005	168	0.84	167.16	0.005	97	0.485	96.515	0.005	254.66	1.2733	253.3867	23.03.1988
91	Hydro	State	Tamilnadu	Periyar	140	0.005	227	1.135	225.865	0.005	213	1.065	211.935	0.005	492.72	2.4636	490.2564	12.10.1958
92	Hydro	State	Tamilnadu	Suruliyar	35	0.005	75	0.375	74.625	0.005	41	0.205	40.795	0.005	101.41	0.50705	100.903	27.08.1986
93	Hydro	State	Tamilnadu	Papanasam	28	0.005	65	0.325	64.675	0.005	47	0.235	46.765	0.005	88.5	0.4425	88.0575	07.04.1944

94	Hydro	State	Tamilnadu	Servalar	20	0.005	19	0.095	18.905	0.005	19	0.095	18.905	0.005	34.62	0.1731	34.4469	20.03.1987
95	Hydro	State	Tamilnadu	Sarkarpathy	30	0.005	97	0.485	96.515	0.005	51	0.255	50.745	0.005	114.67	0.57335	114.0967	12.01.1966
96	Hydro	State	Tamilnadu	Sholayar I	70	0.005	320	1.6	318.4	0.005	199	0.995	198.005	0.005	350.38	1.7519	348.6281	22.04.1971
97	Hydro	State	Tamilnadu	Sholayar II	25													25.03.1970
98	Hydro	State	Tamilnadu	Aliyar	60	0.005	108	0.54	107.46	0.005	86	0.43	85.57	0.005	162.08	0.8104	161.2696	25.03.1970
99	Hydro	State	Tamilnadu	Kodayar I	60	0.005	150	0.75	149.25	0.005	141	0.705	140.295	0.005	207.06	1.0353	206.0247	02.01.1971
100	Hydro	State	Tamilnadu	Kodayar II	40													17.11.1971
101	Hydro	State	Tamilnadu	Kadamparai	400	0.005	203	1.015	201.985	0.005	408	2.04	405.96	0.005	256.79	1.28395	255.5061	28.03.1987
102	Hydro	State	Tamilnadu	Vaigai Small	6	0.005	4	0.02	3.98	0.005	5	0.025	4.975	0.005	12.25	0.06125	12.18875	23.02.1990
103	Hydro	State	Tamilnadu	Pykara Mini	2	0.005	0	0	0	0.005	0	0	0	0.005	5.04	0.0252	5.0148	07.10.1989
104	Hydro	State	Tamilnadu	Lower Bhavani Small	8	0.005	21	0.105	20.895	0.005	9	0.045	8.955	0.005	61.52	0.3076	61.2124	31.03.1990
105	Hydro	State	Tamilnadu	Lowerbavani RBC	8													10.02.1998
106	Hydro	State	Tamilnadu	Punachi Mini	2	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	16.12.1992
107	Hydro	State	Tamilnadu	Maravakandy Mini	0.75	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	14.10.1992
108	Hydro	State	Tamilnadu	Sathanur	7.5	0.005	2	0.01	1.99	0.005	2	0.01	1.99	0.005	10.21	0.05105	10.15895	30.03.1999
109	Hydro	State	Tamilnadu	Parsons Valley	30	0.005	16	0.08	15.92	0.005	18	0.09	17.91	0.005	55.6	0.278	55.322	29.03.2000
110	Hydro	State	Tamilnadu	Thirumurthy Mini	1.95	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	20.03.2000
111	Hydro	State	Tamilnadu	Mukurthy Mini	0.7	0.005	0	0	0	0.005	0	0	0	0.005	0	0	0	18.08.2000
133	Hydro	KPCL	Karnataka	Kodasalli 3	40													28.08.1999
132	Hydro	KPCL	Karnataka	Kodasalli 2	40													20.04.1999
131	Hydro	KPCL	Karnataka	Kodasalli 1	40	0.005	218	1.09	216.91	0.005	214	1.07	212.93	0.005	214.76	1.0738	213.6862	20.06.1998
130	Hydro	KPCL	Karnataka	Ghatprabha	32	0.005	59	0.295	58.705	0.005	62	0.31	61.69	0.005	96.61	0.48305	96.12695	01.01.1993
129	Hydro	KPCL	Karnataka	Varahi	230	0.005	844	4.22	839.78	0.005	721	3.605	717.395	0.005	973.27	4.86635	968.4037	01.01.1990
128	Hydro	VVNL	Karnataka	Shivnasamudram	42	0.005	14	0.07	13.93	0.005	79	0.395	78.605	0.005	191.59	0.95795	190.6321	01.01.1902
127	Hydro	VVNL	Karnataka	Shimshapur	17.2	0.005	57	0.285	56.715	0.005	57	0.285	56.715	0.005	93.85	0.46925	93.38075	01.01.1940
126	Hydro	VVNL	Karnataka	Munirabad	27	0.005	47	0.235	46.765	0.005	41	0.205	40.795	0.005	68.71	0.34355	68.36645	01.01.1965
125	Hydro	VVNL	Karnataka	Jog	120	0.005	146	0.73	145.27	0.005	160	0.8	159.2	0.005	174.18	0.8709	173.3091	01.01.1952
							18167.8	**90.8388**	**18076.9**		**17317**	**86.585**	**17230.4**		**25280.4**	**147.38**	**25133**	

NUCLEAR

SN	Type	Ownership	State	Station	Capacity (MW)	Aux Con % (2002-03)	Gross Gen (2002-03)	Aux Con (2002-03)	Net Gen (2002-03)	Aux Con % (2003-04)	Gross Gen (2003-04)	Aux Con (2003-04)	Net Gen (2003-04)	Aux. Con % (2004-05)	Gross Gen (2004-05)	Aux Con (2004-05)	Net Gen (2004-05)	Commissioning
220	Nuclear	NPC	Karnataka	Kaiga 2	220													16.03.2000
219	Nuclear	NPC	Karnataka	Kaiga 1	220	0.12	3317	398.04	2918.96	0.12	3123	374.76	2748.24	0.12	2926.25	351.15	2575.1	16.11.2000
218	Nuclear	NPC	Tamilnadu	MAPP Kalpakkam	340	0.12	1073	128.76	944.24	0.12	1577	189.24	1387.76	0.12	1480.48	177.6576	1302.8224	21.03.1986
							4390	**526.8**	**3863.2**		**4700**	**564**	**4136**		**4406.73**	**528.81**	**3877.92**	

OMPIVOT

Count of Gross Gen (2002-03)	
Type	Total
Diesel	11
Gas	13
Hydro	86
Nuclear	2
Thermal	18
Wind	
Grand Total	130

BM Base

SN	Type	Ownership	State	Station	Capacity (MW)	Aux. Con % (2004-05)	Gross Gen (2004-05)	Aux Con (2004-05)	Net Gen (2004-05)	Gross	Aux	Net	Commissioning
1	Thermal	State	AP	Vijayawada -1	210.0	9.6%	9848.8	943.5	8905.3	1641.5	157.3	1484.2	01.11.1979
2	Thermal	State	AP	Vijayawada - 2	210.0					1641.5	157.3	1484.2	10.10.1980
3	Thermal	State	AP	Vijayawada - 3	210.0					1641.5	157.3	1484.2	05.10.1989
4	Thermal	State	AP	Vijayawada - 4	210.0					1641.5	157.3	1484.2	23.08.1990
5	Thermal	State	AP	Vijayawada - 5	210.0					1641.5	157.3	1484.2	31.03.1994
6	Thermal	State	AP	Vijayawada - 6	210.0					1641.5	157.3	1484.2	24.02.1995
7	Thermal	State	AP	Rayalaseema - 1	210.0	9.4%	3353.6	314.6	3039.0	1676.8	157.3	1519.5	31.03.1994
8	Thermal	State	AP	Rayalaseema - 2	210.0					1676.8	157.3	1519.5	25.02.1995
9	Thermal	State	AP	Kothagudem - 1	60.0	8.8%	5363.4	471.4	4892.0	459.7	40.4	419.3	04.07.1966
10	Thermal	State	AP	Kothagudem - 2	60.0					459.7	40.4	419.3	27.11.1966
11	Thermal	State	AP	Kothagudem - 3	60.0					459.7	40.4	419.3	27.05.1967
12	Thermal	State	AP	Kothagudem - 4	60.0					459.7	40.4	419.3	08.07.1967
13	Thermal	State	AP	Kothagudem - 5	120.0					919.4	80.8	838.6	13.08.1974
14	Thermal	State	AP	Kothagudem - 6	120.0					919.4	80.8	838.6	19.12.1974
15	Thermal	State	AP	Kothagudem - 7	110.0					842.8	74.1	768.7	10.03.1977

16	Thermal	State	AP	Kothagudem - 8	110.0					842.8	74.1	768.7	10.01.1978
17	Thermal	State	AP	Kothagudem V Stage I	250.0	8.8%	4140.9	364.0	3776.9	2070.5	182.0	1888.5	27.03.1997
18	Thermal	State	AP	Kothagudem V Stage II	250.0					2070.5	182.0	1888.5	28.02.1998
19	Thermal	State	AP	Ramagundam B	62.5	9.0%	496.0	44.6	451.4	496.0	44.6	451.4	17.10.1971
20	Thermal	State	AP	Nellore	30.0	10.1%	153.9	15.5	138.4	153.9	15.5	138.4	22.04.1965
21	Gas	State	AP	Vijjeswaram I - 1	33.0	2.5%	229.6	49.8	1942.5	229.6	5.7	223.9	02.12.1990
22	Gas	State	AP	Vijjeswaram I - 2	33.0		236.1			236.1	5.9	230.2	12.03.1991
23	Gas	State	AP	Vijjeswaram I - 3	34.0		264.0			264.0	6.6	257.4	17.03.1992
24	Gas	State	AP	Vijjeswaram II - 1	112.0		837.4			837.4	20.9	816.5	31.03.1997
25	Gas	State	AP	Vijjeswaram II - 2	60.0		425.2			425.2	10.6	414.6	23.12.1997
26	Gas	IPP	AP	BSES-Peddapuram	220	2.5%	1141.3	28.5	1112.8	1141.3	28.5	1112.8	30.11.2001
27	Gas	IPP	AP	Jegrupadu	216	2.5%	1419.6	35.5	1384.1	1419.6	35.5	1384.1	01.01.1998
28	Gas	IPP	AP	LANCO-Kondapalli	355	2.5%	2246.3	56.2	2190.2	2246.3	56.2	2190.2	01.03.2002
29	Gas	IPP	AP	Spectrum-Godavari	208	2.5%	1373.0	34.3	1338.6	1373.0	34.3	1338.6	01.01.1997
30	Diesel	IPP	AP	LVS power	36.8	3.0%	0.0	0.0	0.0	0.0	0.0	0.0	15.01.2002
31	Hydro	Shared	AP	Machkund (AP Utilisation)	84.0	2.5%	900.6	22.5	878.1	900.6	22.5	878.1	01.01.1956
32	Hydro	Shared	AP	Tungabhadra (AP Utilisation)	57.6	2.5%	148.3	3.7	144.6	148.3	3.7	144.6	01.01.1964

33	Hydro	State	AP	Upper Sileru 1	60.0	0.5%	544.1	2.7	541.4	136.0	3.4	132.6	14.10.1967
34	Hydro	State	AP	Upper Sileru 2	60.0					136.0	3.4	132.6	31.03.1968
35	Hydro	State	AP	Upper Sileru 3	60.0					136.0	3.4	132.6	31.03.1994
36	Hydro	State	AP	Upper Sileru 4	60.0					136.0	3.4	132.6	31.03.1995
37	Hydro	State	AP	Donkarayi	25.0	0.5%	132.3	0.7	131.6	132.3	3.3	129.0	04.10.1983
38	Hydro	State	AP	Lower Sileru	460.0	0.5%	1171.3	5.9	1165.4	1171.3	29.3	1142.0	01.01.1978
39	Hydro	State	AP	Srisailam Right 1	110.0	0.5%	941.0	4.7	936.3	134.4	0.7	133.8	30.08.1982
40	Hydro	State	AP	Srisailam Right 2	110.0					134.4	0.7	133.8	14.12.1982
41	Hydro	State	AP	Srisailam Right 3	110.0					134.4	0.7	133.8	19.11.1983
42	Hydro	State	AP	Srisailam Right 4	110.0					134.4	0.7	133.8	27.08.1984
43	Hydro	State	AP	Srisailam Right 5	110.0					134.4	0.7	133.8	31.03.1986
44	Hydro	State	AP	Srisailam Right 6	110.0					134.4	0.7	133.8	31.10.1986
45	Hydro	State	AP	Srisailam Right 7	110.0					134.4	0.7	133.8	19.03.1987
46	Hydro	State	AP	Srisailam Left 1	150.0	0.5%	1411.6	7.1	1404.5	235.3	1.2	234.1	26.04.2001
47	Hydro	State	AP	Srisailam Left 2	150.0					235.3	1.2	234.1	12.11.2001
48	Hydro	State	AP	Srisailam Left 3	150.0					235.3	1.2	234.1	19.04.2002
49	Hydro	State	AP	Srisailam Left 4	150.0					235.3	1.2	234.1	29.11.2002
50	Hydro	State	AP	Srisailam Left 5	150.0					235.3	1.2	234.1	28.03.2003

51	Hydro	State	AP	Srisailam Left 6	150.0					235.3	1.2	234.1	04.09.2003
52	Hydro	State	AP	Nagarjunasagar	815.6	0.5%	501.5	2.5	499.0	501.5	2.5	499.0	01.01.1985
53	Hydro	State	AP	NS Right Canal 1	30.0	0.5%	47.7	0.2	47.5	15.9	0.1	15.8	24.02.1983
54	Hydro	State	AP	NS Right Canal 2	30.0					15.9	0.1	15.8	14.09.1983
55	Hydro	State	AP	NS Right Canal 3	30.0					15.9	0.1	15.8	10.08.1990
56	Hydro	State	AP	NS Left Canal	60.0	0.5%	5.1	0.0	5.1	5.1	0.0	5.1	27.09.1992
57	Hydro	State	AP	Pochampad	27.0	0.5%	1.6	0.0	1.6	1.6	0.0	1.6	31.03.1988
58	Hydro	State	AP	Nizamsagar	10.0	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	28.11.1954
59	Hydro	State	AP	Penna Ahobilam	20.0	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	23.01.1994
60	Hydro	State	AP	Singur	15.0	0.5%	1.5	0.0	1.5	1.5	0.0	1.5	31.03.2000
61	Hydro	State	AP	Mini Hydro	30.0	0.5%	6.3	0.0	6.3	6.3	0.0	6.3	01.12.2005
62	Wind	IPP	AP	Wind	2.0								10.10.1994
63	Thermal	State	Tamilnadu	Ennore	450	12.3%	1223.0	149.9	1073.0	1223.0	149.9	1073.0	31.03.1983
64	Thermal	State	Tamilnadu	Tuticorin	1050	7.9%	8180.0	643.8	7536.2	8180.0	643.8	7536.2	09.07.1979
65	Thermal	State	Tamilnadu	Mettur	840	8.3%	6684.0	556.1	6127.9	6684.0	556.1	6127.9	07.01.1987
66	Thermal	State	Tamilnadu	North Chennai 1	210	9.2%	3916.0	359.9	3556.1	1305.3	120.0	3556.1	25.10.1994
67	Thermal	State	Tamilnadu	North Chennai 2	210					1305.3	120.0	0.0	27.03.1995
68	Thermal	State	Tamilnadu	North Chennai 3	210					1305.3	120.0	0.0	24.02.1996
69	Gas	State	Tamilnadu	Kovilkalapai	108	2.5%	763.3	19.1	744.2	763.3	19.1	744.2	30.09.2000
70	Gas	State	Tamilnadu	Basin Bridge	30	2.5%	40.5	1.0	39.5	10.1	0.3	39.5	12.02.1996
71	Gas	State	Tamilnadu	Basin Bridge	30					10.1	0.3	0.0	25.02.1996
72	Gas	State	Tamilnadu	Basin Bridge	30					10.1	0.3	0.0	26.03.1996
73	Gas	State	Tamilnadu	Basin Bridge	30					10.1	0.3	0.0	31.03.1996
74	Gas	State	Tamilnadu	Valuthur	94	2.5%	557.5	13.9	543.6	557.5	13.9	543.6	13.03.2003

75	Gas	State	Tamilnadu	Kuttalam	64	2.5%	640.9	16.0	624.9	410.2	10.3	399.9	30.11.2003
76	Gas	State	Tamilnadu	Kuttalam	36					230.7	5.8	224.9	30.03.2004
77	Gas	IPP	Tamilnadu	Pillai Perumal Nallur GTPP	330.5	2.5%	464.3	11.6	452.7	464.3	11.6	452.7	26.04.2001
78	Diesel	IPP	Tamilnadu	Samalpatti DEPP	105.7	3.0%	357.3	10.7	346.6	357.3	10.7	346.6	15.07.2001
79	Diesel	IPP	Tamilnadu	Samayanallur DEPP	106	3.0%	382.0	11.5	370.6	382.0	11.5	370.6	22.09.2001
80	Diesel	IPP	Tamilnadu	GMR Vasavi DEPP	196	3.0%	762.2	22.9	739.4	762.2	22.9	739.4	01.02.1999
81	Hydro	State	Tamilnadu	Pykara	70	0.5%	213.4	1.1	212.4	213.4	1.1	212.4	19.10.1932
82	Hydro	State	Tamilnadu	Moyar	36	0.5%	90.2	0.5	89.7	90.2	0.5	89.7	10.04.1952
83	Hydro	State	Tamilnadu	Kundah I	60	0.5%	1567.4	7.8	1559.6	169.5	0.8	168.6	26.03.1960
84	Hydro	State	Tamilnadu	Kundah II	175					494.2	2.5	491.8	31.10.1960
85	Hydro	State	Tamilnadu	Kundah III	180					508.4	2.5	505.8	07.04.1965
86	Hydro	State	Tamilnadu	Kundah IV	100					282.4	1.4	281.0	10.05.1966
87	Hydro	State	Tamilnadu	Kundah V	40					113.0	0.6	112.4	31.10.1964
88	Hydro	State	Tamilnadu	Mettur Dam	40	0.5%	26.0	0.1	25.9	26.0	0.1	25.9	13.06.1937
89	Hydro	State	Tamilnadu	Mettur Tunnel	200	0.5%	308.6	1.5	307.0	308.6	1.5	307.0	13.08.1965
90	Hydro	State	Tamilnadu	Lower Mettur	120	0.5%	254.7	1.3	253.4	254.7	1.3	253.4	23.03.1988
91	Hydro	State	Tamilnadu	Periyar	140	0.5%	492.7	2.5	490.3	492.7	2.5	490.3	12.10.1958
92	Hydro	State	Tamilnadu	Suruliyar	35	0.5%	101.4	0.5	100.9	101.4	0.5	100.9	27.08.1986
93	Hydro	State	Tamilnadu	Papanasam	28	0.5%	88.5	0.4	88.1	88.5	0.4	88.1	07.04.1944
94	Hydro	State	Tamilnadu	Servalar	20	0.5%	34.6	0.2	34.4	34.6	0.2	34.4	20.03.1987
95	Hydro	State	Tamilnadu	Sarkarpathy	30	0.5%	114.7	0.6	114.1	114.7	0.6	114.1	12.01.1966
96	Hydro	State	Tamilnadu	Sholayar I	70	0.5%	350.4	1.8	348.6	258.2	1.3	256.9	22.04.1971
97	Hydro	State	Tamilnadu	Sholayar II	25					92.2	0.5	91.7	25.03.1970
98	Hydro	State	Tamilnadu	Aliyar	60	0.5%	162.1	0.8	161.3	162.1	0.8	161.3	25.03.1970
99	Hydro	State	Tamilnadu	Kodayar I	60	0.5%	207.1	1.0	206.0	124.2	0.6	123.6	02.01.1971
100	Hydro	State	Tamilnadu	Kodayar II	40					82.8	0.4	82.4	17.11.1971
101	Hydro	State	Tamilnadu	Kadamparai	400	0.5%	256.8	1.3	255.5	256.8	1.3	255.5	28.03.1987
102	Hydro	State	Tamilnadu	Vaigai Small	6	0.5%	12.3	0.1	12.2	12.3	0.1	12.2	23.02.1990
103	Hydro	State	Tamilnadu	Pykara Mini	2	0.5%	5.0	0.0	5.0	5.0	0.0	5.0	07.10.1989

104	Hydro	State	Tamilnadu	Lower Bhavani Small	8	0.5%	61.5	0.3	61.2	30.8	0.2	30.6	31.03.1990
105	Hydro	State	Tamilnadu	Lowerbavani RBC	8					30.8	0.2	30.6	10.02.1998
106	Hydro	State	Tamilnadu	Punachi Mini	2	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	16.12.1992
107	Hydro	State	Tamilnadu	Maravakandy Mini	0.75	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	14.10.1992
108	Hydro	State	Tamilnadu	Sathanur	7.5	0.5%	10.2	0.1	10.2	10.2	0.1	10.2	30.03.1999
109	Hydro	State	Tamilnadu	Parsons Valley	30	0.5%	55.6	0.3	55.3	55.6	0.3	55.3	29.03.2000
110	Hydro	State	Tamilnadu	Thirumurthy Mini	1.95	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	20.03.2000
111	Hydro	State	Tamilnadu	Mukurthy Mini	0.7	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	18.08.2000
112	Thermal	State	Karnataka	Raichur TPS	210	8.8%	10717.9	945.3	9772.6	1531.1	135.0	1396.1	01.03.1985
113	Thermal	State	Karnataka	Raichur TPS	210					1531.1	135.0	1396.1	01.03.1986
114	Thermal	State	Karnataka	Raichur TPS	210					1531.1	135.0	1396.1	01.03.1991
115	Thermal	State	Karnataka	Raichur TPS	210					1531.1	135.0	1396.1	01.09.1994
116	Thermal	State	Karnataka	Raichur TPS	210					1531.1	135.0	1396.1	01.01.1989
117	Thermal	State	Karnataka	Raichur TPS	210					1531.1	135.0	1396.1	01.01.1999
118	Thermal	State	Karnataka	Raichur TPS	210					1531.1	135.0	1396.1	10.12.2002
119	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130	8.3%	516.3	42.8	473.6	258.2	21.4	236.8	15.12.1999
120	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130					258.2	21.4	236.8	15.12.1999
121	Diesel	VVNL	Karnataka	Yelehanka Diesel	128	3.0%	271.1	8.1	263.0	271.1	8.1	263.0	01.04.1994
122	Diesel	IPP	Karnataka	Bellay	25.2	3.0%	40.3	1.2	39.1	40.3	1.2	39.1	15.05.2000
123	Diesel	TATA IPP	Karnataka	Belgaum	81.3	3.0%	238.5	7.2	231.3	238.5	7.2	231.3	01.07.2001
124	Gas	GMR IPP	Karnataka	Tanir Bavi	220	3.0%	629.6	18.9	610.7	629.6	18.9	610.7	15.05.2001
125	Hydro	VVNL	Karnataka	Jog	120	0.5%	174.2	0.9	173.3	174.2	0.9	173.3	01.01.1952
126	Hydro	VVNL	Karnataka	Munirabad	27	0.5%	68.7	0.3	68.4	68.7	0.3	68.4	01.01.1965
127	Hydro	VVNL	Karnataka	Shimshapur	17.2	0.5%	93.9	0.5	93.4	93.9	0.5	93.4	01.01.1940

128	Hydro	VVNL	Karnataka	Shivnasamudram	42	0.5%	191.6	1.0	190.6	191.6	1.0	190.6	01.01.1902
129	Hydro	KPCL	Karnataka	Varahi	230	0.5%	973.3	4.9	968.4	973.3	4.9	968.4	01.01.1990
130	Hydro	KPCL	Karnataka	Ghatprabha	32	0.5%	96.6	0.5	96.1	96.6	0.5	96.1	01.01.1993
131	Hydro	KPCL	Karnataka	Kodasalli 1	40	0.5%	214.8	1.1	213.7	71.6	0.4	71.2	20.06.1998
132	Hydro	KPCL	Karnataka	Kodasalli 2	40					71.6	0.4	71.2	20.04.1999
133	Hydro	KPCL	Karnataka	Kodasalli 3	40					71.6	0.4	71.2	28.08.1999
134	Hydro	KPCL	Karnataka	Bhadra	33.4	0.5%	41.4	0.2	41.2	41.4	0.2	41.2	29.03.1998
135	Hydro	KPCL	Karnataka	Kalindi Nagjhari	810	0.5%	1719.7	8.6	1711.1	1719.7	8.6	1711.1	01.01.1984
136	Hydro	KPCL	Karnataka	Almattidam 1	15	0.5%	138.7	0.7	138.0	7.2	0.0	7.1	26.03.2004
137	Hydro	KPCL	Karnataka	Almattidam 2	55					26.3	0.1	26.2	04.11.2004
138	Hydro	KPCL	Karnataka	Almattidam 3	55					26.3	0.1	26.2	13.01.2005
139	Hydro	KPCL	Karnataka	Almattidam 4	55					26.3	0.1	26.2	26.03.2005
140	Hydro	KPCL	Karnataka	Almattidam 5	55					26.3	0.1	26.2	06.07.2005
141	Hydro	KPCL	Karnataka	Almattidam 6	55					26.3	0.1	26.2	10.08.2005
142	Hydro	KPCL	Karnataka	Kalindi Supa DPH	100	0.5%	294.6	1.5	293.2	294.6	1.5	293.2	23.08.1985
143	Hydro	KPCL	Karnataka	Gerusuppa	240	0.5%	437.6	2.2	435.4	437.6	2.2	435.4	01.05.2001
144	Hydro	KPCL	Karnataka	Linganamakki	55	0.5%	194.3	1.0	193.3	194.3	1.0	193.3	01.01.1980
145	Hydro	KPCL	Karnataka	Mallapur	9	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	01.01.1994
146	Hydro	KPCL	Karnataka	Manidam DPH	9	0.5%	23.5	0.1	23.3	23.5	0.1	23.3	01.01.1994
147	Hydro	KPCL	Karnataka	Sharavati	1035	0.5%	3853.7	19.3	3834.5	3853.7	19.3	3834.5	01.01.1977
148	Hydro	KPCL	Karnataka	Sirwar	1	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	01.01.1993
149	Hydro	KPCL	Karnataka	Kadra 1	50	0.5%	231.0	1.2	229.8	77.0	0.4	76.6	2.061997
150	Hydro	KPCL	Karnataka	Kadra 2	50					77.0	0.4	76.6	23.01.1999
151	Hydro	KPCL	Karnataka	Kadra 3	50					77.0	0.4	76.6	21.05.1999
152	Hydro	Bhoruka P	Karnataka	Madhavmantrii	3	0.5%	22.9	0.1	22.7	22.9	0.1	22.7	01.07.2001
153	Hydro	Bhoruka P	Karnataka	Shahpur	6.6	0.5%	25.2	0.1	25.0	25.2	0.1	25.0	01.11.1998
154	Hydro	Bhoruka P	Karnataka	Harangi	9	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	19.07.1999
155	Hydro	Bhoruka P	Karnataka	Shivpura	18	0.5%	72.3	0.4	72.0	72.3	0.4	72.0	01.11.1992
156	Hydro	Bhoruka P	Karnataka	Rajankollur	2	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	01.08.1999
157	Hydro	Bhoruka P	Karnataka	Shahpur	1.4	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	01.08.2003

158	Hydro	Mysore PC	Karnataka	Narayanpur	6.6	0.5%	42.5	0.2	42.2	42.5	0.2	42.2	01.12.2005
159	Diesel	State	Kerala	Brahmpuram	107	3.0%	136.4	4.1	132.3	136.4	4.1	132.3	24.11.1998
160	Diesel	State	Kerala	Kozhikode	129	3.0%	160.5	4.8	155.7	160.5	4.8	155.7	01.12.1998
161	Diesel	IPP	Kerala	Kasargode	21.84	3.0%	15.7	0.5	15.3	15.7	0.5	15.3	15.03.2001
162	Gas	IPP	Kerala	BSES	174	2.5%	111.8	2.8	109.0	111.8	2.8	109.0	01.01.1998
163	Hydro		Kerala	Pallivasal	37.5	0.5%	222.6	1.1	221.4	222.6	1.1	221.4	31.12.1940
164	Hydro		Kerala	Other Hydro	5	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	01.12.2005
165	Hydro		Kerala	Peppara	3	0.5%	6.4	0.0	6.3	6.4	0.0	6.3	31.12.1996
166	Hydro		Kerala	Edamalayar	75	0.5%	338.3	1.7	336.6	338.3	1.7	336.6	31.12.1996
167	Hydro		Kerala	Malampuzha	2.5	0.5%	0.0	0.0	0.0	0.0	0.0	0.0	01.12.2005
168	Hydro		Kerala	Sholayar	54	0.5%	263.0	1.3	261.7	263.0	1.3	261.7	31.12.1966
169	Hydro		Kerala	Senagulam	48	0.5%	167.0	0.8	166.1	167.0	0.8	166.1	31.12.1954
170	Hydro		Kerala	Sabaragiri	300	0.5%	1224.5	6.1	1218.4	1224.5	6.1	1218.4	31.12.1966
171	Hydro		Kerala	Porimgalkuttu	32	0.5%	181.6	0.9	180.7	181.6	0.9	180.7	31.12.1957
172	Hydro		Kerala	Panniar	30	0.5%	142.4	0.7	141.7	142.4	0.7	141.7	31.12.1963
173	Hydro		Kerala	Kuttiadi	75	0.5%	370.5	1.9	368.7	222.3	1.1	221.2	31.12.1972
174	Hydro		Kerala	Kuttiadi	50					148.2	0.7	147.5	27.01.2001
175	Hydro		Kerala	Iddukki	780	0.5%	2003.4	10.0	1993.4	2003.4	10.0	1993.4	31.12.1976
176	Hydro		Kerala	Kakkad	50	0.5%	210.4	1.1	209.3	210.4	1.1	209.3	14.10.1999
177	Hydro		Kerala	Poringal Kuthu L	16	0.5%	108.0	0.5	107.4	108.0	0.5	107.4	31.12.1976
178	Hydro		Kerala	Lower Pariyar	180	0.5%	512.4	2.6	509.8	512.4	2.6	509.8	31.12.1997
179	Hydro		Kerala	Madupetty	2	0.5%	4.1	0.0	4.0	4.1	0.0	4.0	31.12.1998
180	Hydro		Kerala	Nariamanglam	45	0.5%	232.0	1.2	230.8	232.0	1.2	230.8	31.12.1961
181	Hydro		Kerala	Kallada	15	0.5%	76.9	0.4	76.5	76.9	0.4	76.5	31.12.1994
182	Hydro		Kerala	Malankara	10.5	0.5%	3.0	0.0	2.9	3.0	0.0	2.9	30.05.2004
183	Hydro	KLPVT	Kerala	Maniar	10	0.5%	34.5	0.2	34.3	34.5	0.2	34.3	31.12.1987
184	Hydro	KLPVT	Kerala	Kuthungal	21	0.5%	36.2	0.2	36.0	36.2	0.2	36.0	01.07.2001
185	Hydro		Kerala	Chembukadavu	6.5	0.5%	6.2	0.0	6.2	6.2	0.0	6.2	30.12.2003
186	Hydro		Kerala	Urumi	6.2	0.5%	0.9	0.0	0.9	0.9	0.0	0.9	30.12.2003
187	Gas	State	Pondicherry	PPCL GTG	32.5	2.5%	275.7	6.9	268.8	275.7	6.9	268.8	25.05.1999
188	Diesel		Lakshdeep	Mix	10	3.0%	6.0	0.2	5.8	6.0	0.2	5.8	01.01.1992

189	Gas	NTPC	Kerala	Kayamkulam GT1	115.2	2.5%	620.5	15.5	605.0	198.8	5.0	193.8	01.11.1998
190	Gas	NTPC	Kerala	Kayamkulam GT2	115.2					198.8	5.0	193.8	01.02.1999
191	Gas	NTPC	Kerala	Kayamkulam GT3	129.2					222.9	5.6	217.4	01.10.1999
192	Thermal	NTPC	AP	Ramagundam STPS 1	200	6.6%	17169.8	1131.5	16038.3	1635.2	107.8	1527.5	01.10.1983
193	Thermal	NTPC	AP	Ramagundam STPS 2	200					1635.2	107.8	1527.5	01.05.1984
194	Thermal	NTPC	AP	Ramagundam STPS 3	200					1635.2	107.8	1527.5	01.12.1984
195	Thermal	NTPC	AP	Ramagundam STPS 4	500					4088.1	269.4	3818.7	01.06.1988
196	Thermal	NTPC	AP	Ramagundam STPS 5	500					4088.1	269.4	3818.7	01.03.1989
197	Thermal	NTPC	AP	Ramagundam STPS 6	500					4088.1	269.4	3818.7	01.10.1989
198	Thermal	NTPC	AP	Simhadri	500	5.7%	8122.1	458.9	7663.2	4061.1	229.4	3831.6	15.08.2002
199	Thermal	NTPC	AP	Simhadri	500					4061.1	229.4	3831.6	15.01.2002
200	Thermal	IPP	Tamilnadu	Neyvelli Zero	250	8.8%	1335.8	118.0	1217.9	1335.8	118.0	1217.9	16.12.2002
201	Thermal	NLC	Tamilnadu	NLC TSI	50	8.3%	4257.8	352.5	3905.2	354.8	29.4	325.4	01.05.1962
202	Thermal	NLC	Tamilnadu	NLC TSI	50					354.8	29.4	325.4	01.05.1962
203	Thermal	NLC	Tamilnadu	NLC TSI	50					354.8	29.4	325.4	01.05.1962
204	Thermal	NLC	Tamilnadu	NLC TSI	50					354.8	29.4	325.4	01.05.1962
205	Thermal	NLC	Tamilnadu	NLC TSI	50					354.8	29.4	325.4	01.05.1962
206	Thermal	NLC	Tamilnadu	NLC TSI	50					354.8	29.4	325.4	01.05.1962
207	Thermal	NLC	Tamilnadu	NLC TSI	100					709.6	58.8	650.9	01.05.1962
208	Thermal	NLC	Tamilnadu	NLC TSI	100					709.6	58.8	650.9	01.05.1962
209	Thermal	NLC	Tamilnadu	NLC TSI	100					709.6	58.8	650.9	01.01.1970
210	Thermal	NLC	Tamilnadu	NLC TS II	210	8.3%	9247.4	765.7	8481.7	1321.1	109.4	1211.7	01.03.1986
211	Thermal	NLC	Tamilnadu	NLC TS II	210					1321.1	109.4	1211.7	01.03.1986
212	Thermal	NLC	Tamilnadu	NLC TS II	210					1321.1	109.4	1211.7	01.03.1986

213	Thermal	NLC	Tamilnadu	NLC TS II	210					1321.1	109.4	1211.7	01.06.1993
214	Thermal	NLC	Tamilnadu	NLC TS II	210					1321.1	109.4	1211.7	01.06.1993
215	Thermal	NLC	Tamilnadu	NLC TS II	210					1321.1	109.4	1211.7	01.06.1993
216	Thermal	NLC	Tamilnadu	NLC TS II	210					1321.1	109.4	1211.7	01.06.1993
217	Thermal	NLC	Tamilnadu	NLC TS I extension	420	8.3%	3237.7	268.1	2969.6	3237.7	268.1	2969.6	15.09.2003
218	Nuclear	NPC	Tamilnadu	MAPP Kalpakkam	340	12.0%	1480.5	177.7	1302.8	1480.5	177.7	1302.8	01.01.1986
219	Nuclear	NPC	Karnataka	Kaiga 1	220	12.0%	2926.3	351.2	2575.1	1463.1	175.6	1287.6	16.11.2000
220	Nuclear	NPC	Karnataka	Kaiga 2	220					1463.1	175.6	1287.6	16.03.2000

ALL STATES

SN	Type	Ownership	State	Station	Capacity (MW)	Aux Con % (2002-03)	Gross Gen (2002-03)	Aux Con (2002-03)	Net Gen (2002-03)	Aux Con % (2003-04)	Gross Gen (2003-04)	Aux Con (2003-04)	Net Gen (2003-04)	Aux. Con % (2004-05)	Gross Gen (2004-05)	Aux Con (2004-05)	Net Gen (2004-05)	Commissioning
1	Thermal	State	AP	Vijayawada -1	210.0	8.8%	10283.0	901.8	9381.2	9.4%	10104.0	945.7	9158.3	9.6%	9848.8	943.5	8905.3	01.11.1979
2	Thermal	State	AP	Vijayawada - 2	210.0													10.10.1980
3	Thermal	State	AP	Vijayawada - 3	210.0													05.10.1989
4	Thermal	State	AP	Vijayawada - 4	210.0													23.08.1990
5	Thermal	State	AP	Vijayawada - 5	210.0													31.03.1994
6	Thermal	State	AP	Vijayawada - 6	210.0													24.02.1995
7	Thermal	State	AP	Rayalaseema - 1	210.0	10.0%	3489.0	349.6	3139.4	9.7%	3331.0	324.1	3006.9	9.4%	3353.6	314.6	3039.0	31.03.1994
8	Thermal	State	AP	Rayalaseema - 2	210.0													25.02.1995
9	Thermal	State	AP	Kothagudem - 1	60.0	9.1%	4645.0	424.6	4220.4	9.5%	4183.0	395.7	3787.3	8.8%	5363.4	471.4	4892.0	04.07.1966
10	Thermal	State	AP	Kothagudem - 2	60.0													27.11.1966
11	Thermal	State	AP	Kothagudem - 3	60.0													27.05.1967
12	Thermal	State	AP	Kothagudem - 4	60.0													08.07.1967
13	Thermal	State	AP	Kothagudem - 5	120.0													13.08.1974
14	Thermal	State	AP	Kothagudem - 6	120.0													19.12.1974
15	Thermal	State	AP	Kothagudem - 7	110.0													10.03.1977
16	Thermal	State	AP	Kothagudem - 8	110.0													10.01.1978
17	Thermal	State	AP	Kothagudem V Stage I	250.0	9.1%	4081.0	371.4	3709.6	9.5%	3994.0	377.8	3616.2	8.8%	4140.9	364.0	3776.9	27.03.1997
18	Thermal	State	AP	Kothagudem V Stage II	250.0													28.02.1998
19	Thermal	State	AP	Ramagundam B	62.5	14.5%	288.2	41.8	246.4	9.0%	471.0	42.4	428.6	9.0%	496.0	44.6	451.4	17.10.1971
20	Thermal	State	AP	Nellore	30.0	7.0%	145.9	10.3	135.7	9.8%	146.0	14.4	131.6	10.1%	153.9	15.5	138.4	22.04.1965
21	Gas	State	AP	Vijjeswaram I - 1	33.0	2.5%	2031.0	50.8	1980.2	2.5%	2147.0	53.7	2093.3	2.5%	229.6	49.8	1942.5	02.12.1990
22	Gas	State	AP	Vijjeswaram I - 2	33.0										236.1			12.03.1991
23	Gas	State	AP	Vijjeswaram I - 3	34.0										264.0			17.03.1992
24	Gas	State	AP	Vijjeswaram II - 1	112.0										837.4			31.03.1997
25	Gas	State	AP	Vijjeswaram II - 2	60.0										425.2			23.12.1997
26	Gas	IPP	AP	BSES- Peddapuram	220	2.5%	850.0	21.3	828.8	2.5%	1249.0	31.2	1217.8	2.5%	1141.3	28.5	1112.8	30.11.2001
27	Gas	IPP	AP	Jegrupadu	216	2.5%	1583.0	39.6	1543.4	2.5%	1505.0	37.6	1467.4	2.5%	1419.6	35.5	1384.1	01.01.1998

28	Gas	IPP	AP	LANCO- Kondapalli	355	2.5%	2477.0	61.9	2415.1	2.5%	2238.0	56.0	2182.1	2.5%	2246.3	56.2	2190.2	01.03.2002
29	Gas	IPP	AP	Spectrum- Godavari	208	2.5%	1250.0	31.3	1218.8	2.5%	1100.0	27.5	1072.5	2.5%	1373.0	34.3	1338.6	01.01.1997
30	Diesel	IPP	AP	LVS power	36.8	3.0%	2.0	0.1	1.9	3.0%	0.0	0.0	0.0	3.0%	0.0	0.0	0.0	15.01.2002
31	Hydro	Shared	AP	Machkund (AP Utilisation)	84.0	0.5%	579.6	2.9	576.7	0.5%	529.0	2.6	526.4	2.5%	900.6	22.5	878.1	01.01.1956
32	Hydro	Shared	AP	Tungabhadra (AP Utilisation)	57.6	0.5%	118.5	0.6	117.9	0.5%	148.0	0.7	147.3	2.5%	148.3	3.7	144.6	01.01.1964
33	Hydro	State	AP	Upper Sileru 1	60.0	0.5%	245.6	1.2	244.4	0.5%	401.0	2.0	399.0	0.5%	544.1	2.7	541.4	14.10.1967
34	Hydro	State	AP	Upper Sileru 2	60.0													31.03.1968
35	Hydro	State	AP	Upper Sileru 3	60.0													31.03.1994
36	Hydro	State	AP	Upper Sileru 4	60.0													31.03.1995
37	Hydro	State	AP	Donkarayi	25.0	0.5%	40.0	0.2	39.8	0.5%	111.0	0.6	110.4	0.5%	132.3	0.7	131.6	04.10.1983
38	Hydro	State	AP	Lower Sileru	460.0	0.5%	613.7	3.1	610.7	0.5%	977.0	4.9	972.1	0.5%	1171.3	5.9	1165.4	01.01.1978
39	Hydro	State	AP	Srisailam Right 1	110.0	0.5%	538.7	2.7	536.0	0.5%	309.0	1.5	307.5	0.5%	941.0	4.7	936.3	30.08.1982
40	Hydro	State	AP	Srisailam Right 2	110.0													14.12.1982
41	Hydro	State	AP	Srisailam Right 3	110.0													19.11.1983
42	Hydro	State	AP	Srisailam Right 4	110.0													27.08.1984
43	Hydro	State	AP	Srisailam Right 5	110.0													31.03.1986
44	Hydro	State	AP	Srisailam Right 6	110.0													31.10.1986
45	Hydro	State	AP	Srisailam Right 7	110.0													19.03.1987
46	Hydro	State	AP	Srisailam Left 1	150.0	0.5%	559.7	2.8	556.9	0.5%	328.0	1.6	326.4	0.5%	1411.6	7.1	1404.5	26.04.2001
47	Hydro	State	AP	Srisailam Left 2	150.0													12.11.2001
48	Hydro	State	AP	Srisailam Left 3	150.0													19.04.2002
49	Hydro	State	AP	Srisailam Left 4	150.0													29.11.2002
50	Hydro	State	AP	Srisailam Left 5	150.0													28.03.2003
51	Hydro	State	AP	Srisailam Left 6	150.0													04.09.2003
52	Hydro	State	AP	Nagarjunasagar	815.6	0.5%	869.0	4.3	864.7	0.5%	369.0	1.8	367.2	0.5%	501.5	2.5	499.0	01.01.1985
53	Hydro	State	AP	NS Right Canal 1	30.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	47.7	0.2	47.5	24.02.1983
54	Hydro	State	AP	NS Right Canal 2	30.0													14.09.1983
55	Hydro	State	AP	NS Right Canal 3	30.0													10.08.1990
56	Hydro	State	AP	NS Left Canal	60.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	5.1	0.0	5.1	27.09.1992
57	Hydro	State	AP	Pochampad	27.0	0.5%	83.0	0.4	82.6	0.5%	64.0	0.3	63.7	0.5%	1.6	0.0	1.6	31.03.1988
58	Hydro	State	AP	Nizamsagar	10.0	0.5%	0.0	0.0	0.0	0.5%	6.0	0.0	6.0	0.5%	0.0	0.0	0.0	28.11.1954
59	Hydro	State	AP	Penna Ahobilam	20.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	23.01.1994

60	Hydro	State	AP	Singur	15.0	0.5%	6.3	0.0	6.2	0.5%	6.0	0.0	6.0	0.5%	1.5	0.0	1.5	31.03.2000
61	Hydro	State	AP	Mini Hydro	30.0	0.5%	11.7	0.1	11.6	0.5%	8.0	0.0	8.0	0.5%	6.3	0.0	6.3	01.12.2005
62	Wind	IPP	AP	Wind	2.0													10.10.1994
63	Thermal	State	Tamilnadu	Ennore	450	10.1%	1747.0	177.0	1570.0	9.7%	1258.0	121.5	1136.5	12.3%	1223.0	149.9	1073.0	31.03.1983
64	Thermal	State	Tamilnadu	Tuticorin	1050	7.7%	8187.0	630.4	7556.6	8.0%	8084.0	650.0	7434.0	7.9%	8180.0	643.8	7536.2	09.07.1979
65	Thermal	State	Tamilnadu	Mettur	840	7.9%	6739.0	529.7	6209.3	7.9%	6735.0	534.8	6200.2	8.3%	6684.0	556.1	6127.9	07.01.1987
66	Thermal	State	Tamilnadu	North Chennai 1	210	9.2%	4405.0	405.3	3999.7	9.2%	4347.0	398.2	3948.8	9.2%	3916.0	359.9	3556.1	25.10.1994
67	Thermal	State	Tamilnadu	North Chennai 2	210													27.03.1995
68	Thermal	State	Tamilnadu	North Chennai 3	210													24.02.1996
69	Gas	State	Tamilnadu	Kovilkalapai	108	2.5%	726.0	18.2	707.9	2.5%	745.0	18.6	726.4	2.5%	763.3	19.1	744.2	30.09.2000
70	Gas	State	Tamilnadu	Basin Bridge	30	2.5%	276.0	6.9	269.1	2.5%	89.0	2.2	86.8	2.5%	40.5	1.0	39.5	12.02.1996
71	Gas	State	Tamilnadu	Basin Bridge	30													25.02.1996
72	Gas	State	Tamilnadu	Basin Bridge	30													26.03.1996
73	Gas	State	Tamilnadu	Basin Bridge	30													31.03.1996
74	Gas	State	Tamilnadu	Valuthur	94	2.5%	104.0	2.6	101.4	2.5%	671.0	16.8	654.2	2.5%	557.5	13.9	543.6	13.03.2003
75	Gas	State	Tamilnadu	Kuttalam	64	2.5%	0.0	0.0	0.0	2.5%	108.0	2.7	105.3	2.5%	640.9	16.0	624.9	30.11.2003
76	Gas	State	Tamilnadu	Kuttalam	36													30.03.2004
77	Gas	IPP	Tamilnadu	Pillai Perumal Nallur GTPP	330.5	2.5%	2169.0	54.2	2114.8	2.5%	1314.0	32.9	1281.2	2.5%	464.3	11.6	452.7	26.04.2001
78	Diesel	IPP	Tamilnadu	Samalpatti DEPP	105.7	3.0%	623.0	18.7	604.3	3.0%	458.0	13.7	444.3	3.0%	357.3	10.7	346.6	15.07.2001
79	Diesel	IPP	Tamilnadu	Samayanallur DEPP	106	3.0%	589.0	17.7	571.3	3.0%	457.0	13.7	443.3	3.0%	382.0	11.5	370.6	22.09.2001
80	Diesel	IPP	Tamilnadu	GMR Vasavi DEPP	196	3.0%	1209.0	36.3	1172.7	3.0%	992.0	29.8	962.2	3.0%	762.2	22.9	739.4	01.02.1999
81	Hydro	State	Tamilnadu	Pykara	70	0.5%	254.0	1.3	252.7	0.5%	141.0	0.7	140.3	0.5%	213.4	1.1	212.4	19.10.1932
82	Hydro	State	Tamilnadu	Moyar	36	0.5%	105.0	0.5	104.5	0.5%	53.0	0.3	52.7	0.5%	90.2	0.5	89.7	10.04.1952
83	Hydro	State	Tamilnadu	Kundah I	60	0.5%	764.0	3.8	760.2	0.5%	429.0	2.1	426.9	0.5%	1567.4	7.8	1559.6	26.03.1960

84	Hydro	State	Tamilnadu	Kundah II	175													31.10.1960
85	Hydro	State	Tamilnadu	Kundah III	180													07.04.1965
86	Hydro	State	Tamilnadu	Kundah IV	100													10.05.1966
87	Hydro	State	Tamilnadu	Kundah V	40													31.10.1964
88	Hydro	State	Tamilnadu	Mettur Dam	40	0.5%	41.0	0.2	40.8	0.5%	15.0	0.1	14.9	0.5%	26.0	0.1	25.9	13.06.1937
89	Hydro	State	Tamilnadu	Mettur Tunnel	200	0.5%	89.0	0.4	88.6	0.5%	70.0	0.4	69.7	0.5%	308.6	1.5	307.0	13.08.1965
90	Hydro	State	Tamilnadu	Lower Mettur	120	0.5%	168.0	0.8	167.2	0.5%	97.0	0.5	96.5	0.5%	254.7	1.3	253.4	23.03.1988
91	Hydro	State	Tamilnadu	Periyar	140	0.5%	227.0	1.1	225.9	0.5%	213.0	1.1	211.9	0.5%	492.7	2.5	490.3	12.10.1958
92	Hydro	State	Tamilnadu	Suruliyar	35	0.5%	75.0	0.4	74.6	0.5%	41.0	0.2	40.8	0.5%	101.4	0.5	100.9	27.08.1986
93	Hydro	State	Tamilnadu	Papanasam	28	0.5%	65.0	0.3	64.7	0.5%	47.0	0.2	46.8	0.5%	88.5	0.4	88.1	07.04.1944
94	Hydro	State	Tamilnadu	Servalar	20	0.5%	19.0	0.1	18.9	0.5%	19.0	0.1	18.9	0.5%	34.6	0.2	34.4	20.03.1987
95	Hydro	State	Tamilnadu	Sarkarpathy	30	0.5%	97.0	0.5	96.5	0.5%	51.0	0.3	50.7	0.5%	114.7	0.6	114.1	12.01.1966
96	Hydro	State	Tamilnadu	Sholayar I	70	0.5%	320.0	1.6	318.4	0.5%	199.0	1.0	198.0	0.5%	350.4	1.8	348.6	22.04.1971
97	Hydro	State	Tamilnadu	Sholayar II	25													25.03.1970
98	Hydro	State	Tamilnadu	Aliyar	60	0.5%	108.0	0.5	107.5	0.5%	86.0	0.4	85.6	0.5%	162.1	0.8	161.3	25.03.1970
99	Hydro	State	Tamilnadu	Kodayar I	60	0.5%	150.0	0.8	149.3	0.5%	141.0	0.7	140.3	0.5%	207.1	1.0	206.0	02.01.1971
100	Hydro	State	Tamilnadu	Kodayar II	40													17.11.1971
101	Hydro	State	Tamilnadu	Kadamparai	400	0.5%	203.0	1.0	202.0	0.5%	408.0	2.0	406.0	0.5%	256.8	1.3	255.5	28.03.1987
102	Hydro	State	Tamilnadu	Vaigai Small	6	0.5%	4.0	0.0	4.0	0.5%	5.0	0.0	5.0	0.5%	12.3	0.1	12.2	23.02.1990
103	Hydro	State	Tamilnadu	Pykara Mini	2	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	5.0	0.0	5.0	07.10.1989
104	Hydro	State	Tamilnadu	Lower Bhavani Small	8	0.5%	21.0	0.1	20.9	0.5%	9.0	0.0	9.0	0.5%	61.5	0.3	61.2	31.03.1990
105	Hydro	State	Tamilnadu	Lowerbavani RBC	8													10.02.1998
106	Hydro	State	Tamilnadu	Punachi Mini	2	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	16.12.1992

107	Hydro	State	Tamilnadu	Maravakandy Mini	0.75	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	14.10.1992
108	Hydro	State	Tamilnadu	Sathanur	7.5	0.5%	2.0	0.0	2.0	0.5%	2.0	0.0	2.0	0.5%	10.2	0.1	10.2	30.03.1999
109	Hydro	State	Tamilnadu	Parsons Valley	30	0.5%	16.0	0.1	15.9	0.5%	18.0	0.1	17.9	0.5%	55.6	0.3	55.3	29.03.2000
110	Hydro	State	Tamilnadu	Thirumurthy Mini	1.95	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	20.03.2000
111	Hydro	State	Tamilnadu	Mukurthy Mini	0.7	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	18.08.2000
112	Thermal	State	Karnataka	Raichur TPS	210	8.4%	10290.0	868.5	9421.5	8.6%	11400.0	978.1	10421.9	8.8%	10717.9	945.3	9772.6	01.03.1985
113	Thermal	State	Karnataka	Raichur TPS	210													01.03.1986
114	Thermal	State	Karnataka	Raichur TPS	210													01.03.1991
115	Thermal	State	Karnataka	Raichur TPS	210													01.09.1994
116	Thermal	State	Karnataka	Raichur TPS	210													01.01.1989
117	Thermal	State	Karnataka	Raichur TPS	210													01.01.1999
118	Thermal	State	Karnataka	Raichur TPS	210													10.12.2002
119	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130	8.4%	872.0	73.1	798.9	9.0%	766.0	69.2	696.8	8.3%	516.3	42.8	473.6	15.12.1999
120	Thermal	Jindal IPP	Karnataka	Torangulu Steam	130													15.12.1999
121	Diesel	VVNL	Karnataka	Yelehanka Diesel	128	3.0%	715.0	21.5	693.6	3.0%	384.0	11.5	372.5	3.0%	271.1	8.1	263.0	01.04.1994
122	Diesel	IPP	Karnataka	Bellay	25.2	3.0%	64.0	1.9	62.1	3.0%	42.0	1.3	40.7	3.0%	40.3	1.2	39.1	15.05.2000
123	Diesel	TATA IPP	Karnataka	Belgaum	81.3	3.0%	355.0	10.7	344.4	3.0%	235.0	7.1	228.0	3.0%	238.5	7.2	231.3	01.07.2001
124	Gas	GMR IPP	Karnataka	Tanir Bavi	220	3.0%	1280.0	38.4	1241.6	3.0%	1631.0	48.9	1582.1	3.0%	629.6	18.9	610.7	15.05.2001
125	Hydro	VVNL	Karnataka	Jog	120	0.5%	146.0	0.7	145.3	0.5%	160.0	0.8	159.2	0.5%	174.2	0.9	173.3	01.01.1952
126	Hydro	VVNL	Karnataka	Munirabad	27	0.5%	47.0	0.2	46.8	0.5%	41.0	0.2	40.8	0.5%	68.7	0.3	68.4	01.01.1965
127	Hydro	VVNL	Karnataka	Shimshapur	17.2	0.5%	57.0	0.3	56.7	0.5%	57.0	0.3	56.7	0.5%	93.9	0.5	93.4	01.01.1940
128	Hydro	VVNL	Karnataka	Shivnasamudram	42	0.5%	14.0	0.1	13.9	0.5%	79.0	0.4	78.6	0.5%	191.6	1.0	190.6	01.01.1902
129	Hydro	KPCL	Karnataka	Varahi	230	0.5%	844.0	4.2	839.8	0.5%	721.0	3.6	717.4	0.5%	973.3	4.9	968.4	01.01.1990

130	Hydro	KPCL	Karnataka	Ghatprabha	32	0.5%	59.0	0.3	58.7	0.5%	62.0	0.3	61.7	0.5%	96.6	0.5	96.1	01.01.1993
131	Hydro	KPCL	Karnataka	Kodasalli 1	40	0.5%	218.0	1.1	216.9	0.5%	214.0	1.1	212.9	0.5%	214.8	1.1	213.7	20.06.1998
132	Hydro	KPCL	Karnataka	Kodasalli 2	40													20.04.1999
133	Hydro	KPCL	Karnataka	Kodasalli 3	40													28.08.1999
134	Hydro	KPCL	Karnataka	Bhadra	33.4	0.5%	18.0	0.1	17.9	0.5%	11.0	0.1	10.9	0.5%	41.4	0.2	41.2	29.03.1998
135	Hydro	KPCL	Karnataka	Kalindi Nagjhari	810	0.5%	1812.0	9.1	1802.9	0.5%	1718.0	8.6	1709.4	0.5%	1719.7	8.6	1711.1	01.01.1984
136	Hydro	KPCL	Karnataka	Almattidam 1	15	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	138.7	0.7	138.0	26.03.2004
137	Hydro	KPCL	Karnataka	Almattidam 2	55													04.11.2004
138	Hydro	KPCL	Karnataka	Almattidam 3	55													13.01.2005
139	Hydro	KPCL	Karnataka	Almattidam 4	55													26.03.2005
140	Hydro	KPCL	Karnataka	Almattidam 5	55													06.07.2005
141	Hydro	KPCL	Karnataka	Almattidam 6	55													10.08.2005
142	Hydro	KPCL	Karnataka	Kalindi Supa DPH	100	0.5%	257.0	1.3	255.7	0.5%	241.0	1.2	239.8	0.5%	294.6	1.5	293.2	23.08.1985
143	Hydro	KPCL	Karnataka	Gerusuppa	240	0.5%		0.0	0.0	0.5%	358.0	1.8	356.2	0.5%	437.6	2.2	435.4	01.05.2001
144	Hydro	KPCL	Karnataka	Linganamakki	55	0.5%	111.0	0.6	110.4	0.5%	721.0	3.6	717.4	0.5%	194.3	1.0	193.3	01.01.1980
145	Hydro	KPCL	Karnataka	Mallapur	9	0.5%	1.0	0.0	1.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	01.01.1994
146	Hydro	KPCL	Karnataka	Manidam DPH	9	0.5%	18.0	0.1	17.9	0.5%	11.0	0.1	10.9	0.5%	23.5	0.1	23.3	01.01.1994
147	Hydro	KPCL	Karnataka	Sharavati	1035	0.5%	2950.0	14.8	2935.3	0.5%	3316.0	16.6	3299.4	0.5%	3853.7	19.3	3834.5	01.01.1977
148	Hydro	KPCL	Karnataka	Sirwar	1	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	01.01.1993
149	Hydro	KPCL	Karnataka	Kadra 1	50	0.5%	238.0	1.2	236.8	0.5%	223.0	1.1	221.9	0.5%	231.0	1.2	229.8	2.061997
150	Hydro	KPCL	Karnataka	Kadra 2	50													23.01.1999
151	Hydro	KPCL	Karnataka	Kadra 3	50													21.05.1999
152	Hydro	Bhoruka P	Karnataka	Madhavmantrii	3	0.5%	0.0	0.0	0.0	0.5%	13.0	0.1	12.9	0.5%	22.9	0.1	22.7	01.07.2001

153	Hydro	Bhoruka P	Karnataka	Shahpur	6.6	0.5%	22.0	0.1	21.9	0.5%	22.0	0.1	21.9	0.5%	25.2	0.1	25.0	01.11.1998
154	Hydro	Bhoruka P	Karnataka	Harangi	9	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	19.07.1999
155	Hydro	Bhoruka P	Karnataka	Shivpura	18	0.5%	67.0	0.3	66.7	0.5%	54.0	0.3	53.7	0.5%	72.3	0.4	72.0	01.11.1992
156	Hydro	Bhoruka P	Karnataka	Rajankollur	2	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	01.08.1999
157	Hydro	Bhoruka P	Karnataka	Shahpur	1.4	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	01.08.2003
158	Hydro	Mysore PC	Karnataka	Narayanpur	6.6	0.5%	36.0	0.2	35.8	0.5%	38.0	0.2	37.8	0.5%	42.5	0.2	42.2	01.12.2005
159	Diesel	State	Kerala	Brahmpuram	107	3.0%	367.0	11.0	356.0	3.0%	266.0	8.0	258.0	3.0%	136.4	4.1	132.3	24.11.1998
160	Diesel	State	Kerala	Kozhikode	129	3.0%	385.0	11.6	373.5	3.0%	313.0	9.4	303.6	3.0%	160.5	4.8	155.7	01.12.1998
161	Diesel	IPP	Kerala	Kasargode	21.84	3.0%	148.0	4.4	143.6	3.0%	78.0	2.3	75.7	3.0%	15.7	0.5	15.3	15.03.2001
162	Gas	IPP	Kerala	BSES	174	2.5%		0.0	0.0	2.5%	991.0	24.8	966.2	2.5%	111.8	2.8	109.0	01.01.1998
163	Hydro		Kerala	Pallivasal	37.5	0.5%	157.0	0.8	156.2	0.5%	193.0	1.0	192.0	0.5%	222.6	1.1	221.4	31.12.1940
164	Hydro		Kerala	Other Hydro	5	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	01.12.2005
165	Hydro		Kerala	Peppara	3	0.5%	6.0	0.0	6.0	0.5%	1.0	0.0	1.0	0.5%	6.4	0.0	6.3	31.12.1996
166	Hydro		Kerala	Edamalayar	75	0.5%	259.0	1.3	257.7	0.5%	155.0	0.8	154.2	0.5%	338.3	1.7	336.6	31.12.1996
167	Hydro		Kerala	Malampuzha	2.5	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	01.12.2005
168	Hydro		Kerala	Sholayar	54	0.5%	138.0	0.7	137.3	0.5%	202.0	1.0	201.0	0.5%	263.0	1.3	261.7	31.12.1966
169	Hydro		Kerala	Senagulam	48	0.5%	130.0	0.7	129.4	0.5%	128.0	0.6	127.4	0.5%	167.0	0.8	166.1	31.12.1954
170	Hydro		Kerala	Sabaragiri	300	0.5%	804.0	4.0	800.0	0.5%	698.0	3.5	694.5	0.5%	1224.5	6.1	1218.4	31.12.1966
171	Hydro		Kerala	Porimgalkuttu	32	0.5%	123.0	0.6	122.4	0.5%	142.0	0.7	141.3	0.5%	181.6	0.9	180.7	31.12.1957
172	Hydro		Kerala	Panniar	30	0.5%	78.0	0.4	77.6	0.5%	76.0	0.4	75.6	0.5%	142.4	0.7	141.7	31.12.1963
173	Hydro		Kerala	Kuttiadi	75	0.5%	304.0	1.5	302.5	0.5%	259.0	1.3	257.7	0.5%	370.5	1.9	368.7	31.12.1972
174	Hydro		Kerala	Kuttiadi	50													27.01.2001
175	Hydro		Kerala	Iddukki	780	0.5%	1905.0	9.5	1895.5	0.5%	1246.0	6.2	1239.8	0.5%	2003.4	10.0	1993.4	31.12.1976
176	Hydro		Kerala	Kakkad	50	0.5%	150.0	0.8	149.3	0.5%	126.0	0.6	125.4	0.5%	210.4	1.1	209.3	14.10.1999
177	Hydro		Kerala	Poringal Kuthu L	16	0.5%	78.0	0.4	77.6	0.5%	88.0	0.4	87.6	0.5%	108.0	0.5	107.4	31.12.1976
178	Hydro		Kerala	Lower Pariyar	180	0.5%	414.0	2.1	411.9	0.5%	363.0	1.8	361.2	0.5%	512.4	2.6	509.8	31.12.1997
179	Hydro		Kerala	Madupetty	2	0.5%	2.0	0.0	2.0	0.5%	8.0	0.0	8.0	0.5%	4.1	0.0	4.0	31.12.1998
180	Hydro		Kerala	Nariamanglam	45	0.5%	230.0	1.2	228.9	0.5%	196.0	1.0	195.0	0.5%	232.0	1.2	230.8	31.12.1961
181	Hydro		Kerala	Kallada	15	0.5%	35.0	0.2	34.8	0.5%	36.0	0.2	35.8	0.5%	76.9	0.4	76.5	31.12.1994
182	Hydro		Kerala	Malankara	10.5	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	3.0	0.0	2.9	30.05.2004

183	Hydro	KLPVT	Kerala	Maniar	10	0.5%	23.0	0.1	22.9	0.5%	21.0	0.1	20.9	0.5%	34.5	0.2	34.3	31.12.1987
184	Hydro	KLPVT	Kerala	Kuthungal	21	0.5%	23.0	0.1	22.9	0.5%	19.0	0.1	18.9	0.5%	36.2	0.2	36.0	01.07.2001
185	Hydro		Kerala	Chembukadavu	6.5	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	6.2	0.0	6.2	30.12.2003
186	Hydro		Kerala	Urumi	6.2	0.5%	0.0	0.0	0.0	0.5%	0.0	0.0	0.0	0.5%	0.9	0.0	0.9	30.12.2003
187	Gas	State	Pondicherry	PPCL GTG	32.5	2.5%	265.0	6.6	258.4	2.5%	277.0	6.9	270.1	2.5%	275.7	6.9	268.8	25.05.1999
188	Diesel		Lakshdeep	Mix	10	3.0%	0.0	0.0	0.0	3.0%	0.0	0.0	0.0	3.0%	6.0	0.2	5.8	01.01.1992
189	Gas	NTPC	Kerala	Kayamkulam GT1	115.2	2.5%	2127.0	53.2	2073.8	2.5%	2118.0	53.0	2065.1	2.5%	620.5	15.5	605.0	01.11.1998
190	Gas	NTPC	Kerala	Kayamkulam GT2	115.2													01.02.1999
191	Gas	NTPC	Kerala	Kayamkulam GT3	129.2													01.10.1999
192	Thermal	NTPC	AP	Ramagundam STPS 1	200	9.6%	16839.0	1614.9	15224.1	9.6%	16332.0	1566.2	14765.8	6.6%	17169.8	1131.5	16038.3	01.10.1983
193	Thermal	NTPC	AP	Ramagundam STPS 2	200													01.05.1984
194	Thermal	NTPC	AP	Ramagundam STPS 3	200													01.12.1984
195	Thermal	NTPC	AP	Ramagundam STPS 4	500													01.06.1988
196	Thermal	NTPC	AP	Ramagundam STPS 5	500													01.03.1989
197	Thermal	NTPC	AP	Ramagundam STPS 6	500													01.10.1989
198	Thermal	NTPC	AP	Simhadri	500	9.0%	4974.0	447.7	4526.3	9.0%	7722.0	695.0	7027.0	5.7%	8122.1	458.9	7663.2	15.08.2002
199	Thermal	NTPC	AP	Simhadri	500													15.01.2002
200	Thermal	IPP	Tamilnadu	Neyvelli Zero	250	9.3%	1395.0	130.0	1265.0	9.3%	1395.0	130.0	1265.0	8.8%	1335.8	118.0	1217.9	16.12.2002
201	Thermal	NLC	Tamilnadu	NLC TSI	50	8.4%	4378.7	366.9	4011.7	9.0%	4400.0	397.8	4002.2	8.3%	4257.8	352.5	3905.2	01.05.1962
202	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
203	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
204	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
205	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
206	Thermal	NLC	Tamilnadu	NLC TSI	50													01.05.1962
207	Thermal	NLC	Tamilnadu	NLC TSI	100													01.05.1962
208	Thermal	NLC	Tamilnadu	NLC TSI	100													01.05.1962
209	Thermal	NLC	Tamilnadu	NLC TSI	100													01.01.1970

210	Thermal	NLC	Tamilnadu	NLC TS II	210												01.03.1986
211	Thermal	NLC	Tamilnadu	NLC TS II	210												01.03.1986
212	Thermal	NLC	Tamilnadu	NLC TS II	210												01.03.1986
213	Thermal	NLC	Tamilnadu	NLC TS II	210	8.4%	10504.4	880.3	9624.1	9.0%	10003.0	904.3	9098.7	8.3%	9247.4	765.7	8481.7	01.06.1993
214	Thermal	NLC	Tamilnadu	NLC TS II	210												01.06.1993
215	Thermal	NLC	Tamilnadu	NLC TS II	210												01.06.1993
216	Thermal	NLC	Tamilnadu	NLC TS II	210												01.06.1993
217	Thermal	NLC	Tamilnadu	NLC TS I extension	420	8.4%	86.9	7.3	79.6	9.0%	1993.0	180.2	1812.8	8.3%	3237.7	268.1	2969.6	15.09.2003
218	Nuclear	NPC	Tamilnadu	MAPP Kalpakkam	340	12.0%	1073.0	128.8	944.2	12.0%	1577.0	189.2	1387.8	12.0%	1480.5	177.7	1302.8	21.03.1986
219	Nuclear	NPC	Karnataka	Kaiga 1	220	12.0%	3317.0	398.0	2919.0	12.0%	3123.0	374.8	2748.2	12.0%	2926.3	351.2	2575.1	16.11.2000
220	Nuclear	NPC	Karnataka	Kaiga 2	220													16.03.2000
															142298.2	**9003.5**	**133294.7**	
														20%	**28459.6**	**1800.7**	**26658.9**	

CER Calculation :

Year	Period	Power Generation (MWh)	Average carbon	Baseline	CER
		MWhrs	emission factor (tCO2/MWh)	emission (tCO2/year)	(tCO2/year)
1	April 00- March 01	13006.458	0.810	10539.10	10539
2	April 01- March 02	24891.552	0.810	20169.55	20170
3	April 02- March 03	18031.976	0.810	14611.26	14611
4	April 03- March 04	14738.874	0.810	11942.87	11943
5	April 04- March 05	22684.548	0.810	18381.22	18381
6	April 05- March 06	22684.548	0.810	18381.22	18381
7	April 06- March 07	22684.548	0.810	18381.22	18381
8	April 07- March 08	22684.548	0.810	18381.22	18381
9	April 08- March 09	22684.548	0.810	18381.22	18381
10	April 09- March 10	22684.548	0.810	18381.22	18381
				Total	**167550**

ANNEX. 4

Monitoring Plan

Project Management & Monitoring Plang:

Monitoring of Generation Data

Each Wind Turbine has a local control system (LCS) in the Control Panel , which records the generation from that Turbine. A number of such Wind Turbines are connected to the common metering point, known as HTSC (High Tension Service Connection), which has a digital meter certified and owned by APTRANSCO. This HTSC meter will record the total generation from all these Wind Turbines and auxiliary consumption .The sum total of the LCS readings of the individual Wind Turbines will not be equal to the HTSC meter readings due to internal line loss in the range of 5 to 7%.
The daily reading from individual turbines (LCS) is recorded. The HTSC Meter reading is also recorded and compared for variance. The Site-in-Charge is responsible for the collection , reporting and archiving of this data in Physical/ electronic form. The readings taken at the Wind farm from the LCS display is sent as a soft copy to the Head Office for monitoring and analysis.

The HTSC meter is inspected and the reading is recorded and certified by the APTRANSCO Officials, each month on a prescribed date. A copy of this Monthly Power generation reading so taken by representatives of APTransco is furnished to the Site-in- Charge who in turn transmits the same to the Head Office. The APTransco meter is of the Trivector type which records the electricity exported and imported.

Training program:

There is no specialised training required for recording and monitoring the generation and the staff are trained on the job. Additionally, training programs are conducted at the Site with respect to technical subjects by Senior management personnel. Further training on HR and other subjects are given in Chennai by external faculty.

Emergency Preparedness plan:

The Technicians at the Site are all aware of the steps to be taken during Emergencies at the Site. The Quality System process Manual is available at the Site for guidance.Danger boards have been put out at the High Voltage Electrical Installations. The staff are also trained in the First aid and Safety methods.

THERE IS NO EXPECTED UN-INTENTIONAL EMISSION FROM THIS PROJECT ACTIVITY

Calibration and Maintenance of Meters:

The HTSC meter which records the generation is monitored and maintained by the APTransco Officials. They record the generation every month and provide tamper proof seals which can be broken by them only.

The individual meter in the Turbine is maintained by the company.

For all purposes including revenue realisation, it is the APTransco certified data which is used by the Project Proponent.

Monitoring Data - Adjustments & Uncertainties

The uncertainty level of data is low . The individual meter readings are compared with the HTSC reading and checked in the event of any variance beyond the 10% limit (between LCS and HTSC reading), corrective action is initiated internally if the cause is the LCS in the Control panel. If any action is required at the HTSC meter, the same will be communicated / reported the officials immediately for necessary action at their end.

The HTSC meter is of standard Trivector type of approved specification and installed by AP Transco and tamper proof. The seal is broken open at the time of recording the data and closed after the same.

Performance Review and Internal Audit of Reported data

There is a monthly review of generation data internally. The data of actual generation is compared to the scheduled generation and variance analysis is done and recorded in the monthly Operations Report. Corrective action is taken as required.

Proposed Windfarm at Kadavukallu Village, Tadipatri, AP - 13.50 MW
(54 Nos. WEGs of 250 KW capacity)
Assumptions and Notes

1	Generation Expected	4	lac units /WEG p.a.	
2	Tariff is Rs.	3.62	per unit	
	Increase in Tariff	6%	p.a.	
3	Discount offered	10%	on tariff rate to consumer	
4	Wheeling charges	2%		
5	Lease Rentals	0.87	Average Rs. Lac per month per WEG	
	Increase p.a.proportionate to tariff increase	6%	based on structuring of lease on case to case	
7	Operation & mainteance exp.	1%	of capital cost of asset	
	O & M Increase p.a.	5%		
8	Insurance on WEG	0.21	lac per WEG p.a.	21000.00
9	Manpower costs Rs.	1	lac p.m.	
	Increase p.a.	7.5%		
10	Administrative exp	0.75	lac p.m.	
	Increase p.a.	5%		
12	CO2 emission redn.	800	MT for every 1 million units generation	
13	Carbon Trading Revenue	5	US $ per MT	
14	US $ Exchnage rate	43	Rs. / 1 USD	
15	Inc.in Carbon Trading rev. on a/c of better price and inc. in $ rate	10%		
16	Taxation	38.50%	(35% Income Tax + 10% surcharge)	

	Project Description	**IRR with CDM rev**		**IRR Without CDM Rev.**	
		IRR	Pretax * equivalent		Pretax * equivalent
a	Tadapatri 13.50 MW		7.1%		4.9%

* Corporate Income tax rate of 38.5% is assumed
The pretax equivalent of 7.1% with carbon trading revenue is barely over bank rate.
Without Carbon Trading Revenue, the IRR is 4.90% which is below bank rate
Hence it is the factoring of the Carbon Trading income which is the deciding factor. The rate of US $ 5 per ton of CO2 is also expected to increase in the coming years.
The generation of 4 lac units assumed though conservative is a figure which can definitely be achieved. Improved generation will better the return on investment

The project can see reasonable returns only after the 10 year period upto 20 years.
At 4.5 lac units generation per WEG, the IRR will improve and focus must be on improved generation.

Project at Tadipatri		54	nos WEGs	250	Kw capaity	13.5	MW

Cost of Project

Total cost incl. Commisssioning & Installation			6400	lacs				
Lease Finance Requested			6400					
Deposits placed			1964					
Net inflow from Lessor			4436					
Lease Finance:								
			GTB	CB	SFL	LGF	ICCFL	Total
No. of WEGs			20	16	12	2	4	54
Lease Assistance			2460	1920	1320	220	480	6400
Deposit placed			840	640	210	70	204	1964
Min. gen.per WEG/p.a.		lac units	4.00	4.00	4.00	4.00	4.00	4.00
Wheeling charges	2.00%	lac units	0.08	0.08	0.08	0.08	0.08	0.08
Banking charges	2.00%	lac units	0.08	0.08	0.08	0.08	0.08	0.08
Net Realisation		lac units	3.84	3.84	3.84	3.84	3.84	3.84
Prevailing tariff		Rs.	3.62	3.62	3.62	3.62	3.62	3.62
Discount offered	10%	Rs.	0.36	0.36	0.36	0.36	0.36	0.36
Rate realised per unit		Rs.	3.26	3.26	3.26	3.26	3.26	3.26
Total gen. For all WEGs		lac units	80	64	48	8	16	216
Net of wheeling/banking		lac units	**76.80**	**61.44**	**46.08**	**7.68**	**15.36**	**207.36**
Total generation income		Rs.lacs	260.64	208.64	156.48	26.08	52.16	704.00
Net of wheeling/banking		Rs.lacs	**250.21**	**200.29**	**150.22**	**25.04**	**50.07**	**675.84**
CO2 emission reduction		MT/ 10 lac units	800	800	800	800	800	800
CO2 credits from generation		MT	6400	5120	3840	640	1280	17280
Realisation per MT		US $	5	5	5	5	5	5
Rate / $		Rs.	43	43	43	43	43	43
Annual Carbon trading income		Rs.in lacs	**13.76**	**11.01**	**8.26**	**1.38**	**2.75**	**37.15**

Rs. In Lacs

Considering CDM Revenue			I	II	III	IV	V	VI	VII	VIII	IX	X
Realisation pa.a for all WEGs		106%	675.84	716.39	759.37	804.94	853.23	904.43	958.69	1016.21	1077.19	1141.82
Carbon Credit realisation		110%	37.15	40.87	44.95	49.45	54.39	59.83	40.87	37.15	37.15	37.15
Total Income			**712.99**	**757.26**	**804.33**	**854.39**	**907.63**	**964.26**	**999.56**	**1053.37**	**1114.34**	**1178.97**
Lease Rentals commitments			566.33	608.44	648.87	686.77	728.84	761.14	796.80	834.84	528.14	557.62
Balance after Lease commit.			**146.66**	**148.82**	**155.45**	**167.62**	**178.78**	**203.12**	**202.76**	**218.53**	**586.19**	**621.35**
O&M Expediture	1%	105%	64.00	67.20	70.56	74.09	77.79	81.68	85.77	90.05	94.56	99.29
Insurance	0.21		11.34	11.34	11.34	11.34	11.34	11.34	11.34	11.34	11.34	11.34
manpower (1 lac p.m.)	12	107.5%	12.00	12.90	13.87	14.91	16.03	17.23	18.52	19.91	21.40	23.01
Adminis.exp (0.75 pm)	9	105%	9.00	9.45	9.92	10.42	10.94	11.49	12.06	12.66	13.30	13.96
			96.34	**100.89**	**105.69**	**110.75**	**116.10**	**121.74**	**127.69**	**133.97**	**140.60**	**147.59**
PBT			50.32	47.93	49.76	56.86	62.69	81.39	75.07	84.56	445.60	473.75
Taxation		38.5%	19.37	18.45	19.16	21.89	24.13	31.33	28.90	32.56	171.56	182.39
PAT			30.95	29.47	30.60	34.97	38.55	50.05	46.17	52.00	274.04	291.36
PAT			30.95	29.47	30.60	34.97	38.55	50.05	46.17	52.00	274.04	291.36
Refund of deposit										840.00	0.00	1124.00
Cash flow for IRR		-1964	30.95	29.47	30.60	34.97	38.55	50.05	46.17	892.00	274.04	1415.36
Post tax IRR		**4.35%**										
		61.50										
Pre tax equivalent		7.07%										

Rs. In Lacs

Without Considering CDM Revenue				I	II	III	IV	V	VI	VII	VIII	IX	X
Realisation pa.a for all WEGs			106.00%	675.84	716.39	759.37	804.94	853.23	904.43	958.69	1016.21	1077.19	1141.82
Carbon Credit realisation				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Income				**675.84**	**716.39**	**759.37**	**804.94**	**853.23**	**904.43**	**958.69**	**1016.21**	**1077.19**	**1141.82**
Lease Rentals commitments				566.33	608.44	648.87	686.77	728.84	761.14	796.80	834.84	528.14	557.62
Balance after Lease commit.				**109.51**	**107.95**	**110.50**	**118.17**	**124.39**	**143.29**	**161.89**	**181.37**	**549.04**	**584.19**
O&M Expediture		1%	105%	64.00	67.20	70.56	74.09	77.79	81.68	85.77	90.05	94.56	99.29
Insurance		0.21		11.34	11.34	11.34	11.34	11.34	11.34	11.34	11.34	11.34	11.34
manpower	1 lac p.m.	12	107.5%	12.00	12.90	13.87	14.91	16.03	17.23	18.52	19.91	21.40	23.01
Adminis.exp	0.75 pm	9	105%	9.00	9.45	9.92	10.42	10.94	11.49	12.06	12.66	13.30	13.96
				96.34	**100.89**	**105.69**	**110.75**	**116.10**	**121.74**	**127.69**	**133.97**	**140.60**	**147.59**
PBT				13.17	7.06	4.81	7.41	8.29	21.55	34.21	47.41	408.45	436.60
Taxation			38.5%	5.07	2.72	1.85	2.85	3.19	8.30	13.17	18.25	157.25	168.09
PAT				8.10	4.34	2.96	4.56	5.10	13.26	21.04	29.16	251.19	268.51
PAT				8.10	4.34	2.96	4.56	5.10	13.26	21.04	29.16	251.19	268.51
Refund of deposit											840.00	0.00	1124.00
	Cash flow for IRR		-1964	8.10	4.34	2.96	4.56	5.10	13.26	21.04	869.16	251.19	1392.51
	Post tax IRR		**3.01%**										
			61.50										
	Pre tax equivalent		4.90%										